

Russia's Nuclear Posture: Modernization and the State of Arms Control

Vincent C. Fournier and Ulrich Kühn

This issue brief analyzes Russia's nuclear posture, meaning the composition of the Russian strategic triad, its non-strategic nuclear arms, and Moscow's current nuclear doctrine. Although Moscow's policy of limited transparency on both capabilities and doctrines makes it hard to assess its nuclear posture precisely, a number of open sources¹ allow for a good overview. Since large parts of the Russian nuclear deterrent are undergoing modernization, a closer look at the future Russian nuclear architecture is taken. The impacts of Russia's disarmament obligations under the New START treaty are also examined, particularly as the Russian numbers have gone up in recent months. While there is currently no political sign that Russia will miss the final 2018 New START ceilings, the qualitative modernization and the slow pace of New START implementation is a worrisome signal for nuclear disarmament. The consequences of this negative trend might affect the global non-proliferation regime.

The Strategic Triad

Russia's Soviet-era nuclear missiles and systems still represent the core of its strategic nuclear capabilities (see Table 1, p. 10). This situation is progressively changing as Russia modernizes each 'leg' of its strategic triad. RS-24 missiles, in both mobile and silo versions, will gradually replace the remaining SS-18, SS-19, and SS-25. Delta-class submarines will be decommissioned at a rate that will likely be equivalent to the production rate of the Borei-class subs. Russia's bomber fleet will not, however, see major changes before the mid-2020s as a new bomber is only in its early developmental phase. Aside from modernization programs, the strategic triad will maintain capabilities for ensuring the inherited missions of deterrence and second-strike.

Strategic Missile Forces

There are currently three Cold War era ICBMs in Russia's strategic missile forces: the silo-based RS-20V (SS-18) and RS-18 (SS-19) and the road-mobile RS-12M Topol (SS-25). These missiles are all in the process of being phased out.² The 46 ten-warhead RS-20Vs currently represent Russia's most important missiles in terms of the percentage of total warheads. This situation will remain so in the short- to mid-term as their service life has been extended to 25-30 years, which means that they could stay in operation up until the early-2020s. Similarly, the six-warhead RS-18, the oldest missile of Russia's arsenal, will see its service life expire by 2019.³ The remaining 117 road-mobile single-warhead RS-12Ms, which are going through a life extension program, should also reach the end of their operational lives in 2021 and gradually make way for the new generation of RS-24 missiles.

Comprising roughly 193 'old' missiles, they constitute about 63.5 percent of Russia's total number of ICBMs and around 78.3 percent of the total number of warheads in its strategic missile forces. By 2016, Russia projects seeing the number of old systems decrease to 30-40 percent and, by the early 2020s, the vast majority of these weapons should be completely retired.⁴

The 'new' generation of ICBMs has now been in deployment since 1997. The single-warhead RS-12 Topol-M⁵ (SS-27 Mod 1) was developed in a silo and road-mobile version, which were deployed in 1997 and 2006 respectively. The deployment phase of these two versions of the missile was completed in 2013 and Russia's missile forces now account for 60 silo-based and 18 road-mobile Topol-Ms for a total of 78 warheads.⁶ This ICBM type was a direct replacement for the aging RS-12Ms (also a single warhead

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missile). However, it cannot substitute for the Multiple Independently Targetable Reentry Vehicle (MIRV) RS-20Vs and RS-18s in terms of warhead numbers. Indeed, as the central component of Russia's strategic architecture, a relative decrease in the number of warheads in its ICBM forces compared to the two other components of its triad was not a coherent outcome. Hence, Russia developed a MIRVed version of the Topol-M, the RS-24 Yars (SS-27 Mod 2), which is said to have enhanced combat and operational capabilities.⁷

The RS-24, which was first deployed in 2010, also comes in a road-mobile and a silo version. Four regiments of mobile RS-24s are now in operation for a total of 33 missiles. The two latest regiments deployed in 2013, composed of nine and six missiles, were put on 'experimental combat duty' and it is unknown whether these missiles are mounted with warheads.⁸ Multiple regiments of mobile RS-24s will be deployed through 2014 and further on, mainly replacing the RS-12Ms. Deployment of the RS-24 in silo should begin in 2014, gradually replacing the remaining RS-18s and RS-20Vs in their different locations. This missile will be at the forefront of Russia's deployment of ICBMs for the foreseeable future.⁹ The total number of RS-24 Moscow plans on commissioning is uncertain and will depend on production rates and financial means. However, it is estimated that it could possibly involve a total of around 120 to 150 missiles in the future.¹⁰ The missile's number of warheads is uncertain. Estimates¹¹ vary from three to ten warheads, assuming that the silo version could carry a greater number of warheads than the mobile version. Based on official Russian statements, this paper will make the assumption that the RS-24 has a payload of four warheads. In addition, a new solid-propelled ICBM that would eventually supplement the Topol-M and the Yars has been test-launched in 2012 and 2013 and could be deployed around 2015.¹² The specification of this new ICBM (RS-26 Rubezh) are classified, however, it could be equipped with new advanced warheads that are capable of traveling at hypersonic speed and performing missile defense evading maneuvers.¹³

In summary, Russia currently has an inventory of about 304 ICBMs, carrying a total of approximately 967 warheads. These missiles are spread across Russia's three Missile Armies, which are

composed of a total of 12 Missile Divisions. After the modernization period of its strategic missile forces, Russia's number of Missile Divisions should go down to seven (three silo divisions and four road-mobile divisions). Replacing the single-warhead SS-25 mobile missiles with mobile MIRVed RS-24s could see the proportion of mobile missile warheads significantly increase from 14 percent today to roughly 70 percent by the early 2020s.¹⁴ This shows Russia's effort to enhance the survivability of its forces. Once dispersed, these mobile ICBMs are considered to be Russia's most survivable weapons because of the difficulty of destroying them all in a disarming first-strike. That said, Russia's missile forces structure will maintain both silo-based and mobile missiles for the foreseeable future, with the former bound to the concept of deterrence and the latter to ensuring Russia's second-strike capability.

