PISM REPORT

ASSESSMENT

of the Russian Armed Forces' State Armament Programme in 2011–2020

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MAIN CONCLUSIONS AND RECOMMENDATIONS

- Despite the sanctions imposed on it in 2014, Russia managed to achieve the basic formal goal of its State Armament Programme (SAP) for 2011-2020: it achieved a 70% share of modern weapons in total armaments of the armed forces. Russia describes "modern" as newly produced or upgraded ("modernised") types of weapons. Despite uncertainty in the specific details, it is clear that the overall potential of Russia's armed forces has grown significantly since 2011.
- The Strategic Missile Forces that comprise the basis of Russia's nuclear deterrence potential have the highest percentage (81%) of modern weapons.
- During the implementation of the SAP, changes were made in response to the operational needs of the armed forces participating in operations in Ukraine and Syria, and because of technical problems with the implementation of advanced projects (T-14 Armata tank, Su-57 fighter) and insufficient funding. Funds were prioritised for projects that would give Russia an operational advantage over other countries and additional opportunities for political influence, such as hypersonic weapons.
- The vast majority of new or modernised weapons went to the western part of Russia. Officially, this was a response to policy moves in NATO, which in 2014 decided to strengthen the Eastern Flank. However, it stemmed from Russia's continued perception of the Alliance as the main threat. Moreover, a further strengthening of Russian forces in this strategic direction should be expected.
- In the next SAP, for the years 2018–2027, the Land Forces have been the priority. In this period, Russia also views as important the rearming of the Russian Navy, which must be ready to conduct both a large-scale land operation and deep-sea operations.
- Russia, in pursuing policy towards its neighbours and NATO countries, will continue to use its growing military potential. The increase in Russian military capabilities in the western strategic direction should therefore be met by a response from the Alliance in terms of strengthening the deterrence and defence potential on the Eastern Flank. Like earlier, it must be balanced to gain the consensus of all the allies, but it also should take into account the progress in the modernisation of the Russian military and changes in the local balance of power. It is therefore particularly important to further strengthen missile defence and air-defence capabilities, and to invest in naval forces, drones, and in loitering munitions.

INTRODUCTION

Russia's State Armament Programme (SAP) comprises medium-term plans for the technical modernisation of all the armed forces. It includes an analysis and assessment of threats to national security. The development of the SAP iterations is coordinated by the Ministry of Defence (MoD) and involves other ministries and the defence industry. The SAP is subject to periodic reviews, which lead to revisions based on experience from military operations and other testing and uses. Before the SAP for 2011-2020, Russia implemented other reforms and the SAP for 2007-2015, the primary goal of which was to increase the share of modern weapons in the armed forces to 30%. According to data presented by the Russian authorities (both the defence minister and the president), in 2020 the formal goal of the SAP for 2011-2020 had been achieved: the share of modern weapons exceeded 70%.[1] It is difficult to properly assess the methodology adopted by the Russian MoD or indicate which portion of the armaments are completely new and which were only modernised and to what extent.

SAP 2011-2020 was prepared under specific conditions. It was an integral part of the comprehensive reform of the Russian armed forces inaugurated in 2009. Moreover, it was created at a time when Russia, for the first time in its modern history, had at its disposal sufficient financial resources and technical capabilities to implement such reform, which was mainly possible due to the growing revenues from the sale of energy resources. The assumptions of the document also corresponded to the next version of the Russian military doctrine that was being developed at that time and subsequently published in 2010.[2]

In the 2010 doctrine, Russia identified as significant threats the creation and deployment of strategic missile defence systems that undermine global stability and upset the existing balance of strategic (nuclear) forces, the militarisation of outer space, and the deployment of strategic non-nuclear precision weapons systems. The document also emphasised that military operations would be characterised by the growing importance of precision electromagnetic and laser platform weapons, information systems, unmanned aerial vehicles and autonomous maritime vehicles. It pointed out that nuclear weapons will remain an important factor in preventing the outbreak of nuclear armed conflicts as well as certain conventional armed conflicts.

The response to these challenges and threats was largely reflected in SAP 2011-2020. One of the priorities was to modernise the strategic forces, which corresponded to the content of the doctrine in which Russia must maintain the condition of these forces, the level of combat readiness and the training of crews to a degree that guarantees damage to the aggressor under all conditions (in practice, this meant maintaining the capability of a retaliatory nuclear strike on a severe scale). The 2010 doctrine also assumed a comprehensive rearmament of military units to a level of constant combat readiness, as well as anti-terrorist, engineering, and technical forces. The Russian government set itself the goal of providing the armed forces with modern weapons, military and special equipment (material and technical resources) and increasing the technological capabilities of the defence industry as well as the quality of the weapons produced. An important task was ensuring technological independence from NATO countries or Ukraine, a traditional

[1] *Rasshirennoye zasedaniye kollegii Minoborony*, Sections of the website of the President of Russia, 20 December, 2020, http://kremlin.ru/events/president/news/64684.

[2] *Voyennaya doktrina Rossiyskoy Federatsii*, Sections of the website of the President of Russia, 5 February 2010, http://kremlin.ru/supplement/461.

supplier, in the production of strategic and other weapons, as well as military and special equipment.

Another multi-annual rearmament plan was adopted in December 2017 and covered the period 2018-2027 (the scope of it partially overlaps SAP 2011-2020). Its assumptions drew on the operational experience of the Russian armed forces in Syria and Ukraine. It also took into account the degree of implementation of SAP 2011-2020, in particular the need to extend work on some flagship projects (e.g., concerning a modern tracked platform and a 5th-generation fighter). The new SAP was adapted to the changing international reality, including military activities by the U.S. and China. The task was to maintain the modernisation of the armed forces at a level that also would increase their operational capabilities.

1. THE MOST IMPORTANT ASSUMPTIONS OF THE STATE ARMAMENTS PROGRAMME 2011-2020

Work on the 2011-2020 SAP began in 2009 when, according to official information, the share of modern weapons in all types of Russian armed forces oscillated around 10%. In developing the plan, the experiences from the armed conflict in Georgia in 2008 were factored in, and the most important goal was to modernise the Russian armed forces to the extent that they would maintain full combat readiness. The programme was approved by President Dmitry Medvedev on 31 December 2010. For its implementation, RUB 20 trillion ($720 billion in current prices and exchange rates) was earmarked, of which 70% was allocated to the purchase of new equipment and 30% to repairs and modernisations.

Half of all 2011-2020 SAP expenditure was to be allocated to the rearmament of the Navy and the Air Force (25% and 24% of the total programme volume, respectively). The plan called for the delivery of eight Borei-class nuclear submarines and eight universal Yasen-class nuclear submarines, thanks to which Russia was supposed to, among other goals, increase the potential for nuclear retaliation. There were also plans to build 50 surface combatants, including 15 frigates and 35 corvettes.

For the Air Force, 600 aircraft (including Su-35 fighters and Su-34 front bombers) and 1,100 helicopters were to be purchased. Seventeen percent of the funding was allocated to the acquisition of 100 units of S-400, S-500 and S-350 air-defence missile systems, as well as for the Pantsir-S and other systems.

Fifteen percent was allocated to the Land Forces, including the acquisition of 2,300 tanks, 2,000 artillery sets, 10 Iskander-M brigades (about 200 rockets each), and S-300W anti-aircraft systems.

Five percent of SAP expenditure was reserved for the Strategic Missile Forces, with plans to purchase 270-280 Yars ICBMs.

Another 14% of the expenditure was allocated to new communications, command-and-control and intelligence systems.

The programme was also aimed at the development and serial production of new types of weapons, including the *Armata* universal combat platform (intended for both the tank of the same name and an infantry fighting vehicle, or IFV), as well as for the 5th-generation fighter (now known as the Su-57), and new intercontinental missiles.

