STIMSON

INTERNATIONAL ORDER & CONFLICT

REPORT

# U.S.-Russia Military-to-Military Dialogue

Track-2 Format
Key Findings, 2020-2021

US-Russia Military-to-Military Dialogue

Russia Program

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**Note:** The statements made and views expressed are solely the responsibility of the authors and contributors.

# Executive Summary

This report summarizes the findings of four online Track-2 discussions (2020-2021) between American and Russian retired senior military officers in the framework of the U.S.-Russia Military-to-Military Dialogue, initiated by the EastWest Institute in 2020 and later relaunched at the Stimson Center.

The report presents an overview (authored by Nataliya V. Stepanova) of opinions and ideas voiced by the participants and invited experts on topics discussed at the Dialogue sessions, including strategic stability, arms control, China, emerging technologies, cybersecurity, and military incidents.

In the annexes of the report, principal contributors and experts affiliated with the project provide more detailed analyses of select key topics.

In "Nuclear Deterrence: Cruise Missiles and Autonomous Nuclear Weapon Systems," Vladimir Z. Dvorkin outlines the role of nuclear weapons as a means to deter a large-scale war, and states that nuclear deterrence capabilities will be maintained at the necessary level in the foreseeable future, despite the impact of new technologies. He concludes that weaponry systems such as cruise missiles (CM) with nuclear payloads, drones with nuclear propulsion units, and nuclear warheads not only stand in the way of negotiation processes, but also increase the likelihood of nuclear conflicts. Dvorkin recommends concluding a multilateral agreement to renounce nuclear CMs.

In "Are Current Cyber Defense Practices Enhancing Cyberspace Security and Stability?" Bruce W. McConnell outlines the dangers of the conflict in cyberspace that continue to intensify. He discusses the increasing securitization of cyberspace, the escalation of the cyber arms race, and other outstanding concerns in this domain. McConnell concludes by noting that the international consensus is currently limited to non-binding norms that do not reflect the current dynamic of state-on-state cyber conflict. He suggests that governments work toward an international agreement on binding rules for conflict in cyberspace, to which Track-2 diplomacy and other communication channels can contribute.

In "Impact of ICT on the Level of Strategic Stability: A New Format," Natalia P. Romashkina discusses the latest developments in information and communications technologies (ICT), the influence of ICT on strategic stability and international security, and the ongoing interstate dialogue on these issues. She argues that the dialogue between the U.S. and Russia should ultimately aim at signing a document obliging states to abandon cyberattacks on each other's strategic command and control systems to prevent an unintended exchange of nuclear strikes.

Romashkina regards the U.S.-Russia negotiation process as essential for strategic stability and for restructuring the arms control system from bilateral to multilateral formats.

In "Nuclear Deterrence and Escalation Management in Near-Peer Competition," James A. Siebens outlines the risks and costs of unintended escalation between the U.S. and Russia, and argues that strategic stability based on the principle of "mutually assured destruction" will remain unaltered under the developing great power rivalry between the U.S., Russia, and China. Siebens

also notes that efforts to revise the status quo via political warfare or conventional military means may have destabilizing consequences. He concludes that it is critical to pursue measures for reassurance, transparency, and clearer communication of national strategic means in anticipation of future crises.

In "Possible Approaches to Reducing the Risks of Nuclear Escalation at the Regional Level," Pavel S. Zolotarev argues that a full-scale nuclear war between Russia and the United States could result from the escalation of a local military conflict, and that preventing this is a common interest. He then discusses practical steps to avoid such a scenario. Zolotarev believes that NATO's intention to acquire the ability to deliver high-precision strikes against Russia's important infrastructure assets, and to use the European missile defense system to counter similar strikes, will increase the risk of a nuclear conflict. He concludes that the deployment of medium-and shorter-range missiles in Europe is unacceptable and extremely dangerous from the standpoint of nuclear conflict escalation.

# Introduction

Shortly after the destroyer USS *Porter* entered the Black Sea on October 30, 2021, Russian President Vladimir Putin remarked that "it could be seen through binoculars or through the sight of our defense systems."[i] This reference was just another signal of Russia's concern about U.S. and NATO's recently increased military activities close to Russia's national borders, underpinning the Kremlin's desire to come to agreed "red lines" with its Western counterparts to avoid dangerous military escalation.[ii] President Joe Biden, however, ahead of his December 7, 2021, video call with Vladimir Putin, said that he doesn't "accept anybody's red lines."[iii]

In practice, the lingering debate between American and Russian leadership on "red lines" ultimately should be translated into metrics of a hot war threshold between the two most powerful nuclear nations, which is highly dependent on the efficiency and effectiveness of communication protocols and levels of mutual understanding between their respective militaries. A solid agreement on this matter can hardly be reached and properly implemented without extensive involvement of the military leadership and defense communities of both countries in the strategic conflict risk reduction negotiation process, as well as further doctrinal and regulatory institution-building. Since the 2016 disruption of the official military ties between the United States and Russia, efforts to return to minimum levels of mutual engagement by the two militaries have been installed, including in support of the deconflicting efforts initiated at the Biden– Putin presidential summit in Geneva on June 16, 2021.

The U.S.-Russia Military-to-Military Dialogue, a bilateral Track-2 initiative, was launched by the EastWest Institute (EWI) in spring 2020, and aimed to help narrow the existing gap in official communications between the military communities of the two powers. After the closure of EWI at the end of 2020, the project and its staff migrated to the Stimson Center. The project aims to contribute to strategic conflict risk reduction and confidence building by sustaining regular informal discussions among senior retired Russian and American military officers, supported by issue-focused experts, on pressing bilateral and international security issues.

In 2020-2021, four online discussions involving four Russian and four American retired generals were held. The first two meetings preceded the June 2021 Biden-Putin summit and the subsequent intensification of bilateral interagency consultations on a variety of issues of common interest, with strategic stability and military conflict risk reduction at the top of the list. The official set of priorities, as formulated at the summit, resonated well with the major topics of discussion among Russian and American retired generals participating in the Dialogue. Beyond mutual updates and an exchange of views on recent developments in U.S.-Russia relations, participants focused on several of the most critical areas affecting strategic stability, including the future of arms control and WMD non-proliferation treaties, evolving military doctrines, regulation of new types of weapons, cyber-security, prevention of dangerous military activities, avoidance of military incidents, and the NATO-Russia standoff, as well as major regional conflicts where Russia, the United States, and their respective partners have vital stakes.

Participants also strived to compare and develop deeper understanding of each other's threat perceptions and areas of disagreement, and explored opportunities for alignment of U.S. and Russian

military policies. On most of the issues discussed, the participants were roughly on the same page. Some topics, e.g., eventual NATO expansion, regulation of new warfare technologies, and the ways to engage China in the strategic arms control negotiations, remain subject to further discussion and joint assessment.

The Dialogue series of meetings, and related expert analysis and outreach activities, not only facilitate mutual understanding and trust among the participants, but also generate practical policy advice for bilateral cooperation that can ultimately contribute to Track-1 consultations.

During the second phase of the project in 2022-2023, the Stimson Center plans to build on the trust and mutual understanding developed during the first phase. The project will expand the array of activities of the Dialogue, including by launching expert working groups in support of joint assessment of a few critical challenges of common concern and development of practical suggestions. Expert work will include a series of research and policy publications and webinars.

The future activities of the project will build on key findings, viewpoints, and suggestions of participants.

This report summarizes those findings and reflections. At this point, the Stimson Center presents the variety of expert ideas that emerged in the course of the Dialogue activities, without suggesting that all of them reflect consensus views of the participants. The section *Major Assessments and Suggestions* provides an expert overview of most important findings and suggestions submitted by principal participants and experts involved; some of these have not yet been thoroughly discussed and will become topics for joint assessment in the next rounds of the Dialogue deliberations. The report also includes issue-focused articles authored by select participants and experts involved in the discussions of the Dialogue to date.

The ongoing geopolitical crisis in Europe and further deterioration of the U.S.-Russia bilateral relationship following the outbreak of Russia-Ukraine hostilities on February 24, 2022 does not make this report obsolete. On the contrary, the usefulness of a trusted dialogue between the militaries against such a backdrop becomes more compelling, and strategic ideas developed in the course of Track-2 discussions, being tested in the light of harsh realities of an unfolding real-time conflict, can be more quickly transformed into practical suggestions.

On behalf of the Stimson Center's Russia Program, I wish to express our deepest gratitude to Dialogue participants and experts, who generously gave their time and talents to this project. We are immensely grateful to the Carnegie Corporation of New York, whose support made possible this publication and the entire project.

Vladimir N. Ivanov

Director, Russia Program
Stimson Center

February, 2022

# Dialogue Discussions Overview: Major Assessments and Suggestions*

Nataliya V. Stepanova**

The ongoing transformation of the international relations system and its regionalization presents an array of new challenges to international security. In this light, maintaining U.S.-Russia cooperation and working relations in key areas is an important factor in global stability and peace. The Dialogue participants noted the positive tone of bilateral relations since the Biden administration came to office. The recent meetings of the leaders of both countries and increased working contacts, including visits of several American officials to Moscow, and meetings of military and security leaders all speak to the pragmatic approach displayed by the political and military leadership of Russia and the United States. It is imperative to restore regular cooperation at all key levels of military leadership.

## Strategic Stability

Although the bilateral relationship is subject to increasing tensions, the June 2021 U.S.-Russia Presidential Joint Statement[iv] reaffirmed the Reagan-Gorbachev principle that a nuclear war cannot be won and must never be fought.[v] Strategic stability negotiations that are currently under way can provide an opportunity for both sides to prioritize the issues they see as strategically significant.

Another positive development is the establishment in September 2021 of two working groups on strategic stability issues: the Working Group on Principles and Objectives for Future Arms Control, and the Working Group on Capabilities and Actions with Strategic Effects. Such productive negotiations on this topic had not been seen for almost 10 years. This signals serious commitment of the parties and can lay the foundation, if not for future arms control treaties, for particular agreements and arrangements in this area. Perhaps, during such negotiations, the parties will succeed in finding a compromise between the U.S. desire to "deepen" arms control (to include all nuclear warheads and their delivery vehicles) and Russia's desire to "broaden" it (to include all nuclear and non-nuclear weapons systems that may affect strategic stability).

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* This text builds on the ideas discussed in the course of the Dialogue to date and on several more detailed suggestions by the Russian and U.S. expert communities, subject to further discussion. Framing of these ideas and suggestions is the sole responsibility of the author and does not represent the position of the Stimson Center nor of any Dialogue participants.

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*Actionable ideas:*

- Taking into account reports of China's nuclear buildup, reevaluate the strategic stability landscape, which now apparently involves three parties;
- In order to increase the effectiveness of the dialogue on strategic stability, conduct it on a regular basis with the participation of a wide range of military and civilian officials;
- Conduct consultations on strategic stability issues within the framework of the NATO-Russia dialogue.

