

NOVEMBER 2018

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A Report of the
CSIS RUSSIA AND EURASIA PROGRAM

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INTERNATIONAL STUDIES

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1 | Introduction

The last two conflicts in which Russia drew on the capabilities of the full range of its armed forces—Georgia in 2008 and Syria in 2015—clearly illustrate the changes that have occurred in the Russian army over the past 10 years.

While the conflict with Georgia lasted only five days, Russia used its full array of conventional weapons, including long-range bombers and short-range ballistic missiles. The Russian Navy carried out a landing operation. Several airborne battalions were airlifted from thousands of kilometers away. All said, up to 30,000 Russian troops were involved in the operation. This number far exceeds the small contingent deployed in Syria, which by most accounts has remained below 10,000 members of the armed forces.

Victory over Georgia was quick and decisive, but the opponent was very weak. Moreover, the operation revealed a plethora of problems in the Russian military. The subsequent reforms were long, turbulent, painful, and at times, inconsistent.

Relative to 2008, today's Russian army is smaller in size. It has less manpower and deploys a smaller number of armored fighting vehicles, aircraft, ships, and ammunition than it did 10 years ago. To compensate for this, Russia has worked hard to increase the efficiency and combat readiness of the army.

The conflict in Syria provides a natural opportunity to analyze the success of these reform efforts, elucidating what new capabilities the Russian Armed Forces have acquired in the past decade as well as where these reforms fall short.

2 | Personnel

Reforms undertaken after the war with Georgia prioritized a reduction in the total number of personnel in the Russian Armed Forces, as well as the share of officers in it. Russia aimed to abandon a Soviet-style army with a large number of understaffed “skeleton” military units for a smaller but more mobile army which theoretically remains at a high level of permanent readiness.

Central to these reforms was the challenge of personnel fill. In 2007 to 2008, the term of conscript service in the Russian army was reduced from two years to one. Most contract (professional) soldiers were concentrated in the elite military units of the airborne forces and the permanent readiness units based in the North Caucasus.

Despite laws explicitly prohibiting sending conscripts into combat, some ended up on the front lines in Georgia in 2008.¹ Even in the North Caucasus Military District, which was the best-manned district after the wars in Chechnya, conscripts constituted a majority in many combat units. But the Georgian conflict’s brevity and success meant there was no concomitant societal outrage.

According to initial plans for the “New Look” reform, Russia planned to reduce the proportion of contract soldiers threefold, to 5 percent of the total by 2010. Aside from its other benefits, this was expected to substantially reduce military personnel costs.² But with a shortened term of conscript service and a limited pool to draw on, the Ministry of Defense proved unable to draft enough conscripts to staff even the reduced army. As a result, in 2012, instead of a planned million-person force, Russia fielded fewer than 800,000 military personnel. This demonstrated that without a substantial increase in the number of contract personnel, the armed forces could not be fully staffed.³ Plans to save on personnel costs in this way were abandoned, and from 2012 onwards, the number of contract soldiers in the army began to grow steadily. The new long-term (2017) target was a force with a ratio of five contract soldiers to every four conscripts, based on 420,000-450,000 of the former.⁴

1. Grigory Bakunin and Love Chizhov, “Russian Conscripts in Georgia: Coercion to Contract,” Radio Svoboda, August 22, 2008, <https://www.svoboda.org/a/461909.html>.

2. Alexey Gaidai, “The Professional Army of Russia - A Lost Prospect,” *Russia’s Soldiers*, 2011, <http://soldatru.ru/read.php?tid=945>.

3. Alexey Nikolsky, “The Ministry of Defense: Armed Forces Understaffed by 20%,” *Vedomosti*, June 9, 2012, https://www.vedomosti.ru/politics/articles/2012/06/09/voennyh_ne_hvataet.

4. “The Number of Conscripts in Russia Will Decrease, Medvedev Said,” RIA Novosti, November 26, 2011, https://ria.ru/defense_safety/20111126/498797434.html.

This plan was mostly successful, and today the composition of the Russian army is quite different than it was before the war with Georgia.

Table 1. Changes in military personnel structure

	Year 2008	Year 2017
Conscripts	450,000	276,000
Contract Soldiers	180,000	384,000
Warrant Officers	142,000	55,000
Officers	355,000	217,000
Max Number (planned)	1,130,000	1,013,628

Source: Compiled by author.

By early 2015, for the first time, the number of contract soldiers exceeded the number of conscripts,⁵ which can be considered an important watershed in the history of the modern Russian army. Starting from 2017, for the first time in Russian history, all sergeant positions were manned by contract soldiers.⁶ This means that typical “sergeant”⁷ roles in Russian Armed Forces—section commanders, deputy platoon commanders, armored fighting vehicle commanders, and special vehicles driver-operators⁸—are manned by better prepared, more experienced personnel. Conscripts are used in basic combat roles, such as a rifleman or a machine gunner,⁹ and in support units.

This significant increase in the number of contract soldiers allowed Russia to avoid using conscripts in the operation to annex Crimea and in eastern Ukraine. Conscripts were not sent to Syria, either. This means that Russia is now able to conduct small- and medium-scale military operations, including expeditionary, solely using military professionals. They are more experienced and effective and better disciplined. Furthermore, professional military casualties are expected to result in less public anger than conscript casualties.

Noncommissioned officer (NCO) reform is an especially fundamental change compared to previous decades, when even in the elite military units of special forces and airborne troops many NCOs were ordinary conscripts. A new, professional NCO corps is intended to preserve military traditions and be the backbone of a more professional army. Such an approach is promising, but the transition is only in its first year, and the results are not yet clear.

Moreover, the principle of mixed manning presents its own problems, the largest of which is unequal levels of training. For example, as of now, out of any three battalions in each regiment or brigade of the ground forces, only two are staffed by contract soldiers and ready

5. “Ministry of Defense: The Number of Contract Soldiers in the Russian Army For the First Time Exceeded the Number of Conscripts,” TASS, December 19, 2014, <http://tass.ru/armiya-i-opk/1660725>.

6. “Report by the Minister of Defense to the State Duma,” Ministry of Defense of the Russian Federation, December 22, 2017, https://function.mil.ru/news_page/person/more.htm?id=12112634.

7. Noncommissioned ranks in the Russian armed forces do not translate directly into U.S. counterparts. Russian “sergeants” correspond to most but not all U.S. noncommissioned officer (NCO) roles. There is not a “corporal” rank.

8. “In Western Military District, Sergeant Positions are 90% Manned by Contract Servicemen,” Ministry of Defense, August 22, 2016, https://function.mil.ru/news_page/country/more.htm?id=12093326.

9. “Gerasimov: 384 Thousand Contract Soldiers in the Armed Forces of the Russian Federation,” Regnum, November 7, 2017, <https://regnum.ru/news/2342742.html>.

for immediate action at best.¹⁰ One of the goals of the “New Look” reform was to make the military units fully combat-ready. However, full professionalization is not on the horizon.

Maintaining a level of about 400,000 contract soldiers is another serious challenge for the Russian Ministry of Defense. After the war with Georgia and at the beginning of the reform effort, the salaries of contract soldiers were quite competitive, allowing the army to attract hundreds of thousands of young people. In 2012, the salary of a contract soldier at the rank of private was 25 percent higher than the average salary in Russia. But budgetary constraints in the years that followed meant that army salaries did not grow apace with national averages, and military service became less attractive.