The 2011-2020 SAP was almost entirely implemented by the Russian arms industry. Russia managed to avoid problems related to the depreciation of the rouble as a result of the country's economic problems and the introduction of sanctions by Western countries in 2014 following the Russian aggression against Ukraine. As a result, the estimated cost of the SAP in U.S. dollars fell by almost a third (see further discussion below and Figure 1). Other consequences of the Western sanctions were also largely avoided, although one effect was that Russia did not complete the purchase of Mistral-class ships from France. It also overcame sourcing problems related to the production of engine parts for helicopters and submarines previously manufactured in Ukraine.

TABLE 1. OBJECTIVES OF THE REARMAMENT PROGRAMME

Type of armed forces	RUB (trillions)	%	Aims
The Land Forces	2.6	14	300 tanks, 2,000 artillery systems, 10 Iskander-M units (160 coaxial launchers, 320 missiles), 9 S-300W4 Army air-defence systems, more than 30,000 military cars
The Navy	4.5–5	26	8 Borei-class SSBN with 120-130 Bulava SLBMs, 8 Yasen-class multifunctional nuclear submarines , 8 non-nuclear powered submarines, 51 surface combatants, including 14-15 frigates, and up to 25 corvettes
The Air Forces [3]	4–5	21	600 aircraft, 1,000-1,100 helicopters
Strategic Missile Forces (RVSN)	1	6	270-280 Yars ICBMs, development of a new solid fuel for ICBMs (Rubezh Project) and a new liquid-propellant heavy ballistic missile
The Aerospace Defence Forces	3.4–4	17	6 S-400 squadrons (448 launchers and 1,798 missiles), 38 S-500 sets (300-460 launchers and 1,220-1,820 missiles), integrated air-defence control system, 4 Voronezh radars. The S-500 was planned to enter service in late 2016.
Others	2.7	14	New communications, control, and intelligence systems, individual sets of equipment for military personnel, etc.

Source: Own figures based on: www.pircenter.org/media/content/files/12/13880454280.pdf

The assemblies under the SAP were almost entirely completed: the Russian Armed Forces received 109 Yars ICBMs, 108 ballistic missiles for submarines, 4 strategic Borei-class submarines, 7 modern submarines, and 161 surface combatants, as well as 17 Bal and Bastion missile systems, over 1,000 new and modernised combat aircraft and helicopters, and more than 3,500 armoured vehicles.[4]

According to Defence Minister Sergei Shoygu, 12 missile regiments were armed with Yars complexes, 10 missile brigades with Iskander systems, and 20 anti-aircraft regiments with S-400 air-defence systems. In addition, 13 aviation regiments received modernised 4th generation aircraft—MiG-31BM, Su-35S, Su-30SM, and Su-34—as well as Ka-52 and Mi-28 helicopters.[5]

TABLE 2. SIGNIFICANT DELIVERIES TO THE RUSSIAN ARMED FORCES IN 2011-2020

Type of armament	Number of units
Military satellites	57
ICBM RS-24 Yars	109
Ballistic missiles for submarines	108
Borei-class submarines	4
Other submarines	7
Various types of surface combatants	161
Airplanes and helicopters	1000

Source: M. Khodarenok, "Rakety, korvety i tanki: kakoye oruzhiye poluchila armiya Rossii v 2020-m", Gazieta.ru, 27 December 2020, www.gazeta.ru/army/2020/12/27/13416440.shtml.

Despite the formal completion of the SAP, some flagship projects such as the *Armata* combat platform, the Su-57 fighter, and the Sarmat ICBM still remain in the implementation phase. Moreover, some projects, including the RS-26 Rubezh rocket and the Barguzin railroad combat complex (a railway platform for launching ICBMs), have been suspended. The main reason for this was the need to shift funds to more promising projects that would give Russia a military advantage, such as hypersonic weapons, including the *Avangard* system.

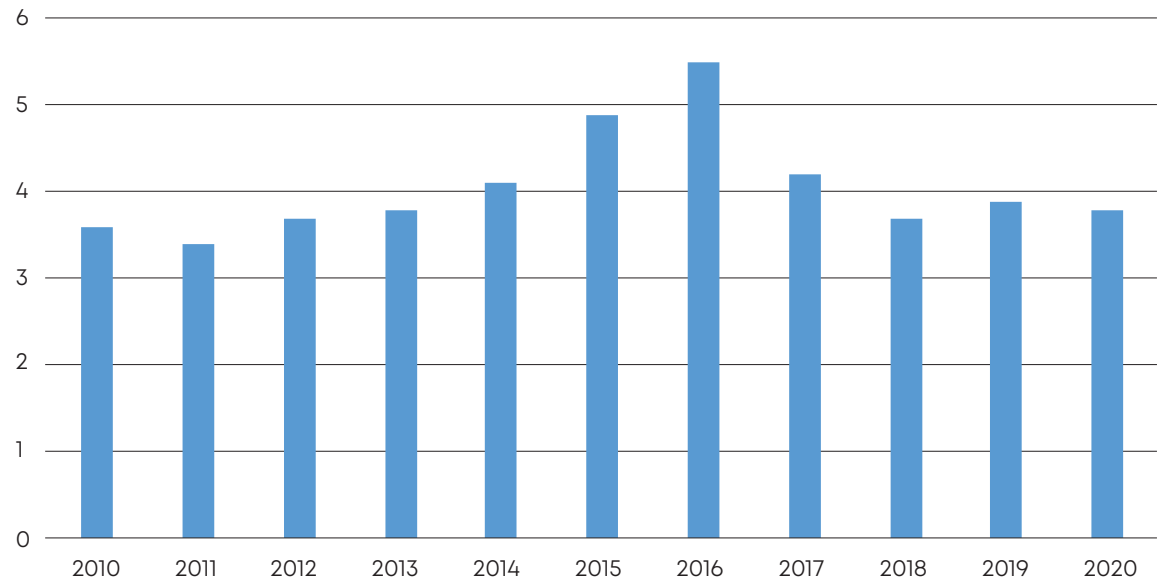
According to the Stockholm Institute for Peace Research (SIPRI), Russia's military spending in 2010-2019 stayed at a high level and never fell below 3.4% of GDP.

[3] In 2010, the Aerospace Forces had not been formed yet.

[4] "Zakonchena desyatiletka perevooruzheniya," *Nezavisimaya gazeta*, 25 December 2010, www.ng.ru/armies/2020-12-25/11_8049_army1.html.

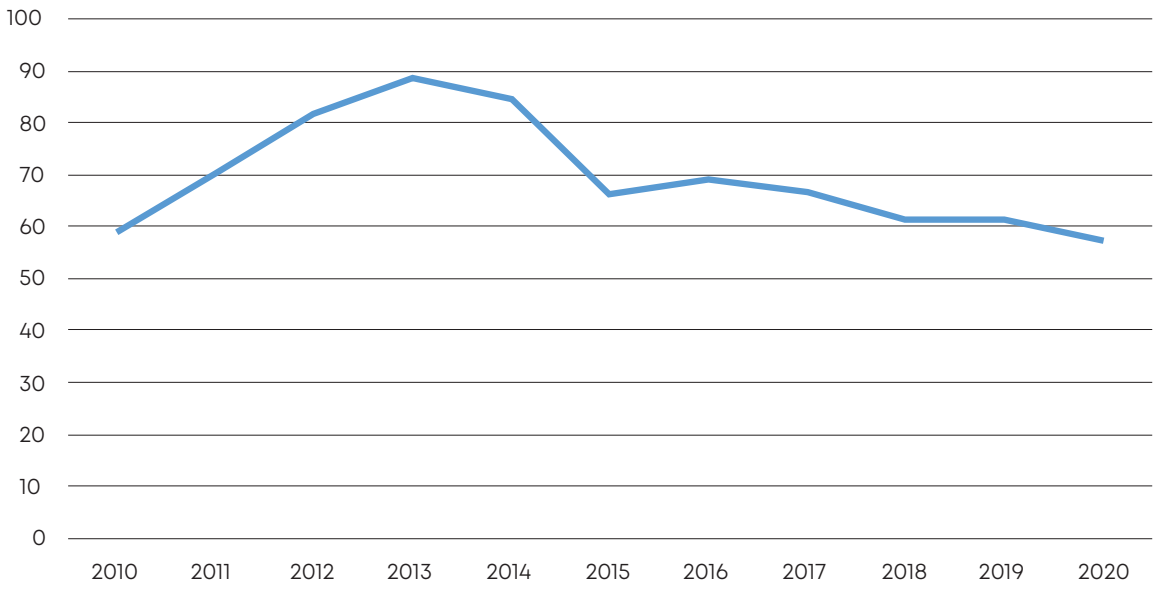
[5] M. Khodarenok, "Rakety, korvety i tanki: kakoye oruzhiye poluchila armiya Rossii v 2020-m," *Gazieta.ru*, 27 December 2020, https://www.gazeta.ru/army/2020/12/27/13416440.shtml.