# Arms Control

The ongoing Russian-American talks address the entire spectrum of factors affecting strategic stability, while it is proposed not to overload the dialogue with issues of secondary importance. The priority is to conclude a new bilateral agreement that would replace the New START treaty after its expiration in 2026, taking into account vulnerabilities of the current agreement.

First, New START does not cover some of the existing nuclear weapons delivery systems, such as non-strategic ballistic and cruise nuclear missiles and new "exotic" nuclear weapons delivery systems, as well as high-precision non-nuclear strategic weapons. Secondly, it does not include restrictions on missile defense, the unlimited growth of which has led to the development of many new systems aimed at defeating missile defense. Thirdly, the arms control provisions include only two parties, without affecting other countries that are building up or planning to build up their nuclear arsenal. Both the U.S. and Russia should be encouraged to conclude a comprehensive agreement with a common ceiling for both strategic and non-strategic nuclear weapons, as well as deployed and non-deployed nuclear weapons.

The China factor will also be essential in future negotiations on this issue, as a result of uncertainties with regard to the development of the country's nuclear capabilities.

*Actionable ideas:*

- First, determine the priority areas of the future arms control regime, taking into account the shortcomings of the New START treaty, which does not correlate with the current situation;
- Conclude a comprehensive agreement with a common ceiling for both strategic and non-strategic nuclear weapons, as well as deployed and non-deployed nuclear weapons;
- Bilaterally discuss the issues of missile defense, hypersonic weapons, outer space, and cyberspace;
- Negotiate regional agreements that would cover the deployment of medium-range missiles in Europe or Asia (in addition to a comprehensive arms control treaty).

# China

Military and particularly nuclear modernization in China presents a certain challenge for Russian-American bilateral negotiations. This is primarily due to significant differences in the balance of Russian-Chinese and U.S.-Chinese relations. The American approach entails strategic competition with the PRC, while Russian-Chinese relations represent a comprehensive partnership and strategic reciprocity. At the present moment, taking into account significant differences between the Chinese, American, and Russian approaches to nuclear policy, conclusion of a trilateral nuclear arms control agreement does not seem feasible in the near future. Possible limitations of the nuclear buildup could be agreed upon in a multilateral format. Nuclear reductions are unlikely to be achievable in the short term.

Rapid modernization of China's nuclear forces in recent years presents a challenge for arms control. This modernization focuses on both strategic and regional threats. In particular, China is building up its arsenal of intermediate-range ballistic missiles and cruise missiles, equipping existing missiles with multiple independently targetable reentry vehicles, boosting the People's Liberation Army Navy (PLAN)'s submarine capabilities, and building a comprehensive early warning system including both ground-based and space-based components. Over the past year, information surfaced about the construction of about 300 silos in the northern regions of China, presumably dedicated for intercontinental ballistic missiles. An alleged test of a partially orbital bombardment system with a hypersonic glide vehicle also became known. Gen. Mark Milley, chairman of the U.S. Joint Chiefs of Staff, called this development "very close" to a "Sputnik moment."[vi] In addition, the Chinese government heavily encourages R&D investments and effectively exploits the achievements of the private sector in many areas related to high technologies. China is also accused of large-scale intellectual property theft from leading Western high-tech companies.

It is currently not feasible to involve China immediately in the arms control process, but it is necessary to carry on with dialogue in order to clarify Chinese leadership plans and intentions, as well as possible changes in their nuclear strategy.

*Actionable ideas:*

- Engage China in arms control negotiations on a Track-2 level; the Russian side would prefer to involve the UK and France as well;
- Discuss whether new changes in the Chinese nuclear arsenal are an attempt to change the nuclear doctrine or an effort to maintain the status quo. This is important for both the United States and Russia;
- Maintain a dialogue on reducing nuclear risks, primarily between China and the United
- States.

# Emerging Technologies

Emerging technologies bring additional uncertainty to the sphere of strategic stability, since the specifics of their development and possible applications are not fully clear yet. Their introduction could

change the nature of nuclear deterrence, as well as the balance of power between nuclear weapon states.

Nuclear weapons command and control infrastructure is increasingly dependent on computer networks (in Russia, to a lesser extent) and on space-based infrastructure. Modern satellites and infrastructure that provides access to satellite imagery allow even commercial entities and individuals to use it for their benefit. On one hand, this information can help monitor and verify the implementation of arms control agreements but, on the other, it can also be used to gain military advantage. Moreover, if some of the data that the parties would prefer to discuss behind closed doors becomes public, this may have negative consequences.

As for so-called hypersonic weapons, they are not precisely a new technology, since ballistic missiles are also capable of traveling at hypersonic speed during the reentry phase. A new element is the ability of the reentry vehicle to maneuver with increased accuracy due to deceleration, which reportedly allows it to more effectively defeat ballistic missile defenses and more accurately hit certain types of targets. Hypersonic gliders are capable of staying airborne for a long time after reentering the atmosphere, which increases the range of these systems. Currently, the United States, China, and Russia are participating in a hypersonic arms race, both nuclear and non-nuclear, land-based, air-based, and sea-based. It seems necessary to develop a common definition of a hypersonic weapon and take such systems into account in future arms control agreements.

High-precision strategic-range weapons capable of effectively hitting strategic targets such as critical infrastructure, nuclear command and control facilities, and nuclear forces can change the nature of strategic deterrence and strategic stability. Using these systems lowers the nuclear threshold, and their deployment may create incentives for a preemptive strike. Russia and the United States are actively developing such systems. Arms control measures with regard to such weapons should focus on preventing proliferation of relevant missile technologies and preventing covert preparations for their massive first use.

Autonomous systems also have an impact on the global military balance, as they allow actors to project military power without increasing the vulnerability of personnel. Currently, they are actively used, among other things, for disabling civil and military infrastructure. The emergence of fully autonomous systems capable of determining targets, performing combat missions without human intervention, and maintaining autonomous functionality over a long period of time is utterly undesirable. Neither should we allow for autonomous systems to become more lethal. The use of commercial unmanned vehicles for military purposes, primarily for causing physical damage, is also dangerous.

The field of artificial intelligence (AI) is one of the areas of technological competition between major powers. A particularly fierce rivalry is taking place between the United States and China. The latter aims to surpass the United States in this area over the course of the next decade. AI is already driving radical changes in data collection and analysis, including intelligence gathering. The use of AI as a disinformation tool also poses a significant threat. Autonomous combat systems also can be powered by AI. Commercial entities are far ahead of government agencies in terms of applying AI, so establishing military-civilian cooperation in this area can give some states a serious advantage over others. Because of unpredictability, the use of AI is not recommended in the field of

critical infrastructure management, especially that related to command and control of nuclear weapons.

Most new technologies become cheaper and more widespread over time. This tendency poses a threat that non-state actors will apply new technologies with malicious intentions. The development of new technologies creates a demand for highly trained technicians, which makes increased demands on education and on preventing "brain drain," another area of competition between major powers. A related tendency restricts the activities of rival powers' high-tech companies, which clearly manifests itself in U.S.-China relations.

*Actionable ideas:*

- Work out in detail possible plans of action in the field of new technologies and their impact on strategic stability, preferably in a multilateral format;
- Work out (multilaterally if possible) a common approach to the definition of hypersonic weapons and their inclusion in further arms control negotiations;
- Promote unilateral measures to prevent the proliferation of new missile technologies and their massive use.

# Cybersecurity

A recent positive development is the joint cybersecurity resolution submitted by Russia and the United States, and recently approved by the First Committee of the UN General Assembly.

In the framework of the current mil-to-mil Dialogue, assessment of cyber threats in the context of the strategic stability agenda emerged as a particular topic. Because cyberspace is a unique environment with a number of unique characteristics, including the absence of national borders, the very first challenge to reaching any agreement is the issue of cyber threats attribution.

The first step would be to assess the practical vulnerability of strategic infrastructure to cyber threats. For example, the Russian side indicates that Russia possesses an automatic nuclear weapon control system, Perimeter (also known as Dead Hand), which is not exposed to threats of this type. Therefore, a common understanding of threats should be a top priority for nuclear weapon states.

At the same time, a number of unilateral measures could, at this stage, help to reduce risks in cyberspace. These measures could include showing restraint and refraining from interfering with command and control systems and early warning systems. At the planning stage, Russia and the United States could refine their nuclear doctrines in the context of the possible use of nuclear weapons in response to a cyberattack. With regard to possible joint actions, it is recommended to increase transparency by creating Joint Data Exchange Centers (JDEC), preferably in the virtual domain. Back in 2000, Russia and the United States signed a memorandum on the establishment of a JDEC in Moscow. Despite the fact that for a number of reasons such a center turned out to be unviable, states could return to this initiative, taking into account the experience gained earlier. China and other P5 states can be invited to take part in that initiative.

*Actionable ideas:*

- Conduct an assessment of practical vulnerability of strategic infrastructure to cyber threats;
- Implement unilateral measures to reduce the dependence of nuclear and military infrastructure on cyber means, as well as exhibit restrained behavior in the field of cyberspace;
- Establish a virtual JDEC;
- Establish a dialogue between related military agencies of the two countries, and introduce the practice of notifications prior to exercises in cyberspace, as well as military exercises with cyber components.

# Military Incidents

A conflict with the use of conventional weapons presents the greatest risk of unleashing a nuclear war. Since the end of the Cold War, major security threats have shifted to the regional level. The system of conventional arms control, primarily in Europe, directly affects the aspect of strategic stability in Russian-American relations. Recent events indicate an unprecedented rise of tensions in the region. Notably, the primary danger in this regard is not presented by new types of weapons per se; it is the provocative actions of both sides, or initiated by a third party, that can lead to an actual armed clash.

It seems that concrete steps are needed, both at the doctrinal and practical levels. When developing their nuclear doctrines, both Russia and the United States could limit the scenarios for the use of nuclear weapons and abandon the provision that allows for their use in response to a conventional attack. Modern means of non-nuclear deterrence are quite suitable for these purposes. Avoiding military incidents is inextricably linked to the interaction between the militaries of Russia and the United States, implying involvement not only of the Chiefs of Staff, but also, which is particularly important, commanders at lower levels.

The relations between Russia and NATO countries, which affect first and foremost the security environment in Europe, present a separate challenge. The conclusion of any formal agreement in this area suggests the need for the display of political will from both parties. Quite often, the proposals of a party that deserve attention are rejected by the opposite party solely because it was the first side that proposed them.

*Actionable ideas:*

- Review U.S. and Russian doctrinal documents by limiting scenarios for the use of nuclear weapons;
- Restore official contacts without delay, including the NATO Military Liaison Mission in Moscow, as well as the Russian Permanent Mission to NATO;
- Create special communication channels—hot lines—in sensitive regions such as the Baltic Sea and the Black Sea regions;

- Exercise restrained behavior and take unilateral measures to reduce military activity in the border areas;
- Conduct joint exercises or invite observers, and use the notification system, if necessary, in a "quiet" format.

# Other Issues

The ongoing coronavirus pandemic is having a significant impact on the global strategic environment. Its consequences have yet to be evaluated. However, it provides an additional impetus for building Russian-American cooperation not only with regard to a bilateral agenda, but also on a set of global challenges, including healthcare and climate change issues.

