Solving the Strategic Equation: Integrating Missile Defense and Conventional Weapons in U.S.–Russian Arms Control

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ABSTRACT

With the New START treaty extension, Moscow and Washington are on course for new arms control negotiations. The unprecedented breadth of the strategic bilateral agenda issues means that any future talks would entail extensive linkages and trade-offs in various spheres. The article explores two of the domains that would inevitably have to be addressed in future negotiations – missile defense and strategic conventional weapons. Missile defense was an integral part of U.S.–Russian arms control from early on, most prominently reflected in the ABM treaty of 1972. However, a deep look into the current state and trajectory of U.S. missile defense developments suggests that instead of focusing on the "strategic" interceptors in the continental U.S., the aim should be on regulating new mobile systems, which pose a more significant threat to the strategic stability and might be more amenable to limitations. Strategic conventional weapons are less clearly defined, and there is less arms control experience with dealing with them. On occasions where they were subject to arms control regulations, they were either banned or included in the strategic nuclear forces limits. With many types of strategic conventional weapons, it does not seem that a one-size-fits-all approach is feasible. Some of the newer systems might remain too niche to have an impact on strategic stability. With the most ubiquitous strategic conventional weapons – long-range cruise missiles – a framework of asymmetric limits might be considered.

KEYWORDS

arms control, missiles defense, strategic conventional weapons, strategic equation, U.S.–Russian relations

When Russia and the United States finally extended New START for another five years in February 2021, it soon became obvious that the hardest part was very much ahead of them. With all but one arms control treaty terminated or suspended, there was a void in place of the complicated architecture that once limited and managed nuclear competition between Moscow and Washington. Well aware of this void, Russia presented the United States with its vision of the "strategic equation" or "security equation," which would account for all the factors impacting strategic stability between the two countries. In the words of Deputy Minister of Foreign Affairs of the Russian Federation S.V. Ryabkov, "it is not limited to nuclear weapons. We consider it very important to embrace the entire spectrum of both nuclear and non-nuclear offensive and defensive arms that are capable of resolving strategic tasks."[1] Such an equation would form a general understanding of U.S.–Russian strategic relations, which could be than implemented in a number of specific agreements and legal arrangements.

Two components of the equation are of particular note. Strategic missile defense has been a problem in bilateral relations for decades, even more so after the United States withdrew from the Anti-Ballistic Missile Treaty (ABM Treaty) in 2002. By contrast, strategic conventional weapons were slowly gaining traction, but became an equally important issue for Moscow. They were almost never regulated by arms control agreements, the most important of which – the Intermediate-Range Nuclear Forces Treaty (INF Treaty) – disappeared in 2019 after yet another withdrawal on the part of the United States. It is hard to imagine any solution to the "strategic equation" without addressing these two issues.

A rich body of research exists on the topic of missile defense in arms control. Among Russian experts, A. Arbatov has noted that current ballistic missile defenses do not change the strategic balance, although defense capabilities aimed at third countries should be considered in the framework of the "interrelationship between strategic offensive and defensive arms."[2] V. Mizin has suggested that Moscow might not be interested in a new ABM agreement since new Russian strategic systems would penetrate any future U.S. missile defense.[3] V. Dvorkin has presented a case for why existing U.S. and Russian missile defense systems do not pose a threat to the strategic nuclear forces of the parties.[4] In an equally well researched piece, V. Yesin agreed that the current U.S. missile defense system does not undermine Russian strategic deterrence and pointed to the open-ended and global nature of the U.S. system, which would require further attention.[5]

American experts generally accept that Russia has an issue with the U.S. missile defense system. P. Vaddi and G. Perkovich have suggested that the United States should explore how its missile defense could be designed to counter missile treats from rogue states, but not Russia or China.[6] However, elsewhere, P. Vaddi and J.M. Acton

1 "Deputy Foreign Minister Sergey Ryabkov's Opening Remarks at a Briefing at the Rossiya Segodnya International Information Agency on Arms Control and Strategic Stability," Russian Ministry of Foreign Affairs, accessed February 11, 2021, https://www.mid.ru/en/main_en/-/asset_publisher/G51iJnfMMNKX/content/id/4570219.

2 *Арбатов, А.Г.* Роль ядерного сдерживания в стратегической стабильности. Гарантия или угроза // Московский центр Карнеги. 28 января 2019. [Электронный ресурс]. URL: https://carnegie.ru/2019/01/28/ru-pub-78209 (дата обращения: 01.03.2021).

3 Мизин 2019.

4 Дворкин 2019.

5 Есин 2017.

6 Perkovich, Vaddi 2021.

have noted that the United States has ruled out the possibility of putting legally binding limits on its missile defense, and Moscow should instead focus on politically binding transparency and confidence-building measures.[1] S. Pifer supported the idea of regular information exchange on U.S. missile defense capabilities, but he believes that this might not be enough for Moscow and has thus suggested limiting the number of U.S. interceptors in Europe.[2] G. Thielmann provided a thorough analysis of how many of the ABM Treaty's provisions could be reenacted in the current setting and reintroduced the idea of joint ceilings for strategic offensive and defensive weapons.[3]

However, few solutions have been offered on the Russian side to Moscow's concerns about the U.S. missile defense system, which undoubtedly will appear in any future negotiations. And the proposals on the American side, while generally well thought through, have not touched on some of the issues of concern and have not been ambitious enough to solve this long-standing problem.

The issue of regulating strategic conventional weapons is less researched, partly because of an ambiguity about what constitutes a strategic conventional weapon, and partly because of the diversity of the systems. On the Russian side, A. Arbatov has suggested that there is probably no single way to cover all existing high precision conventional weapons, but one way to partly address the issue is to control the number of tactical aviation vehicles that carry such weapons (in an agreement similar to the Treaty on Conventional Armed Forces in Europe), and including air-launched strategic conventional weapons in the common warhead ceilings of the next arms control treaty (by returning to the START I counting rules for heavy bombers) alongside strategic nuclear arms.[4] S. Oznobischev and K. Bogdanov propose controlling the numbers of tactical aviation, which carries strategic conventional weapons (in a CFE like agreement).[5] E. Buzhinskiy agrees that limiting air-launched strategic weapons could be straightforward, and that there could be technical solutions for sea- and ground-launched missiles as well.[6]

In the United States, J. Acton, P. Vaddi and T. MacDonald believe that there is no way to realistically limit conventional sea-launched missiles and suggest data exchange.[7] S. Pifer proposes capping the number of U.S. hypersonic boost glide vehicles, although he believes that it would be hard for Washington to limit its conventional sea- and air-launched cruise missiles and thus suggests discussing their implication for the strategic nuclear balance instead.[8]

It is unclear whether Moscow and Washington would even be interested in getting back to the counting rules established by the START I Treaty. In the meantime, transparency measures and discussions would probably not be enough to address the issue from the Russian point of view.