On January 1, 2018, the salaries of contract soldiers and officers were increased by 4 percent. The same increase is promised for 2019 and 2020.¹¹ However, this raise remains below official projected inflation figures. Today, the career of a professional soldier looks less attractive even for those from poorer, rural regions. Inadequate wages also reduce the quality of applicants, creating serious doubt that government plans to achieve 499,200 contract soldiers by 2020 are realistic.¹²

Russia aims to further reduce the number of conscripts to 150,000 people (a reduction of 30 percent) by 2020-2021.¹³ However, if it is unable to attract enough contract soldiers, the shortage will likely be compensated for by keeping conscript numbers at close to current levels. Russia is currently at the bottom of a “demographic pit.” This means that a historically low number of young men—only about 600,000—reach conscript age every year. But drafting just 200,000-250,000 of them has proven feasible.¹⁴ A large proportion of conscripts will reduce the overall quality of military personnel but will allow the Russian army to maintain staffing at the current level of about 95 percent.

The quality of personnel has increased not only through professionalization, but also thanks to an improved training system for officers and soldiers. Since 2013, large-scale surprise inspections, complex two-sided tactical exercises, and major sports-like army competition events such as “Tank Biathlon” and “Air Darts” have made the Russian Armed Forces much more “fit” and prepared for real deployment. Ammunition consumption in exercises has increased by 5-7 times compared to 2012. Fuel consumption in drivers’ training increased threefold.¹⁵ Tempered by surprise inspections and large-scale exercises, Russian military logistics have improved drastically, as witnessed in Syria and Ukraine.

10. Ibid.

11. “Military Salaries Will Be Indexed in 2018-2020,” Ministry of Defense of the Russian Federation, December 27, 2017, https://function.mil.ru/news_page/country/more.htm?id=12156812.

12. “Report by the Defense Ministry Sergey Shoigu,” Ministry of Defense of the Russian Federation, November 7, 2017, https://function.mil.ru/news_page/country/more.htm?id=12149740.

13. Julia Kozak, “The Right to Become a Defender of the Motherland,” *Krasnaya Zvezda*, October 1, 2017, <http://archive.redstar.ru/index.php/news-menu/vesti/v-voennyh-okrugah/iz-zapadnogo-voennogo-okruga/item/34611-pravo-stat-zashchitnikom-rodiny>.

14. “The Ministry of Defense Announced That the Autumn Draft Plan Was Implemented in Full,” TASS, <http://tass.ru/armiya-i-opk/4851081>.

15. “In the Troops of the Eastern Military District, the Consumption of Ammunition During Combat Training Was Increased by 5-7 Times,” *Vesti Primoria*, July 29, 2014, <http://vestiprim.ru/news/ptrnews/10137-v-voyskah-vostochnogo-voennogo-okruga-rashod-boepripasov-pri-boevoy-podgotovke-uvelichen-v-5-7-raz.html>.

However, armed forces reserves have shown little improvement, owing to failed attempts to depart from the Soviet concept of a large but poorly trained reserve. Moreover, with the current reduction in the number of conscripts, the total number of available reserve soldiers is also on the decline.

This said, after the success of a small-scale pilot program in several regions, a new reform launched in 2018 for the entire country. It makes it possible for individuals to sign a contract for reserve service that commits them to one month per year on active duty, complemented by 2-3 days per month in training. The aim is to develop and maintain highly qualified military personnel on which the armed forces can draw upon in times of need.¹⁶ However, even if this approach is broadened and proves effective, it is unlikely to be sufficient for a major, high-quality expansion of the armed forces.

To sum up, the key new capabilities in personnel since the war with Georgia in 2008 are:

- Professionalization of the armed forces
- Fully professional sergeant corps
- Up to 2/3 of forces are permanent-ready
- Significantly improved training

16. Bogdan Stepova, et al., "To Contract Reserve," *Izvestia*, February 13, 2018, <https://iz.ru/706732/bogdan-stepovoi-aleksei-ramm-evgenii-andreev/v-rezerv-po-kontraktu>.

3 | Command and Control

Both Soviet and Russian troops have traditionally experienced difficulties with command and control, with ground forces, for example, often suffering from unreliable communications and problems with navigation, especially in unfamiliar territory. This was confirmed again in 2008 during the conflict with Georgia, when Russian forces showed extremely poor situational awareness, experienced problems with military communication, and demonstrated limited coordination between different force branches.¹⁷

The government introduced major changes in the command and control system in the recent years, rebuilding it from the ground up on the strategic, operational, and tactical levels. A high-tech, joint National Defense Management Center in Moscow replaced the Soviet-era command center of the Ministry of Defense and the General Staff in 2014. It manages the entire army and strategic nuclear forces, oversees combat operations in real time, and also tracks vital everyday activities including exercises, logistics functions, and even military bases' electricity consumption.¹⁸

The armed forces procure several thousand units of modern communication equipment each year. In 2017 alone, they procured 4,000 pieces of strategic- and operational-level equipment and 49,000 tactical-level devices. That same year, the Ministry of Defense declared 58 percent of its communication equipment to be new and modern.¹⁹ The new equipment makes it possible to monitor strikes on important targets in Syria in real time: live video from the unmanned aerial vehicles (UAV) "Forpost" is streamed simultaneously at the Khmeimim headquarters and the National Defense Management Center in Moscow.

The government created similar but smaller control centers at each of the four military districts, which can be used as backups for the center in Moscow. Russia plans to develop high-tech stationary and mobile command centers on the army level in the future and procure 32 Akacia-M mobile complexes for armies' automatization by the end of 2020.²⁰

17. "The Tanks of August," CAST, 2010, <http://cast.ru/eng/books/the-tanks-of-august.html>.

18. "Russia's National Defense Control Center Officially Takes Up Combat Duty," TASS, December 1, 2014, <http://tass.com/russia/764480>.

19. "Report by the Chief of General Valery Gerasimov," Ministry of Defense of the Russian Federation, November 7, 2017, https://function.mil.ru/news_page/country/more.htm?id=12149743.

20. "The Ministry of Defense Will Spend 20 Billion on the Automation of the Army," CNews.ru, June 29, 2018 http://biz.cnews.ru/news/top/2018-06-29_minoborony_potratit_20_milliardov_na_avtomatizatsiyu.

In 2008, military units coordinated between each other using civilian cell phones.²¹ For example, the war commander of Russian 58th Army struggled to establish communication with army units and was forced to use a satellite phone borrowed from a newspaper correspondent. Since then, significant progress has been made. Elite special operation forces currently deployed to Syria in a tactical capacity use individual sets of Strelec equipment. Each soldier can receive encrypted radio communication with commanders and within units. Platoon commanders and scouts can transmit the coordinates of detected targets through digital encrypted communication channels to headquarters in real time, interact with artillery and aviation, and have access to satellite communication. This allows them to be integrated into automated control systems.

Russia is actively developing its own version of the joint battlespace information system, which gathers information from different kinds of sensors and different branches of armed forces and allocates targets for the military automatically.

In Syria, a few of the best-trained and most well-equipped fighters and staff officers are employing new communication and control equipment, but it is not clear if these systems have been mastered by more common military units in Russia. Of course, Strelec and Ratnik equipment are widely used in all major exercises, but they, and Russian command and control systems as a whole, remain untested in real, large-scale combat.