At a time when the issues of maintaining domestic stability are of greatest relevance for Russia and the United States, it is necessary to concentrate efforts on the overlapping interests of the two powers, while minimizing the conflict agenda and exploring possible topics for dialogue in the areas where their interests coincide in a longer term. Those issues, which have the potential to mitigate current geopolitical controversies, can include building up humanitarian contacts, cooperating in the field of fundamental science, and maintaining cultural and historical heritage.

# Annexes

The following annexes feature issue-focused articles authored by participants and experts involved in the Dialogue sessions. They provide deeper insights on select major topics of discussion and will serve as milestone reference materials for further expert work under the Project agenda in 2022-2023.

# Annex 1. Nuclear Deterrence: Cruise Missiles and Autonomous Nuclear Weapon Systems

Vladimir Z. Dvorkin*

For decades, nuclear deterrence at the global and regional levels has kept us safe from large-scale wars using these kinds of weapons. It will continue to do so in the foreseeable future, despite the doubts expressed by some experts over the impact of new technologies associated with the development of artificial intelligence, hypersonic weapons, omnipresent space monitoring capabilities, and other innovative systems.

These factors are believed to be capable of undermining nuclear retaliation capabilities and severely disrupting the strategic equilibrium. However, continuous improvements, underpinned by the same factors of stealth, defensibility, and responsiveness, allow us to believe that nuclear deterrence capabilities will be maintained at the necessary level.

In the mutual nuclear deterrence between Russia and the United States, the central role belongs to the countries' nuclear triads consisting of land-based ICBMs, submarine-based SLBMs, and heavy bomber aircraft (HBA) carrying cruise missiles (CMs). The composition and quantitative parameters of these triads have always been central to the negotiation and adoption of the strategic offensive arms reduction and limitation treaties (START), up to and including the most recent New START. Recently, Russia and the United States have developed new types of weapons, including hypersonic and gliding systems capable of carrying nuclear warheads (NWH), and (in Russia) nuclear autonomous torpedoes. If Russia and the United States intend to continue their START talks, which have proven very instrumental, new weapons systems could obstruct that path to an extent.

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In addition to assessing these systems, it also seems appropriate to analyze the components of the traditional triad in terms of how they impact the effectiveness of nuclear deterrence and nuclear arms control generally outside the START framework. This applies primarily to nuclear CMs.

## Cruise Missiles

Conventionally equipped CMs are an effective precision weapon system capable of engaging a wide range of land and seaborne targets in virtually any armed conflict environment and at any distance. This has been confirmed by the experience of CM combat uses over the last 30 years, first by the U.S. and later by the Russian Armed Forces.

CMs with NWH are another matter. Initially included in the strategic nuclear triads of the USSR and the United States as HBA-borne weapons, they were listed as subject to the INF Treaty between Russia and the United States, although they could carry either nuclear or non-nuclear payloads. They rapidly evolved as part of air-, ground-, and sea-based systems in a number of nuclear states.

Doubts about the expediency of using nuclear CMs in strategic triads are not new. A number of prominent politicians, scientists, and experts, including former U.S. Defense Secretary and Stanford University professor emeritus William Perry, have on many occasions suggested that nuclear CMs should be renounced based on an international treaty.

In the U.S.-Russian mass nuclear exchange models, the pivotal role always rested with land-and sea-based strategic ballistic missiles, capable of being launched instantly and swiftly delivering devastating nuclear strikes in the enemy territory, something nuclear CMs are not capable of.

It is difficult to imagine the function of nuclear CMs in a retaliatory strike after hundreds of ICBMs and SLBMs have struck enemy territory, which is already in an apocalyptic state, devastated by radiation, fires, and other consequences. Airborne CM guidance systems are unlikely to be operational in this environment.

As a very minimum, the view that CMs do not contribute appreciably to retaliatory strike capability is partly supported by the New START parameters where, according to Article III, the number of nuclear CMs on HBA does not count toward the total number of nuclear warheads on deployed carriers; instead, it is only the number of TBs that counts ("for each deployed heavy bomber, one nuclear warhead is counted").

If one tries to assess the role of nuclear CMs in other forms of massive nuclear strikes (first, retaliatory counterstrike), issues with their use become evident in regards to organization, planning, and effectiveness. If launched prematurely, ahead of ICBMs and SLBMs, they would compromise the stealth of the first strike. In a retaliatory counterstrike, even if the CMs could be launched from airborne HBA, they could arrive at the target territory after massive nuclear explosions, as noted above.

If HBA were to be kept part of the nuclear triad, they could carry only nuclear bombs. Other HBA would carry only non-nuclear CMs. This is all the more likely as their expenditure rates, as the experience of regional armed conflicts shows, are always significant. At present, the composition, quantities, and deployment types of CMs with different kinds of payload are becoming less and less

certain worldwide. The U.S. is considering plans to deploy CMs in the Asia-Pacific region to deter China.

New types of such missiles, both subsonic and hypersonic, are being intensively developed and adopted. Currently, all eight nuclear states already have missiles with both nuclear warheads and conventional payloads, the latter being readily replaceable with nuclear ones.

As these states steadily grow their CM stockpiles, it becomes extremely uncertain how many of them are equipped with nuclear warheads. According to Igor Braichev (Russia), a nonpublic high-level expert with extensive experience in the research and modeling of nuclear weapon operations, "CMs undermine the principles of nuclear deterrence."[vii]

Given the indistinguishable role of nuclear CMs in nuclear deterrence and the lack of any rational scenarios for their use, it seems expedient for nuclear states to reach a multilateral agreement or a treaty whereby they would undertake not to equip all CMs with nuclear warheads. A multilateral treaty should include international verification, inspection, and notification mechanisms, which is not achievable in the foreseeable future. Therefore, at the first stage, renunciation of nuclear CMs could be implemented as an agreement providing for a set of confidence-building and transparency measures.

A positive response to such an initiative could primarily be expected from the United States and Russia, because, as noted above, nuclear CMs contribute much less to these countries' nuclear deterrence systems as compared to ICBMs and SLBMs. One could also count on the UK and France to agree to renounce their nuclear CMs, thus inviting other nuclear states to follow suit.

An additional argument in favor of renouncing nuclear CMs could be their relatively low reliability, as demonstrated by actual launches of non-nuclear CMs. This creates an additional security hazard under various conditions if they are equipped with nuclear warheads.

It is also important to note that, were nuclear CMs taken off the table, it would be much easier to achieve treaties and agreements not only in the strategic arms domain, but in relation to non-strategic weapons as well.

## Autonomous Nuclear Weapon Systems

Of all known new weapons, Russia's strategic nuclear arms include the Sarmat ICBM, the Avangard missile system with a gliding wing unit, the Poseidon supertorpedo (nuclear drone), and the Burevestnik unlimited range cruise missile with a nuclear propulsion unit.

The first two items fit well with the current New START. The Sarmat ICBMs are intended to replace silo-launched Voevoda ICBMs that are part of the Strategic Missile Forces order of battle. The Avangard system, which uses the UR-100N UTTH ICBM as a booster for its gliding wing unit, is also deployed in the Voevoda ICBM silos. The fact that the United States and Russia have agreed to include Avangard in the New START framework is evidenced by a direct on-site inspection of this system by American inspectors in accordance with treaty procedures.

Therefore, the Sarmat and Avangard missile systems were not formally an obstacle to the extension of New START, or to the negotiations on a new treaty.

The Poseidon and Burevestnik systems could be considered for inclusion in a hypothetical new treaty if similar systems or other new designs existed in the United States that would be subject to control and would not upset the overall balance of deterrence capabilities. At present, a solution to this problem seems extremely difficult.

In this environment, it is expedient to assess the contribution of the Poseidon and Burevestnik systems to nuclear deterrence capabilities, taking into account that the existing and upgraded triad of the Russian strategic nuclear forces will ensure, in the foreseeable future, guaranteed nuclear deterrence that any U.S. missile defense or high-precision non-nuclear weapons will not be able to tilt.

The Poseidon system capability estimates vary depending on the delivery range, speed, and depth, the set of U.S. anti-torpedoes, detection systems, and other characteristics. Experts believe that Poseidon systems with nuclear and conventional payloads could be used to engage U.S. aircraft carriers, two naval submarine missile carrier bases, coastal infrastructure, and other key facilities. Assessments of various hypothetical Poseidon launch preparation scenarios and the weapon's uncertain survivability when confronted with active countermeasures all testify to its insufficient effectiveness.

In the context of the tasks assigned to this type of weapon, the central question is: What sort of conventional or nuclear war scenarios have room for Poseidon uses? If we are talking about full-scale conventional warfare, which side is capable of striking first, Russia or the United States? The obvious answer is neither, because if it were the United States, then, according to the Russian Military Doctrine, there would be nuclear retaliation, and for Russia it would be suicidal madness to start such a war.

If this weapon were to become a deal-breaker in the highly desirable extended START negotiations, and a push to the nuclear arms race, it would be wise to freeze its further development, while preserving any past engineering and manufacturing accomplishments for a case of some totally unpredictable development.

Similarly, there is no realistic scenario under which the Burevestnik cruise missile would be capable of contributing to Russia's nuclear deterrence capability underpinned by the existing SNF triad. At the same time, it should be remembered that the probability of a successful delivery of cruise missiles with much shorter flight times as compared to the Burevestnik is noticeably lower vs. SNF weapons. The experience of building small nuclear propulsion systems in nonmilitary spheres could add more value.

# Conclusion

Summing up, the weaponry systems we have examined — cruise missiles with nuclear payloads, drones with nuclear propulsion units, and nuclear warheads — not only stand in the way of negotiation processes, but also increase the likelihood of nuclear conflicts of various scale.

Wiping hardly controllable nuclear CMs and drones off the nuclear landscape would not undermine the security of any state. This is supported by the lack of rational scenarios for the use of these systems or of their contribution to nuclear deterrence capabilities, as well as by their vulnerability to enemy countermeasures, and the difficulties of ensuring nuclear security.

# Annex 2. Are Current Cyber Defense Practices Enhancing Cyberspace Security and Stability?

Bruce W. McConnell*

Conflict in cyberspace continues to increase in severity and become more dangerous to everyday life. Cyber crimes such as ransomware attacks, supported or tolerated by states, are a growing menace. Cyber operations conducted by governments are becoming more aggressive. The networks that connect people around the world and power the modern economy provide the perfect domain for undermining powerful states and robbing businesses and individuals on an entirely new and larger scale. At a time when humanity is more dependent than ever on a safe, secure, well-functioning cyberspace, we are headed in the wrong direction. It isn't war, but it certainly doesn't feel like peace.

How did we get here? Conventional approaches to defense have proven ineffective in cyberspace. Nations have learned that, in cyberspace, "offense wins." Accordingly, they have abandoned conventional theories of deterrence developed and honed in other domains, for new strategies of conflict and conflict management.