FIGURE 1. DEFENCE EXPENDITURE AS PERCENTAGE OF RUSSIA'S GDP IN 2010-2020



Source: Own calculations based on SIPRI[6] and The Military Balance 2021[7] data.

FIGURE 2. VOLUME OF RUSSIAN DEFENCE EXPENDITURE IN 2010-2020 (USD BILLIONS)



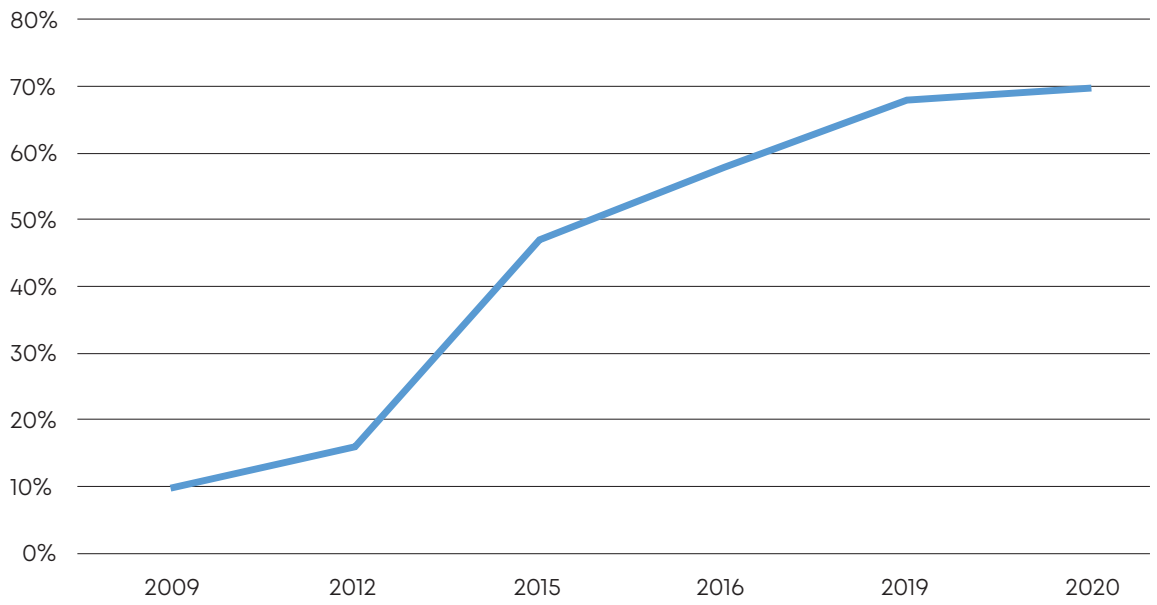
Source: Own calculations based on SIPRI[8] and The Military Ballance 2021[9] data.

It is worth noting that the decrease between 2014 and 2015 did not result from a reduction in the level of financing but from the depreciation of the Russian rouble against the dollar and other global currencies. During this time, Russia's military expenditure in relation to its GDP increased from 4.1% to 4.9%, and in 2016 it reached a record high value of 5.5% of GDP.

[6] S.T. Wezeman, "Russia's military spending: Frequently asked questions," *SIPRI*, 27 April 2020, www.sipri.org/commentary/topical-backgrounder/2020/russias-military-spending-frequently-asked-questions.
[7] *Russia and Eurasia*, "The Military Ballance 2021," p. 173.
[8] S.T. Wezeman, "Russia's military spending ...," *op. cit.*
[9] *Russia and Eurasia*, *op. cit.*

The defence budget, despite the financial crisis, has hardly been reduced compared to other expenses, such as social spending. This demonstrates the priority given by the Russian authorities to the modernisation and reform of the Armed Forces.

FIGURE 3. MODERNISED WEAPONS IN SELECTED YEARS, 2009-2020 (% OF TOTAL ARMS)



Source: Own calculations based on public press reports.

The significant increase in military spending in 2015-2016 was reflected in an increase in the share of modern armaments. While in 2015, modern weapons amounted to 47% of the total forces, a year later it was 11% higher. It is also worth noting that 2015 was the second year of the strengthening Russian military presence in occupied Crimea, support for "separatists" in the self-declared "People's Republics" of Donetsk and Luhansk, and the commencement of the Russian military operation in Syria.

2. THE LAND FORCES

Although the weaknesses in Russia's Land Forces revealed during the Russo-Georgian war of August 2008 became the impetus for the comprehensive reform of the Russian military and the development of the SAP 2011-2020, which started a year later, this armed forces branch was not the priority of the technical modernisation. This was due to the relatively good condition of the Land Forces' equipment, especially compared to the Navy's ships, which were very advanced in age. Upgrades were also less important than the strategic forces, and Russia did not plan to participate in a large-scale land operation at the time. However, these priorities changed quickly, particularly with the Russian operation against Ukraine. After 2014, it was decided that in the next SAP, the one for 2018-2027, the Land Forces would be the priority.

The aim of the modernisation programme of the Land Forces was both to upgrade their equipment, as well as to standardise it, which was to reduce maintenance costs and simplify service and training. Therefore, a lot of effort was expended on the production of new lines, such as the *Armata* universal combat platform. It would be the basis for the T-14 heavy tank (which features an unmanned turret and modern defence systems along with an advanced gun) and the T-15 infantry fighting vehicle. The need to develop these new lines was explained partly by the opinion that Russia's two main battle tanks (MBT)—the T-72 and T-90—had exhausted their modernisation potential. Initially, the T-14 tank was to be put into service by 2017, and by 2020, about 2,000 were to be delivered to the Land Forces.

The T-14 tank was first presented at the 2015 Victory Parade, during which it crashed—a harbinger of problems that the designers had to refine and advanced systems and technologies that had to be integrated. The most important of these was the new engine and an advanced fire-control system. The increasing costs of refining the project also stood in the way. The scalable costs for this new tank turned out to be much higher than wide modernisation of the T-72 MBT. Only with significant quantities produced would the cost of a single T-14 tank drop to RUB 250 million ($4 million),[10] while an upgraded T-72B3 was estimated at RUB 52 million (about $1 million).[11]

Moreover, so far, neither the Bumerang wheeled IFV nor the Kurganets-25 modular IFV have entered mass production. Like the T-14 tank, the first examples were built for the 2015 Victory Parade. However, later tests showed many problems, so it was necessary to extend the work on these projects. Their failure to date is also due to financial issues as the funds allocated to their production were reduced. However, armaments companies working for the Russian MoD have been improving the prototypes and nowadays there is some information that the first batches of these vehicles are to be mass-produced in the coming years.

The problems with launching mass production of modern tanks and combat vehicles caused the Russians to switch to modernising existing vehicles, in particular to upgrade the T-72 tank to the B3 version, the T-90 tank to the AM version, and to modernise vehicles from the T-80 family, even if they had been considered already relatively modern and meeting the needs of the Land Forces.