In sum, Russia's key new capabilities in command and control are:

- A joint National Defense Management Center
- Wide automatization of control of military operations
- Improved communication equipment

21. Vladimir Bakhur, "Recollection By the Correspondent Aleksander Kots," KP.ru, August 21, 2008, <https://www.kp.ru/daily/24150.4/366231/>.

4 | Unmanned and Robotic Vehicles

Successful development of the command and control system would have been impossible without the widespread deployment of small reconnaissance drones on tactical and operational levels. Today, drones are one of Russia's fastest growing military capabilities.

Russia's extensive use of UAVs in Ukraine and Syria provides a case study of how a problem identified in the 2008 Georgia campaign was resolved.²² The war with Georgia demonstrated the Russian army's catastrophic deficiency in this crucial component of modern warfare. The Russian forces used only one complex with several Pchela-1T UAVs during the operation, and even the official Russian Ministry of Defense press was forced to admit that this complex was hopelessly outdated and useless.²³ The only way to gather information was via old-fashioned photographic reconnaissance undertaken by Su-24MR aircraft. At the same time, Georgia used several effective reconnaissance drones, including Hermes 450 of the MALE class, which were bought from Israel.

In 2009, the Russian Ministry of Defense conducted comparative tests of all models of drones that were developed by Russian enterprises. The test program cost \$160 million—a very large amount for that time. None of the drones satisfied the military.²⁴

That same year, the Ministry of Defense decided to purchase two models of Israeli drones, the MALE-class Searcher II and the tactical Skylark. In 2011, the Ministry of Defense began to reinvest in the development of Russian drones and financed several light models.

In 2013, after a few years of research and development and testing, the Ministry of Defense began to supply UAVs to the ground forces. By the end of 2015, the number of drones deployed with the troops had increased from a few dozen to 1,720 units.²⁵ In 2016–2017, another 164 complexes were purchased, including 459 light reconnaissance and electronic warfare UAVs.²⁶

22. Keir Giles, "Assessing Russia's Reorganized and Rearmed Military," Carnegie Endowment for International Peace, May 3, 2017, <http://carnegieendowment.org/2017/05/03/assessing-russia-s-reorganized-and-rearmed-military-pub-69853>.

23. Konstantin Rashepkin, "Blind Patrol," *Krasnaya Zvezda*, August 1, 2009, http://old.redstar.ru/2009/08/01_08/5_01.html.

24. "MO Spent 5 Billion Rubles on Drones, but There Is No Result," RIA Novosti, April 7, 2010, https://ria.ru/defense_safety/20100407/219023444.html.

25. Ministry of Defense, "Annual Report 2015," <http://itogi2015.mil.ru/page145246.html>.

26. Ministry of Defense, "Report on Activities of the Ministry of Defense," December 2016, <http://syria.mil.ru/>

This pace of development relied substantially on commercial off-the-shelf components available on the international market. The most common type of Russian light drones, the Orlan-10, consists almost entirely of imported components, including key parts such as its engines, video cameras, and flight control systems.²⁷

As a result, a full complex of two light, truck-based Orlan-10 UAVs with payload and ground equipment costs the Ministry of Defense only \$600,000.²⁸ Even the procurement of hundreds of such UAVs is not prohibitively expensive. This has enabled the Ministry of Defense to procure 120 more Orlan drones in the first four months of 2018, a pace that the Ministry of Defense intends to maintain.

The ground forces own the majority of the 2,000 UAVs in operation, but UAVs are also increasingly being used in the navy, and several dozen small UAVs are currently employed to guard mobile launchers in the strategic missile force.²⁹

Each motor-rifle and tank brigade or regiment has created separate companies of tactical UAVs. Special sections for the use of unmanned vehicles now exist at brigade, division, corps, and army headquarters. With the increased use of drones, the ground forces have gained improved reconnaissance capabilities and artillery effectiveness.³⁰ Now, drones are included in every major exercise involving Russian artillery.

Russia can now conduct real-time reconnaissance at a range of up to 250 km with dozens of Forpost drones and hundreds of Orlan drones, which can monitor a range of up to 120 km. Short-range reconnaissance and fire direction using Eleron-3 UAVs gives Russian forces unprecedented situational awareness on the tactical and operational level.

Drone use in Syria intensified by two and a half times over the course of the first two years of Russian operations, demonstrating the growing centrality of these systems to Russia's mission. Initially, UAVs carried out about 400 sorties per month, but in October 2017, at the peak of the fight against ISIS, they were used about 1,000 times. In total, Russian drones carried out 23,000 sorties with a total flight time of 140,000 hours in less than three years.³¹

In 2011, the Ministry of Defense began developing a family of three heavy reconnaissance and strike drones, though owing to the complexity of these projects they are far from complete. Prototypes weighing 1.2 tons ("Orion") and 7.6 tons ("Altius") performed test flights but are years from being implemented. The pace of development of the most ambitious platform, the 20-ton strike drone "Ohotnik," is even slower and even its prototype is not yet flight-ready.

[files/morf/2016-12-22_MoD_board_extended_session_RUS.pdf](#); Minister of Defense, "Report on Collegium of the Ministry of Defense," December 2017, <http://syria.mil.ru/news/more.htm?id=12155960>.

27. "The Russian UAV Orlan-10 Consists of Parts Manufactured by the United States and Other Countries," *Informnapalm*, January 30, 2018, <https://informnapalm.org/42114-orlan-10-pod-mikroskopom/>.

28. Official site for state procurements, June 27, 2017, <http://www.zakupki.gov.ru/epz/order/notice/ea44/view/documents.html?regNumber=0195400000217000154>.

29. Perspective drones were used at the exercises of Strategic Missile Force near Novosibirsk.

30. Anton Lavrov, "Russian UAVs in Syria," *Moscow Defense Brief*, 2017, <http://www.mdb.cast.ru/mdb/2-2017/item3/article4/>.

31. "In the Near Future, the Ministry of Defense Will Purchase the Most Advanced UAV Systems," *Krasnaya Zvezda*, July 6, 2018, <http://redstar.ru/bspilotnaya-aviatsiya-uzhe-nezamenima/?attempt=1>.

Heavy strike drones are among the most important UAV components missing from the Russian army. However, in the coming years, strike drones of heavy or at least intermediate class (such as the recently presented “Corsair”) are likely to be employed. Years of experience with reconnaissance drones and a solid UAV infrastructure should ease their integration into the force.

Russia is also working on acquiring ground “robots,” or remotely controlled combat vehicles. Over the past few years, Russia has developed a whole line of robots, from small reconnaissance robots to a the massive (and futuristic) 11-ton, heavily-armed Uran-9.³²

The Ministry of Defense is in no hurry to buy robots in large quantities. Many military robots were sent to Syria to test the concept. Combat experience with the Uran-9 indicated that the technology is still immature.³³ However, both light and heavy unarmed robots have proven useful and their procurement has increased.

To summarize, the key new capabilities in this department are:

- More than 2,000 light reconnaissance drones
- Dozens of MALE-class reconnaissance drones
- Close integration of UAVs and artillery
- Assortment of ground engineering robotic vehicles

32. Samuel Bendett, “What Moscow Thinks About When It Thinks About War Robots,” WarIsBoring, March 17, 2018, <https://warisboring.com/what-russia-thinks-about-when-it-thinks-about-war-robots/>.