Today, all major cyber powers[viii] are conducting continuous cyber operations on their competitors' networks below the threshold of armed conflict. Because of democratic participation and the way policy is developed in the United States, the U.S. government has written extensively about this operational practice, which they call "persistent engagement."[ix] But make no mistake: The U.S. approach is quite similar to that of its major competitors, including Russia and China.

As a practical matter, military forces now operating in the interconnected global domain of cyberspace experience deep, continual encounters with their competitors inside each other's automated systems. In addition, most nations' networks extend essentially everywhere and are intertwined with their competitors'. There are no effective national boundaries; code itself becomes part of the terrain. We collectively operate in an environment of inherent systemic vulnerability.

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# Doctrinal Underpinnings

In 2018, the U.S. declared that the previous doctrine of restraint in cyberspace and "cyber deterrence" as a strategy had proved to be ineffective. Extremely capable competitors were deliberately operating below the threshold of armed conflict against U.S. interests. No single incident or attack was sufficient to breach the threshold, but the cumulative effects of attacks (for example, in the theft of intellectual property) were of strategic significance, warranting a new approach.

The U.S. response included a reversal of previous policy that limited military cyber operations to military networks, except within zones of declared hostility. Recognizing that better security alone could not prevent successful attacks, national cyber strategies shifted from defense to a combination of defense and persistent engagement. Persistent engagement goes beyond an earlier doctrine, "active cyber defense," i.e., measures carried out with the goal to neutralize or mitigate the impact of a specific ongoing malicious cyber operation or campaign.[x] An example is the takedown of the computers that are controlling an ongoing disinformation campaign. Today, national cyber forces "defend forward" — they prospectively disrupt or halt malicious cyber activity at its source, and persistently contest malicious cyber activity in day-to-day competition.

A key element of the new approach is the concept of "initiative." Operationally, seizing and maintaining the initiative equals setting and resetting the conditions for security in order to place the competitor at a disadvantage or to force them to adjust. The base goal of these tactics is to reduce the effects of current and future malicious cyber campaigns, and perhaps to instill caution in a competitor by demonstrating their networks' vulnerability.

At the level of strategic theory, it is a new world — in part. There is a new lexicon, one that deals with campaigns and interaction. Activity is continuous, not episodic. It's cumulative, it's exploitative. In addition to persistent engagement and defend forward, we have "hunt forward" operations, offensive operations, and information operations.

Moreover, unlike in conventional warfare where victory occurs on the battlefield, and unlike in nuclear warfare where victory is defined by the absence of war, the new theory of cyber warfare is continuous activity and maintaining the initiative, as an alternative to war. The goal is to anticipate, to "defend forward" in time, and reduce the options available to the competitor. The traditional distinction between offensive and defensive operations is rapidly eroding.

# International Law and Practical Measures

All major cyber powers are operating more or less in this manner today. These countries argue (or would argue, if they admitted their conduct) that their activities are permitted under international law. But it is a gray area. For example, Herpig asserts that the only legal basis for conducting a nonconsensual active cyber defense operation on an allied or unaligned state's network may be their failure to root out malicious activity occurring from their networks.[xi] Such "due diligence" falls within the consensus United Nations cyber norms.[xii] The extent to which these

activities are legal, and how they fit within the consensus United Nations norms, has not been fully analyzed.[xiii]

In the meantime, there are hazards. Lack of transparency about the nature and extent of current cyber operations creates instability in cyberspace and increases the chances of miscalculation. You find the competitor's code in your network and you do not know its purpose. Is it there to steal date or to disrupt the network? This is destabilizing and dangerous.

Across the world, in smaller countries and particularly in non-aligned nations, strong concerns have been voiced over the increasing securitization of cyberspace and further escalation of the cyber arms race. Current tactics are conducted by all competitors unreservedly in defense of their own national interests; the interests of allies and partners may not be fully aligned. Thus, the current approach raises concerns about being caught in the middle of major cyber power competition and being drawn into an unwanted conflict.

## A Choice to Be Made

What is the alternative? Some propose an approach reminiscent of Thomas Friedman's "Golden Arches" theory in The Lexus and the Olive Tree, known as "entanglement deterrence."[xiv] Others have suggested that the alternative is layered cyber deterrence, a strategy that combines multiple instruments of power and focuses less on offense and more on defense based on "positive objectives linked to long-term national strategy."[xv]

The latter argument is sound, but the proposed strategy, to the extent it is not already established in national practice, avoids acknowledging the new reality. It is true that cyber operations cannot be considered in isolation. States already respond to cyber intrusions using diplomacy, threats of military force, legal indictments, sanctions, and a host of other instruments. Furthermore, the fact that much of critical infrastructure is in private hands should change how states think about competition in cyberspace. Before taking offensive actions, a nation should gauge the security and resiliency of its private networks, and its ability to ensure continuity of the economy after a major cyber incident. But states already *are* on the offensive, and their networks, and their economies, are at risk.

The degree to which the structure of the international system has changed is less significant than the degree to which connections between states and society have grown. The world still has great powers, international institutions, and globalized economic activity. The goal should be to protect those connections, not use them to launch cyber campaigns against competitors. Yet today, instead of working to make cyberspace safer and more secure, states are using the public space of the Internet as a domain of conflict without rules. It is as if rival clans were fighting in the *agora*, the open public marketplace, and in the schoolyards. Governments should moderate this behavior.

To date, the international consensus is limited to non-binding norms that do not reflect the current dynamic of state-on-state cyber conflict. Governments should work harder to reach agreement at the United Nations on binding, enforceable rules for conflict in cyberspace, as they have done more or less successfully in other domains. Specifically, such rules should provide for transparency and notification in cyber operations, particularly with regard to third countries, including

allies, on whose networks cyber operations are being conducted. Increased transparency, the regular exercise of emergency communications channels, Track-2 diplomacy, and other confidence-building measures can contribute to the development and ultimate viability of such formal agreements.

# Annex 3. Impact of ICT on the Level of Strategic Stability: A New Format

Natalia P. Romashkina*

After the meeting of the presidents of Russia and the United States in June 2021 in Geneva, consultations on strategic stability began at the interdepartmental level under the auspices of the Russian Ministry of Foreign Affairs and the U.S. Department of State. The Russian interdepartmental delegation is headed by the Deputy Minister of Foreign Affairs of the Russian Federation Sergey Ryabkov and the American delegation by Deputy Secretary of State Wendy Sherman. At the regular meeting, it was decided to form two working groups: the Working Group on Principles and Objectives for Future Arms Control, and the Working Group on Capabilities and Actions with Strategic Effects. After the meetings of these groups, a third plenary session is scheduled. Fundamentally new is the fact that, as part of this comprehensive dialogue, expert consultations on cybersecurity under the auspices of the Russian Security Council and U.S. National Security Council are being held in Geneva.

## Introduction

Not so long ago, skeptics suggested that it was inexpedient to discuss, even at the expert level, the issues of linking nuclear and cyber problems in the military field, that no agreements in this area were possible, and so on. However, the natural process of development of scientific and technological progress, primarily in the field of information and communication technologies (ICT), has led to the creation of new capabilities for both offensive and defensive weapons. At the same time, natural awareness of the vulnerability arising from accelerated growth in the likelihood of malicious ICT being used in the military sphere led to a new format for this topic. And today, despite the opinions of pessimists, not only is the problem of ICT influence on the level of strategic stability recognized at the highest level in the great powers, but interstate dialogue on this issue has resumed.

The transition of the problem of ICT influence on the level of strategic stability to a new format is taking place against the background, throughout 2021, of important breakthrough events in the development of the system of international information security and Russia's participation in this process.

In March 2021, at a meeting of the Russian Security Council, the international information security problem was discussed for the first time. In April 2021, Russian President Vladimir Putin

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approved a new edition of one of the fundamental documents in this area, "Fundamentals of the State Policy of the Russian Federation in the Field of International Information Security."[xvi]

In addition, important positive changes have taken place at the international level. The UN adopted the final reports of the Open-ended Working Group (OEWG) and the Group of Governmental Experts (GGE) in the field of international information security. Thus, the "Report of the Group of Governmental Experts on Advancing Responsible State Behaviour in Cyberspace in the Context of International Security," adopted by consensus in June 2021, can be seen as the beginning of the process of transforming the rules of responsible behavior into a system of norms of "soft" international law. Russia especially notes the position of the GGE Report on the parallel existence of the norms of responsible behavior of states in the ICT environment and international law, which reflects the awareness of cyberspace as a new area of international cooperation, significantly different from traditional spaces.[xvii]

In October 2021, the UN First Committee decided by consensus to merge the two parallel international information security platforms that existed from 2019 to 2021 — the OEWG and the GGE, created at the initiative of Russia and the United States, respectively. This will undoubtedly help to increase the effectiveness of countering existing and potential threats to international security in the ICT environment.

On December 6, 2021, the UN General Assembly by consensus adopted the Russian-American draft resolution "Developments in the field of information and telecommunications in the context of international security, and advancing responsible State behaviour in the use of information and communications technologies," put forward at the initiative of Russia.[xviii]

All this allows us to speak about the positive dynamics in the creation of an international information security system process.

## Russia's Cyber Stability Policy

After the Statement by President of Russia Vladimir Putin on a comprehensive program of measures for restoring Russia-U.S. cooperation in the field of international information security on September 25, 2020, as well as his proposals in 2020-2021 on the need to sign bilateral documents between the Russian Federation and the United States — in particular, the Bilateral Intergovernmental Agreement on the Prevention of Incidents in the Information Space, as well as universal international legal agreements aimed at preventing conflicts and building a mutually beneficial partnership in the global information space[xix] — this problem has found a real embodiment.

At a briefing for foreign military attachés on December 24, 2020, Chief of the General Staff of the RF Armed Forces, General of the Army Valery Gerasimov noted: "The military confrontation extends to cyberspace and outer space, as a result, the risks of incidents due to interference in the functioning of control systems and ensuring the use of nuclear weapons increase. . . . In these conditions, nuclear deterrence remains a key element of ensuring the military security of the Russian Federation."[xx]

The problem of the impact of ICT on the level of international security and strategic stability was also sounded in many speeches and at the annual Moscow conference on international security of the Russian Ministry of Defense in June 2021.