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[10] "Seriynyyepostavkitankov«Armata»planiruyutnachat'v2021godu,"*Kommersant*,19April2020,www.kommersant.ru/doc/4326197.

[11] A. Mikhailov, V. Voloshin "Voyska otkazalis' ot modernizirovannogo tanka T-72," *Izvestiya*, 21 February 2013, https://iz.ru/news/545300.

The problems with the production of the Kurganets-25 IFV resulted in the modernisation of the BMP-3 version and the purchase by the Russian MoD of a large batch of these vehicles. It was also decided that the BTR-80 armoured personnel carriers (APC) commonly used by mechanised troops would be upgraded to the BTR-82 version. Still, the basic IFVs of the Russian Armed Forces remain the BMP-1 and BMP-2.

It is also worth noting that, according to official information, the Russian arms industry has fulfilled its contracts for the delivery of modernised versions of both tanks and IFVs. In 2020, the Land Forces received 100 modernised T-72B3M tanks, 60 BMP-2s, more than 100 BMP-3s, 460 BTR-82As, and BTR-82-AM APCs.[12]

The plan of rearming the Land Forces also assumed equipping them with modern missile systems. In SAP 2011-2020, the transfer of 10 Iskander-M brigade complexes equipped with missiles with a range of up to 500 km was planned. During this period, Russia adapted more than 200 rocket artillery systems from the Tornado multiple rocket launcher family, which entered into service in 2013, and several dozen Khrizantema-S anti-tank guided-missile systems (NATO: AT-15 Springe), which entered service in 2012.

As for gun artillery, the Land Forces received more than 250 Msta-S self-propelled howitzers and Koalitsiya-SV self-propelled guns, among others. In turn, the missile brigades were equipped with S-300W4 (NATO: SA-10 Grumble) anti-aircraft and anti-missile defence systems. Moreover, the retooling of anti-aircraft units with modernised Buk-M2 (NATO: Grizzly) systems was also in progress. At the same time, the Russians worked on its next version, the Buk-M3, with the first sets ordered in 2013.

During SAP 2011-2020, Russia developed the production of medium-range missiles—the reason why the U.S. terminated the INF treaty[13]. These include the 9M729, a modernised version of the 9M728 missile that is part of the Iskander-M (NATO: SS-26 Stone) missile system. Officially, they have not been deployed in the European part of Russia, but there is no technical reason preventing it. What is more, in 2020 Russian President Vladimir Putin announced that if any European country deployed missile systems of this type on its territory, the Russian missiles would be shifted to the west of the country.[14]

According to official data, therefore, the most important objectives of SAP 2011-2020 have been achieved. The Land Forces received a sufficient number of upgraded tanks and artillery systems, including the Iskander-M (more than originally assumed). Most of the equipment went to units located in the west of the country—to the Western and Southern Military Districts (MD).[15] It is also worth noting that in 2016, the 1st Guards Tank Army[16] was reconstructed in the Western MD, and in 2014 in the Southern MD, four mechanised divisions were created on the basis of existing brigades.[17] Officially, Russia connected this to its response to NATO strengthening its Eastern Flank. In fact, most of the decisions on these changes were taken by the Russian authorities before the 2014 and 2016 Alliance summits that resulted in the enhanced deterrence strategy. Moreover, the strengthening of the Southern MD was related to the Russian military involvement in the war in Donbas and the

[12] M. Khodarenok, "Rakety, korvety i tanki ...," *op. cit.*

[13] M.A. Piotrowski, "Russia's Approach to the Development of Intermediate-Range Missiles," *PISM Bulletin*, No. 151 (1724), 14 November 2018, pism.pl/publications/Russia_s_Approach_to_the_Development_of_Intermediate_Range_Missiles.

[14] "Putin: Rossiya gotova otkazat'sya ot razvertyvaniya v yevropeyskoy chasti strany raket 9M729," *TASS*, 26 October 2020, https://tass.ru/politika/981656.1.

[15] I. Safronov, A. Nikolsky, "Novaya motostrelkovaya diviziya ukrepit gruppirovku na granitse s Ukrainoy," *Vedomosti*, 22 March 2020, www.vedomosti.ru/politics/articles/2020/03/22/825872-novaya-diviziya.

[16] A. Khrolenko, "Dlya chego Rossii nuzhna novaya tankovaya armiya," *RIA Novosti*, 3 February 2016, https://ria.ru/20160203/1369103343.htm.

[17] A. Nikolsky, I. Safronov, *op. cit.*

need to strengthen the military presence in occupied Crimea. It is worth noting that one division (the 42nd) was created in Chechnya, which increases Russian military capabilities in both the North and South Caucasus.

3. THE NAVY

Until the SAP 2011-2020 implementation, the Navy had been the most underinvested of the Russian Armed Forces. In 2010, it was estimated that only 25% of the Navy's ships were capable of operating in open seas, and the rest were suitable only for coastal operations, mainly due to their advanced age and problems related to the low culture of technical servicing, among other factors. The Navy, then, together with the strategic nuclear forces, gained priority in the rearming process.[18] Still, the goal was not so much to modernise the Navy as to maintain its ability to conduct sea and ocean operations.

Since 2011, the Navy has received 46 new ships out of a planned 51. Of these, most were conventional submarines of the Project 877 Paltus (Kilo-class) and Buyan-M corvettes (8 each).

As for new projects—flagship undertakings in SAP 2011-2020—only 1 Yasen-class submarine entered into service (out of 8 planned), 4 Borei-class ballistic missile submarines (out of 8 planned) and 2 frigates of the Admiral Gorshkov-class. Delays in the latter class of ships included the need to move construction of the marine engines to Russia, as before 2014 they had been built in Ukraine.

Also during this period, a number of repairs were initiated, especially of nuclear-powered submarines that had entered service in the 1980s and 1990s. Renovation of Russia's only nominal aircraft carrier, the *Admiral Kuznetsov*, also was started. Most of the upgraded ships were received by the Black Sea Fleet (20), the Baltic Fleet (12), and the Caspian Flotilla (10). The two largest Russian fleets—the North and the Pacific Ocean—received 6 each.

During the SAP 2011-2020 implementation, Russian coastal defence units received several batteries of Bal (NATO: SSC-6 Sennight) and Bastion-P (NATO: SSC-5 Stooge) coastal-defence missile systems. They were received mainly by the Black Sea Fleet (installed in occupied and annexed Crimea) and the Baltic Fleet (Kaliningrad Oblast).

The distribution of priorities of the Navy's technical modernisation shows that Russia focused on retrofitting formations operating in the west of the country, particularly in the Western and Southern MDs. It also points to the importance that the Russian command attaches to this strategic direction, which directly borders NATO countries. At the same time, rearming the Baltic and Black Sea fleets first is in line with the maritime doctrine of the Russian Federation of 2015, which indicates the western direction, called the Atlantic one, as privileged.

It is worth noting that the Black Sea Fleet took part (mainly as support) in the actions aimed at Ukraine and Syria, and the Caspian Flotilla was used many times in military operations conducted in Syria, mainly to fire at targets located in that country with Kalibr missiles, which have a range of up to 2,500 km.

The significant investments aimed at retrofitting the Northern Fleet are planned for the coming years and are related to, among others, upgrading its status to the role of a Military District (as of 1 January 2021[19]). However, acquiring modern ships for the Northern and Pacific fleets is much more expensive due to the size and tasks of these units—the core of these fleets carry intercontinental missiles (SLBMs), which are the pillar of the Russian nuclear counterattack capability. At the same time, it is visible that despite Russia's ambitious

[18] M. Shepovalenko, "Predvaritel'nyye itogi GPV-2020 v chasti voyennogo korablestroyeniya," *CAST*, http://cast.ru/products/articles/predvaritelnye-itogi-gpv-2020-v-chasti-voennogo-korablestroeniya.html.