Strategic Naval Forces

Russia's strategic naval forces currently have two models of Cold War era submarines. Of them, three 667BDR Kalmar (Delta III) submarines are in service within the Pacific Fleet. They are equipped with the D-16R missile system with 16 RSM-50 Volna missiles (SS-N-18 Stingray), which carry three warheads each; adding up to 48 SLBMs and 144 warheads for that class of submarine. The Kalmar will be the first to be replaced by the next generation of Borei-class SSBNs. Moreover, six Project 667BDRM Delfin (Delta IV-class) SSBNs presently constitute the backbone of Russia's strategic fleet and will remain so in the short- to mid-term. They are in operation within the Northern Fleet. These submarines have recently completed a modernization program including refueling of nuclear reactors and installation of the new four-warhead RSM-54 Sineva missiles (SS-N-23).¹⁵ Together, the six 16-missile-capable Delta IV-class submarines account for a total of 69 SLBMs and 384 warheads (only four Delta-IV are currently operational).¹⁶

The Layner, said to be a further modification of the SS-N-23, could be put in service with some of the Delfin-class submarines within a few years. Although the missile's characteristics remain unclear, it is said that the payload could consist of up to ten warheads and could include

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additional decoys and penetration aids against ballistic missile defenses.¹⁷

After almost 25 years without commissioning a new submarine in its strategic fleet, it is now possible to see what this component of Russia's triad will look like in the future. The plan is for eight new generation Project 955 Borei-class ships to gradually replace the old Delta IIIs and Delta IVs by the early 2020s.¹⁸ This submarine was designed to be equipped with 16 missile tubes and each Borei-class submarine (first version and upgraded version) is set to carry the RSM-56 Bulava missiles (SS-NX-32), which is declared to carry up to six warheads.¹⁹ In addition, the subs will be equipped with long-range cruise missiles (either the 3M10/RK-55 Granat or the newer missile, the Kalibr).²⁰

After 15 years of design, development, production and testing, the first of the Borei-class, the Yuri Dolgoruki, entered service with the Northern Fleet in early 2013. The second Borei-class submarine, the Alexander Nevsky, was commissioned, also with the Northern Fleet (although it will later be transferred to the Pacific Fleet), at the end of December 2013 after undergoing its acceptance tests throughout the year.²¹ However, as long as the Bulava missile is not fully operational, the two first Borei subs are likely to be restricted to perform a secondary role.²² The third sub, the Vladimir Monomakh, finished its sea trials in late 2013. It is scheduled to test-launch Bulava missiles and conduct some extra exercises before its formal commissioning within the Pacific around late 2014. These plans will, however, very much depend on the development progress of the Bulava.²³

The fourth and subsequent submarines will constitute an upgraded version of the Borei-class known as the Project 955A class submarine (Borei-A). It is supposed to be stealthier and to differ significantly from the previous ones, as it will be equipped with new advanced sonar, navigation, communications, and fire-control systems.²⁴ Following a period of uncertainty concerning the submarine's number of missile tubes, a senior defense industry source stated in early-2013 that the number of tubes would not differ from the previous Borei model.²⁵ The first of these Borei-A class subs, the Knyaz Vladimir, was laid down for construction in July 2012 and is expected to sail in its fleet towards 2015-2017.

Although they were both scheduled to be laid down in 2013, construction of the second Borei-A sub began in July 2014 and the third one of the class, the Mikhail Kutuzov, should be laid down in late 2014.²⁶ Those two subs are expected to sail in their fleet towards 2020.

Strategic Bombers

Russia's Long-Range Aviation Command currently operates two nuclear-capable heavy bombers, the Tu-95MS (Bear H) in two models and the Tu-160 (Blackjack). Even though there are uncertainties about the number of bombers and their operational status²⁷, it is estimated that the fleet is composed of 13 Tu-160s, 30 Tu-95MS16s and 29 Tu-95MS6s.²⁸ The Tu-95MS strategic bomber can carry up to six AS-15A (Kh-55) cruise missiles in its bomb bay. The upgraded version of the bomber, the Tu-95MS16, can carry an additional ten missiles under its wings²⁹ and the Tu-160 is capable of carrying twelve AS-15B³⁰ (Kh-55SM) or AS-16 (KH-15) missiles. Furthermore, a modernization program will enable the Tu-160 to carry gravity bombs and non-nuclear cruise missiles. A new long-range cruise missile has now been in development for a long time. The Kh-101, the conventional system variant, and the Kh-102, the nuclear system variant, are meant to eventually replace the aging AS-15s.³¹

The Tu-160 and Tu-95MS are being upgraded with new avionics and new weaponry to improve their combat effectiveness and about half of the Tu-95MSs will be overhauled to extend their lifetimes until the new bomber, referred to as the PAK DA, enters service to replace both bombers. With adequate maintenance, the bombers could stay in operation up until 2030 allowing enough time to develop the new bomber. This new subsonic aircraft will have improved stealth capabilities. Moreover, it will be equipped with advanced electronic warfare systems and it should be armed with new and advanced long-range nuclear-capable cruise missiles and high-precision conventional weapons.³² With full-scale research and development scheduled to begin in 2014, a prototype of the PAK DA is supposed to be ready for 2020 and the bomber could begin service around 2025.³³

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Non-Strategic Nuclear Weapons

The knowledge surrounding Russia's arsenal of non-strategic nuclear weapons (NSNWs), more specifically of its architecture and the exact status of its weapons, remains extremely vague. So far, Moscow has only stated that the "remaining non-strategic nuclear weapons have been removed from combat duty, undeployed and concentrated in centralized storage sites on the Russian territory."³⁴

Experts' estimates of Russia's arsenal vary significantly due to diverging baselines and different methodologies of accounting. The general estimate of Russia's NSNWs arsenal is roughly 2,000 operationally assigned NSNWs warheads³⁵ (see Table 2, p. 10), distributed in Russia's military structure (ground, naval, air, and air-defense forces). Another 2,000 warheads are said to be retired and awaiting dismantlement.³⁶ A recent study³⁷ suggests that the total number of operationally assigned NSNWs warheads might be of approximately 860 to 1,040.

Most of today's estimations of Russia's arsenal derive from estimates of the arsenal's 1991/92 size, which generally varies from about 15,000 to 21,700 NSNWs warheads.³⁸ This coincides with the bilateral U.S.-Russian Presidential Nuclear Initiatives (PNIs), which included plans, with no timelines, to cut and/or eliminate NSNWs and to reduce their operational status. Since then, information and statements released concerning the relative (as opposed to absolute) implementation of the PNIs, and the delivery platforms' nominal loading capacities, serve as a vague basis from which estimates are based on. Thereby, today's estimates are generally consistent with Moscow's 2005 Statement that it had reduced its arsenal of NSNWs by 75 percent from its 1991 size.³⁹

Estimates suggest that Russia's air force is equipped with a combined 730 AS-4 (Kh-22) air-to-surface dual-capable missiles and gravity bombs, representing about half of the 1991 numbers.⁴⁰ This makes it the biggest category of NSNWs in Russia's military structure. The fleet of dual-capable bombers includes about 150 Tu-22M3 Backfire-C intermediate-range bombers, which can deliver Kh-22 Burya (AS-4 Kitchen) dual-capable cruise missiles, Kh-15 (AS-16 Kickback) dual-capable short-range missiles⁴¹

and gravity bombs, and roughly 50 only-bomb-capable Su-24M Fencer-D tactical bombers and Su-34s (Fullback).⁴² Other sources include a broader spectrum of aircrafts certified for nuclear missions. Although some Su-24Ms are now going through a modernization program, they will eventually get replaced by the Su-34 bomber.⁴³ An improved version of the Kh-22 missile, the Kh-32, is apparently in the works and would possibly be deployed on an upgraded version of the Tu-22M3: the Tu-22M5.⁴⁴