1 Vaddi, Action 2020.
2 Pifer 2016.
3 Thielmann 2020.
4 Arbatov, Alexey, and Ivanov, Igor. "Untangling the Knot of Strategic Arms Control. The Nuclear Threat Initiative," NTI. Building a Safer World, 2020, accessed March 3, 2021, https://www.nti.org/analysis/opinions/untangling-knot-strategic-arms-control/.
5 Ознобищев, Богданов 2020, 46.
6 *Бужинский, Е.* СНВ-3 и перспективы ограничения вооружений в российско-американских отношениях // Международный дискуссионный клуб Валдай. 5 февраля 2021. [Электронный ресурс]. URL: https://ru.valdaiclub.com/a/highlights/snv-3-i-perspektivy-ogranicheniya-vooruzheniy/ (дата обращения 03.03.2021).
7 James M. Acton, Thomas MacDonald, and Pranay Vaddi, "Revamping Nuclear Arms Control: Five Near-Term Proposals," Carnegie Endowment for International Peace, accessed March 3, 2021, https://carnegieendowment.org/2020/12/14/revamping-nuclear-arms-control-five-near-term-proposals-pub-83429.
8 Pifer 2016.

Finally, a number of works look into how arms control itself operates and how specific technologies can be included in it. In 1960, R. Bowie famously described arms control as "any agreement among several powers to regulate some aspect of their military capability or potential. The arrangement may apply to the location, amount, readiness, or types of military forces, weapons, or facilities."[1] In addition to the agreement limiting military capabilities, arms control normally implies the possibility of verifying that the parties are fulfilling their obligations.

Some arms control mechanisms appear to be more successful than others. Counties withdraw from legally binding treaties (for example, the ABM Treaty or theINF Treaty), while informal agreements are sustained even without an ongoing dialogue (such as SALT II). This can be partly explained by domestic politics, but some other general observations can be made. As T. Schelling, one of the first thinkers on arms control, wrote: "Most powerful limitations, the most appealing ones, the ones most likely to be observable in wartime, are those that have a conspicuousness and simplicity, that are qualitative and not a matter of degree, that provide recognizable boundaries."[2] This makes sense from the practical point of view – bans on whole classes of weapons are easier to verify than reducing their numbers or placing limitations on specific parameters.

P. Scharre points out that the success of arms control agreements can also be influenced by the military significance of the weapon in question (the higher the significance, the lower the chance of success) and its distribution (if both parties possess comparable number of the weapon, interest in bilateral limitation increases and the chance of success rises).[3]

In order to understand how to address missile defense and strategic conventional weapons in the U.S.–Russian arms control framework, this paper will explore the technical and political underpinning of both issues in detail, look into past efforts to address them, propose possible solutions, and estimate how realistic they could be.

Strategic Missile Defense

Intercontinental ballistic missiles (ICBMs) are still the main way of delivering nuclear weapons to enemy territory. They form the backbone of nuclear deterrence. The flight trajectory of an ICBM and its reentry vehicle (RV) can be divided into two parts – active (guided flight with an active propulsion) and passive (free flight after the engine shuts down and the RV separates from the missile).[4] The passive stage of the trajectory can also be subdivided into exo-atmospheric and atmospheric parts. Throughout the history, Moscow and Washington have developed missile defense that is aimed at interception at every stage of the trajectory.

Intercepting a missile in the active phase of its flight helps solve the problem of decoys and other countermeasures and destroys several warheads with a single strike

1 Bowie 1960.
2 Schelling 1966, 164.
3 Scharre 2018, Ch. 20.
4 Траектория полёта баллистической ракеты // Министерство обороны РФ. [Электронный ресурс]. URL: https://encyclopedia.mil.ru/encyclopedia/dictionary/details_rvsn.htm?id=14145@morfDictionary (дата обращения 03.03.2021). In the Western tradition, the trajectory of an ICBM is usually divided in three phases: boost phase, midcourse phase, and terminal phase.

(for missiles with multiple reentry vehicles). A missile with its engines firing provides a highly visible target, even when it has not reached maximum speed. At the same time, trying to intercept a missile at this stage has its disadvantages. The interceptor must "catch up" with the ICBM, which requires considerably high speed and must be launched from a location close to the target. The task is further complicated by existing countermeasures, which include shortening the active part of the trajectory by using more powerful engines.

Atmospheric intercept of RVs is complicated by the high speed and possible change of the missile's trajectory. The atmosphere also limits the use of sensors on the interceptors and their range.[1]

Exo-atmospheric intercept takes place at the most predictable ballistic part of the trajectory. Despite the largest number of possible countermeasures (the lack of atmosphere and orbital motion significantly complicate discrimination between RVs and decoys), exo-atmospheric intercept is currently the most promising and well-developed method, and it is used as the basis for all existing strategic missile defense systems.

U.S. Strategic Missile Defense

As of January 2021, the U.S. missile defense system includes three main components. First, two sites equipped with "heavy" GBI's (Ground-Based Interceptors) in the continental United States. There are total of 44 interceptors: 40 at Fort Greely, Alaska and 4 at Vandenberg Air Force Base, California.[2] Second, 48 U.S. Navy ships equipped with the Aegis Ballistic Missile Defense System and armed with different versions of atmospheric (RIM-156 Standard Block IV (SM-2) and RIM-174 Standard ERAM (SM-6)) and exo-atmospheric (RIM-161 Standard Missile 3 (SM-3)) interceptors.[3] Under the FY2021 budget submission, the number of BMD-capable Navy Aegis ships is projected to increase to 65 by the end of FY2025.[4] Third, land-based Aegis system (Aegis Ashore) in Europe deployed as a part of the European Phased Adaptive Approach, which includes 24 SM-3 interceptors at the Deveselu Facility in Romania. A further 24 are expected to be deployed at a second site in Poland.