[19] A.M. Dyner, "Russia Forms the Military District of the Northern Fleet," *PISM Bulletin*, No. 4/2021, www.pism.pl/publications/Russia_Forms_the_Military_District_of_the_Northern_Fleet.

plans to regain the capability to conduct deep-sea and ocean-going military operations, this goal has largely failed to be achieved. The rearmament will, however, continue in the coming years, and will be followed by Russia's aim to expand its network of foreign naval bases (e.g., Syria,).

4. THE AEROSPACE FORCES

The Aerospace Forces were created on 1 August 2015 by a merger of the Air Force and the Aerospace Defence Forces. At the time of the inauguration of SAP 2011-2020, a significant percentage (38%) of the planned budget was allocated to the Air Force and the Aerospace Defence Forces. This amount was related, among other things, to the fact that the Air Force— equipped with strategic bombers—is part of the nuclear triad and as such, is an important element of Russia's nuclear deterrent, and therefore the leaders wanted to maintain its combat capabilities. These upgraded forces quickly passed the combat test by participating in the military operation in Syria, launched in September 2015. Since the collapse of the USSR, it was the first military operation in which Russian aviation was used on such a significant scale.

In the period 2011-2020, aircraft types that have been in service for years were the ones purchased. These included MiG-29 (NATO: Fulcrum) fighters of various modifications intended mainly for naval aviation, modernised Su-30 (NATO: Flanker-C) in versions M2 and SM versions, Su-27 (NATO: Flanker-B) in the SM3 version, and Su-25 (NATO: Frogfoot) in versions SM2 and SM3. In 2017, the MoD also decided that all "light" fighters (mainly MiG-29s in different versions) are to be replaced by MiG-35 (NATO: Fulcrum-F), which is the next development version of the MiG-29.[20] The ministry announced the purchase of 170 of this type. Moreover, modernisation of MiG-31 (NATO: Foxhound) heavy interceptors, which are in turn a deep modernisation of the MiG-25, continued as well. This is important because the plane was adapted to carry the Kh-47M2 Kinzhal hypersonic missile (created on the Iskander missile). These hypersonic missiles entered into service in 2017 and are designed to counter targets on land and water. They have a range of up to 2,000 km and can travel at speeds of up to Mach 10.[21]

Since 2011, Russia has used the most modern fighter currently in service, the Su-35 (NATO: Flanker-E+), a 4^{++}-generation type. It was first flown in 2008, so it is a relatively new fighter, although it uses the Su-27 airframe. In 2020, 20 Su-35s were delivered to the Aerospace Forces.

However, a 5th-generation fighter—the Su-57 (NATO: Felon)—in the SAP 2011-2020 failed to be delivered. As a result of delays related to technical problems, mainly with the engine, only one Su-57 fighter entered into service, in 2020.

The Russian Aerospace Forces received another significant boost—several dozen Yak-130 (NATO: Mitten) trainers, as well as basic combat and transport helicopters purchased on a large scale, especially those in the Ka-52 (NATO: Hokum B), Mi-8 (NATO: Hip), Mi-26 (NATO: Halo), Mi-28 (NATO: Havoc) and Mi-35 (NATO: Hind-D) families.

The Russian MoD also started the modernisation of long-range strategic bombers. The decision on a multi-stage modernisation of the Tu-160 (NATO: Blackjack) bomber was made at the beginning of the 21st century, but implementation began only in 2015. The first test flight of the upgraded plane, the Tu-160M, was made in 2020, and the first units of this modernised aircraft are to be received by the Russian strategic aviation wings in 2021.[22]

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[20] "VKS Rossii polnost'yu zamenyat legkiye istrebiteli noveyshimi MiG-35," *RIA Novosti*, 27 January 2017, https://ria.ru/20170127/1486653405.html.

[21] "Kompleks 9-A-7660 Kinzhal, raketa 9-S-7760," *Military Russia*, 28 May 2020, http://militaryrussia.ru/blog/topic-896.html.

[22] "Tu-160M: novyy «lebed'» podnimayetsya v nebo," *Rostec*, 26 March 2020, https://rostec.ru/news/tu-160m-novyy-lebed-podnimaetsya-v-nebo.

The Tu-95 (NATO: Bear) bomber was also being modernised in the MSM version, adapted, among others, to carry the modern Kh-101 (NATO: AS-23 Kodiak) strategic cruise missile and the Kh-102 version with a nuclear warhead. A contract for the delivery of these aircraft was signed in 2018. The first test flight took place in 2020, and the aircraft is expected to become the basis of the aviation component of the Russian nuclear triad. Moreover, to improve its combat capabilities, some of the bombers were upgraded to the transitional Tu-95MS version.[23]

Tu-22M3 (NATO: Backfire) bombers were upgraded to the M3M version, making it the second plane, next to the MiG-31 fighters, capable of carrying Kinzhal hypersonic missiles.[24]

The decision to modernise all three types of strategic bombers was due to the much lower costs of upgrading them than developing new structures, which would enter service not earlier than in a dozen years.

Il-20M (NATO: Coot-A) radio and technical reconnaissance aircraft, Il-22 airborne command posts, and the Il-78 (NATO: Midas) aerial refuelling tanker were modernised to the M1 version. Tu-214R electronic reconnaissance aircraft also were ordered.

Russia also carried out modernisation of most types of transport aircraft, in particular the An-124 (NATO: Condor) and Il-76 (NATO: Candid), which make it possible to quickly transfer troops and equipment, a necessary task from the point of view of the Armed Forces.[25] As part of this process, pilot and navigation systems, engines and the loading system were improved.[26]

In summary, although the Aerospace Forces received many new airplanes and helicopters, and thus managed to achieve the basic objectives of the SAP, these were primarily modernisations of builds that had been in service for many years. However, the implementation of SAP 2011-2020 did not reduce the problems related to the large variety of aircraft types. Despite the announcement that a 5th-generation aircraft would enter service, it failed to materialise. It is worth noting, however, that almost all of the aircraft types were tested in combat conditions in Syria, which provided significant experience to the crews, command, and ground personnel.

During the SAP 2011-2020 implementation, the air-defence units were also retooled, mainly with S-400 (SA-10C) anti-aircraft missile systems (entered into service in 2007),[27] but also older ones, including various types of the S-300 and the S-350. As planned, the Russian Armed Forces managed to acquire the planned number of S-400 and 4 Voronezh radars.[28]

In the period, the goal of getting the S-500 Prometey system into service was not implemented. It remains in testing and the projected implementation date is currently estimated as 2021 or 2022. Ultimately, the system is to have a range of 600 km and be capable

[23] T. Alimov, "Smertonosnyye i nadezhnyye: NI otsenil modernizatsiyu Tu-95," *Russkoe oruzhie*, 23 December 2020, https://rg.ru/2020/12/23/smertonosnye-i-nadezhnye-ni-ocenil-modernizaciiu-tu-95.html.

[24] A. Valagin, "Sverkhzvukovaya „otvetka": chem opasen dlya vraga Tu-22M3," *Russkoe oruzhie*, 20 June 2020, https://rg.ru/2020/06/20/sverhzvukovaia-otvetka-chem-opasen-dlia-vraga-tu-22m3.html.

[25] For more, see: T. Kwasek, „Modernizacja techniczna Sił Powietrzno-Kosmicznych Federacji Rosyjskiej," *Nowa Technika Wojskowa*, numer specjalny, 14 July 2018, pp. 64-75.

[26] "Novyy Il-76MD-90A: modernizirovany prakticheski vse sistemy," *Rostec*, 9 November 2020, https://rostec.ru/news/novyy-il-76md-90-modernizirovany-prakticheski-vse-sistemy/.

[27] A. Lavrov R. Kretsul, "Udarnaya kombinatsiya: S-400 i S-300 prevratyat v arsenaly," *Izvestiya*, 9 October 2020, https://iz.ru/1071265/anton-lavrov-roman-kretcul/udarnaia-kombinatciia-s-400-i-s-300-prevratiat-v-arsenal.