Approximately 700 NSNWs warheads are assigned to Russia's 190 dual-capable naval delivery platforms⁴⁵, which represent about a third of its 1991 size.⁴⁶ These weapons include land-attack sea-launched cruise missiles, anti-submarine weapons, air defense missiles, torpedoes, and depth bombs. Russia's five dual-capable cruise missiles represent its most important group of this wide variety of weapons and are also used against naval forces. Moreover, Russia has two types of anti-submarine missiles that can be launched from either submarines or ships and depth bombs delivered by some maritime aircrafts.⁴⁷ Each of Russia's submarines can technically carry NSNWs. The first of the new nuclear-powered, dual-capable, Severodvinsk-class attack submarine (Yasen-class) was handed over to the Northern Fleet in December 2013. Four other subs have gradually been laid down for construction with the second one expected to sail within its fleet around 2017.⁴⁸ The model is equipped for antisubmarine missiles and has eight vertical launch tubes for cruise missiles. Russia plans on commissioning eight to ten of them as part of its 2011 to 2020 arms procurement program.⁴⁹

An estimated 430 NSNWs are assigned to Russia's air-defense, missile defense and coastal defense forces (subordinated to the Navy), approximately 60 percent less than in 1991.⁵⁰ The majority of them is assigned to the S-300 air-defense interceptor system which is located along Russia's periphery, near highly valued installations and around major cities such as Moscow. A third of the systems are assumed to have a secondary nuclear capability in times of crisis.⁵¹ Taking into account that they will eventually be replaced by the S-400 Triumf (SA-21 Growler) air defense system, it is difficult to know what kind of impact this change could have on the number of NSNW warheads as-

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signed to this division, as the capability of each of the S-300 interceptors (SA-10, SA-12 and SA-20) is unclear and doubts remain about whether the S-400 will be nuclear-capable at all.⁵² This system should form the foundation of Russia's theater and missile defense as a total of 28 regiments (composed of two or three battalions—four systems—each) are anticipated to be deployed by 2020.⁵³ Another segment of NSNWs is assigned to the gazelle interceptor (SH-08) as part of the A-135 ballistic missile defense system, which has five sites surrounding Moscow and is currently being upgraded. A few warheads are also allocated to the SSC-1b (Redut) coast defense missiles, which are deployed in the Baltic Sea Fleet and the Pacific Fleet.

Although Russia was expected to eliminate all existing types of NSNWs for its ground force weapons systems as part of the PNIs, it did not make similar commitments for systems under development such as Iskander. It is estimated that Russia's ground forces still have around 170 NSNWs.⁵⁴ They are assigned to two short-range, road-mobile, ballistic missiles, the OTR-21 Tochka (SS-21 Scarab) and the Iskander (SS-26 Stone), which are mainly deployed in the western and eastern extremities of Russia. However, the latter one's nuclear capability is less clear.⁵⁵ Moscow is in the process of replacing its Tochkas with Iskanders, which should eventually be deployed with all tactical missile brigades.⁵⁶

Further on, Russia has kept some NSNWs for its short-range dual-capable platforms. These include short-range air-to-surface and naval aviation missiles and anti-ship and anti-submarine depth bombs and torpedoes, which are especially meant to deter and/or de-escalate large-scale attacks on the field. In addition, Moscow relies on intermediate nuclear capabilities such as sea-launched cruise missiles for attack submarines and the long range Tu-22M3 bomber. Based on their characteristics, they are said to be capable of performing strategic missions.⁵⁷ They still account for a significant segment of Russia's air and naval forces stockpiles.

Nuclear Doctrine

The Russian Nuclear Doctrine is expounded in three official documents: the "2010 Military Doctrine", which includes, among other things, its nuclear posture for the coming decade as well

as an assessment of its perceived threats, "Russia's National Security Strategy to 2020", and 'The Foundations of State Policy in the Area of Nuclear Deterrence until 2020'. The latter one, which is not publicly available, is said to include precise and detailed criteria for the use of nuclear weapons (under what circumstances and level of use) and the role played by each component of the strategic nuclear triad according to different scenarios of conflict.⁵⁸

According to the 2010 Military Doctrine, Russia regards its nuclear arsenal as an important means of "preventing the outbreak of nuclear military conflicts and military conflicts involving the use of conventional means of attack (a large-scale war or regional war)." In order to prevent and deter military conflicts (nuclear conflicts included), Russia needs, among other things, "to maintain strategic stability and the nuclear deterrence potential at an adequate level". This means that it needs to maintain the capacity to inflict "the required damage on the aggressor whatever the conditions of the situation".

Russia's main red line for the employment of nuclear weapons is as follows: "The Russian Federation reserves the right to utilize nuclear weapons in response to the utilization of nuclear and other types of weapons of mass destruction against it and (or) its allies, and also in the event of aggression against the Russian Federation involving the use of conventional weapons when the very existence of the state is under threat." However, there is no definition of what the 'very existence of the state' means.

Instead, Moscow has publicly identified a number of external military threats that influence strategic stability, among them: "the plans for unilateral deployment of strategic missiles defense systems; the development of non-nuclear SOA [strategic offensive arms]; potential deployment of weapons in outer space; increasing quantitative and qualitative imbalances in conventional weapons amidst persistent, or emerging regional conflicts".⁵⁹

There are no official documents describing the exact role attributed to Russia's NSNWs. Russian experts often refer to them as a counterweight or a neutralizer to certain external threats.⁶⁰ Concretely, these threats are: 1) conventional force imbalances vis-à-vis NATO and

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neighboring third countries (perhaps meaning China) and 2) U.S. high-precision conventional weapons. Furthermore, NSNWs are seen as means to deter, to de-escalate or to terminate both nuclear attacks and conventional attacks that could threaten to overpower Russian conventional capabilities.⁶¹

The Impact of New START

New START requires Russia and the United States to reduce strategic nuclear warheads to 1,550 each, deployed strategic missiles and bombers to 700, and deployed and non-deployed strategic missile launchers and bombers to 800 each for the year 2018. As seen earlier, Russia is gradually replacing its Cold War era nuclear triad with new generation systems. This process is likely to continue until the mid-2020s. While Russia has been below the agreed New START ceilings during the last years, latest data shows a significant increase in deployed ICBM/SLBM warheads and heavy bombers. Russia, just like the United States, is now above the limit. This political signal is particularly worrying with a view to the 2015 NPT Review Conference.

Strategic Missile Forces

Russia's strategic missile forces may be the component of its triad that is the most affected by the slow production rate. Indeed, considering Russia's production of ICBMs over the past decade⁶², even an optimistic assessment of Russia's capacities to deploy missiles would see the number of strategic nuclear missiles go down by approximately one third to 220 and the number of warheads go down to roughly 650 by the early 2020's.⁶³ This may explain, to a certain extent, why a new liquid-fuel, silo-based MIRVed heavy ICBM, named Sarmat, with an estimated payload of up to six to ten warheads, was placed on the agenda of the procurement program through 2020.⁶⁴ Indeed, production of such a missile would offset the massive reduction of warheads that will come from the retirement of the 10-warhead RS-20Vs. Together with a new advanced ICBM targeting system, currently under development, and a capacity to carry a number of decoys and other penetration aids, this MIRVed missile would be more effective in prevailing against missile defense capabilities of

other states.⁶⁵ A Defense Ministry source stated that Russia would begin construction of a full-size prototype in 2014.⁶⁶ The missiles are scheduled for deployment around 2020, although delays can be envisaged.