In addition, the United States possess mobile THAAD (Terminal High Altitude Area Defense) systems aimed at intercepting intermediate-range ballistic missiles in the atmosphere and at the very end of the exo-atmospheric part of the trajectory.[5]

Ground-based Interceptors consist of a booster and a kinetic kill vehicle. All the GBI's deployed by the United States are currently equipped with an EKV (Exoatmospheric Kill Vehicle). The system has a mixed track record. Since 1999, only 11 of 19 tests were successful.[6] The development of a new kill vehicle – the RKV (Redesigned Kill Vehicle) –

1 Garwin 1999.
2 "Department of Defense Press Briefing on the President's Fiscal Year 2019 Defense Budget for the Missile Defense Agency," The US Dept of Defense, February 13, 2018, accessed March 3, 2021, https://www.defense.gov/Newsroom/Transcripts/Transcript/Article/1440326/department-of-defense-press-briefing-on-the-presidents-fiscal-year-2019-defense/.
3 "Navy Aegis Ballistic Missile Defense (BMD) Program: Background and Issues for Congress," Congressional Research Service, December 23, 2020, accessed March 3, 2021, https://fas.org/sgp/crs/weapons/RL33745.pdf.
4 Ibid.
5 "Fact Sheet, Terminal High Altitude Area Defense," The US Dept of Defense, Missile Defense Agency, September 24, 2018, accessed March 3, 2021, https://www.mda.mil/global/documents/pdf/thaad.pdf.
6 "Ballistic Missile Defense Intercept Flight Test Record," Missile Defense Agency, September 2019, accessed March 3, 2021, http://surl.li/mpvo.

led by Boeing was a failure. The deadlines for testing and deployment were constantly postponed, and in August 2019, the Department of Defense terminated the project, stating that "we decided the path we're going down wouldn't be fruitful."[1] On April 24, 2020 the U.S. Missile Defense Agency (MDA) released a request for proposals on the Next Generation Interceptor (NGI).[2]

The cancelation of the RKV put on hold plans for the deployment of 20 additional GBIs in Alaska, which was planned for 2023.[3] As of right now, the Missile Defense Agency is still planning to build 20 silos to be used for NGI deployment. But since the NGI program aims to develop an interceptor from scratch (including a new booster),[4] it is not expected to be deployed until the 2030s, although the director of the Missile Defense Agency has since said it would be possible to field the NGI by 2028.[5]

The U.S. Navy operates the *Aegis Combat System*, which in one of its modifications is capable of intercepting ballistic missiles with an SM-3 interceptor. Aegis is deployed on two types of ships: Ticonderoga-class cruisers (CG-47) and Arleigh Burke-class destroyers (DDG-51). By September 30, 2021, a total of 48 of these ships will be equipped with an Aegis version capable of missile defense, making them BMD-capable Navy Aegis ships. Other ships with Aegis systems can be upgraded to perform a BMD role, which would require changes to be made to the computer systems, new software to be installed, and interceptors to be uploaded.[6] Under the FY2021 budget submission, the number of BMD-capable Navy Aegis ships is projected to increase to 65 by the end of FY2025. However, Congress reduced funding for the future large surface combatant ships in December of 2020, which calls these plans into question.[7]

Ticonderoga-class cruisers are equipped with 122 Mark 41 (Mk-41) Vertical Launching Systems, while Arleigh Burke-class destroyers have 90 or 96 Mk-41 launchers depending on the version. These launchers can fire a broad range of land-attack, anti-ship, anti-submarine, and anti-ballistic missiles. It is impossible to assess the number of launchers equipped with anti- ballistic missiles at any given time, but it is obviously less than the maximum possible.

The most concerning missiles from the point of view of strategic missile defense are the SM-3s, which are capable of performing the exo-atmospheric kinetic intercept of ballistic missiles. There are three consecutive versions of the missile. SM-3 Block IA and Block IB (with an upgraded seeker, processor, and increased maneuverability) are currently deployed on U.S. ships. Estimates put their number at a few hundred.[8]

1 Paul Mcleary, "Pentagon Cancels Multi-Billion $ Boeing Missile Defense Program," Breaking Defense, August 21, 2019, accessed March 3, 2021, https://breakingdefense.com/2019/08/pentagon-cancels-multi-billion-boeing-missile-defense-program/.
2 Aaron Mehta, "Pentagon Releases Request for Proposals on Next Generation Interceptor," Defense News, April 24, 2020, accessed March 3, 2021, https://www.defensenews.com/space/2020/04/24/pentagon-releases-request-for-proposals-on-next-generation-interceptor/.
3 "Missile Defense. Delivery Delays Provide Opportunity for Increased Testing to Better Understand Capability," Government Accountability Office, June 2019, accessed March 3, 2021, https://www.gao.gov/assets/700/699546.pdf.
4 "Hill: NGI Has Flexibility In Development Cycle, Replaces Whole Interceptor," Defense Daily, March 10, 2020, accessed March 3, 2021, https://www.defensedaily.com/hill-ngi-flexibility-development-cycle-replaces-whole-interceptor/missile-defense/.
5 Jen Judson, "Congress Directs DoD to Build Interim Homeland Missile Defense Interceptor," Defense News, December 3, 2020, accessed March 3, 2021, https://www.defensenews.com/land/2020/12/03/congress-directs-dod-to-build-interim-homeland-missile-defense-interceptor/.
6 "Navy Aegis Ballistic Missile Defense (BMD) Program: Background and Issues for Congress," Congressional Research Service, December 23, 2020, accessed March 3, 2021, https://fas.org/sgp/crs/weapons/RL33745.pdf.
7 David B. Larter, "Congress Guts Funding for Cruiser Replacements," Defense News, December 23, 2020, accessed March 3, 2021, https://www.defensenews.com/naval/2020/12/23/congress-guts-funding-for-cruiser-replacements/.
8 "Standard Missile-3 (SM-3)," CSIS Missile Defense Project, September 28, 2018, accessed March 3, 2021, https://missilethreat.csis.org/defsys/sm-3/.