[28] "Zakryt' "gorbachevskuyu bresh'": na chto sposoben novyy radar "Voronezh-DM"," *RIA Novosti*, 6 June 2017, https://ria.ru/20170606/1495945989.html.

of countering ballistic missiles in the final phase of flight or hypersonic missiles traveling at a speed of less than Mach 5.[29]

The challenge for Russia will be the production of various types of unmanned aerial vehicles (drones, UAVs). Since 2012, the Armed Forces have received 900 pieces. However, it can be noted that in recent months, the Russian arms industry has significantly accelerated work on various types of drones and loitering munitions, which in the opinion of the Russians and others are becoming an increasingly important element in conducting contemporary armed conflicts.[30] In 2020, the first batch of MALE Orion-class medium-altitude long flight UAVs was put into service.[31] Its maximum flight altitude is 8,000 m and it can stay in the air for up to 24 hours and carry 250 kg of cargo.[32]

This UAV has been tested in Syria and elsewhere. In addition, another heavy combat drone, the S-70 Okhotnik-B, is being tested. It weighs 20 tonnes and can carry up to 2 tonnes of armaments. The Russian MoD ordered it in 2012, but its entry into service is not planned before 2024.

[29] Sistemu S-500 primut na vooruzheniye v sleduyushchem godu, *Intierfax*, 30 December 2020, www.interfax.ru/russia/743556.

[30] A. Ramm, "Kuda letit bespilotnaya aviatsiya," *Nezavisimoye Voyennoye Obozreniye*, 21 January 2021, https://nvo.ng.ru/armament/2021-01-21/1_1125_aviation.html.

[31] S. Ptichkin, "Drony k boyu gotovy," *Russkoe oruzhie*, 27 October 2020, https://rg.ru/2020/10/27/v-rossijskuiu-armiiu-nachinaiut-postupat-udarnye-bespilotniki.html.

[32] "Minoborony vpervyye pokazalo bespilotnik "Orion" v udarnom variante," *RIA Novosti*, 28 December 2020, https://ria.ru/20201228/orion-1591162329.html.

5. STRATEGIC MISSILE FORCES (RVSN)

The RVSN is the backbone of Russia's nuclear deterrent, and its modernisation was a key way for Russia to maintain its status as a nuclear power with a credible retaliatory nuclear strike capability. The modernisation was necessary due to ageing of the post-Soviet ballistic missile arsenal and its increasingly limited potential.

Strategic Forces comprise the basis of Russia's deterrence and defence and are the priority of its Armed Forces. Thanks to its strategic capability, Russia is able to cover for the limitations of its equipment in the conventional armed forces. New strategic systems are also a response to the perceived growing effectiveness of U.S. missile defence, which could significantly reduce the Russian strategic capabilities.

According to Russian strategic documents, including a decree on the foundations of state policy in the field of nuclear deterrence signed by Putin in June 2020, Russia's nuclear capability may be used in response to an attack with weapons of mass destruction and also in case of a conventional attack if it threatens the "existence" of the state and/or its allies, or if it were to deprive Russia of its ability to carry out a retaliatory nuclear strike.[33] This represented not only an element of Russia's strategic communication but also the formal allocation of additional tasks to the Strategic Forces.

The priority in SAP 2011-2020 in this area was for three programmes providing for the entry into service of several types of ICBMs: the RS-24 Yars (NATO: SS-29), RS-26 Rubezh (NATO: SS-X-31) and RS-28 Sarmat (NATO: SS-X-30). It also called for a return to the plans for the development of the Barguzin rail-mobile ICBM platform (BZhRK).

The RS-24 Yars is an extension of the Topol-M (NATO: SS-27 Sickle B) missile project and is intended to replace the Topol (NATO: SS-25 Sickle) missile. It has a range of 11,000-12,000 km, and the first missiles of this type were received by RVSN in 2009. In 2020, Russia already had about 170 launchers for these missiles, and all RVSN regiments in the country were armed with them. Apart from standard warheads, the RS-24 Yars can carry *Avangard* system warheads.[34]

In 2018, the RS-26 Rubezh and Barguzin projects were excluded from SAP 2011-2020. The funds allocated to them were transferred, among others, to the development of the *Avangard* hypersonic system.

During the SAP 2011–2020 period, two new projects appeared: an autonomous, nuclear-powered, and nuclear-armed unmanned underwater vehicle, the 2M39 Poseidon (NATO: Kanyon) which was to have a range of 10,000 km and a nuclear-powered, nuclear-armed cruise missile, the 9M730, later called Burevestnik (NATO: SSC-X-9 Skyfall).

Putin first informed about the Burevestnik[35] during a speech in March 2018. At the time, he also announced that Russia was working on several types of hypersonic rockets. The Burevestnik is to be similar in size to the Kh-101 rocket and is to have an innovative, miniature nuclear propulsion system that gives the missile unlimited range and carry a nuclear warhead. Currently, tests of this rocket are underway, although U.S. intelligence sources

[33] A.M. Dyner, "Russian Policy on Nuclear Deterrence," *PISM Spotlight*, No. 39/2020, www.pism.pl/publications/Russian_Policy_on_Nuclear_Deterrence.

[34] "RVSN nazvali kolichestvo polkov s novym raketnym kompleksom «Yars»," *RBS*, 29 November 2019, www.rbc.ru/rbcfreenews/5de041759a7947001c1e8e35.

[35] M.A. Piotrowski, "Military Application of Nuclear Propulsion: Russian 9M730/SSC-X-9 Cruise Missile Project," *PISM Bulletin*, No. 84 (1832), 24 June 2019, www.pism.pl/publications/Military_Application_of_Nuclear_Propulsion_Russian_9M730SSCX9_Cruise_Missile_Project.

indicate that many of the tests have ended in failure, resulting in significant environmental contamination because of the nuclear component.

The underwater nuclear-powered Poseidon drone is also being tested, but it will not enter service sooner than in a few years, most likely only around 2027.

In 2019, the Peresvet laser was introduced into service, intended for the protection of mobile ICBM systems, including against UAVs.[36] Its main task is to use its laser to disable or destroy objects[37] that are too close to the launcher.

The RVSN commander stated in December 2020 that the share of modern missile weapons had reached 81%.[38] In January 2021, Defence Minister Shoigu said that it had reached 86%.[39] Despite this, Russia has been unable to implement the flagship project to replace the obsolete RS-20 Voevoda (NATO: SS-18 Satan) ICBM, which entered service in the 1970s. The plan was to replace it with the RS-28 Sarmat (NATO: SS-X-30), which through MIRV technology is to carry not only 10 nuclear warheads (and according to some estimates, even 15) but also Avangard warheads. Its maximum range is 16-18,000 km. Therefore, the Voevoda missiles remain the heaviest in the RVSN arsenal, but in 2021-2022, they are to be successively replaced by the Sarmat missiles. By 2024, RVSN aims to achieve its goal of a 100% modern weapons arsenal.

[36] A. Zakvasin, E. Komarova, "«Mgnovennoye porazheniye tseli»: kakimi vozmozhnostyami obladayet rossiyskiy boyevoy lazer «Peresvet»," *RT*, 19 December 2019, https://russian.rt.com/russia/article/699378-peresvet-lazer-boevoe-dezhurstvo.

[37] "Lazer „Peresvet" zastupil na boyevoye dezhurstvo v Rossii. Chto eto za sistema?," *BBC News*, 5 December 2018, www.bbc.com/russian/features-46452274.

[38] "Dva polka RVSN v 2021 godu budut perevooruzheny na raketnyye kompleksy "Yars"," *TASS*, 21 December 2020, https://tass.ru/armiya-i-opk/10312921.

[39] A. Arkad'yev, "Shoygu zayavil, chto uroven' sovremennosti strategicheskikh yadernykh sil dostig 86%," Zvezda, 29 January 2021, https://tvzvezda.ru/news/forces/content/20211291312-IZS2L.html.