Strategic Naval Forces

The impact of the modernization plans of the strategic fleet on New START numbers will depend on many variables, such as the rate of production of the new subs (and the readiness of the Bulava missile) relative to the decommissioning of old ones. As the Delta-IIIs and Delta-IV are likely to be withdrawn from service at the rate at which the new subs are built, the impact on the number of deployed launchers should not be too significant. However, the number of warheads should progressively increase as the Bulava missile, which will eventually be carried by the Borei-class submarines, has an estimated payload of six warheads, compared to the three and four warheads of the RSM-50 and RSM-54 of the Delta-class submarines. By 2022, Russia's strategic fleet inventory could include six Borei-class and three Delta IV subs adding up to a total of 156 missiles and 840 warheads.⁶⁷ When the modernization plan is completed, Russia's fleet should consist of eight Borei-class subs, amounting to 128 SLBMs with a total of 768 warheads. However, it is important to note that these numbers relate to Russia's full inventory and do not reflect what is included in Russia's published aggregate numbers of strategic offensive arms, released bi-annually as part of the New START Treaty.

As a result of the diminishing number of ICBMs, Russia's strategic fleet is set to carry a greater share of Russia's strategic warheads. However, this greater statistical share does not mean that this portion of Russia's strategic triad is able, in its current state, to carry a heavier load of deterrence responsibilities. Indeed, with doubts about whether Russia is able to maintain continuous deterrent patrols at sea throughout the year⁶⁸, Russia's strategic fleet is potentially vulnerable to other state's conventional naval capabilities, such as U.S and British anti-submarine warfare. Consequently, it can be argued that this reduces the survivability potential of its fleet⁶⁹ as long as submarines remain at designated ports.⁷⁰ As the Borei-class model replaces the old subs, Russia's strategic deter-

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rence capability should gradually improve through more efficient and reliable deterrence patrols.

Strategic Bombers

Unlike the other two legs of the triad, the strategic bomber forces will not face many changes in the short to mid-term. Indeed, major changes may only occur when the PAK DA becomes operationally deployable. Moreover, as long as the New START counting rules stay the same, it is not likely that changes in this component of Russia's triad will have a significant impact on its official and declared numbers of deployed nuclear warheads. Indeed, the counting rule states that each bomber counts as one operationally deployed nuclear warhead. As a result, while the bomber fleet could technically carry a maximum load of approximately 810 nuclear weapons, out of which around 200 to 300 may be stored at bomber bases, the strategic bombers component of Russia's triad accounts for an estimated maximum of 72 warheads (depending on operational status of bombers).

Increase in Numbers

The latest official figures from New START show that Russia is 172 deployed launchers and bombers below the 700 limit and 93 warheads on deployed delivery systems above the 1,550 limit (official numbers: 528 deployed launchers and bombers; 1643 warheads on deployed delivery systems).⁷¹ This marks a serious increase since 2013. Although, it can be argued that the continuing increases since 2013 are mostly due to normal events in the maintenance of strategic forces (e.g. temporary spikes associated with the overhaul of submarines)^{72,73}, the increase in numbers comes at a significant time.

With the Ukraine conflict, relations between Russia and the West have experienced an all-time low since the end of the Cold War. Mutual accusations are the order of the day and particularly Russia has not shied away from belligerent language. On August 29, 2014 Russian President Vladimir Putin explained that Russia is 'strengthening our nuclear deterrence forces and our armed forces [...] I want to remind you that Russia is one of the most powerful nuclear nations,' the President said. Later, he warned that 'we must always be ready to repel any aggression

against Russia and [potential enemies] should be aware [...] it is better not to come against Russia as regards a possible armed conflict.'⁷⁴ At the same time, Russia as well as the United States held nuclear strike exercises in May 2014.⁷⁵

Against this background, the sudden increase in Russian numbers looks like a form of political signaling, intended to show Russian resolve in the crisis. While currently no side has indicated to back out of New START and on-site inspections as well as notifications continue in a regular manner, the high numbers of Russia and the United States at the mid-term of treaty implementation are a worrying trend.

Arms Control in Times of Crisis

For the time being, Russia seems very reluctant to engage in further nuclear arms control or even disarmament measures. In the realm of bilateral arms control, Russia has so far not answered the 2013 pledge of U.S. President Obama to seek further cuts. Moscow has indicated that it sees no need to engage before the expiry of New START in 2021. At the same time, Russia has considerably raised the ante for a possible follow-on agreement. Moscow argues that it should take into account current weapons developments (e.g. conventional precision-guided munitions, ballistic missile defenses, and outer space weapons) as well as third country arsenals. Whether such demands are only of a tactical nature to halt further reductions or whether they really reflect serious Russian security concerns remains a matter of speculation.

While the strategic dialogue with the United States is thus, at best, delayed, mutual allegations concerning the Intermediate-Range Nuclear Forces (INF) have come to the fore in recent months. Washington accuses Russia of having test-flown a ground-launched cruise missile (GLCM) which exceeds the treaty's limitations on ranges between 500-5,500 kilometers. Russia in turn accuses Washington to use drones that have equal characteristics comparable to the objects banned by INF; to use target missiles for BMD purposes which would fall under INF categories; and to employ launchers as part of the EPAA which could, theoretically, also launch cruise missiles of the banned category. While the treaty's Special Verification Commission has convened in September in Moscow without

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clarifying the outstanding issues, the prospect of possible non-compliance has given rise to arms control critics in both capitals. Some even questions not only INF but also call for withdrawal from New START. So far, officials have remained calm and underscored the continuing relevance of INF. It is however not clear, what will happen if parties fail to remove the outstanding compliance issues.

The Ukraine conflict has also left its marks on the multilateral realm of nuclear arms control. Since Russian annexation of Crimea is a breach of the 1994 Budapest Memorandum (signed by Ukraine, Russia, the United States, and Great Britain) which guaranteed the territorial integrity of Ukraine in return for giving up thousands of Soviet nuclear weapons under NPT accession of Ukraine, also negative security assurances are significantly weakened. Particularly with a view to a possible Iran deal, Iranian negotiators might correctly ask what value such guarantees have.

Taken together, the qualitative build-up and modernization of the Russian nuclear arsenal, Russian reluctance to engage in further reductions in the next years, the deadlock around the EPAA, INF compliance issues, and the devaluation of negative security assurances by Moscow send a worrisome signal to all non-nuclear weapons states who insist on Russia fulfilling her commitments under the NPT. Article VI of the NPT binds all five recognized nuclear weapons states to undertake negotiations on "nuclear disarmament, and on a treaty on general and complete disarmament under strict and effective international control." The language in New START notes that Russia and the United States are "endeavoring to reduce further the role and importance of nuclear weapons". Even though New START has lowered their levels of nuclear arms, both continue to rely on unreasonably large arsenals. At the NPT Review Conference in 2015, and at the very latest in 2020, non-nuclear weapons states will correctly pose the question about significant fulfillment of disarmament obligations. Simply pointing to New START as a 'major achievement' will most likely be not enough to ease the justified concerns of the vast majority of NPT members.