In his report at the opening of the Conference, the Minister of Defense of the Russian Federation Sergey Shoigu, speaking about topical issues of international security, said:

Hypersonic, digitalization and robotization come to the fore in the development of new weapons. Space and cyberspace are increasingly involved in military confrontation. As part of the armed forces of a number of countries, space and cyber commands are being created, the main task of which is not defense, but the planning and conduct of offensive operations in the relevant areas. A careful attitude towards international obligations is replaced by unilateral sanctions and the introduction of a certain order based on rules invented by someone unknown. The world is rapidly plunging into a new confrontation, much more dangerous than during the Cold War.[xxi]

It is logical that during the military exercises of the militarily advanced states, this problem is already being taken into account. In Russia, according to the Ministry of Defense, similar tasks were solved during an exercise in the Kemerovo region in September 2021: signalmen of the combined-arms formation of the Central Military District repelled a simulated enemy's cyberattack on secret communication channels and ensured covert command and control of troops. According to the concept of the exercise, one of the currently topical scenarios for the malicious use of ICT was worked out: A conditional adversary attempted a network attack on secret communication channels for command and control of troops in order to distort and substitute transmitted information. In response to these actions, continuous monitoring of equipment performance was organized, and a special technological barrier was created to prevent a network attack. Receiving information about the next cyberattack attempt, the operators manually blocked the attacked communication channel and switched to backup wire and satellite communication channels.[xxii]

## Strategic Stability and Cybersecurity – Towards New Agreements?

A key factor in determining the stepping up of this issue to a new format was the announcement of the launch of the Russian-American dialogue on strategic stability following the Putin-Biden meeting in Geneva on June 16, 2021. The Joint Statement of the Presidents of Russia and the United States on Strategic Stability indicated that Russia and the United States would participate in an "integrated bilateral Strategic Stability Dialogue," the purpose of which "to lay the groundwork for future arms control and risk reduction measures."[xxiii]

An important result of the meeting between the leaders of Russia and the United States was the first reaffirmation of adherence to the "principle that a nuclear war cannot be won and must never be fought" since the key Russian-American statement of 1985. This is notable in itself in modern conditions, when irresponsible calls for the use of nuclear weapons are heard in the West more and more often, when society purposefully minimizes the threat and consequences of nuclear war. After the end of the summit, Putin called the decision to start bilateral consultations on cybersecurity "extremely important" — both for Moscow and Washington and for the whole world.

On July 28 and September 30, 2021, two rounds of interagency consultations on strategic stability were held in Geneva under the auspices of the Russian Ministry of Foreign Affairs and the U.S. Department of State.[xxiv] According to Deputy Minister Ryabkov, the future agreements on strategic stability should be based on a new "security equation" that would take into account all factors affecting this area, including strategic defensive and offensive weapons in their interconnection, as well as strategic offensive weapons in non-nuclear equipment — that is, systems that allow, without the use of nuclear warheads, the solving of strategic tasks in terms of hitting targets on the territory of the other side. Russian statements that this new "security equation" should take into account the situation in outer space, where the danger of an arms race is growing, as well as the problems of cybersecurity, are of paramount importance.[xxv]

Thus, negotiations on strategic stability are aimed not only at reaching a new treaty on the limitation of strategic nuclear weapons in the future. Discussions will focus on transparency and risk mitigation measures for unintentional or deliberate escalation of nuclear weapons use during a crisis or conflict. In addition, work is planned to analyze the proposed doctrines that could exacerbate tensions or complicate the management of emerging crisis.

Both sides once again emphasized the importance of the dialogue between Russia and the United States on information security issues during the lengthy conversation of Putin and Biden via videoconference on December 7, 2021. Leaders of the states expressed their readiness to continue working together on practical matters related to combating cybercrime through the criminal justice process, as well as using technical intelligence. Noting the unsatisfactory state of bilateral cooperation between Russia and the United States, the presidents nevertheless noted the importance of the process of implementing the results of the June 2021 Geneva summit, consistent implementation of the agreements reached at the highest level, and preservation of the "spirit of Geneva" when problems arise between Russia and the U.S.[xxvi]

## Strategic Cyber Instability Issues

However, a huge number of problems make dialogue difficult. The very term "strategic stability" has no common understanding, which could have been foreseen after a long vacuum — in fact more than 20 years — of a constructive dialogue between the Russian Federation and the United States on this issue. It is logical that in such conditions, Russia and the United States propose different concepts and therefore have different priorities in relation to the newly emerging dialogue. As expected, controversial and difficult to reach a compromise on are the issues of missile defense of the United States and its allies; inclusion in the dialogue of all types of weapons systems with a possible strategic effect, both nuclear and non-nuclear; strategic systems for the delivery of medium and intercontinental nuclear weapons; tactical nuclear weapons; the destructive influence of ICT on military-political processes, etc.[xxvii]

Therefore, the discussion of cybersecurity issues within the framework of this complex dialogue in Geneva is of the utmost importance. A very wide range of issues have emerged over a long period of absence of dialogue. In particular, these include Russia's concerns about U.S. missile defense plans, increasing threats from harmful ICTs; the growing risks of militarization of outer space and interest in new types of anti-satellite weapons; interference in the internal affairs of sovereign states, etc.

There have already been five main and intermediate consultations between the Russian Federation and the United States on cybersecurity issues. In addition, contact has continued by videoconferencing at the level of experts and the exchange of messages and signals at the level of embassies.

The very beginning of the Russian-American dialogue on these most urgent and vital issues can be considered the most important result of this work. In addition, according to the parties, the format of the participants and the practice of exchanging views have already been worked out, in addition to holding online meetings via a closed channel. New contacts are planned for the coming period. According to the statement of the Russian Ambassador to Washington, Anatoly Antonov, "There are small but concrete results in the area of suppressing hacker activity. We are responding to all the concerns that Washington communicates to us through established channels."[xxviii]

However, the American side, trying to achieve unilateral advantages, seeks to focus all work in negotiations on cybersecurity exclusively on the interests of the United States, ignoring Russia's concerns in this area. Russia is ready to discuss with Americans topics of their primary interest (currently, first of all the suppression of the activities of hacker groups attacking objects in the United States with the help of ransomware viruses), but believes that the conversation on this topic should include not only discussion of an attack by some groups on, for example, a meat processing plant with the aim of obtaining a ransom, but also many other aspects: "With all the importance that the American side attaches to what it considers to be hacker attacks by cyber fraudsters, we must look at [cybersecurity] from the point of view of a more direct link with the task of strengthening strategic stability in general."[xxix] Russia, in particular, considers it important to discuss the risks of cyberattacks on elements of the armed forces command and control system.

Expanding the topic and agenda, taking into account the interests of Russia, is still the most important task for professionals from various fields, but at this stage, first of all, for Russian diplomacy. There are some shifts in this direction, but they are not sufficient. According to the Russian Foreign Ministry, it is still premature to talk about any binding agreements in this area, since there is no experience in developing binding agreements in this area in connection with the task of strengthening strategic stability.[xxx]

Indeed, the problems of developing measures of transparency, trust, and predictability, agreeing and verifying with regard to restrictions or abandoning cyber weapons, now may seem insoluble, but today one can and should make every effort to develop a dialogue between the Russian Federation and the United States, ultimately aimed at developing and signing a document that politically obliges states to abandon cyberattacks on each other's strategic control systems to prevent an unintended exchange of nuclear strikes.

Russia expects dialogue with the United States on cybersecurity to become regular if a broad agenda is discussed.

In the context of the new format of the problem of ICT's impact on the level of strategic stability, the question of the prospects for signing legally binding documents is currently quite acute. This is due to the following problem. On the one hand, at present, the latest weapons systems and military technologies, including ICT, create difficulties for the development of

control and restrictive regimes in relation to strategic stability. On the other hand, new ICT capabilities objectively add uncertainty and, consequently, increase the risks of starting a nuclear war. This means that in the future they contribute to the awareness of this threat, the awareness of equal vulnerability for all players of strategic stability. In addition, as history proves, this leads as a result to the achievement of a compromise, which is necessary and inevitable in order to reduce the number of conflicts with a high probability of escalation to a large-scale nuclear war.

This problem has largely become one of the reasons for the emergence of the theory that changes in the world order and revolutionary military technologies require the abolition of negotiations and treaties on arms limitation, including cybernetic ones. Instead, these would be replaced with multilateral forums of states and broadly focused experts — in order to agree on a common philosophy of stability. In addition, there are arguments for the complete abandonment of control and restrictive treaties in favor of military rivalry without rules — in order to achieve strategic superiority. And this is a direct path to disaster.

At present, the awareness of the importance of arms control — the desire and ability to consistently seek agreements in this area, relying on the half-century experience of its predecessors — plays a global role. As a result, the world will be able to avoid new cycles of the arms race, further proliferation of nuclear weapons, and an increase in the number of conflicts with a high probability of escalation to a large-scale nuclear war. Awareness of the need to preserve and develop the arms control system, its adaptation to new destabilizing factors, including the use of ICT for harmful military-political purposes, plays a global role. Of course, on the way to new agreements, it is advisable to productively use the many years of experience of Russia (USSR) and the United States to consistently and professionally seek agreements.

With the political will of the parties, the system of limiting and non-proliferation of weapons can be preserved and adapted to cover many of the latest destabilizing weapons. As happened in the past, not all innovative technologies can be taken under control now or tomorrow. However, the continuation of the productive negotiation process — with the leading role of Russia and the United States — is an indispensable condition for the subsequent inclusion of the latest weapons and technologies in the legal regimes. This is necessary for the future restructuring of the arms control system from bilateral to multilateral formats, and for creating a base to ensure the necessary and sufficient level of strategic stability.

In a recent interview, speaking about the problem of cybersecurity, Director of the Russian Foreign Intelligence Service Sergey Naryshkin noted: “Of course, we are following development in this area, because we must not lag behind, and we must ensure national security, including cybersecurity. . . . We see how our partners are building up their offensive cyber capabilities both in the United States and NATO member states, but I can assure that Russia is capable of and will ensure information security. Russia is making its contribution to the creation of a global security system in the cyber-sphere.”[xxxi]

It is logical to assume that one of the most important tasks in this case is the international legal support of strategic stability, taking into account ICT threats.

# Annex 4. Nuclear Deterrence and Escalation Management in Near-Peer Competition*

James A. Siebens**

Political tensions and military friction between the U.S., Russia, and China have raised concerns on all sides about the potential for unintended escalation to nuclear war. On one hand, recent improvements to the range, accuracy, speed, scope, and quantity of strategic weapons and cross-domain capabilities have arguably strengthened mutual deterrence over issues around which clear and credible commitments are maintained by each party. On the other hand, these capabilities have raised the danger and anticipated speed of any potential conflict. Unfortunately, these advancements in strategic weapons and military capabilities may also diminish the likelihood of successful escalation management in the event of a conflict by increasing the likelihood of misperception and rapid escalation.

All sides rightly regard the prospect of nuclear war with trepidation, yet increasing geopolitical tensions have been exacerbated by the precipitous breakdown of arms control, surveillance and verification mechanisms, and military-military dialogue, as well as the rapid pursuit of new nuclear/strategic weapons. These developments have contributed to the likelihood that all parties may make calculations based on pessimistic assumptions and incomplete information, and may choose to hedge by increasing their reliance on nuclear threats and a "launch on warning" deterrence posture. Unfortunately, there is little hope of reliably distinguishing between conventional and nuclear weapons launches in the event of a conflict.