6. HYPERSONIC WEAPONS AND OTHER WEAPON SYSTEMS

During the SAP 2011-2020 period, Russia conducted many other research and development works aimed at bringing new weapons systems to fruition. These projects mainly concerned hypersonic weapons and improvements to tactical nuclear weapons, but also logistics, cybersecurity, and command systems (C2). In this way, Russia aimed for both a military advantage over other powers (such as the U.S. or China) as well as an expansion of its hybrid capabilities. Some of this work was not included in the original version of the SAP 2011-2020, which indicates that despite the quite clearly defined priorities of the armaments-financing plan, the Russian MoD is able to quickly shift some available funds or guarantee additional funding for new projects if developing new types of weapons is needed. It also may prove that part of the armaments plan is secret, which is not surprising given the ways in which armaments were developed during the USSR era.

HYPERSONIC WEAPONS.

Research on hypersonic weapons began in the USSR in the 1980s, and Russia returned to it in the first decade of the 21st century. The official reason for returning to these programmes was to try to offset the U.S. conventional advantage. Importantly, work on this type of weapon was not officially listed in the SAP 2011-2020, but was announced by Putin in March 2018.

In 2017, Russia introduced the Kinzhal missile with a range of up to 2,000 km, which was developed on the basis of the Iskander missile. It is launched, among others, from modernised MiG-31 fighters and can travel at a speed of Mach 7-10.

Another important project to which funds were redirected under SAP 2011-2020 was the Avangard missile system. It is a specially designed hypersonic gliding vehicle that can be launched into a ballistic trajectory by heavy ICBMs and strike distant targets with nuclear warheads. In the final phase of the attack, it could reach Mach 28, which makes it impossible to intercept by any present-day anti-missile system. In 2018, the Avangard tests ended and it went into mass production. In December 2019, the system was handed over to the 13th RVSN Rocket Division and entered the armament of the Russian Armed Forces.

In 2020, most of the tests of the 3M22 Zircon (NATO: SS-N-33) missile, a scramjet-powered manoeuvring anti-ship hypersonic cruise missile, were completed. It has a range of up to 400 km and can reach speeds of up to Mach 8. The first tests began in 2018, and in 2020, after numerous tests conducted mainly from Northern Fleet ships, the Russian MoD announced the successful completion of the design phase. However, the tests are to continue throughout 2021. Ultimately, the missiles are to be used mainly by Admiral Gorshkov-class frigates and Yasen-class submarines.

While the development of hypersonic systems was officially a response to the American missile-defence development plans and the Conventional Prompt Global Strike programme, the U.S. plans have not been implemented. Russia has consistently conducted research on hypersonic weapons, seeing them as helping to level the military advantage

vis-à-vis the U.S. and China.[40] It was also supposedly a response to the withdrawal of the U.S. from the Anti-Ballistic Missile Treaty (ABM) in 2002.[41]

TACTICAL NUCLEAR WEAPONS

In its modernisation programmes, Russia also attached great importance to the development of tactical nuclear weapons and their delivery systems. The most important projects include the Kalibr (NATO: Club) ship-, submarine-launched, and airborne anti-ship and coastal anti-ship, land-attack cruise missiles, Iskander-M missiles capable of carrying nuclear warheads, and the Kh-101/102 manoeuvring missiles.

The Kalibr rocket was created in the 1980s. It has a range of up to 2,500 km and can be launched from both surface combatants and submarines, including Kilo-class submarines, which operate, among other places, in the Baltic Sea. These missiles are also capable of carrying nuclear warheads, and were first used during a military operation in Syria. Currently, work is underway on the M version with a range of 4,500 km.[42]

The Iskander-M system was accepted into service in 2006. The basic missile has a range of up to 500 km and is capable of carrying nuclear warheads. At the same time, almost since the entry into service of the Iskander, Russia tested the 9M729 (NATO: SC-8) missiles, a newer type with a range of up to 2,500 km at a distance of over 500 km.[43]

The range of the Kh-101 missiles is up to 5,500 km and they are mainly carried by Tu-95MSM/MS and Tu-160 bombers. A modification of this missile, known as the Kh-102, is capable of carrying nuclear warheads. Production started in 2018.[44] The first combat use (conventional warheads) took place in 2015 during the operation in Syria.

LOGISTICS

In recent years, the Russians have also been working on the ability to quickly deploy troops and weapons. Due to the above-mentioned limitations of transport aviation, the emphasis was placed on the development of railroads and cooperation with Russian Railways (RZD). In recent years, two new battalions of railway troops were created just in the Western MD,[45] and the ability to transport significant components of the ground forces was exercised, among others, during the Vostok-2018 manoeuvres.[46] It is in the east of the country where the infrastructure is the least developed. However, Russia has shown that it is able to shift fully equipped military units in a relatively short time, allowing it to overcome the distance problem, which otherwise would prevent it from conducting a large-scale military operation.

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[40] M.A. Piotrowski, "The Potential for a Hypersonic Arms Race between the U.S., China, and Russia," *PISM Bulletin*, No. 32 (1780), 8 March 2019, https://www.pism.pl/publications/The_Potential_for_a_Hypersonic_Arms_Race_between_the_U_S___China__and_Russia.

[41] D. Litovkin, "Armii potrebovalos' bol'she giperzvukovykh raket, perspektivnyy tank i BTR otpravyat na eksport," *Nezavisimaya gazeta*, 7 February 2021, https://www.ng.ru/week/2021-02-07/7_8076_week3.html

[42] "Istochnik: v Rossii razrabatyvayut novuyu krylatuyu raketu "Kalibr-M"," *TASS*, 8 January 2019, https://tass.ru/armiya-i-opk/5979716.

[43] M.A. Piotrowski, "Russia's Approach to the Development of Intermediate-Range Missiles," *PISM Bulletin*, No. 151 (1724), 14 November 2018, https://www.pism.pl/publikacje/Podej_cie_Rosji_do_rozwoju_pocisk_w__redniego_zasi_gu_.

[44] Y. Gavrilov, "Nevidimka vybirayet tsel'," *Ruskoye oruzhiye*, 18 September 2019, https://rg.ru/2019/09/18/vozdushnuiu-raketu-h-101-mogut-adaptirovat-k-puskam-s-zemli.html.

[45] R. Kretsul A. Ramm, "Chrezvychaynyy skoryy: zheleznodorozhnyye voyska usilivayut dlya bor'by s CHP," *Izvestia*, 19 ugust 2019, https://iz.ru/911063/roman-kretcul-aleksei-ramm/chrezvychainyi-skoryi-zheleznodorozhnye-voiska-usilivaiut-dlia-borby-s-chp.

[46] A.M. Dyner, "Vostok 2018 Exercises: The Largest Manoeuvres in Russian Federation History," *PISM Bulletin*, No. 129 (1702), 20 September 2018, pism.pl/publications/Vostok_2018_Exercises___The_Largest_Manoeuvres_in_Russian_Federation_History.

CYBERSPACE AND ELECTRONIC COMBAT CAPABILITY

In recent years, Russia has also significantly increased its capabilities to operate in cyberspace. In 2014, the Information Troops unit was established, which reports directly to the MoD and are part of the General Staff.[47]

Units of the Main Directorate of the General Staff of the Armed Forces of the Russian Federation (formerly GRU) are also responsible for such operations, and have been accused many times of conducting operations against other countries. Such actions resulted, among others, from the importance that Russia attaches to the conduct of hybrid operations. In 2018, Putin increased the powers of the Federal Security Service to operate in cyberspace.[48]

Moreover, in recent years, Russia has significantly developed its ability to conduct radio-electronic warfare, and the latest systems have been deployed in the west of the country, especially in the Kaliningrad Oblast and in occupied Crimea.