While nuclear arms control is thus experiencing hard times, particularly Russia and the United States might return to those policy instruments –

not so much for the sake of the international community but more for reasons of national security. Over the mid- to long-term, both sides might come to agree that cooperative arms control measures are still a viable tool, even in an adversarial relationship. What might sound like wishful thinking at the moment has in fact its blueprints in the history of the Cold War. Cooperative arms control measures between the former two superpowers were almost always an instrument for achieving a more reliable degree of military stability. Even though, Moscow and Washington might differ today in their respective assessment of what stability should achieve, a general dismissal of the principle of stability is not in sight. Even during the darkest periods of the Cold War, the two superpowers were able to forge meaningful arms control agreements. Why should that not be possible today?

Given these considerations, neither Moscow nor Washington should rule out a certain level of re-engagement on arms control issues such as further strategic reductions. What was sensible and justifiable before the Ukraine conflict has not lost its rationale under the current circumstances. This fact does, however, also apply to the obstacles that have hindered progress already before the new situation.

Washington has never specified its 2013 offer to reduce strategic arms with Moscow. While Washington was also interested in addressing Russian NSNWs, Russia was more inclined to achieve a significant reduction of U.S. deployed strategic delivery vehicles (possibly down to 400) and launchers (possibly down to 500). Here policy goals diverge significantly. In addition, the hotly debated issue of ballistic missile defense, future conventional high-precision weapons, and outer space capabilities are all a matter of contention. None of these issues will disappear with the current crisis and some positions will even harden. In any case, it will require both sides a decisive will to engage on these complicated issues, coupled with a lot of creative thinking on how to address the most pressing obstacles.

Conclusion

As part of the modernization process of the Russian Army, Moscow has ordered a significant qualitative overhaul of the Russian nuclear forces in all three legs of the Russian triad. While Moscow is modernizing, its overall arsenal of nuclear warhead still exceeds massively any reasonable security needs. Efforts at reducing the Russian arsenal in a mutually agreed manner with the United States beyond New START are experiencing considerable problems. The fallout from the Ukraine conflict has already damaged bilateral relations. There is the danger that the standstill in U.S.-Russian nuclear arms control relations might severely affect the NPT regime. The Ukraine conflict will certainly continue to complicate any cooperative approach in the short to mid-term. However, its incalculable implications might even lead to a certain level of re-engagement in order to achieve a more profound level of stability. With the already existing obstacles (missile defense, conventional precision-guided weapons, outer space) still in place, any re-engagement on the issue will call for creativity, common interest, and enough political will and capital. While the obstacles are well-known, the arguments in favor of achieving lower levels in strategic arms have not changed as well. What was reasonable during the last Cold War has not lost its validity in the current crisis.

The views expressed are those of the authors and do not necessarily reflect the views of Deep Cuts Commissioners or organizations associated with the Deep Cuts project.

About the Authors

Vincent C. Fournier is a Canadian national. His academic background is with the Quebec Institute of High International Studies (Laval University, Canada). He has also studied at the Tampere Peace Research Institute (University of Tampere, Finland). He has been a Visiting Researcher at the Institute for Peace Research and Security Policy at the University of Hamburg (IFSH) and an intern with the External Relations and International Cooperation Section of the CTBTO.

Ulrich Kühn is a Researcher at IFSH and coordinator of the Deep Cuts project. He has worked as an external advisor to the Division for Disarmament, Arms Control and Non-Proliferation at the German Federal Foreign Office. In 2011 he was named a United Nations Fellow on Disarmament. He is also a co-initiator of the Initiative for the Development of a Euro-Atlantic and Eurasian Security Community (IDEAS). Kühn has published on conventional and nuclear arms control and Euro-Atlantic security.

Tables

	Russian Designation	NATO designation	Year First Deployed	Launchers	Warheads	Total Warheads
ICBMs	RS-20V (<i>Silo</i>)	SS-18 Satan	1988	46	10	460
	RS-18 (<i>Silo</i>)	SS-19 Stiletto	1980	30	6	180
	RS-12M Topol (<i>Mobile</i>)	SS-25 Sickle	1988	117	1	117
	RS-12M1 Topol-M (<i>Silo</i>)	SS-27	1997	60	1	60
	RS-12M2 Topol-M (<i>Mobile</i>)	SS-27	2006	18	1	18
	RS-24 Yars (<i>Silo</i>)	SS-27 Mod 2	2014	0	4	0
	RS-24 Yars (<i>Mobile</i>)	SS-27 Mod 2	2010	33	4	132
	Total			304		967
SLBMs	RSM-50 Volna	SS-N-18 M1 Stingray	1978	3 - 16	3	144
	RSM-54 Sineva	SS-N-23 Skiff	2007	6 - 16	4	384
	RSM-56 Bulava	SS-NX-32	2014	(2 - 16)	6	(192)
		Total		(144)		(528)
Bombers	Tu-95MS6	Bear-H6	1984	29	6 x AS-15A ALCMs, Bombs	174
	Tu-95MS16	Bear-H16	1984	30	16 x AS-15A ALCMs, Bombs	480
	Tu-160	Blackjack	1987	13	12 x AS-15B ALCMs or AS-16 SRAMs, Bombs	156
		Total		72		810
Total				520		1567

Table 1: Estimates of Russian Strategic Nuclear Forces as of 2014 (based on data from the Bulletin of Atomic Scientists)⁷⁶

Non-Strategic and Defensive Weapons	Warheads
ABM/Air/Coastal Defense	425
53T6 (SH-08, Gazelle)	68
S-300 (SA-10/12/20)	340
SSC-1B (Sepal)	17
Air forces	730
Tu-22M3 (Backfire-C)	450
SU-24M/M2 (Fencer-D)	260
SU-34 (Fullback)	20
Ground forces	170
OTR-21 Tochka (SS-21 Scarab)	140
Iskander (SS-26 Stone)	30
Naval forces	700
Submarines/surface ships/air	
Total	2025

Table 2: Russian Non-Strategic Nuclear Weapons Architecture⁷⁷, Estimation of Operationally Assigned Warheads