33. “About Uran-9 in Syria,” andrei-bt.livejournal.com, June 15, 2018, <https://andrei-bt.livejournal.com/871851.html>.

5 | Ground Forces

The war with Georgia showed that Soviet-era land equipment was critically worn out and did not meet the requirements of modern warfare. Since that time, the Russian Ground Forces have received thousands of new and modernized units of armored combat vehicles and weapons.

Despite this, the armament of Russia's ground forces is not significantly different than it was during the conflict in Georgia. The sheer size of the ground forces makes it resistant to large-scale change. Even updates to uniforms required several years of effort. Replacing heavy equipment was further complicated by the fact that the ground forces were not made a priority in the 2010-2020 State Armament Program. As a result, by the end of 2017, only 42 percent of their equipment was new or modernized³⁴—the lowest percentage among all military branches.

The new armored vehicles procured cannot truly be called modern. T-72B3 tanks, BMP-3 infantry fighting vehicles, BTR-82AM armored personnel carriers, and self-propelled howitzer MST-A-S are modernized versions of Soviet equipment. Their purchase is a temporary solution because new platforms of armored vehicles are being tested and are far from mass production. But even once these systems are ready for mass production, complete rearmament will take many years, both for financial and manufacturing capacity reasons.

Even the modernization of Russia's signature weapon, main battle tanks, was severely limited for economic reasons. The upgraded T-72B3, implemented in 2011, did not receive radically increased protection or firepower capabilities relative to the baseline T-72B model. Analysis of their performance in combat in Syria and Ukraine showed that this new modification was lacking in key areas. In 2016, Russia began using an advanced T-72B3(M) model, which included much better protection from cumulative ammunition strikes and additional removable armor for urban environments.³⁵ The protection of the T-90A tank used in Syria was also deemed insufficient, necessitating replacement with the newest T-90M, which is equipped with better armor. The first battalion of these new tanks will be employed in the ground forces in 2018.³⁶

34. "Interview With Colonel-General Oleg Salyukov, Commander-in-Chief of the Land Forces," *Izvestia*, October 1, 2017, <https://iz.ru/651606/oleg-saliukov/sukhoputnye-voiska-vykhodiat-na-novyi-uroven>.

35. "Tanks T-72B3 With Additional Protection in the Army," *bmpd.livejournal.com*, March 25, 2017, <https://bmpd.livejournal.com/2509153.html>.

36. "Upgraded T-90M Tank to Enter Service Soon," TASS, January 31, 2018, <http://tass.com/defense/987833>.

The Ministry of Defense signed a contract to supply two battalions with experimental Armata main battle tanks and one battalion with heavy T-15 BMPs, built on the Armata chassis, for a trial operation. Tests of about 100 vehicles will be completed no earlier than 2020 and will determine whether these new armored vehicles will be fully deployed.³⁷ Other new systems, including an infantry fighting vehicle, armored personnel carrier, and self-propelled artillery system, are also in their trial phases.

Artillery, however, has changed more significantly than other ground forces weapons since the Georgia war. Suppression of the enemy with superior firepower remains a preferred tactic of the Russian Ground Forces. Because of this, Russia deploys substantially more artillery with its units than does the United States or other NATO countries.³⁸

Artillery reform aimed to expand the zone of control for Russian units by increasing artillery firepower range relative to foreign armies. To achieve this goal, the old 122mm BM21 Grad MRLS models previously deployed with motor rifle divisions and brigades were replaced with 122mm Tornado-G MRLS systems, which have a much longer range (40km versus 20km). A long-range, 220mm Uragan MLRS was also added. It has a range of over 90km and is compatible with a variety of ammunition, including cluster and homing munitions. This ammunition trend will continue with the procurement of the 152mm self-propelled Koalition howitzers.

The experience from Syria and Ukraine demonstrated that 122mm and 152mm artillery is not powerful enough to destroy well-fortified positions and reinforced concrete buildings. Therefore, Russia is actively reviving heavy, 203mm artillery and 240mm mortars. The latter is often used in exercises with Smelchak laser-guided mines. They are chosen not for their range, but for their firepower. Heavy guided artillery munition gives tactical commanders the capability to precisely strike individual buildings from a long range, which is especially important for urban combat.

In Georgia, Russian regimental and brigade commanders lacked the intelligence capabilities to reconnoiter and direct artillery fire at long distances. Light and simple drones, capable of monitoring artillery for its full range of up to 120km, are now included in brigades. Additionally, target coordinates can be obtained from external sources using new automatic control systems. Thus, even basic combat structures can put these new long-range and high-power artillery capabilities to good use.

All artillery exercises are now conducted with UAVs that monitor the results of artillery fire in real time. In addition, an automated system for adjusting artillery fire from drones is being tested. Russian military theorists consider the use of drones a way to significantly save on ammunition, as well as a means to win counterbattery artillery duels.

“Krasnopol” is a prototype UAV with a laser target designator for guided artillery shells that was successfully tested in the fall of 2017 in Syria. It was used to target stationary and mobile targets, field fortifications, and individual buildings in urban areas. This is an

37. “The Ministry of Defense of the Russian Federation Will Decide on the Large Purchases of ‘Armata’ after 2020,” TASS, February 9, 2018, <http://tass.ru/armiya-i-opk/4943749>.

38. Scott Boston and Dara Massicot, “The Russian Way of Warfare,” RAND, 2017, <https://www.rand.org/pubs/perspectives/PE231.html>.

extremely promising direction for the development of Russian artillery, capable of further increasing its lethality.

A serious enhancement of the ground forces' capabilities resulted from their re-equipment with new short-range ballistic missiles. In the conflict with Georgia, 20-30 old Tochka-U missiles were used, and nearly all were equipped with cassette warheads because of their low accuracy. The replacement of these old missiles, which only have a range of 120km, is almost finished. By the end of 2018, all 12 deployed brigades of operational-tactical missiles will be fully rearmed with the new ballistic Iskander-M missiles, which possess a range of 500km.³⁹ With much better accuracy, four times the range, and twice the number of ready-to-launch missiles in each brigade, this represents a radical improvement in the capabilities of the Russian missile forces.

Moreover, a new and unexpected addition to missile brigades is the Iskander-K model equipped with ground-based R-500 (9M728) cruise missiles. According to the Russian military, these missiles, although closely resembling the sea-based Kalibr, possess a heavier and more powerful warhead, but have a smaller range of under 500km. The United States, however, believes that Russia has developed and deployed another cruise missile, designated the 9M729, that could be an extended-range variation on the Iskander-K.⁴⁰ If this missile has a range of over 500km, as the United States believes, it is in violation of the 1987 Intermediate-Range Nuclear Force Treaty.⁴¹

Whatever the real range, the introduction of cruise missiles into the missile brigades makes missile troops more flexible and versatile. For the first time in the post-Soviet period, ground forces have received long-range weapons capable of delivering non-nuclear precision strikes of up to 500km against key enemy targets. This means the Iskander can reach targets of strategic importance in the enemy's rear area. It is also almost impossible to effectively defend against combined attack by advanced ballistic and cruise missiles.⁴²

Plans following the war with Georgia to unite the airborne troops, marines, and Spetsnaz units into a separate "mobile forces" entity were never implemented. However, airborne troops are increasingly becoming light ground troops. They have grown in numbers and have received additional armored vehicles, including tanks. The naval infantry has also received armored vehicles and tank companies. On their basis, a future expeditionary infantry core will be formed, capable of operating outside the country.⁴³

39. "448th Missile Brigade in Kursk Will Be Rearmed on Iskander-M Missile Systems," [bmpd.livejournal.com](https://bmpd.livejournal.com/2989975.html), December 6, 2016, <https://bmpd.livejournal.com/2989975.html>.