SM-3 Block IIA, developed jointly with the Japan Self-Defense Forces, is purchased by the Pentagon in limited numbers and is still undergoing testing. Block IIA missiles were given a larger fuel tank, which increases its speed and potential flight time, as well as a bigger kinetic warhead.[1] According to expert estimates, the speed of SM-3 Block IIA reaches 4.5km/s compared to 3km/s for Block IB.[2] The United States officially canceled the development of the next generation of SM-3 Block IIB interceptors, which were aimed at intercepting ICBMs, in 2013.[3]

Nevertheless, with the lack of progress of the Ground-Based Midcourse Defense in the continental United States, Washington is investigating the possibility of using SM-3 Block IIA missiles against ICBMs. On November 18, 2020, this anti-ballistic missile successfully intercepted an ICBM-class target.[4] Such developments could potentially threaten Russian strategic forces. Especially with the number of SM-3 Block IIA planned for purchase exceeding 300.[5]

Allies of the United States, including Australia, Spain, Norway, South Korea, and Japan, either have Aegis ships in their fleets, are in the process of building them or plan to build them in the future. Most of the six Japanese Aegis destroyers are BMD-capable. Tokyo plans to upgrade the remaining ships in the upcoming years, with two additional BMD destroyers currently under construction.[6] The Aegis ships of the United States' other allies are not BMD capable.

As a part of the European Phased Adaptive Approach, the Deveselu Facility in Romania hosts *Aegis Ashore* system, with 24 SM-3 Block IB interceptors. The construction of the second U.S. missile defense site in Europe near the Polish village of Redzikowo, which will host another 24 SM-3 missiles, keeps getting delayed. The facility, which was supposed to become operational in 2018, will not be ready before 2022 because of contractor's poor performance.[7] Both sites are expected to host SM-3 Block IIA missiles.

Aegis Ashore is considered as an alternative to both GBIs and Aegis BMD ships. There were proposals to deploy further Aegis Ashore sites in the continental United States,[8] Guam (as a substitute for THAAD battery),[9] and Hawaii (at Pacific Missile Range Facility Barking Sands).[10]

Until recently, Japan was planning to build two Aegis Ashore sites on its territory. According to the Ministry of Defense, the systems could have become initially

1 "Navy Aegis Ballistic Missile Defense (BMD) Program: Background and Issues for Congress," Congressional Research Service, December 23, 2020, accessed March 3, 2021, p. 5, https://fas.org/sgp/crs/weapons/RL33745.pdf.
2 See, for example: Joan Johnson-Freese, and Ralph Savelsberg, "Why Russia Keeps Moving the Football on European Missile Defense: Politics," Breaking Defense, October 17, 2013, accessed March 3, 2021, https://breakingdefense.com/2013/10/why-russia-keeps-moving-the-football-on-european-missile-defense-politics/.
3 "Missile Defense Announcement. As Delivered by Secretary of Defense Chuck Hagel," Legistorm, March 15, 2013, accessed March 3, 2021, https://www.legistorm.com/stormfeed/view_rss/76757/organization/31751.html.
4 "U.S. Successfully Intercepts ICBM with Ship-Launched Missile in Historic Test," ABC News, accessed March 3, 2021, http://surl.li/mpxw.
5 Laura Grego, "The SM-3 Block IIA Interceptor. A New Arms Control Challenge," Union of Concerned Scientists, August 2019, accessed March 3, 2021, https://www.ucsusa.org/sites/default/files/attach/2019/08/SM-3%2520IIA.pdf.
6 "Navy Aegis Ballistic Missile Defense (BMD) Program: Background and Issues for Congress," Congressional Research Service, December 23, 2020, accessed March 3, 2021, p. 5, https://fas.org/sgp/crs/weapons/RL33745.pdf.
7 "MDA, Army Withholding Pay as Aegis Ashore Poland Construction Still Drags," USNI News, March 12, 2020 accessed March 3, 2021, https://news.usni.org/2020/03/12/mda-army-withholding-pay-as-aegis-ashore-poland-construction-still-drags.
8 "Inflection Point: Missile Defense and Defeat in the 2021 Budget," CSIS Missile Defense Project, March 23, 2020, accessed March 3, 2021, https://missilethreat.csis.org/inflection-point-missile-defense-and-defeat-in-the-2021-budget/.
9 "Pentagon Considers Replacing Guam's THAAD Battery with Aegis Ashore," Jane's, February 5, 2020, accessed March 3, 2021, https://www.janes.com/article/94114/pentagon-considers-replacing-guam-s-thaad-battery-with-aegis-ashore.
10 "2019 Missile Defense Review," The US Dept of Defense, accessed March 3, 2021, p. XV, https://media.defense.gov/2019/Jan/17/2002080666/-1/-1/1/2019-MISSILE-DEFENSE-REVIEW.PDF.

operational in the mid-2020s.[1] However, on June 15, 2020, Minister of Defense Taro Kono canceled the program, citing technical issues and the increasing cost.[2] Japan decided to add two more Aegis BMD ships to its fleet instead.

The United States also considers using *THAAD for the atmospheric intercept of ICBMs* and integrating it into a multilayered system together with GBIs and SM-3s. Both the use of the existing interceptors and modification of the seeker and the booster are being considered.[3]

The Donald Trump administration also showed some interest in the *active phase intercept of ballistic missiles*. The 2019 Missile Defense Review stated that, "As rogue state missile arsenals develop, the space-basing of interceptors may provide the opportunity to engage offensive missiles in their most vulnerable initial boost phase of flight, before they can deploy various countermeasures [...] DoD will undertake a new and near-term examination of the concepts and technology for space-based defenses to assess the technological and operational potential of space-basing in the evolving security environment."[4] The same document noted the potential of the F-35 Lightning II for "shooting down adversary ballistic missiles in their boost phase," when equipped with a new or modified interceptor.[5]

At the same time, the required DoD report on space sensors and interceptors, which was supposed to be delivered within six months (by July 2019),[6] was never finished. The National Defense Authorization Acts for 2020 and 2021 show that almost no work is being done on boost phase intercept.[7]

Russian Strategic Missile Defense

Unlike the United States, Russia is not developing and does not plan to develop a country-wide ABM system. Russia maintains *A-135 anti-ballistic missile system*, protecting Moscow and the surrounding industrial region. The system is compliant with the 1972 ABM Treaty. According to open-source information, when the A-135 was completed in 1989, it included a Don-2N battle management radar and two types of interceptors: 68 shorter range 53T6 (Gazelle) missiles for atmospheric interception and 32 longer-range 51T6 (Gordon) missiles for exo-atmospheric interception.[8] The 2019 U.S. Missile Defense Review also states 68 interceptors.[9] The system is currently undergoing modernization with new interceptors that are being developed and tested.