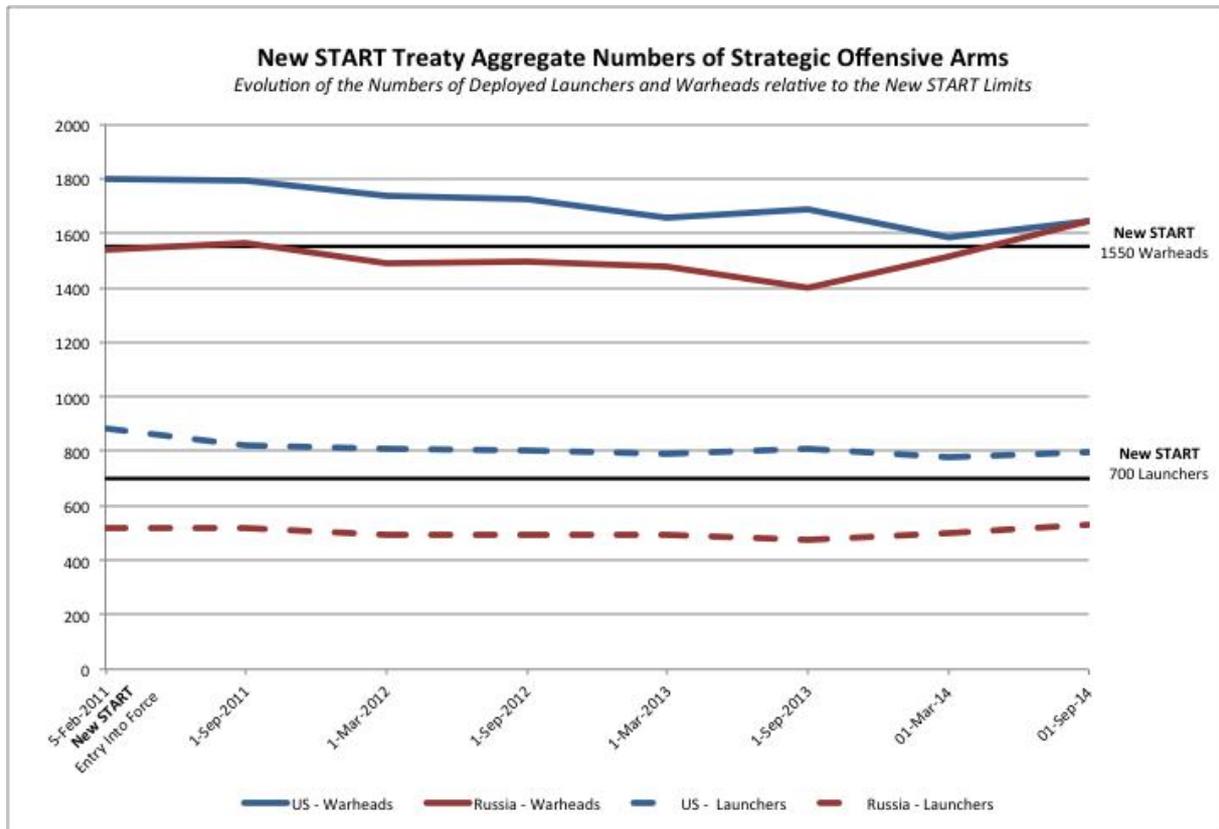


Table 3: New START Treaty Aggregate Numbers of Strategic Offensive Arms. Evolution of the Numbers of Deployed Launchers and Warheads Relative to the New START Limits; figures taken from U.S. Department of State, <http://www.state.gov/t/avc/rls/232359.htm>

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Endnotes

¹ Among others: "Russian nuclear forces, 2013" and "Russian nuclear forces, 2014" in the Bulletin of the Atomic Scientists by Hans M. Kristensen and Robert S. Norris, "II. Russian nuclear forces" in the SIPRI Yearbook 2013 by Vitaly Fedchenko, Hans M. Kristensen and Philip Schell, and Pavel Podvig's "Russian Strategic Nuclear Forces" blog.

² Around 400 of them have been retired from service over the last decade.

³ Kristensen, Hans M. and Robert S. Norris, "Russian Nuclear Forces, 2013", Bulletin of Atomic Scientists, Vol. 69, No. 71, Online Version, 2013, p. 74.

⁴ Kristensen, Hans M., "Trimming Nuclear Excess: Options for Further Reductions of U.S. and Russian Nuclear Forces", Federation of American Scientists, Special Report No. 5, 2012, p. 23; See footnote 3, p. 73.

⁵ "The Topol-M missile, with a range of about 7,000 miles (11,000 km), is said to be immune to any current and planned U.S. antiballistic missile defense. It is capable of making evasive maneuvers, and carries targeting countermeasures and decoys." RIA Novosti, "Russia to Get New ICBM Later this Year", 18 April 2013, available at: http://en.ria.ru/military_news/20130418/180717057/Russia-to-Get-New-ICBM-Later-this-Year.html

⁶ "In 2010 the SFR abandoned further procurement of the RS-12M1 in favor of the mobile version of the RS-24 Yars [...] in 2012 the decision was taken to also stop procurement of the RS-12M2". Fedchenko, Vitaly, Hans M. Kristensen and Philip Schell, "II. Russian Nuclear Forces", World Nuclear Forces, SIPRI Yearbook 2013: Armaments, Disarmament and International Security, SIPRI, Oxford Press University, 2013, p. 297.

⁷ RIA Novosti, "Russia to Deploy More Yars Ballistic Missiles by Year-End", 6 November 2013, available at: http://en.ria.ru/military_news/20131106/184554661/Russia-to-Deploy-More-Yars-Ballistic-Missiles-by-Year-End.html

⁸ Kristensen, Hans M. and Robert S. Norris, "Russian Nuclear Forces, 2014", Bulletin of Atomic Scientists, Vol. 70, No. 75, Online Version, 2014, p. 76.

⁹ See footnote 3, p. 73. This information runs contrary to a source that stipulates that "by 2020, the RSVN are expected to be equipped with over 170 Topol-Ms (mobile and silo-based), as well as 30 SS-19 and 108 RS-24 missile defense systems in nine divisions." RIA Novosti, "Russia to Get New ICBM Later this Year", 18 April 2013, available at: http://en.ria.ru/military_news/20130418/180717057/Russia-to-Get-New-ICBM-Later-this-Year.html

¹⁰ See footnote 4, p. 23.

¹¹ See footnote 4, p. 23.

¹² See footnote 8, p. 78.

¹³ RIA Novosti, "Russia to Test Launch Newest ICBM by Year-End – Industry Official", 3 October 2013, available at: http://en.ria.ru/military_news/20131003/183922417/Russia-to-Test-Launch-Newest-ICBM-by-Year-End-Industry-Official.html; GERTZ, Bill, "Inside the Ring: Russia to Test New Missile", The Washington Times, 16 October 2013, Available at: <http://www.washingtontimes.com/news/2013/oct/16/inside-the-ring-russia-to-test-new-missile/?page=all#pagebreak>

¹⁴ See footnote 4, p. 74. However, Russian expert Eugene Miasnikov points to recent trends showing more emphasis on deployment of silo ICBMs (Yars and Sarmat) in future.

¹⁵ Podvig, Pavel, "Russia's Nuclear Forces: Between Disarmament and Modernization", Proliferation Papers, IFRI Security Studies Center, 2011, p. 12.

¹⁶ See footnote 8, p. 80.