Additionally, recent developments in conventional and cross-domain capabilities have rendered the predictable consequences of even a "limited" conventional conflict between major powers unacceptably high (at least from a political standpoint). While the U.S. holds significant military advantages in conventional power projection, counterforce targeting, and precision deep strike capabilities, both Russia and China have developed their conventional and cross-domain forces and doctrines with the explicit goal of deterring conventional military interventions or nuclear attacks against them. Both have made substantial investments in hypersonic delivery systems designed to

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defeat U.S. missile defenses and weapons designed to attack U.S. command and control, communications, computers, intelligence, surveillance, and reconnaissance (C4ISR) systems, such as anti-satellite missiles, electromagnetic pulse weapons, and cyber weapons. The U.S. is more than capable of holding Russian and Chinese forces and other targets at risk simultaneously for purposes of deterrence, and yet has no immediate or reliable countermeasures to defeat the threat of assured retaliation. Thus, for the moment there is good reason for confidence that strategic stability based on the principle of "mutually assured destruction" will remain unaltered under the developing great power rivalry between the U.S., Russia, and China, in spite of ongoing investments in damage limitation capabilities. There is no prospect for a conflict between major powers in which any side could plausibly avoid significant damage and cross-domain attacks. Thus, mutual deterrence remains a prevailing feature of near-peer competition.

This strategic dynamic has reduced the salience of relative military capabilities to great power relations by rendering conventional conflict between major powers prohibitively costly and risky, and has thus substantially increased the importance of political commitments and diplomatic communications contributing to perceptions of credibility and resolve. In the context of ongoing competition between high-technology industrialized military powers, all sides must rely on the tight coordination of policy, information, and action across agencies and domains to avoid miscommunication and unintentional escalation.

## Deterrence Credibility and Resolve

Deterrence requires that an adversary be dissuaded from pursuing an action or policy (hereafter "policy") that they would otherwise pursue because they are convinced that they would incur unacceptable costs in doing so. Deterrence is made possible by the communication of future costs through explicit or implicit threats to prevent or punish the pursuit of the forbidden policy. Thus, predicting the efficacy of any given deterrence effort requires an understanding of both sides' interests and intentions, as well as both sides' "resolve" and "credibility" around the specific policy in question.

*Resolve* is the level or degree of each side's commitment to a particular cause, either carrying out the action or preventing it. The premise that one side must be deterred is predicated on the assumption that they would prefer to carry out the policy and must therefore be convinced not to do so. Thus, it is necessary to have a sense of *how much* they want to pursue the forbidden policy, i.e., how much they are willing to pay to achieve their goal. Some issues, such as territorial integrity or regime security, may be practically non-negotiable, meaning that an actor may be willing to pay extremely high costs to preserve its own national territory or political sovereignty. On the other hand, if an actor has no practical intention to carry out a proscribed policy, then it cannot (or need not) be deterred from doing so. The deterrer must also understand, and have a means of conveying, its own degree of resolve in preventing the proscribed policy and carrying out its threats, which may come at considerable cost.

*Credibility* is the ability and propensity to carry out the intended (or threatened) action, either the policy in question or the prevention/punishment of it. In essence, if the side contemplating the proscribed policy is incapable of carrying it out, it does not need to be deterred, and if the side

seeking to prevent the policy cannot or will not follow through on its threats, it cannot reasonably hope to deter. Likewise, if either side is perceived as lacking the political wherewithal (i.e., resolve) to carry out an action or threat, its commitment can be said to lack credibility. Because the limitations on credibility may emanate from technological, logistical, or political challenges, they may sometimes be directly related to resolve.

These theoretical foundations of deterrence are prerequisite to a discussion of how near-term changes in the security environment and recent or forthcoming technological advancements may impact strategic stability. This is because, in principle, advancements in weaponry or shifts in the overall distribution of power in the international system will only affect strategic stability to the extent that they affect different actors' practical capabilities and political will to uphold their commitments to particular policies and threshold conditions (i.e., "red lines").[xxxii]

The most credible mechanisms by which states can set threshold conditions for military intervention or retaliation are treaties and laws. For example, the U.S. has mutual defense treaties with dozens of countries and is formally pledged to treat an attack on any of them as a threat to its own security.[xxxiii] The U.S. is also obligated to provide Taiwan with the means to defend itself from an armed attack through the Taiwan Relations Act. Russia has formal defense ties with the states parties of the Collective Security Treaty Organization.[xxxiv] China has enacted laws authorizing the use of force to prevent Taiwanese independence and to defend China's "territorial integrity."[xxxv] Such measures publicly and formally commit states to uphold a particular policy, by force if necessary, and thereby make it impossible for other states to transgress without knowingly invoking the promised response.

Formal doctrine for the use of military force, and particularly the use of nuclear weapons, also provides a public signal of resolve about the threshold conditions to be upheld by states. While China's nuclear strategy since 1964 has been to achieve deterrence against nuclear coercion or attack through assured retaliation, the U.S. and Russia have more open-ended views on the strategic function of their nuclear forces.[xxxvi] For example, Russia's nuclear doctrine states: "[The] Russian Federation . . . maintains nuclear status to contain (preventing) aggression against her and (or) her allies . . . " and "The Russian Federation shall reserve the right to use nuclear weapons in response to the use of nuclear and other types of weapons of mass destruction against it and/or its allies, as well as in the event of aggression against the Russian Federation with the use of conventional weapons when the very existence of the state is in jeopardy."[xxxvii] Because the more open-ended nuclear doctrines of the U.S. and Russia do not categorically limit the conditions under which they might use nuclear weapons to nuclear retaliation (i.e., nuclear deterrence), and because the types and quantities of weapons they have developed and deployed are apparently designed for nuclear warfighting, any conventional crisis between them could substantially increase the risk of nuclear war.

# Escalation Management and Deterrence Failure

In the event of a conventional conflict between the U.S. and Russia or China, it is unclear whether or how the parties to the conflict will be able to effectively manage escalation. Escalation will not necessarily depend upon the political stakes involved in any of the likely conflict scenarios. Instead, escalation may be based on the threat perceptions of each actor, driven largely by incomplete information about adversary intentions, ambiguous or open-ended nuclear postures, the comingling of nuclear and non-nuclear strategic weapons on many major conventional platforms and systems, and the indistinguishability of nuclear and conventional missiles and delivery vehicles.

Any armed conflict between nuclear-armed advanced industrial states will inevitably put severe and time-sensitive escalatory pressures on military and political leaders. The reason for this is simple: all sides have the ability to attack one another's C4ISR and could gain a critical advantage by doing so in the early or opening stage of a conflict, and so it must be assumed on all sides that such an attack would be part of the adversary's operation plans. This mutual anticipation of early attacks on C4ISR only increases the impetus for such attacks on all sides, reduces the perceived time to respond, and raises the anticipation of impeded sensors and incoming long-range attacks carrying unknown payloads, creating the kind of "fog" that can easily lead to miscalculations and overreactions. As a result, any conventional crisis that results in a contest of violence of almost any scale between the U.S. and Russia or China should be expected to produce a rapid escalation.

Advancements in missile and non-kinetic capabilities now require all sides to plan for drastically compressed response times in the event of an attack, in which conventional or nuclear weapons would be practically impossible to distinguish, as well as the probability of significant damage to command-and-control systems due to kinetic, electromagnetic, or cyberattacks on C4 systems in the early stages of a conflict. Multi-domain warfare will almost inevitably involve the destruction of sensors, communications, targeting and guidance systems, and air defense systems, for example, all of which will create profound vulnerabilities for whichever side is most quickly disrupted, as well as significant advantages for the first mover. In this scenario it will be impossible for the defender to know whether such attacks are to be driven by limited objectives or whether they are merely a prelude to a broader attack. The loss of C4ISR capabilities will also degrade the defender's already dubious ability to distinguish between incoming nuclear and non-nuclear attacks.[xxxviii]

While this predicament is intrinsic to any future conflict between nuclear-armed major powers, at its root is ambiguity regarding intentions and threshold conditions for the use of nuclear weapons. The U.S. and Russia have both explicitly left open the possibility that they may use nuclear weapons in the event of a conventional attack on their territories, allies, or interests.[xxxix]

There are also clear indications that China's strategic community believes that if deterrence between the U.S. and China were to fail, any ensuing nuclear conflict would be "uncontrollable."[xl]

# Conclusion

The existence of strategic stability under the status quo does not obviate the need to understand the deterrent demands and threats presented by all competitors. The ongoing conflict in Ukraine has illustrated that efforts to revise the status quo via political warfare or conventional military means may have quite destabilizing consequences. Indeed, the essence of mutual deterrence is that all sides exercise restraint with respect to one another's interests and declared red lines. All sides must therefore be clear and judicious in their official pronouncements about threshold conditions for the use of force, and should limit such declarations to genuine commitments rooted in clear and intelligible interests, rather than mere policy preferences, posturing, or bluffing.

In light of the risks and costs of unintended escalation outlined above, it will be critical to pursue measures for reassurance and clearer communication of national strategic means and motives in anticipation of future crises. While it can be assumed that no rational actor would wish to initiate a nuclear war, it cannot be assumed that all sides will have adequate confidence in one another's rationality or restraint, especially in the absence of overt policies to refrain from using nuclear weapons. Under conditions of high-technology warfare, traditional military advantages sought through deception, surprise, and speed may in practice be detrimental to successful escalation management. Effective management of political and security tensions may thus require more transparency and communication about intentions and thresholds, as well as good-faith efforts on all sides to restore, expand, and modernize strategic arms control mechanisms and limit the downside risks of deterrence failure through mutual respect and restraint.

# Annex 5. Possible Approaches to Reducing the Risks of Nuclear Escalation at the Regional Level*

Pavel S. Zolotarev**

It can be confidently argued that a full-scale nuclear war between Russia and the United States, if it were ever to happen, would result from the escalation of a local military conflict. It is also possible that situations could occur that could lead to a nuclear war between Russia and the United States. As the two sides' strategic nuclear forces are maintained in constant readiness for immediate launch, an accidental combination of circumstances could have tragic consequences. Organizational and technical solutions to preclude such risks may vary, but they are not discussed in this paper, which focuses entirely on the regional level.

The task of preventing escalation of a local or regional conflict to the nuclear level is of considerable urgency; accomplishing it is in the common interest of Russia, the United States, and China, as well as the entire world community. It is mentioned in the Joint Statement of the presidents of Russia and the United States adopted on June 16, 2021, in Geneva.[xli] The Strategy of National Security, approved by the President of Russia on July 3, 2021, states that the main objective of Russia's foreign policy is to create favorable conditions for the country's development and that one of the main tasks for achieving this goal is "to eliminate preconditions for a nuclear war and the risks of the use of nuclear weapons."[xlii]

Therefore, both on the Russia-U.S. level and in a national doctrinal document, there is a clear emphasis on the need to reduce the risk of nuclear war. Of key importance is the question of what needs to be done and what practical steps are to be taken to achieve this goal.

To answer this question, several aspects should be considered, which concern:

- The sides' doctrinal concepts;
- Short-range nuclear weapons (tactical nuclear weapons); and
- High-precision weapons.

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# Doctrinal Aspects

During the cold war, in 1981 the Soviet Union officially stated that it will never be the first to use nuclear weapons. China adopted the same position. The United States and its NATO nuclear partners did not assume such an obligation, instead stating that nuclear weapons could only be used in extreme circumstances as a last resort.