1 "Lockheed Martin Wins Contract Modification for Japan Aegis Ashore Batteries," The Diplomat, March 9, 2020, accessed March 3, 2021, https://thediplomat.com/2020/03/lockheed-martin-wins-contract-modification-for-japan-aegis-ashore-batteries/.
2 "Japan Suspends Aegis Ashore Deployment, Pointing to cost and Technical Issues," Defense News, June 25, 2020, accessed March 3, 2021, https://www.defensenews.com/global/asia-pacific/2020/06/15/japan-suspends-aegis-ashore-deployment-pointing-to-cost-and-technical-issues/.
3 "MDA's FY21 Budget Paves Way for New Homeland Missile Defense Plans," Defense News, February 10, 2020, accessed March 3, 2021, https://www.defensenews.com/smr/federal-budget/2020/02/11/mdas-fy21-budget-paves-way-for-new-homeland-missile-defense-plans/.
4 "2019 Missile Defense Review," The US Dept of Defense, accessed March 3, 2021, p. IX, https://media.defense.gov/2019/Jan/17/2002080666/-1/-1/1/2019-MISSILE-DEFENSE-REVIEW.PDF.
5 Ibid., XII.
6 "Department of Defense Off-Camera Press Briefing on the 2019 Missile Defense Review," The US Dept of Defense, January 17, 2019, accessed March 3, 2021, http://surl.li/mpzz.
7 "Missile Defense. An Assessment of U.S. Military Power," Heritage Foundation, October 30, 2019, accessed March 3, 2021, https://www.heritage.org/military-strength/assessment-us-military-power/missile-defense.
8 Колтунов et al. 2010, 15.
9 "2019 Missile Defense Review," The US Dept of Defense, accessed March 4, 2021, https://media.defense.gov/2019/Jan/17/2002080666/-1/-1/1/2019-MISSILE-DEFENSE-REVIEW.PDF.

The goal is to have the system operational in 2022.[1] There is no indication that the number of the interceptors will be increased as a result.

Russia also employs a wide range of *mobile air and missile defense systems*. The S-500 Prometey "Prometheus" system, which is expected to be initially deployed in 2021 and mass produced in 2025, is designed to intercept intermediate-range ballistic missiles, as well as ICBMs in the terminal phase and under certain conditions in the midcourse phase.[2] Russia widely exports its predecessor, S-400 "Triumph." The system has been delivered to China and Turkey, a contract has been signed with India.

Russia has also been testing its "Nudol" system, which is allegedly capable of intercepting ballistic missiles out of the atmosphere, as well as targeting space objects.[3]

Arms Control Options for Strategic Missile Defense

The most successful arms control initiative in regards to missile defense was the 1972 ABM Treaty. According to the document, the parties agreed:

– to limit their anti-ballistic missile systems to two (later one) missile fields with up to 100 interceptors;

– not to deploy ABM systems or their components for a defense of the territory of its country and not to provide a base for such a defense in other states, and not to deploy ABM systems for defense of an individual region;

– not to develop, test, or and deploy anti-ballistic missile systems or components which are sea-based, air-based, space-based or mobile land-based.

For the most part, the sides still adhere to the first limitation, despite the withdrawal of the United States from the ABM Treaty in 2002. There is no indication that either Moscow or Washington plan to increase the number of silo-based interceptors beyond 100 in the foreseeable future. Considering the current state of the U.S. Ground-Based Midcourse Defense, based on GBIs, it seems realistic to say that, for technical, financial, and organizational reasons it will pose no threat to the Russian strategic forces for at least the next decade. The Ground-Based Midcourse Defense deployed today is also popular with the American people and both political parties in Congress. Trying to limit it through the arms control negotiations is thus doomed to failure. A more promising approach would be to focus the discussion on those systems that are located outside the United States, which, as we have seen, also have a higher destabilizing potential.

The United States is in clear violation of the second limitation, as it deploys or plans to deploy its *de facto* strategic missile defense systems outside its national territory and transfers these systems to its allies. At the same time, with the new Russian BMD systems coming online, the issue of their delivery to Moscow's allies and partners will have to be addressed. It is entirely possible that Beijing and Tehran may not be interested in ICBM defense – Iran would hardly be targeted by strategic nuclear forces, and China

1 *Гаврилов, Ю*. Чтобы муха не пролетела. Как идет модернизация системы ПРО Москвы // Российская Газета. 22 января 2021. [Электронный ресурс]. URL: https://rg.ru/2021/01/22/kak-moderniziruiut-sistemu-pro-moskvy.html (дата обращения: 04.03.2021).

2 Разработчик рассказал о возможностях С-500 // РИА Новости. 10 февраля 2020. [Электронный ресурс]. URL: https://ria.ru/20200210/1564512668.html (дата обращения: 04.03.2021).

3 *Ходаренок,* М. «Нудоль» и «Прометей»: когда армия получит новые системы // Газета.ру. 19 июня 2020. [Электронный ресурс]. URL: https://m.gazeta.ru/army/2020/06/19/13123189.shtml (дата обращения: 04.03.2021).

does not seem to be looking for nuclear invulnerability, aiming at deterrence instead. This could open the door for U.S.–Russian discussions on the export of strategic BMD systems. Moscow and Washington could establish technical limits for the export of ballistic missile systems. The Missile Technology Control Regime (MTCR), which Russia will be chairing in 2021–2022, could serve as a guide for such limitations.

Finally, both Moscow and Washington ignore the third limitation by deploying or developing mobile BMD systems. At the same time, this issue was already present in the 1990s, when the rapid development of mobile missile defense systems at the theater level forced Russia and the United States to look into ways of distinguishing between strategic and non-strategic BMD. At a meeting in New York in 1997, the parties agreed on a memorandum of understanding and two agreed statements, which were later ratified by Russia, but not the United States.

The agreement stated that, for the purposes of the ABM Treaty, interceptor missiles with a velocity of up to 3 km/sec over any part of its flight trajectory or whose target missile does not exceed 5 km/sec over any part of its flight trajectory and has a range that does not exceed 3500 kilometers are not counted against ABM Treaty limits.[1] The parties also agreed on transparency measures regarding their non-strategic BMD systems (THAAD and the Navy Theater-Wide Theater Ballistic Missile Defense System, which would later become the Aegis Missile Defense System, for the United States and C-300B for Russia).[2] Additionally, the agreement stipulated an annual exchange of information about the systems, the obligation to notify the other party about the construction of new test sites and interceptor launches. The sides promised that deployed non-strategic BMD systems would not pose a threat to the strategic forces of the other party, which was supposed to be supported by the exchange of information about the numbers of such systems and plans for their use and development.