40. Steven Pifer and Oliver Meier, "Are We Nearing the End of the INF Treaty?" Missile Testing, Arms Control Association, January 10, 2018, <https://www.armscontrol.org/taxonomy/term/112>.

41. Michael Gordon, "Russia Deploys Missile, Violating Treaty and Challenging Trump," *The New York Times*, February 14, 2017, <https://www.nytimes.com/2017/02/14/world/europe/russia-cruise-missile-arms-control-treaty.html>.

42. Courtney Kube, "General: U.S. Has 'No Defense' for Russian Ground-Launched Cruise Missile," NBC News, April 4, 2017, <https://www.nbcnews.com/news/investigations/general-u-s-has-no-defense-russian-ground-launched-cruise-n742666>.

43. "In Russia, There Will Be Rapid Reaction Troops Based on Airborne Troops," RBC.ru, May 30, 2018, <https://www.rbc.ru/society/30/05/2015/5569ede59a7947b2d1664e68>.

Yet, it remains difficult to move these “mobile forces.” The air transport fleet has not grown, nor has the number of amphibious ships. Thus, strategic maneuvering by Russia’s new, heavier troops is possible only by ground-based methods.

Despite all shortcomings, the ground forces have some new capabilities:

- Permanent readiness of most of the forces
- More lethal artillery
- Improved missile troops with ballistic and cruise missiles
- Better operational- and strategic-level mobility

6 | Aerospace Forces

In Georgia, the Russian Air Force was burdened by the obsolescence of its planes, helicopters, tactics, and weapons. For the entire duration of the conflict, Russian aircraft used only unguided weapons, with the exception of a few anti-radar missiles. Due to poor training and a shortage of pilots, flight instructors were sent out on combat sorties.

Aviation and ground forces conducted effectively separate campaigns, and coordination of actions between them sometimes took up to a day. There were cases of “friendly fire” on Russian ground troops by aircraft and of retaliation by the former. The Russian Air Forces lost six planes in five days. All of this meant that Russia’s substantial numerical advantage did not, to put it mildly, translate into battlefield results.

This experience led the Ministry of Defense to emphasize air force modernization. Ongoing operations in Syria demonstrate how radical these changes were. In a dramatic structural reform, Russia’s Air Forces, Army Aviation helicopters, long-range Air Defense, and Space Forces have been combined to form the new Russian Aerospace Forces. The aerospace forces are responsible for all aircraft, anti-missile defense, military space satellite launches, and, indeed, the maintenance of the Russian Ministry of Defense’s entire satellite constellation. In addition, procurement changes have enabled Russia to update an entire generation of aircraft and equip forces with new models of precision weapons.⁴⁴

Air force and air defense received the biggest share of funding in the 2010-2020 State Armament Program. This made it possible to update aircraft inventory by purchasing new airplanes and helicopters, rather than simply upgrading the old ones. With the influx of funds, the Russian defense industry was able to quickly ramp up production of new aircraft and helicopters after signing contracts with Ministry of Defense.

In total, Russia’s Air Forces received almost 500 new combat aircraft and more than 500 new helicopters. In addition, a few hundred older airplanes were modernized. The average share of new and modernized weapons in the aerospace forces reached 72.8 percent (72 percent in the air force, 68 percent in air defense forces, and 81 percent in space forces), making this branch of forces the most advanced in the Russian military.⁴⁵

44. “Aerospace Forces,” Ministry of Defense of the Russian Federation, <http://eng.mil.ru/en/structure/forces/aerospace.htm>.

45. Yuri Gavrilov, “Eyes on Modernity,” *Rossiyskaya Gazeta*, November 7, 2017, <https://rg.ru/2017/11/07/sho-jgu-dolia-sovremennogo-oruzhiia-v-rossijskoj-armii-vyrosla-do-59.html>.

Table 2. New combat aircrafts procurement, 2008-2017

	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
MiG-29SMT		28						3	11	
MiG-29UBT		6						2		
MiG-29K						2	8	10		
MiG-29KUB						2	2			
Su-27SM3			4	8						
Su-30M2			2	2		3	8	3	2	
Su-30SM					2	14	21	27	17	17
Su-34	1	2	4	6	10	14	18	18	16	16
Su-35S					2	8	24	12	12	10
Yak-130		3	6	3	15	18	20	14	10	6
Total	1	39	16	19	29	61	101	90	69	49

Source: "Deliveries of Combat Aircraft to the Armed Forces of Russia in 2017," bmpd.livejournal.com, January 5, 2018, <https://bmpd.livejournal.com/3036294.html>.

The top priority was the purchase of new fighters. The principal innovation of Su-30M, Su-35S, MiG-29SMT models was multifunctionality. Fighters in the 2008 air force were inherited from the USSR and could not be used for effective strikes against ground targets, but the new generation of fighters and bombers used in Syria were widely employed for ground strikes with unguided and precision weapons, including anti-ship missiles.

The improvement of fighter capabilities for air superiority is closely connected with the increased purchases of modern R-77-1 medium-range air-to-air missiles with active-radar homing. These missiles will significantly increase the capabilities of Russian fighters in beyond-visual-range air combat. The forces purchased and received 200 units in 2016-2017 and have already equipped them on Russian planes in Syria.⁴⁶

In 2008, Russia's strategic long-range aviation comprised more than 100 heavy bombers, but they had little utility in Georgia. Strategic bombers simply did not possess non-nuclear precision weapons. Thus, only denuclearized Tu-22M3s were sent to the theater to strike targets with free-fall bombs from low altitudes. They targeted a military airbase, army bases, and a railway station defended by Georgian troops. Yet the bombers proved to be vulnerable even to a weak Georgian air defense. One Tu-22M3 was shot down.

Over the past decade, the capabilities of strategic aviation have grown significantly. This has included the modernization of dozens of aircraft, which are now equipped with new non-nuclear guided weapons, X-555 cruise missiles, and a more accurate low observable X-101. Moreover, while it still lacks guided weapons, the Tu-22M3 has been modernized, and its new computerized Gefest sights enable the delivery of more accurate strikes by unguided bombs from higher altitudes.

46. Dave Majumdar, "Russia's Lethal Su-35 Was Just Spotted Armed With a New Missile NATO Should Fear," *The National Interest*, January 17, 2017, <http://nationalinterest.org/blog/the-buzz/russias-lethal-su-35-was-just-spotted-armed-new-missile-nato-19080>.

Russia tested its entire strategic aviation arsenal in Syria, including the nuclear-capable Tupolev Tu-160 and Tu-95MS strategic bombers. These launched 66 cruise missiles against targets in Syria, the first use in combat of both missiles and airplanes. These missile attacks were primarily intended for testing missiles in combat conditions and assessing their real effectiveness. Strikes were carried out typically by one or two bombers with only a few missiles used per sortie.