¹⁷ Indeed, a source in the Russian General Staff stated that: "It is in fact a Sineva. Only the warhead is new. The Layner has an improved penetration capability achieved by, among other things, a greater number of re-entry vehicles (boyevoyblok) in the warhead". See footnote 3, p. 76 Quoted from Interfax-AVN, "Russia to start building first project 955A sub, while design work continues", 25 July 2012, Translation by Open Source Center via World News Connection.

¹⁸ RIA Novosti, "Russian Navy Likely to Receive 2nd Borey Nuclear Sub by Year-End", 9 November 2013, available at: http://en.ria.ru/military_news/20131109/184598005/Russian-Navy-Likely-to-Receive-2nd-Borey-Nuclear-Sub-by-Year-End.html

¹⁹ Russia has been experiencing some technical problems with the Bulava missiles, failing to test-launch it successfully multiple times. This has significantly hampered the operationalization process of the Borei-class submarines. The navy successfully launched a Bulava missile in early September 2014 and two other test-launches are scheduled for the fall. Isachenkov, Vladimir, "Putin promises new weapons to fend off Western threats", North Jersey, 10 September 2014, available at: <http://www.northjersey.com/news/putin-promises-new-weapons-to-fend-off-western-threats-1.1084941?page=all>

²⁰ Podvig, Pavel, "Project 955 submarines to carry long-range cruise missiles", Russian Strategic Nuclear Forces, 11 January 2013, Available at: http://russianforces.org/blog/2013/01/project_955_submarines_to_carr.shtml Eugene Miasnikov strongly doubts that this is the case, even though it is technically feasible: "SLCMs usually have signifi-

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cantly shorter range than SLBMs, so that strategic submarines would have to change their deployment areas, which is doubtful. Usually, SSBNs carry torpedoes for self defense in the launch tubes, not land attack cruise missiles."

²¹ RIA Novosti, "Russia's Northern Fleet Deploys New Borey-Class Nuclear Subs", 30 December 2013, Available at: http://en.ria.ru/military_news/20131230/186086621/Russias-Northern-Fleet-Deploys-New-Borey-Class-Nuclear-Subs.html

²² RIA Novosti, "Russian Navy's Newest Missile Subs Not Operational - Source ", 1 November 2013, available at: http://en.ria.ru/military_news/20131101/184467946/Russian-Navys-Newest-Missile-Subs-Not-Operational--Source.html; RIA Novosti, " Russia's Northern Fleet Deploys New Borey-Class Nuclear Subs", 30 December 2013, Available at: http://en.ria.ru/military_news/20131230/186086621/Russias-Northern-Fleet-Deploys-New-Borey-Class-Nuclear-Subs.html

²³RIA Novosti, "Russia to Lay Down New Borey Class Nuclear Sub in December", 19 September 2014, available at:http://en.ria.ru/military_news/20140919/193092542/Russia-to-Lay-Down-New-Borey-Class-Nuclear-Sub-in-December.html

²⁴ RIA Novosti, "Russia to Lay Down Two Improved Borey Class Subs in 2013", 14 January 2013, Available at: http://en.ria.ru/military_news/20130114/178766923/Russia_to_Lay_Down_Two_Improved_Borey_Class_Subs_in_2013.html

²⁵ "The project 955A differs significantly from the original Borei (Project 955) but not in the number of missiles carried – there will still be 16 on board" See footnote 3, p. 76, Quoted from RIA-Novosti, "Later Borey Class subs to carry only 16 missiles – Source", 20 February 2013, Available at: http://en.ria.ru/military_news/20130220/179588098.html

²⁶ITAR-TASS, "Russia's Sevmas shipyard lays down 5th Borei-class nuclear sub - Knyaz Oleg", 27 July 2014, available at: <http://en.itar-tass.com/russia/742472>

²⁷ "Russia and the United States no longer disclose the number of aircraft counted under arms control treaties" See footnote 3, p. 77.

²⁸See footnote 6, p. 296.

²⁹ Such added weight significantly reduces the bomber's range. See footnote 6, p. 296.

³⁰ This is an upgraded version of the Kh-55 with an extra fuel tank and an extended range.

³¹See footnote 4, p. 27.

³² RIA Novosti, "Russia Speeds Up Development of New Strategic Bomber", 28 November 2013, available at: http://en.ria.ru/military_news/20131128/185110769/Russia-Speeds-Up-Development-of-New-Strategic-Bomber.html

³³RIA Novosti, "Russian's Air Force to Receive New Generation Long-Range Bomber in 2023", 22 May 2014, available at:http://en.ria.ru/military_news/20140522/190033951/Russians-Air-Force-to-Receive-New-Generation-Long-Range-Bomber.html

³⁴ Statement, "Statement of the Delegation of the Russian Federation at the High-Level Meeting of the 68th Session of the UN General Assembly on Nuclear Disarmament Delivered by Deputy Director of the Department for Security Affairs and Disarmament of the Ministry of Foreign Affairs of the Russian Federation A. Karpov, New York, September 26, 2013", The Ministry of Foreign Affairs of the Russian Federation, 26 September 2013, available at: http://www.mid.ru/brp_4.nsf/0/55FDFDE448B8182744257BF5003F2921

³⁵ "The 2,000 listed make up the estimated nominal load for nuclear-capable delivery platforms", see footnote 3, p. 72. For the purpose of this paper, NSNWs will include all nuclear weapons that are not covered by existing nuclear arms control treaties. A commonly used definition of non-strategic nuclear forces is: "Those nuclear-capable forces located in an operational area with a capability to employ nuclear weapons by land, sea, or air forces against opposing forces, supporting installations, or facilities. Such forces may be employed, when authorized by competent authority, to support operations that contribute to the accomplishment of the commander's mission within the theater of operations." Kristensen, Hans M., "Non-Strategic Nuclear Weapons", Federation Of American Scientists, Special Report No 3, May 2012, p. 8, Quoted from: U.S. Department of Defense, Joint Chiefs of Staff, Department of Defense Dictionary of Military and Associated Terms, Joint Publication 1-02, November 8, 2010, p. 241, Available at: http://www.dtic.mil/doctrine/new_pubs/jp1_02.pdf

³⁶See footnote 6, p. 299.

³⁷Sutyagin, Igor, "Atomic Accounting: A New Estimate of Russia's Non-Strategic Nuclear Forces", Royal United Services Institute, 2012, p. 5.

³⁸Zagorski, Andrei, "Russia's Tactical Nuclear Weapons: Posture, Politics and Arms Control", Hamburger Beiträge zur Friedensforschung und Sicherheitspolitik, Institut für Friedensforschung und Sicherheitspolitik, 2011, pp. 15-6.

³⁹ "According to the Congressional Perry-Schlesinger Commission, Russia and the United States have removed about 14,000 nuclear munitions from their armed forces as part of these NSNW reductions. Neither of the two countries has released any official information about the numbers of non-strategic ammunition that have been eliminated or the numbers still remaining in its arsenals. Russia and the United States do recognize, however, that they have reduced their NSNW stockpiles by 75-80 per cent compared with peak Cold War levels." Antonov, Anatoly,

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"Further Nuclear Arms Limitation: Factors and Prospects", *Security Index: A Russian Journal on International Security*, 19:3, 2013, p. 18.