The 1997 agreements were an interesting experience. Some of their provisions, such as making sure that the configuration of missile defense systems does not threaten the strategic forces of the other side, seem to be quite relevant and promising today. At the same time, other parts need updating. According to the media, SM-3 Block IIA already exceeds the accepted speeds agreed upon in the memorandum. It is safe to assume that this could be the case for some of the newer Russian systems as well. The speed of the interceptors would be an important factor and will have to be addressed, especially for the U.S. anti-ballistic missiles in Europe – both ground- and sea-based. The higher the speed, the bigger the chance that they could be used successfully against Russian ICBMs launched from the European part of the country in the active phase of their trajectory.

At the same time, speed is an important, but not critical factor in successfully intercepting an ICBM in the passive part of its trajectory. The trajectory of the interceptor

1 "First Agreed Statement Relating to the Treaty Between the United States of America and the Union of Soviet Socialist Republics on the Limitation of Anti-Ballistic Missile Systems of May 26, 1972. September 26, 1997. Special Section: New START II and ABM Documents," Arms Control Association, accessed March 3, 2021, https://www.armscontrol.org/act/1997-09/arms-control-today/special-section-new-start-ii-abm-documents.

2 "Agreement on Confidence-Building Measures Related to Systems to Counter Ballistic Missiles other than Strategic Ballistic Missiles," The nuclear information project, September 26, 1997, accessed March 3, 2021, https://fas.org/nuke/control/abmt/text/abm_cbm.htm.

simply needs to cross the trajectory of an ICBM, which is quite easy to calculate.[1] Here the total number of U.S. exo-atmospheric interceptors, primarily SM-3, would make a difference.

Russia and the United States could agree to limit the number of interceptors so that it would be enough to stop a finite number of missiles from third parties, but not enough to threaten the strategic forces of Moscow and Washington. The details of such an agreement could be then re-evaluated every five or ten years. And while the United States is less interested in limiting Russian missile defenses, Moscow's arsenal is growing, and the calculus might change. Additionally, Washington has on multiple occasions raised its concerns about Russian anti-satellite (ASAT) systems. Since exo-atmospheric missile defense and ASAT weapons are essentially based on the same principles, there could be some room for maneuver there.

If Moscow and Washington agree to exchange information on the number of interceptors in their possession, verification and storage would be problematic, as would confirming the presence or absence of SM-3 missiles onboard ships, not least because it would reveal the content of other missile tubes. One idea on how to tackle the issue would be to separate BMD-capable ships, limit their number and provide them with functionally related observable differences (FRODs), which can be observed using national technical means of verification (NTMs). The U.S. Navy might be interested in exploring this option. Its leadership has on several occasions spoken critically about BMD consuming too much of the limited naval resources. For example, in 2018, Chief of Naval Operations Adm. John Richardson said, "Whether that's AEGIS ashore or whatever, I want to get out of the long-term missile defense business and move to dynamic missile defense."[2]

Another critical aspect of missile defense that should be considered in the context of arms control is the non-deployment of BMD systems in outer space and a ban on air-based strategic BMD systems. None of those currently exist, but research and development is being conducted in these areas.

Strategic Conventional Weapons

There is no universally accepted definition of a strategic conventional weapon. However, to have a strategic effect, a conventional weapon must have high precision and be capable of traveling long (though not necessarily intercontinental) ranges, which essentially equates "strategic" with "long-rage high-precision" weapons.

The Handbook of Defence Terminology of the Ministry of Defence of the Russian Federation defines long-rage high-precision weapons as the "weapons of an increased potential threat [...] aimed at the selective assured strike of stationary [...] and in some

1 See, for example, Simon Peterson (@SimonHoejbjerg): "I often see and hear people talking about whether or not a certain interceptor can intercept a specific ballistic missile type, e.g. can an SM-3 intercept an ICBM. And very often people make claims that the interceptor's burn out velocity is critical to that. It's actually not," Tweeter, December 30, 2019, https://twitter.com/SimonHoejbjerg/status/1211582726991691777.

2 "The U.S. Navy is Fed up with Ballistic Missile Defense Patrols," Defense News, June 16, 2018, accessed March 3, 2021, https://www.defensenews.com/naval/2018/06/16/the-us-navy-is-fed-up-with-ballistic-missile-defense-patrols/.

cases quasi-stationary objects [...] at distances exceeding 400 km."[1] The protocol to the New START Treaty defines long-range air-launched cruise missiles (ALCMs) as "an ALCM with a range in excess of 600 kilometers."[2] For air- and sea-launched systems, the genuine range is increased by the range of their platforms. No such criteria have been developed for land-based systems, as they were previously banned under the INF Treaty. Long-range conventional hypersonic missiles should also be included as strategic conventional weapons.

Because of their high precision, strategic conventional weapons are well suited for attacks against enemy infrastructure, including nuclear command and control and dual-use military infrastructure, which can lead to nuclear escalation. Moreover, strategic conventional weapons can be used as a part of a counterforce strike alongside nuclear weapons.

U.S. Strategic Conventional Weapons

The U.S. strategic conventional forces include sea- and ground-launched (after the August 18, 2019 test from a mobile launcher) BGM-109 Tomahawk missiles (conventional only after 2013[3]), air-launched AGM-86C/D cruise missiles (a nuclear version of the missile exists as well), and air-launched AGM-158 JASSM ER cruise missiles (extended range). R&D continues on the new air-launched LRSO (Long-Range Standoff Missile – conventional and nuclear) cruise missile, which is intended to substitute AGM-86 by 2030,[4] the JASSM XR (extreme range) and LRASM (Long Range Anti-Ship Missile) anti-ship cruise missile based on JASSM ER.

In December 2019, a prototype intermediate range ground-launched ballistic missile was tested.[5] According to expert estimates, the prototype was based on the Castor 4A rocket engine. No further tests followed.