Unexpectedly, most strategic aviation sorties in Syria were carried out by the Tu-22M3. The air forces relocated one squadron of 12 bombers to Mozdok airfield in the Russian Caucasus in November 2015 and carried out flights from the base during the most kinetic periods of the conflict. In total, these seemingly obsolete bombers carried out more than 140 sorties,⁴⁷ using unguided bombs weighing 250 and 500 kilograms, as in Georgia.

Tu-22M3 continues to be the most common type of long-range aviation aircraft used by the Russian military, mainly because it is cheaper to use than larger strategic missile carriers. After the use of Tu-22M3s in Syria, the Ministry of Defense decided to extend the life of these aircraft by upgrading and equipping them with new cruise missiles.⁴⁸ The Tu-22M3 will also be able to carry the newest hypersonic Kinzhal missiles.⁴⁹ These new weapons will greatly increase the combat capabilities of long-range aviation in conventional non-nuclear conflicts without increasing the number of airplanes.

While in the process of purchasing new aircraft, much less attention was given by the Ministry of Defense to high-precision weapons for aviation. The main armament of Russian aviation consists of unguided “dumb” bombs and various cluster munitions. Although the Ministry of Defense never disclosed how many smart weapons were used, the author estimates that the ratio of guided to unguided systems used by Russia in Syria is likely somewhere between that of U.S. air forces in Operation Desert Storm against Iraq in 1991 and that of allied forces against Yugoslavia in 1999.⁵⁰

According to media reports, development and procurement of smart ammunition became one of the top priorities in the new State Armament Program for 2018-2027, and this should improve the situation significantly.⁵¹

Russian air defense was minimally active in the conflict with Georgia, but the air defense inventory has also been substantially updated. Aerospace forces received a total of 44 battalions of new S-400 anti-aircraft missile systems, allowing them to rearm 18 regiments and one training unit.⁵² The new short-range complexes Pantsir-S were also adopted, as well as Tor-M2 and Buk-M3 complexes.

47. Calculated by author from Russian Ministry of Defense press-releases.

48. Aleksei Ramm, “Assassins of Aircraft Carriers’ Arsenal Will Be Extended,” *Izvestia*, November 17, 2017, <https://iz.ru/663570/aleksei-ramm/ubiitcam-avianostcev-popolniat-arsenal>.

49. “New Trials of Kinzhal Hypersonic Complex to Show Bomber’s Ability to Boost Missiles,” TASS, July 2, 2018, <http://tass.com/defense/1011683>.

50. Author’s estimate.

51. “Russian State Armaments Program to Focus on Precision Weaponry – Defense Official,” TASS, November 23, 2017, <http://tass.com/defense/977195>.

52. “SAM S-400 in the Russian Armed Forces, Version 4.0,” altyn73.livejournal.com, December 1, 2017, <https://altyn73.livejournal.com/1269824.html>.

The air forces use an advanced multilayer air defense system to protect Russian bases in Syria, including short-range Pantsir-S and Tor-M2 complexes that successfully intercepted dozens of targets, from small drones to Grad missiles.⁵³ This became their first baptism by fire. The problem of protecting troops and objects from attacks by hostile drones is one of the most difficult challenges for modern armed forces. Russia's real-world experience in Syria gives it certain advantages in understanding and responding to this problem.

Part of the reform aimed to increase the space capabilities of the aerospace forces, and they now also control the military satellite constellation. At the time of the war with Georgia, Russia did not have a single active optical reconnaissance satellite in the Earth's orbit, after the last Soviet satellite failed in the early 2000's. However, the new army command and control system demanded better satellite communications, a fully functioning GLONASS satellite navigation system, and potent satellite reconnaissance.

Thus, by the end of 2017, at least 85 Russian military satellites were in orbit, most of them used for communication purposes:⁵⁴

- 43 - communication
- 27 - navigation
- 10 - Earth observation
- 5 - other

The aerospace forces used more than 10 remote sensing satellites from the first days of military operations in Syria.⁵⁵ Most of them, including two high-definition Persona satellites, are optical. Additionally, two more civilian high-resolution Resource-P satellites are under state control and available for potential military use. Moreover, four less-efficient civilian Canopus-B remote sensing satellites are also in orbit. All of them can transfer data to the ground through high-speed radio channels. The time from the order of high-definition pictures to their acquisition has been reduced dramatically to just hours under the best conditions, a completely new and very useful capability for the Russian Armed Forces.

The restoration of the GLONASS satellite constellation is among the most important recent achievements of the aerospace forces. 24 operational satellites in orbit are necessary for Russia's NAVSTAR GPS to be fully available around the globe. At the time of the war with Georgia, only 13 satellites were operational, and they served no military purpose.⁵⁶

A fully functional constellation was in place by December 8, 2011. During the intervention in Syria, there were only a few brief interruptions in service, with a minimum of 21 working satellites always in orbit.⁵⁷

53. "Russian Air Defense Pantsir-S1 Intercepts HTS Missiles Near Hamimiyem Airbase," Murselon, December 27, 2017, <https://en.murselon.com/2017/12/breaking-russian-air-defense-pantsyr-s1-intercepts-hts-missiles-near-hamimiyem-airbase/>.

54. The Satellite Database, Union of Concerned Scientists (UCS), September 1, 2017, https://s3.amazonaws.com/ucs-documents/nuclear-weapons/sat-database/9-1-17-update/UCS_Satellite_Database_9-1-2017.xlsx.

55. "General Staff of the Russian Federation: Reconnaissance of the Territory of Syria Is Conducted by 10 Satellites," RIA Novosti, November 17, 2015, https://ria.ru/syria_mission/20151117/1322904148.html.

56. According to GLONASS monitoring site, <https://www.glonass-iac.ru/archive/index.php>.

57. Ibid.

Comparing the results of military operations in Georgia and Syria, we can see that a fully functioning satellite navigation system allows Russia to use more precision weapons. Without a doubt, this is one of the key capabilities Russia has acquired in recent years. All new long-range air, sea, and land-based cruise missiles, ballistic missiles of small and intercontinental range, drones, and command and control systems rely on it.

Thus, the key new capabilities for the aerospace forces are:

- Hundreds of new aircraft
- Non-nuclear cruise missiles
- A new generation of precision weapons for tactical aviation
- Functioning communication and navigation satellite constellation

7 | Navy

Almost the entire Russian Black Sea Fleet, including small anti-submarine corvettes and even minesweepers, was involved in the conflict with Georgia. The only sea skirmish with small Georgian ships ended without results, but the surprise landing of Russian paratroopers by three large amphibious assault ships on Abkhazia's beach had a major effect on the strategic situation on the ground.

Despite this, the Russian Navy proved of little value for supporting ground operations. Despite its impressive numbers, it was useless to the ground forces except for small-scale tactical assault landing or, perhaps, for creating an air defense “umbrella” in the coastal regions. This might be among the reasons the navy was prioritized in the State Armament Program for 2010-2020 with 25 percent of all expenses allocated to fleet modernization. This included plans for the construction of 24 submarines, 16 of them nuclear, and 54 large surface ships over 10 years.

However, the shipbuilding industry proved unprepared to fulfill such a large order on time. As of May 2018, the ambitious plan remains largely unfulfilled. The navy has received only 10 submarines, 4 of them nuclear, and 16 surface ships (4 frigates, 4 corvettes, and 8 small rocket and artillery ships). There are no indications that by 2020 there will be major improvements or that the rest of planned ships will be completed. Plans for the modernization and overhaul of combat ships were also unsuccessful.⁵⁸

Repair delays and the decommissioning of old ships has meant that in the 10 years that have passed since the war with Georgia, the capabilities of the Russian oceangoing, blue-water navy have only decreased. During this time, Russia has not received a single new surface combatant of destroyer class or larger, and frigates are the biggest combat ships in the new State Armament Program for 2018-2027.