After the end of the Cold War, Russia abandoned the obligation not to be the first to use nuclear weapons. According to the Basic Principles of the Military Doctrine of the Russian Federation, adopted in 1993, this was necessitated by the state of the country's armed forces and its economy. In the event of a local military conflict, the purpose of nuclear weapons was to contain its escalation to a larger-scale level. Taking into account that this approach was in effect consistent with that adopted by NATO as part of its nuclear planning, the alliance's reaction was calm.

China's commitment not to be the first to use nuclear weapons was met with mistrust. Most experts were of the view that this obligation was of a purely declaratory nature. Their mistrust was based on the fact that China's nuclear weapons were not sufficiently survivable in a war and that China therefore would be compelled to use them as early as possible lest they be destroyed. It appears, however, that this logic does not hold as regards China. Like India, China has enormous human mobilization resources that no other country can match.[xliii] Any weapons of mass destruction could deprive China of this advantage. Therefore, there is no reason to assume that China's doctrine on the use of nuclear weapons is at odds with its real position. Also, by now China has solved the problem of survivability of its nuclear weapons.

While adhering to its approach in principle, Russia has clarified its doctrinal concepts on the use of nuclear weapons in a document approved by the president: Basic Principles of State Policy of the Russian Federation in the Area of Nuclear Deterrence.[xliv]

Overall, the doctrinal concepts of Russia, the United States, and China have not undergone significant changes, whereas the situation has changed and new weapons systems have appeared, in particular high-precision weapons. A new generation of warfare (sixth-generation wars or contactless wars)[xlv] appears to be in the offing, and certain nuances are evident in the doctrinal concepts. For example, the 2010 United States Nuclear Posture Review reflected the intent to reduce the role of nuclear weapons by means of increasing the capabilities of conventional weapons and missile defense.[xlvi]

In February 2017, speaking at the opening session of the 2nd All-Russia Youth Forum on International Military-Political and Military-Economic Cooperation at MGIMO University, the Minister of Defense of the Russian Federation stated that "in the future the role of nuclear weapons in deterring potential aggressor will be reduced, primarily as a result of the evolution of high-precision weapons."[xlvii] In 2020, speaking to commanding officers and members of the public, the Minister of the Defense once again stated that high-precision weapons could in the future replace nuclear forces as a factor of strategic deterrence.[xlviii] The Russian leadership thus in effect supported the declared policy of the U.S. administration seeking to reduce the role of nuclear

weapons in ensuring security; however, these statements came during the presidency of Donald Trump.

The Nuclear Posture Review approved by Donald Trump[xlix] clearly went in the opposite direction. It is quite possible that this reflected a general desire to reject any and all decisions of the Obama administration; yet, this is a doctrinal document of the United States of America, officially adopted and still in force, which states that conventional arms must supplement rather than reduce the deterrent role of nuclear weapons.[l]

As the new administration took office in the United States, many ideas regarding nuclear weapons, including some quite radical ones, have been floated. For example, the Federation of American Scientists[li] has published an interesting analysis of the role of ICBMs and prospects of their evolution, which considers the possibility of eliminating them altogether in the future. In the U.S. Congress, Chairman of the House Armed Services Committee Adam Smith and Senator Elizabeth Warren, who ran for president in 2020, introduced in their respective chambers draft legislation on non-first use of nuclear weapons.

It is possible that President Biden's administration could return to the idea of consistently reducing the role of nuclear weapons by developing conventional means of warfare. The Geneva joint statement of the two presidents on strategic stability is a hopeful sign in this regard. It would then become possible to speak of a fundamentally important step of the two main nuclear powers to build the groundwork for reducing the risks of the use of nuclear weapons for the long term.

## Nuclear Weapons at the Regional Level

Further steps to reduce the risks of nuclear escalation of a regional military conflict should be related to concrete steps with regard to:

- Conventional armed forces;
- Conventional arms capable of playing the role of nuclear delivery vehicles; and
- Nuclear weapons associated with those delivery vehicles, and the locations and procedures of their storage.

As for conventional armed forces, the experience accumulated in Europe is sufficient for selecting specific measures for any other potentially problematic region.

At the same time, for Europe itself the selection of such measures is in the current situation of particular urgency. Russia has been accused of planning an aggression against NATO countries and of using an "escalation for de-escalation" doctrine, and has been declared an adversary.

The allegations that Russia intends to attack countries joined by collective defense obligations, of which three are among the five officially recognized nuclear powers, are absurd. Nevertheless, this absurd logic now lies at the basis of NATO's actual military policy, which is of a clearly anti-Russian nature. As a result, we have a situation that is the mirror image of the analogous Cold War situation,[lii] but with one important difference. Today, if NATO and Russia are to be considered as adversaries, the question of the balance of military power is meaningless, above all because their

economies are not comparable. NATO countries account for about 30 percent of the global GDP, while Russia's share is 3 percent. Hence, the level of defense expenditures: Russia spends 4 percent of its GDP for defense,[liii] while the NATO countries, with the exception of the United States, spend about 2 percent. The total budget of NATO countries, however, is 53 percent of global defense spending, while Russia accounts for just 3 percent, and it is hard pressed and already reducing its spending because of the pandemic.

Given this correlation of available potential, Russia has only one way to go, i.e., to rely on nuclear deterrence by means of tactical nuclear weapons.

At the same time, NATO's infrastructure continues to move closer to Russia's borders. The prospect of Ukraine and Georgia becoming members of NATO remains open. NATO countries have stepped up the intensity of their exercises at Russia's southern flank and have shown readiness for military provocations. A graphic example was the crossing of Russia's state border by a British destroyer on June 23. The fact that this was done on the opening day of the International Conference on Security in Moscow leaves no doubt that it was indeed a provocation.

The logic of the situation makes it necessary to equip first-echelon troops with the means for using nuclear weapons, i.e., operational-tactical missiles and large-caliber artillery. The main capabilities of tactical nuclear weapons are in the Russian Navy and Air and Space Force, but they are less related to a specific operational or strategic area and therefore of less concern to a potential adversary.

As mentioned before, the North Atlantic alliance, given its overwhelming superiority, does not have a similar need to rely on tactical nuclear weapons.

As a result, solutions to the task of reducing the risks of a nuclear war have to be sought in the context of the opposing sides' asymmetrical tactical nuclear weapons capabilities. However, by all accounts NATO does not find this acceptable, and it is actively using the current situation to accuse Russia of aggressive intentions and linking Russia's potential for using tactical nuclear weapons to a doctrine of "escalation for de-escalation." This leads to a greater risk of escalation of military conflict to the nuclear level.

The fact that operational-tactical missiles and large-caliber artillery are dual-capable makes them primary targets even if storage facilities of nuclear warheads are located far in the rear, while the risk of losing them provides incentives for using them as early as possible, including those that are nuclear-tipped.

Historically, conventional weapons were developed by nuclear-weapon states in such a way that they could also be used for delivery of nuclear weapons. From a military standpoint, this approach is optimal. As a result, weapons systems capable of delivering nuclear warheads are present in the arsenals of non-nuclear as well as nuclear-weapon states.

In its exercises, NATO trains in the use of allied countries' aircraft for delivering nuclear strikes with U.S. nuclear bombs, which remain in European territory. Such exercises are a clear example of how potential capabilities of dual-capable weapons systems could be used by countries that do not possess their own nuclear weapons.

At present, various weapons systems such as hypersonic weapons, cruise missiles, air and underwater attack drones, etc., are coming on stream. It appears that some of them are being developed to deliver nuclear as well as conventional payloads. As a result, the risk of the use of nuclear weapons in a regional conflict will increase.

The optimum approach would be to create weapons in such a way that they could be equipped either with conventional warheads only or only with nuclear ones. One should be careful, however, to ensure that a balance of military and political interests is observed. This would be possible if, at an early stage of development, technical solutions are implemented that would be verifiable and allow for a clear conclusion by international experts, within the framework of treaties or agreements, as to what kind of warhead can be carried by such systems.

This, however, would require at the very least adopting appropriate political decisions. But are such decisions realistic now? As Russia is compelled to develop nuclear deterrence potential at the regional level, it is now developing new weapons capable of using both nuclear and conventional warheads. Unless NATO's policy with respect to Russia undergoes fundamental change in the near future, the possibility suggested above does not appear realistic.

Therefore, as noted earlier, the questions related to storage procedures and access to tactical nuclear warheads are of great importance.

The optimum variant of storage of tactical nuclear warheads would provide for the following:

- Storage of warheads in special storage facilities only in the country's own territory;
- Denying the right of removal of warheads without orders from the highest level of the country's military-political leadership; and
- Allowing access to nuclear warheads only to technical personnel involved in their periodic maintenance.

Such procedures for storage and access to tactical nuclear weapons have been adopted in the Russian Armed Forces, and it would be logical for all states possessing tactical nuclear weapons to follow similar procedures.

Of equal importance is the question of the remoteness of tactical nuclear warheads storage facilities from their delivery systems. It is obvious that all storage facilities for nuclear warheads must be located in the country's own territory; yet, the refusal of the United States to remove its nuclear weapons from Europe makes it necessary to flag this issue again.

At present, tactical nuclear warheads storage facilities are located at such distance from their delivery system as to allow for their quick transport, if necessary, to deployment areas, i.e., airfields, missile deployment sites, and large-caliber artillery positions. Locating such storage areas in proximity to the line of contact of potential adversaries inevitably results in their being designated as priority targets at an early stage of the conflict. In addition to the threat of being hit during the first strikes, the adversary's successful offensive could create a threat of such facilities being captured, which could prompt the use of nuclear weapons at an early stage of military conflict. As a result, each side would be compelled to seek to use tactical nuclear weapons early in the conflict.

Thus, it would appear that a militarily optimal variant of locating tactical nuclear weapons storage facilities provokes escalation of a military conflict and is totally unacceptable from the standpoint of minimizing the risk of use of nuclear weapons. This means that, to minimize the risk of nuclear weapons being used in a regional conflict, decisions on where to locate tactical nuclear warheads storage facilities should be taken by the opposing sides at a political level and formalized in a legally binding way.

It appears that it would be desirable to reach agreements providing for:

- Locating facilities for storage of nuclear warheads for non-strategic delivery systems outside theaters of military operations (TMO);
- Locating operational-tactical missiles, short- and medium-range missiles, and large-caliber artillery systems capable of using nuclear warheads outside TMO; and
- Developing future rocket, artillery, air, and other advanced TMO fire attack systems with verifiable technical solutions precluding their use for delivery of nuclear warheads.

Proposals to remove tactical nuclear warheads and their delivery systems to areas outside TMO might seem unrealistic and inconsistent with the mission of nuclear deterrence. Nevertheless, the contrary is true: Their implementation could increase the potential of nuclear deterrence. Thus, every step in the direction of preparing for the use of nuclear weapons, combined with appropriate steps in the information domain, would work in the interests of deterrence. The need to redeploy warheads to TMO would be one such step. The specific mechanism of nuclear deterrence would become a multi-step process, leaving space for military-diplomatic efforts to prevent escalation of the conflict to the nuclear level.