The United States has several ongoing R&D projects on hypersonic missiles. Every military service runs its own program. The Army and the Navy design their systems based on a common vehicle developed by the Army.[6] The Navy's project is called Intermediate Range Conventional Prompt Strike Weapon (IR CPS), while the Army's is called Long-Range Hypersonic Weapon (LRHW). The Air Force has canceled a similar program of its own, the Hypersonic Conventional Strike Weapon, (HCSW), to save money and is now focusing on the AGM-183A Air-launched Rapid Response Weapon (ARRW).[7] The Defense Advanced Research Projects Agency (DARPA) is developing at least four hypersonic programs in conjunction with the armed forces: Tactical Boost Glide (TBG), Advanced Full-

1 Высокоточное оружие большой дальности // Справочник по терминологии в оборонной сфере. Министерство обороны России. [Электронный ресурс]. URL: http://dictionary.mil.ru/folder/123102/item/129202/ (дата обращения 03.03.2021).
2 Протокол к Договору между Российской Федерацией и Соединенными Штатами Америки о мерах по дальнейшему сокращению и ограничению стратегических наступательных вооружений // Президент России. [Электронный ресурс]. URL: http://static.kremlin.ru/media/events/files/41d2ef6d0dc8b2e65fc5.pdf (дата обращения 03.03.2021).
3 Hans M. Kristensen, "U.S. Navy Instruction Confirms Retirement of Nuclear Tomahawk Cruise Missile," Federation of American Scientists, March 18, 2013, accessed March 3, 2021, https://fas.org/blogs/security/2013/03/tomahawk/.
4 Kristensen, Korda 2021.
5 "Pentagon Conducts First Test of Non-Nuclear Capable Ballistic Missile Post-INF Treaty," The Drive, December 12, 2019, accessed March 3, 2021, https://www.thedrive.com/the-war-zone/31456/u-s-conducts-first-test-of-non-nuclear-ballistic-missile-following-inf-arms-treaty-collapse.
6 Sydney J. Freedberg Jr., "Army Warhead is Key to Joint Hypersonics," Breaking Defense, August 22, 2019, accessed March 3, 2021, https://breakingdefense.com/2018/08/army-warhead-is-key-to-joint-hypersonics/.
7 "Roper: The ARRW Hypersonic Missile Better Option for USAF," Air Force Magazine, March 2, 2020, accessed March 3, 2021, https://www.airforcemag.com/arrw-beat-hcsw-because-its-smaller-better-for-usaf/.

Range Engine (ARFE), Operational Fires (OpFires) and Hypersonic Air-Breathing Weapon Concept (HAWC).[1]

The U.S. defense budget for FY2021 has earmarked 2.6 billion USD for hypersonic research, including 206 million USD for hypersonic defense.[2] According to the Congressional Research Service, United States is unlikely to field an operational system before 2023.[3]

All the U.S. hypersonic boost glide vehicles under development are conventional only. According to Mike White, the Pentagon's assistant director for hypersonics, because of the differences in ranges and the trajectory of the boost glide vehicles, "any adversary who's got the capability to detect [them] will quickly understand the difference."[4] With this said, the strictly conventional nature of the new weapons increases their requirements, including higher accuracy. Taking the specific conditions in which the hypersonic boost glide vehicles are operating into account – high speed, extreme heating due to air friction – it will be tough to meet these requirements.

Russian Strategic Conventional Weapons

Russian strategic conventional weapons include "Kalibr" sea-launched cruise missiles (a separate nuclear version of the missile also exists), Onyx sea-launched anti-ship cruise missiles (a separate nuclear version of the missile also exist),[5] and Kh-55, Kh-101,[6] and Kh-32[7] air-launched cruise missiles (separate nuclear versions of each of these missiles exist). On December 1, 2017, the "Kinzhal" air-launched ballistic missile (a separate nuclear version exists) mounted on MiG-31K aircraft reached initial operational capability.[8] The "Zircon" hypersonic sea-launched missile is undergoing testing.

The Russian armed forces do not have strategic conventional weapons with intercontinental range. According to open-source information, the "Avangard" hypersonic boost-glide vehicle was developed as a nuclear weapons delivery system.

Arms Control Opportunities for Strategic Conventional Weapons

Russia and the United States have extraordinarily little experience in dealing with strategic conventional weapons in arms control. Whenever Moscow and Washington have touched upon the issue, strategic conventional weapons were either banned or included in the total limits together with the nuclear weapons.

Ground-launched intermediate range conventional missiles were banned alongside their nuclear "cousins" under the INF Treaty, primarily to make the verification easier. START I banned air-launched ballistic missiles, both conventional and nuclear. Finally, New START included conventional ICBMs and SLBMs (in case they would be

1 Kelley M. Sayler, "Hypersonic Weapons: Background and Issues for Congress," Congressional Research Service, accessed March 3, 2021, pp. 4–8, https://www.hsdl.org/?view&did=827149.
2 Sydney J. Freedberg Jr., "Hypersonics Won't Repeat Mistakes of F-35."
3 Kelley M. Sayler, "Hypersonic Weapons: Background and Issues for Congress."
4 Sydney J. Freedberg Jr., "Hypersonics Won't Repeat Mistakes of F-35."
5 Эксперт: бросковые испытания ракеты «Оникс-М» с дальностью 800 км уже проведены // ТАСС. 25 сентября 2019. [Электронный ресурс]. URL: https://tass.ru/armiya-i-opk/6925991 (дата обращения 03.03.2021).
6 Kristensen, Korda 2019.
7 Россия вооружится неуязвимым «убийцей авианосцев» // Лента.ру. 15 мая 2018. [Электронный ресурс]. URL: https://lenta.ru/news/2018/05/15/tu22/ (дата обращения 03.03.2021).
8 Гиперзвуковая ракета «Кинжал». Досье // ТАСС. 19 июля 2018. [Электронный ресурс]. URL: https://tass.ru/info/5387789 (дата обращения 03.03.2021).

produced) in the aggregate strategic offensive arms limit. Neither the United States nor Russia ever built such weapons.

None of this precedent looks especially helpful this time around. It seems clear that neither country is prepared to give up its strategic conventional weapons altogether. And the asymmetry in the Russian and U.S. strategic conventional arsenals just does not stimulate Washington to discuss this issue at all. The United States also needs to take China's substantial missiles arsenal into account.

The situation can change with new Russian systems, such as "Zircon" hypersonic missile, coming online. In the event that Washington becomes interested in discussing sea-, air- and ground-launched strategic conventional missiles, the experience of START I can become relevant. While the original START did not cover sea-launched nuclear cruise missiles, the parties have produced politically binding declarations, limiting the number of long-range nuclear SLCMs (with a range exceeding 600 km) to 880 missiles. Moscow and Washington also pledged to make an annual exchange of plans for the arsenals of such missiles for the next five years. The parties also agreed to exchange the number of nuclear SLCMs with a range of between 300 and 600 km.[1] These limitations were completely lopsided. While the United States was planning to deploy 637 long-range nuclear SLCMs, the USSR only had 100.[2] Similar limitations could be adopted for conventional missiles (including hypersonic) as well.