The navy has played a large role in Syria. From October 2015 to January 2018, navy ships carried out more than 100 cruise missile strikes against ground targets, some of them from up to 1,500km away.⁵⁹ The launches were initiated from both the Mediterranean Sea and the Caspian Sea, a substantial distance from the zone of combat operations.

58. Maxim Shepovalenko, “Preliminary Results of the GPO-2020 in the Military Shipbuilding Sector,” *Export voruzheniy*, no. 1 (2018).

59. Andrei Gavrilenko, “The Navy - On the Edge of Development”, *Red Star*, February 15, 2018, <http://archive.redstar.ru/index.php/advice/item/36166-voenno-morskoj-flot-na-stremnine-razvitiya>.

But the slow pace of naval upgrades means that most of the major Russian surface combatants are legacy ships lacking weapons capable of delivering strikes far from the coast. All strikes were made from a small number of new corvettes and frigates armed with cruise missiles. For the first time in a combat situation, these missiles were also shot by Project 636.3 small, diesel submarines. As of mid-2018, the Russian Navy has only 17 ships and submarines armed with Kalibr cruise missiles, with a total of 148 deployed missiles.

Table 3. Russian Navy ships armed with Kalibr cruise missiles (as of mid-2018)

Type	Name	Project	Build Started	Accepted	Number of missiles
Frigate	Admiral Grigorovich	11356	18.12.2010	11.03.2016	8
Frigate	Admiral Essen	11356	08.07.2011	07.06.2016	8
Frigate	Admiral Makarov	11356	29.02.2012	27.12.2017	8
Corvette	Dagestan	11661K	01.06.1991	28.11.2012	8
Corvette	Grad Sviyazhsk	21631	27.08.2010	27.07.2014	8
Corvette	Uglich	21631	22.07.2011	27.07.2014	8
Corvette	Velikiy Ustyug	21631	27.08.2011	19.12.2014	8
Corvette	Zelenyy Dol	21631	29.08.2012	12.12.2015	8
Corvette	Serpukhov	21631	25.01.2013	12.12.2015	8
Corvette	Vshniy Volochyok	21631	29.08.2013	02.06.2018	8
SSN	Severodvinsk	885	21.12.1993	17.06.2014	32
SS	Novorossiysk	636.3	20.08.2010	17.09.2014	6
SS	Rostov-on-Don	636.3	21.11.2011	30.12.2014	6
SS	Sary Oskol	636.3	17.08.2012	03.07.2017	6
SS	Krasnodar	636.3	20.02.2014	05.11.2015	6
SS	Velikiy Novgorod	636.3	30.10.2014	26.10.2016	6
SS	Kolpino	636.3	30.10.2014	24.11.2016	6

Source: Compiled by author.

Thus, the only major improvements since 2008 are the deployment of small ships capable of launching ground attack strikes and the Kalibr anti-ship cruise missile. Never before have small Russian corvettes (small rocket ship in the Russian classification) or diesel submarines possessed such a long-range weapon (up to 2000km).

These low-noise and low-cost diesel submarines, with a powerful combination of torpedoes and cruise missiles, are very effective in the coastal regions of Russia. The Black Sea Fleet has already received six Project 636.3 (Improved Kilo) submarines, and Russia plans to build six more for the Pacific Fleet.

This preference for small ships and submarines indicates an unspoken gradual transformation of the Russian fleet from oceangoing “blue-water” ambitions to acceptance of a more realistic coastal “green-water” navy. The current State Armament Program (until 2027) focuses on small ships and is more realistic in this regard than its predecessor. It includes an order to build more than two dozen additional light missile corvettes in a

few years for all navy fleets.⁶⁰ At the same time, plans for large combat units, the size of a destroyer or larger, have been postponed for the period after 2035,⁶¹ according to the Shipbuilding Strategy published in 2018.

As in other branches of the armed forces, expenditures for navy training and exercises have significantly increased. If the number of large ships of the Russian Navy has not increased since the war with Georgia, the existing ones have become more active and visible. From 2012 to 2017, the total number of days spent at sea by navy ships has doubled and the average duration of deployment for ships and submarines has increased by one third.⁶² Russia is also “showing the flag” with ship visits to foreign ports.

Naval aviation deserves a separate discussion. By 2008, it had degraded to a completely helpless state and further weakened in the years that followed. In 2012, almost all strike aviation regiments were transferred from the navy to the aerospace forces. The fleet lost all its long-range Tu-22M3s with anti-ship missiles, which had previously been used to attack naval targets, including carrier battle groups.

In 2014, following a change of the defense minister and the beginning of conflict in Ukraine, the concept of fleet aviation changed again. New aviation regiments were formed, and Russia began to procure new aircraft and helicopters. But there are no plans to return Tu-22M3s to the navy.

For the only Russian aircraft carrier, a second carrier regiment was created. The first 279th Naval Air Regiment is equipped with roughly 15 Su-33 heavy fighters. These have not been produced in quite some time and remain outdated, despite some modernizations. From 2013 to 2015, the newly formed 100th Naval Air Regiment received 20 new MiG-29K naval fighters and four more in the MiG-29KUB two-seat training configuration.

In the fall of 2016, the Russian aircraft carrier Admiral Kuznetsov was deployed to the shores of Syria. The Kuznetsov’s air wing consisted of all three types of Russian deck fighters from both regiments. However, this deployment was something of a disappointment. The Su-33 could use only unguided and cluster munitions. For the few new MiG-29Ks, dispatch to Syria was more a trial exercise than a true combat deployment, though they were equipped with KAB-500Kr guided bombs. This was the first time that Russia’s deck aviation was able to deliver precision strikes on the ground, albeit from a short distance. In total, only 154 sorties from the deck of the aircraft carrier were made, and one Su-33 and one MiG-29KUB were lost in air accidents.

The State Armament Program for 2010-2020 allocated significant resources to enhancing Russia’s fleet and deck aircraft. However, deployment in Syria has not confirmed the effectiveness of Russian carrier aviation. The 2018-2027 program is not so generous. It does not budget for the construction of new aircraft carriers. The small, non-nuclear

60. “‘Karakurts’ Will Be Split by Shipyards,” *Kommersant*, July 30, 2017, <https://www.kommersant.ru/doc/3371787>.

61. “Russia Will Abandon Aircraft Carriers For the Sake of the ‘Mosquito Fleet,’” *Svobodnaya Pressa*, July 9, 2018, <https://svpressa.ru/war21/article/20485>.

62. Gavrilenko, “The Navy - On the Edge of Development.”

Admiral Kuznetsov will remain the only carrier at the disposal of the Russian navy for the foreseeable future.

The only bright spot for carrier aviation from its deployment was the new MiG-29K fighters. After the Kuznetsov undertakes an overhaul in 2021, these fighters will be more combat-ready and will form the backbone of the air wing. With the help of their wide array of guided air-to-ground and air-to-surface weapons, the Admiral Kuznetsov will get some real strike power.