⁴⁰Kristensen, Hans M., "Non-Strategic Nuclear Weapons", Federation Of American Scientists, Special Report No 3, May 2012, p. 54.

⁴¹ There are doubts whether that missile is still in operation. See footnote⁴⁰, p. 57.

⁴²See footnote⁴⁰, pp. 56-7.

⁴³ See footnote 3, p. 78.

⁴⁴See footnote 3, p. 27.

⁴⁵See footnote³, p. 27.

⁴⁶See footnote⁴⁰, p. 54.

⁴⁷See footnote⁴⁰ p. 59.

⁴⁸Jane's, "Russia lays keels for three nuclear subs", IHS Jane's 360, 30 July 2014, available at: <http://www.janes.com/article/41339/russia-lays-keels-for-three-nuclear-subs>

⁴⁹ "In November 2012, the Severodvinsk conducted a test-launch of what appeared to be the Caliber (SS-N-30) land-attack cruise missile. It is possible (but uncertain) that the Caliber is nuclear-capable." See footnote 3, p. 78. Following Russian analyst Eugene Miasnikov the projected number is lower; possibly at seven.

⁵⁰See footnote 3, p. 78. The first two types are often regarded as strategic defense weapons.

⁵¹See footnote⁴⁰, p. 63.

⁵²See footnote 3, p. 78.

⁵³ RIA Novosti, "Russia to Deploy New S-400 Air Defense Regiment Near Moscow", 7 October 2013, available at: http://en.ria.ru/military_news/20131007/183988806/Russia-to-Deploy-New-S-400-Air-Defense-Regiment-Near-Moscow.html

⁵⁴See footnote 3, p. 72; See footnote 6, p. 294. It has to be noted that Russia did make the commitment to eliminate its nuclear weapons for all existing systems of ground forces. This commitment does not apply to systems (such as Iskander) under development at the early nineties.

⁵⁵See footnote⁴⁰, p. 54.

⁵⁶See footnote⁸, p. 82.

⁵⁷See footnote³⁸, p. 18.

⁵⁸Quinlivan, James T. and Olga Olikier, "Nuclear Deterrence in Europe Russian Approaches to a New Environment and Implications for the United States", Rand Corporation, Project Air Force, 2011, p. 19, available at: http://www.rand.org/content/dam/rand/pubs/monographs/2011/RAND_MG1075.pdf

⁵⁹See footnote 34.

⁶⁰See footnote³⁸, p. 19.

⁶¹See footnote³⁸, p. 6.

⁶²Miasnikov, Eugene, "Strategic Nuclear Forces: Goals and Possible New Arms Control Measures", Center for Arms Control, Energy and Environmental Studies, Remarks at the Workshop on Prospects for Russia-US Arms Control, May 2013, Available at: <http://www.armscontrol.ru/pubs/en/em051613.html>

⁶³See footnote 3, p. 74 and 4, p. 21.

⁶⁴See footnote¹⁵, p. 11.

⁶⁵See footnote¹⁵, p. 11.

⁶⁶ RIA Novosti, "Russia to Start Building Prototype of New Heavy ICBM in 2014", 18 June 2013, Available at: http://en.ria.ru/military_news/20130618/181738737.html

⁶⁷See footnote 4, p. 24.

⁶⁸ Russia's use of its strategic submarines declined from 37 operations in 1991 to 4-6 in 2012, meaning that "each submarine spends far less time deployed than previously, and that each crew therefore receives less practical experience in operating the SSBN force effectively." See footnote 4, p. 25. Furthermore, a rate of 4-6 patrols per year is not enough to have a continuous deterrent at sea. It is assumed that the duration time of Russian SSBN patrols are considerably shorter than those of the United States, which last for an average of 70 days. Hence, "with only five to six operational SSBNs in 2012, the number of Russian patrols may have been insufficient to maintain continuous patrols." See footnote 3, p. 76.

⁶⁹ However, it has to be noted that a potential nuclear exchange would most likely be preceded by a time of crisis during which most of submarines at port would go to the sea and disperse. As a result, this would increase their survivability potential. The same reasoning can be applied to mobile ICBMs.

⁷⁰ Acton, James M., "Bombs Away? Being Realistic About Deep Nuclear Reductions", *The Washington Quarterly*, 35:5, 2012, p. 44.

⁷¹ Deployed ICBMs, Deployed SLBMs, and Deployed Heavy Bombers: Russia = 528, United States = 794; Warheads on Deployed ICBMs, on Deployed SLBMs, and Nuclear Warheads Counted for Deployed Heavy Bombers: Russia = 1,643, United States = 1,642 in U.S. Department of State, Bureau of Arms Control, Verification and Compliance Releases, 1 October 2014, available at: <http://www.state.gov/t/avc/rls/232359.htm>

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⁷² Thielmann, Greg, "U.S. and Russia Nuclear Numbers Up During Last Six Months", Arms Control Association, 8 October 2014, available at: <http://www.armscontrol.org/armscontrolnow/2014-10-08/US-and-Russia-Nuclear-Numbers-Up-During-Last-Six-Months>

⁷³ "The increase of the Russian count does not indicate that it's increasing its strategic nuclear forces but reflects fluctuations in the number of launchers and their attributed warheads at the time of the count." Kristensen, Hans M., "New START Data Show Russian Increase, US Decrease Of Deployed Warheads", FAS Strategic Security Blog, Federation of American Scientists, 1 April 2014, available at: <http://fas.org/blogs/security/2014/04/newstartdata-3/>

⁷⁴ Putin: You better not come after a nuclear-armed Russia, available at:

http://edition.cnn.com/2014/08/29/world/europe/ukraine-crisis/index.html?hpt=hp_t1

⁷⁵ Kristensen, Hans M., "Nuclear Exercises Amidst Ukrainian Crisis: Time For Cooler Heads" Federation of American Scientists – Strategic Security Blog. May 16, 2014, available at: <http://fas.org/blogs/security/2014/05/nuke-exercises/>

⁷⁶ Kristensen, Hans M. and Robert S. Norris, "Russian Nuclear Forces, 2014", Bulletin of Atomic Scientists, Vol. 70, No. 75, Online Version, 2014. These estimates count all launchers and warheads assumed to be assigned to a nuclear mission. They are based on the latest set of New START aggregate data at the time of the release. The breakdown of deployed and non-deployed launchers and warheads is classified information, making it hard to come up with exact numbers. The two Borei-class subs are not taken into account in the total of launchers and of warheads due to the problems encountered with respect to the operationalization of the Bulava missile. Each bomber accounts for one deployed strategic warhead. Kristensen, Hans M., "Trimming Nuclear Excess: Options for Further Reductions of U.S. and Russian Nuclear Forces", Federation of American Scientists, Special Report No. 5, 2012, p. 21 and email exchanges with the author.

⁷⁷ See footnote 3; See footnote 6.