## High-Precision Weapons at the Regional Level

The demise of the INF Treaty opens up a dangerous prospect of regional deployment of conventionally armed missiles of such class. Even if agreement is reached to adopt verifiable measures preventing their use with nuclear warheads, they could pose a threat to key assets of the nuclear infrastructure even if conventionally armed. As is known, the Basic Principles of State Policy of the Russian Federation in the Area of Nuclear Deterrence,[liv] approved in June 2020, define the conditions under which Russia could use nuclear weapons. They include "attack by adversary against critical governmental or military sites of the Russian Federation, disruption of which would undermine nuclear forces response actions." Hence the need to evaluate possibilities of such an attack with high-precision weapons in the event of deployment of conventionally armed medium- and shorter-range missiles in the territory of European NATO members.

The Russian Ministry of Defense defines high-precision weapons (HPW) as weapons that "have a guidance system and are capable of striking a target with one warhead within its range with at least 0.5 probability."[lv]

The sites on which nuclear forces' response actions depend are:

- State and military control centers from which the order to use nuclear weapons could be issued or duplicated;

- Radio transmission centers that ensure relaying of orders to delivery vehicles in the air or to ballistic missile submarines in submerged state; and
- Nuclear weapon delivery vehicles.

## Control Centers

Russia and the United States have control center systems that include fixed and mobile control centers. Fixed control centers may be hardened to a practically absolute degree, while mobile control centers cannot be destroyed instantaneously. It is clear enough that HPW cannot deliver a decapitating strike against state and military control centers. Theoretically, however, it cannot be excluded that attacks against these centers could undermine response actions in the form of reciprocal retaliatory strike, but that is true if HPW are used in the course of a conventional military conflict directly before a first nuclear strike. The beginning of such an attack would provoke the defending side to launch a preemptive nuclear strike even though the survivability of the control centers system may allow refraining from such a strike. Data from open source calculations of the survivability of deep-lying facilities located in underground soil or rock formations suggest that at certain depth putting them out of commission is about equally unlikely whether by a conventional or even a nuclear strike.[lvi]

## Radio Transmission Centers

HPW are unlikely to successfully disrupt radio communications in the frequency range of radio waves used for communication with air delivery vehicles; however, they are quite likely to disrupt communications with submarine carriers of ballistic missiles. Low frequency wave range requires powerful radio transmitters and large antennae, whose size is comparable to the length of the waves used. Objects of such size can very likely be disabled by conventional weapons. But both the United States and Russia have capabilities for duplication of orders issued from other control centers and for creation of backup means of transmission and relay centers (airborne control centers and airborne relay facilities). Disabling ground-based radio transmission centers could lengthen the time for delivery of orders to submarines, but the main requirement for submarines is to fulfill the order under any circumstances rather than to fulfill it quickly.

Using HPW to strike radio transmission centers is therefore of little or no value: The effect is doubtful, while the consequences may lead to a preemptive nuclear strike.

## Nuclear Weapon Delivery Vehicles

The assets that are the most vulnerable to HPW attacks are fixed ICBM complexes, airborne delivery vehicles at their bases, runways of strategic bombers, and submarines at their bases. Strikes against fixed ICBMs could have the greatest effect. ICBM silos have been hardened against the effects of nuclear explosions, the blast of which is the most effective against silos. It is estimated that silos can withstand excess pressure of up to 200 atmospheres.

The main impact of HPW is achieved by the warhead's kinetic energy and cumulative effect. The use of HPW could result either in disabling the mechanisms responsible for opening the silo's cover or in damaging the missile's canister, or in disabling the control instruments in the silo's head. Any such damage makes launching the missile impossible.

As part of the treaties concluded by them, Russia and the United States have exchanged geographical coordinates of their silo-based ICBMs, so targeting such ICBMs for the purposes of HPW strikes would pose no problem. It is possible, however, that the defending side could use electronic countermeasures to affect precision of targeting, as well as concealment and active defense measures.[lvii] But, overall, using HPW to put out of commission silo-based ICBMs appears to be a quite realistic task.[lviii]

The destruction of road-mobile missile complexes (RMMCs) requires not so much the use of high-yield weapons as the capability to detect, classify, and accurately establish the coordinates of the field positions of a mobile ICBM. In effect, this means accomplishing two independent tasks.

The first task is detection and reliable classification of the target. Whether detection is done visually or by radar, the number of space satellites should be such as to keep an eye on all supposed basing areas. Knowledge of the deployment areas of RMMC divisions and regiments is of little value. Recorded field positions of RMMCs in peacetime and during threat periods may not coincide and be in totally different areas, whereas RMMCs must be detected with the accuracy of down to one launcher rather than one battalion.

The second task is to use the coordinates obtained by satellite reconnaissance in order to direct an HPW to a designated zone, and detect and identify the autonomous launcher, taking into account its possible distance from the point where it was initially detected, including in motion. Control systems of HPW delivery vehicles are quite capable of performing such missions, if the target is tracked from space. It is unlikely that this could be achieved in the foreseeable future with respect to the grouping of Russia's RMMCs.

## HPW Systems That Could Be Used for a Disarming Strike

The systems that could be used to strike ground-based ICBMs include[lix]:

- Sea-launched and air-launched cruise missiles;
- Guided air bombs;
- Conventionally armed medium- and shorter-range missiles;
- Strike unmanned aerial vehicles; and
- Conventionally armed intercontinental ballistic missiles.

Guided air bombs could be regarded as the preferred delivery vehicles but their use is impracticable because of the distance from their deployment sites to the borders. Prospects for using strike unmanned aerial vehicles are as yet not clear. However, using them against assets deep in the territory is unrealistic; it is highly likely that they would be destroyed long before approaching the target.

Thus, the only HPW that may be realistically considered for disarming strikes are sea-launched and air-launched cruise missiles and conventionally armed medium- and shorter-range missiles.

CA1CM air-launched cruise missiles are capable of delivering a 1.5-ton high-explosive munition within a range of 1,000 km with quite high accuracy (5m CEP), carrying the Advanced Unitary Penetrator warhead, which makes possible their use in some strategic directions for striking silo-based ICBMs.

The development of new-generation long-range standoff cruise missile will increase capabilities for striking silo-based ICBMs.

Conventionally armed sea-launched Tomahawk Block IV cruise missiles with an up to 500 kilos munition are capable of striking targets within up to 2,500 km range.

New ground-launched and air-launched cruise missiles will be capable of striking both silo-based and mobile ICBMs in all deployment sites of missile divisions. It has to be borne in mind, though, that the Tomahawks' preferred mission is to strike RMMCs. The yield of one conventional Tomahawk warhead is not enough to reliably destroy a silo launcher. Even destroying a RMMC, though it is not hardened, would take more than one warhead. For example, whatever information is available on the location of a regiment in a field position, it would also be necessary to provide for striking its permanent location and possibly assign additional warheads taking into account decoy field positions and dispersal of battalions into several autonomous launchers.

To conduct a disarming strike, it would be necessary to pre-deploy strike submarines and surface ships in the Barents and Kara Seas and the Seas of Okhotsk and of Japan, as well as preparing strategic aircraft and concentrating them at forward-based airfields. It is highly likely that such activities will be detected.

Destruction of all ICBMs within a short time interval, particularly as regards RMMCs, is unlikely. The situation could change significantly if conventionally armed medium- and shorter-range missiles are deployed in regions adjoining Russia, particularly in Europe. Using them would make it possible to significantly reduce the duration of a disarming strike. The effect of such a strike in terms of the number of delivery vehicles destroyed would be much greater than what could be accomplished by the U.S. missile defense system.

Although the sea leg of the strategic nuclear forces cannot be subject to a quick disarming strike, such a strike cannot be ruled out in the future. It is possible that such a mission could be accomplished by using underwater strike drones, including in the mode of an autonomous strike flock. Nevertheless, it may be generally argued that in the foreseeable future neither a decapitating nor a disarming strike with high-precision conventional weapons can be regarded as a realistic scenario of military actions against Russia.

What requires closer examination, however, is the role of conventionally armed high-precision weapons during the course of a local or regional conflict. NATO used high-precision weapons to great effect against Yugoslavia and against Iraq in 2003. Within a short time, the alliance was able to neutralize the adversary's air defense system and then to deliver selective pointed strikes aimed at creating conditions for achieving the political objectives of the military operation, with no need to crush the adversary's armed forces. In Europe, the United States and its allies are working diligently to increase their air defense and missile defense capabilities.

Following the NATO summit on June 14, 2021, NATO Secretary General Jens Stoltenberg stated that NATO had no intention to deploy nuclear-armed medium- and shorter-range missiles in Europe but that the alliance intended to continue to increase its air defense and missile defense capabilities. This suggests that the North Atlantic alliance intends to acquire the ability to deliver high-precision strikes against Russia's important infrastructure assets to a depth corresponding to the second

strategic echelon. At the same time, NATO would acquire the ability to use the European missile defense system to effectively counter similar strikes.

Such an imbalance of potential capabilities is dangerous in and of itself, regardless of the sides' intentions. It creates the temptation to strike tactical warheads storage facilities located deep in the rear. Their number is not particularly high, whereas high-precision conventional weapon strikes could be quite effective. In such case, the suggestion made above as to the desirability of locating such storage facilities at considerable distance from the area of possible hostilities would become meaningless, and the risk of escalation of nuclear conflict would grow. The logic of "use them or lose them" would impel such escalation. Therefore, deployment in Europe of medium- and shorter-range missiles, whether nuclear or conventional, is unacceptable and extremely dangerous from the standpoint of escalation of nuclear conflict.

[i] "Meeting with Defence Ministry leadership and defence industry heads," President of Russia (website), http://en.kremlin.ru/events/president/news/67051. (accessed 12.16.2021).

[ii] Earlier, Putin emphasized that understanding of the "red lines" "comes during negotiations on the key areas of interaction." "News conference following Russia-US talks," President of Russia (website), http://en.kremlin.ru/events/president/news/65870. (accessed 12.16.2021).

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[vi] David E. Sanger and William J. Broad, "China's Weapon Tests Close to a 'Sputnik Moment,' U.S. General Says," *New York Times,* October 27, 2021, updated November 3, 2021, https://www.nytimes.com/2021/10/27/us/politics/china-hypersonic-missile.html.

[vii] In-person interview with the author, September, 2021.

[viii] Major cyber powers for this purpose include, at least, China, France, Germany, Iran, Israel, North Korea, Russia, the United Kingdom, and the United States.

[ix] For a thorough review of the open literature, see Major Cameron Ross, USAF, "Is It Time to Forget about Cyber Deterrence?" Commentary, *Air & Space Power Journal* (Spring 2021): 69–73, https://www.airuniversity.af.edu/Portals/10/ASPJ/journals/Volume-35_Issue-1/C-Ross.pdf.

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# U.S.-Russia Military-to-Military Dialogue

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