An important decision was made to equip coast-based navy aviation with new multipurpose fighters and drones. Plans call for the procurement of 50 Su-30SM by 2020 for the Black and Baltic Fleets.⁶³ They will be used for both fighter and attack regiments.

The Crimea-based 43rd Assault Regiment has already begun training with anti-ship X-35 missiles. Equipped with these missiles, which have a range up to 260km, fighters can to some extent replace the regiments of the Tu-22M3 lost by the navy. Naval Su-30SMs were actively used in Syria and successfully sunk a practice target of a decommissioned Syrian destroyer.⁶⁴

The navy is second only to the army in its stock of unmanned aerial vehicles. Within each fleet, coastal battalions possess medium- and short-range Forpost and Orlan-10 UAVs. With their help, fleets will be better able to detect land and sea targets and adjust artillery and missile fire from ships. A ship-launched Katran rotary-wing (UAV) is under development.⁶⁵ A series of naval exercises using drones started in 2017,⁶⁶ but even before that, Naval drones were actively used in Syria to support aerospace force operations. When the development of heavy reconnaissance drones of the MALE class is completed, they will be used by the fleet to monitor the seas and detect ground targets.

To summarize, the key new capabilities for the modern Russian fleet are:

- Non-nuclear long-range cruise missiles capable of attacking land targets
- Multifunctional small corvettes and diesel submarines
- Supersonic anti-ship missiles
- Multifunctional fighters with precision strike capabilities
- Coastal and shipborne long-endurance, medium-range drone

63. "Russian Navy Naval Aviation to Receive More Than 50 New Sukhoi Su-30SM by 2020," Navy Recognition, August 22, 2015, <http://www.navyrecognition.com/index.php/news/defence-news/year-2015-news/august-2015-navy-naval-forces-defense-industry-technology-maritime-security-global-news/3027-russian-navy-naval-aviation-to-receive-more-than-50-new-sukhoi-su-30sm-by-2020.html>.

64. Ruslan Melnikov, "After the Attack on Syria, the Su-30SM Demonstratively Sunk the Destroyer With Kh-35 Missile," RG.ru, April 25, 2018, <https://rg.ru/2018/04/25/video-su-30sm-u-beregov-sirii-unichtozhil-esminec-raketnoj-h-35.html>.

65. Nikolai Novichkov, "Katran Rotary-wing Unmanned Aerial Vehicle (UAV)," Jane's 360, June 1, 2018, <http://www.janes.com/article/80560/russia-s-new-katran-uav-to-enter-trials-in-mid-2018>.

66. "With a Wide Range of Tasks," Red Star, November 30, 2017, <http://redstar.ru/index.php/syria/item/35247-pri-shirokom-spektre-zadach>.

8 | Conclusion

A decade of armed forces reforms followed the war with Georgia. These reforms emphasized structural changes and mass re-equipment of all branches with new and modernized weapons. Now, Russia must master its new capabilities.

Even though Russia's defense spending and pace of procurement of new armaments has slowed,⁶⁷ the overall capabilities of the Russian Armed Forces will continue to grow as Russia makes more efficient use of available resources. For instance, qualitative improvements of the Russian Armed Forces have already been numerous:

- Better personnel
- New command and control system
- Modern communication equipment
- Significantly improved situational awareness
- Introduction of precise weapons in all branches of armed forces

Quantitative changes also look impressive. Over the past five years, the share of modern weapons in the armed forces has quadrupled to almost 59 percent.⁶⁸ When considering the share of new and modernized equipment in different branches, it becomes clear which of them were the priority of modernization. Official plans to achieve a figure of 70 percent new and modernized equipment for troops by 2020 seems possible, but inequalities between branches will continue to exist.

67. "Russia to Cut Defense Spending, Capital Construction Outlays, Vows Presidential Aide," TASS, March 16, 2018, <http://tass.com/defense/994572>.

68. Collegium of the Ministry of Defense, December 2017, <http://syria.mil.ru/news/more.htm?id=12155960>.

Table 4. The share of new and modernized weapons in different branches of the Russian Armed Forces by the end of 2017

Branch	Share, percent
Ground Forces	45
Aerospace Forces	73
Navy	53
Nuclear Forces	79
Overall Armed Forces	59.5

Source: Collegium of the Ministry of Defense, December 2017, <http://syria.mil.ru/news/more.htm?id=12155960>.

But success cannot be taken for granted. During rearmament, Russia has faced serious problems in transitioning to fundamentally new generations of armaments from those inherited from the USSR. This has been especially noticeable in the navy and the ground forces. To continue successfully modernizing its armed forces, Russia will have to overcome several key challenges in order to:

- Recruit enough qualified personnel
- Resolve budget and financial constraints
- Demonstrate the ability of the defense industry to innovate and produce new types of weapons despite international sanctions and restrictions on access to financial resources

Even with all the positive changes of the past decade, there are areas in which Russia still lacks key military capabilities. Perhaps most importantly, it remains substantially limited in its ability to project force over long distances.

Certainly, Russia's navy cannot deliver this capability. Aside from the problems described above, Russia faces a gap when it comes to amphibious assault ships. After the misadventures with France's Mistral project, the sale of which was blocked after the start of the Ukraine crisis, there is no replacement or plan B. The Ivan Gren-class of landing ships will not solve the problem. It is vastly inferior to Mistrals. Moreover, its slow pace of construction means that Russia will not even be able to replace its current fleet of landing crafts, which is worn out from Syria.

Nor is strategic airlift sufficient. Plans to restart production of Ilyushin Il-76 transport planes have faced heavy delays. Moreover, there is no replacement for the strategic Antonov An-124 and An-22 military transports in sight since the breakdown of relations with Ukraine. The shortage of the Antonovs is especially damaging to Russia's capacity to move heavy military equipment such as tanks and long-range air defense systems.

Russia's ability to project force is further limited by a shortage of tanker aircraft. Their number has not increased in a decade and is sufficient for neither tactical nor long-range aviation. Russia also does not possess heavy reconnaissance or strike drones able to operate on distances of more than a few hundred kilometers. Finally, Russia lacks a sizeable number of overseas military bases which might otherwise mitigate this deficiency of power projection tools.

These air and maritime logistics gaps will severely limit the expeditionary capabilities of the Russian military in regions that do not have land links to mainland Russian territory.

As a result, Russian capacity to project force into the far abroad remains extremely limited and will not grow significantly in the near future. Moreover, although significant, improvements in Russia's military capabilities after the war with Georgia have not changed the overall strategic balance of power. Russian forces remain inferior in all quantitative indicators not only to the NATO bloc but also to China. Even modernized conventional weapons, which are now procured en masse, are often technologically inferior to their counterparts in the arsenals of advanced NATO countries (tanks are one example). The bottom line is that Russia today is an even more formidable regional military force than before, but it is still not a global one. Russia's Armed Forces are perfectly shaped to protect its territory and project power nearby, but as distance from the border increases, Russian military capability declines.

About the Author

Anton Lavrov was a visiting fellow with the Russia and Eurasia Program at CSIS. He is an independent defense analyst affiliated with the Moscow-based Center for Analysis of Strategies and Technologies (CAST) and expert on the 2008 Russian-Georgian War. Mr. Lavrov was a contributor to the CAST publication “The Tanks of August,” in which he provides a meticulous timeline of the buildup and outbreak of the 2008 war. He has also monitored troop movements in the recent Russia-Ukraine conflict.

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