Washington could be interested in discussing hypersonic systems, an area in which Russia currently has an edge. However, Russian and U.S. hypersonic systems were developed separately and with different goals. In the United States, the Prompt Global Strike was a child of the "capabilities-based" military planning under the G.W. Bush administration, which came to replace the old-fashioned "threat-based approach."[3] For its part, the Russian "Avangard" boost glide vehicle is a continuation of the "Albatros" project started in the 1980s with the aim of defeating the U.S. global BMD and delivering nuclear warhead to the continental United States. Since the Russian and American programs were not created as a reaction to each other, mutual limitation without considering the challenges they were meant to address looks improbable.[4]

Currently the mass production of hypersonic boost glide vehicles is partly limited by New START, which limits the number of deployed ICBMs. The Russian side has agreed to include "Avangard" in the New START limits, as it is mounted on a treaty accountable missile.[5] Hypersonic systems are also rather expensive (more so compared to "classic" warheads), and their missions seem to be quite narrow. One can imagine that hypersonic weapons will remain a niche project, with little impact on strategic stability.

Depending on the pace of development of intermediate-range hypersonic weapons and the threat perceptions of the two sides (especially of sea- and air-

1 "Declaration of the United States of America Regarding its Policy Concerning Nuclear Sea-Launched Cruise Missiles," FAS, July 31, 1991, accessed March 3, 2021, https://fas.org/nuke/control/start1/text/declsts.htm; "Declaration of the Union of Soviet Socialist Republics Regarding its Policy Concerning Nuclear Sea-Launched Cruise Missiles," FAS, July 31, 1991, accessed March 3, 2021, https://fas.org/nuke/control/start1/text/declsts.htm.

2 *The Future of the U.S.-Soviet Nuclear Relationship* 1991.

3 "Special Briefing on the Nuclear Posture Review," The US Dept of Defense, January 9, 2002, accessed March 3, 2021, https://fas.org/sgp/news/2002/01/npr-briefing.html.

4 Borrie et al. 2019, 15–16.

5 В Генштабе заявили, что комплекс «Авангард» не нарушит договоренности по СНВ // Интерфакс. 24 июля 2019. [Электронный ресурс]. URL: https://www.interfax.ru/russia/670264 (дата обращения 03.03.2021).

launched hypersonic weapons), there could be a room for discussing the issue. The sides will have somewhat similar weapons (the Russian "Kinzhal" and the array of the U.S. systems), which could lead to numerical limitations.

Conclusion

None of the possibilities mentioned in this article will be easy to implement. Despite the New START extension, the U.S.–Russia relations remain in poor condition. Views on the strategic stability and the national security of the two countries diverge significantly. Even maintaining the current limitations on strategic offensive arms five years from now is not a given.

Worse still, we should not expect a clean and easy-to-verify solution on missile defense or strategic conventional weapons, and this, experts believe, it increases the chances for an agreement to succeed. In both cases, the capabilities of the two sides are not equal (although Russia is catching up), which leads to an asymmetry of interests. Both missile defense and strategic conventional weapons provide clear military and political benefits (though in a different way) to Moscow and Washington, so limiting them would be a tall order.

However, a case can me made that arms control frameworks could successfully address some of these issues if properly targeted.

In terms of missile defense, instead of focusing on the U.S. Ground-Based Midcourse Defense, which is not the most immediate threat to strategic stability and is an extremely popular program that enjoys bipartisan support in Washington, Russia and the United States should look into the missile defense and mobile systems located outside their territories. Limiting the export of mobile strategic missile defense systems could also be of interest to Moscow and Washington. It will not be easy to put limitations even on mobile U.S. missile defense systems, but some sort of combination of qualitative and quantitative limitations on U.S. interceptors would be beneficial for strategic stability. Such an agreement would need to include robust information exchanges and could be verified by NTMs. Space and air-based missile defense remain as destabilizing as ever and should be avoided.

Moscow and Washington have never had much success in regulating strategic conventional arms. The issue is further complicated by the asymmetry in the U.S. and Russian arsenals. Despite the impressive developments in new technologies, the biggest issue would still be posed by the same old conventional cruise missiles. One possible approach to address this would be to use the experience of SLCM limitations accompanying START I. As for hypersonic boost glide systems, those of the intercontinental range (if produced) will be covered by the existing arms control limitations. Intermediate range hypersonic systems are currently not mass produced. If this changes, and both countries believe that they pose a problem for their security, they can be discussed in the arms control format.

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Решение стратегического уравнения: интеграция противоракетной обороны и обычных вооружений в российско-американский режим контроля над вооружениями

АННОТАЦИЯ

В связи с продлением срока действия нового договора СНВ Москва и Вашингтон вступили в процесс новых переговоров по контролю над вооружениями. Беспрецедентное количество нерешенных вопросов двусторонней повестки означает, что любые будущие переговоры повлекут за собой компромиссы в различных сферах. В статье исследуются две области, которые неизбежно придется рассматривать на будущих переговорах – противоракетная оборона и стратегические обычные вооружения. Противоракетная оборона была неотъемлемой частью российско-американской архитектуры контроля над вооружениями с самого начала, что наиболее ярко отразилось в договоре по ПРО от 1972 г. Однако изучение текущего состояния и вектора развития противоракетной обороны США позволяет предположить, что вместо того, чтобы сосредоточиться на т. н. «стратегических» перехватчиках, расположенных на континентальной части США, цель переговоров должна заключаться в урегулировании статуса и роли новых мобильных систем, которые представляют существенную угрозу стратегической стабильности и с большей вероятностью могут стать предметом ограничений. Определение стратегических обычных вооружений размыто, и опыт контроля их контроля незначителен. В тех случаях, когда на них распространяются положения о контроле над вооружениями, они либо запрещаются, либо включаются в лимиты, распространяемые на стратегические ядерные силы. Более того, ко многим типам стратегических обычных вооружений невозможно применять универсальный подход контроля. Поэтому применительно к самым распространенным стратегическим обычным вооружениям – крылатым ракетам большой дальности – автор считает, можно было бы рассмотреть рамки т. н. асимметричных лимитов.

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