COMMAND SYSTEM (C2)

On 1 December 2014, the modern National Defence Management Centre, also known as the National Defence Control Centre (NDCC), was opened in Moscow. It is from here that the military operation in Syria and the largest exercises of the Russian armed forces are coordinated. The most important tasks of the Centre include:

- maintaining the command system in combat readiness;
- monitoring the condition of troops grouped in strategic directions;
- providing the management of the MoD with information on the military and political situation in the world, the socio-political situation in the Russian Federation and the state of the armed forces;
- management, coordination and control of military aviation flights;
- command security, including units taking part in international operations.[49]

The reform of the armed forces and the establishment of four military districts in 2009 (a fifth, the Military District of the Northern Fleet, in 2021) also allowed for the simplification of the command system. The commanders of individual districts as well as the RVSN and airborne troops report directly to the Chief of the General Staff. Taking into account the scale of exercises that have been conducted in Russia in recent years, this system has made it possible to increase the effectiveness of the command of the Russian armed forces. It is also worth emphasising that a total of 14% of the entire SAP budget for 2011-2020 has been allocated to modern command, communication, and reconnaissance systems.[50] Part of the funds was invested in the Land Forces Combat Centre, which was opened in 2015 in the town of Mulino (Nizhny Novgorod Oblast, Western Military District). Annually, up to 30,000 airborne, mechanised, and coastal defence soldiers can be trained there.[51]

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[47] "V Vooruzhennykh silakh Rossii sozdany voyska informatsionnykh operatsiy," *Nezavisimaya gazeta*, 12 May 2014, https://www.ng.ru/news/465991.html.

[48] "Ukaz Prezidenta Rossiyskoy Federatsii ot 27 fevralya 2018 goda № 89 "O vnesenii izmeneniy v Polozheniye o Federal'noy sluzhbe okhrany Rossiyskoy Federatsii, utverzhdennoye Ukazom Prezidenta Rossiyskoy Federatsii ot 7 avgusta 2004 g. № 1013"," *Rossiyskaya gazeta*, 27 February 2018, https://rg.ru/2018/02/27/prezident-ukaz89-site-dok.html.

[49] "Natsional'nyy tsentr upravleniya oboronoy Rossiyskoy Federatsii," Ministerstvo Obororony Rossiyskoy Federatsii, https://structure.mil.ru/structure/ministry_of_defence/details.htm?id=11206@egOrganization.

[50] "Gosudarstvennyye programmy vooruzheniya Rossii. Dos'ye," *TASS*, 28 February 2018, https://tass.ru/info/4987920.

[51] "Tsentr boyevoy podgotovki v Mulino. Dos'ye," *TASS*, 1 June 2015, https://tass.ru/info/2007921.

7. STATE ARMAMENT PROGRAMME 2018-2027

In February 2018, Deputy Prime Minister Dmitry Rogozin announced that President Putin had signed a new SAP. It was originally supposed to be adopted in 2016, but due to the events of 2014 (the aggression against Ukraine, sanctions, and the fall in oil prices, the export of which is one of the most important sources of revenues for the Russian budget, as well as currency fluctuations, which made it difficult to import some components from abroad), its adoption was postponed to 2018.[52]

The implementation of the next programme is planned until 2027. Its assumptions took into account the experience of Russia's military operations in Syria and activities in Ukraine (mainly during the annexation of Crimea and in connection with the increased military involvement in the Black Sea region). According to the MoD, a total of RUB 20 trillion has been allocated to the implementation of the SAP 2018-2027, which is about $330 billion (although the initial expectations of the Russian military were more than twice higher), of which RUB 19 billion will be allocated to the purchase, repair, and development of weapons and military equipment.

The SAP 2018-2028 will be a bit less ambitious than the one implemented in 2011-2020, largely due to the progress of the modernisation of the Russian armed forces, but also in part because of technological and financial constraints. The priority will be to rearm the Land Forces, for which RUB 4.25 billion have been reserved. Among the projects are the completion of work on armoured vehicles using the *Armata* platform, including the T-14 tank, the delivery of new T-90M tanks, tests of the deeply modernised T-80BWM and purchase of a tank support fighting vehicle, the BMPT Terminator, are planned.[53]

Moreover, the indicated most important projects are work on the S-500 anti-aircraft system and the Zirkon supersonic cruise missile. By 2025, the Aerospace Forces are to receive 94 planes and helicopters (Su-30SM, Su-34, Su-35, MiG-35; Mi-8AMTShs, Mi-28N, and Ka-52 helicopters), including 22 5th-generation Su-57 fighters.[54] Transport aviation will also be developed to increase Russia's ability to rapidly deploy troops.

The RVSN will receive the RS-28 Sarmat ICBM. Russia has set itself the goal of completing the modernisation of its nuclear forces, which are recognised as an essential component of deterrence and containment.

The Navy, especially the Northern Fleet, will be equipped with additional equipment. One of the priorities will be the construction of modified Borei-class ICBM carriers, which will strengthen the maritime component of the strategic nuclear deterrent forces. So far, there have been no plans to build its own aircraft carriers, although Russia is short on ships of this type.[55] In the coming years, however, the Russian Navy is to receive new Steregushchiy-class corvettes, which in recent years have strengthened the Baltic and Northern Fleets.

The need to rearm the Land Forces and airborne troops as a priority is to a large extent the result of conclusions drawn from the war in Ukraine, where it was very important to use these two types of forces. It may also be a reason to state that Russia, which has already

[52] "Gosudarstvennyye programmy vooruzheniya Rossii, Dos'ye," *TASS*, 26 February 2018, https://tass.ru/info/4987920.
[53] ""Armatu" — v seriyu. Kakoye perspektivnoye oruzhiye poydet v voyska do 2027 goda," *RIA Nowvosti*, 27 February 2018, https://ria.ru/20180227/1515311825.html. See also: ""Armaty," "Sarmaty" i "Tsirkony": kakovy prioritety gosprogrammy vooruzheniya do 2027 goda," TASS, 30 January 2018, https://tass.ru/armiya-i-opk/4911274.
[54] A. Ramm, "Ukhodyashchiy god dlya Rossiyskoy armii – odin iz znakovykh," *Nezavisimoye Voyennoye Obozreniye*, 24 December 2020, https://nvo.ng.ru/realty/2020-12-24/1_1123_realty2.html.
[55] "Admiral otvetil na versiyu o nesposobnosti Rossii postroit' avianosets," *Lenta*, 23 January 2021, https://lenta.ru/news/2021/01/23/avianos/.

achieved the capability to conduct expeditionary operations on a relatively small scale, mainly with the use of special operations forces or aviation, plans to increase the ability to conduct long-term military operations with the use of significant forces and resources, including the land component.

At the same time, the planned purchases of technologically advanced equipment indicate that Russia will continue to pursue the professionalisation of the Armed Forces, focusing primarily on the preparation of contract soldiers and treating conscription as a support element and way to train reserves.

Considering the increasing importance of UAVs in contemporary armed conflicts, it can be concluded that in the coming years, Russia will certainly focus on the production and introduction of drones and loitering munition into service.[56] This is the result of both the experience of the operations in eastern Ukraine and the Azerbaijan-Armenia war in Nagorno-Karabakh in autumn 2020.[57] In earlier years, Russia had problems primarily with building propulsion for large vessels of this type, but considerable emphasis was placed on this work. The growing combat importance of such weapons is also evidenced by the announcement that testing of these armaments will be one of the main goals of the *Zapad-2021* exercises[58]—the largest test of combat readiness of both the Russian Armed Forces and the Belarusian Army in 2021. It is very likely that during these drills, which will be closely followed by NATO countries and others, Russia will decide to use its most modern weapons. As a demonstration of strength, taking into account the political events of 2021, the main goal of the *Zapad* exercises will be to demonstrate Russia and Belarus' readiness to resist full-scale aggression by Alliance countries.

The nature of the planned rearmament also shows that Russia is ready to defend not only its own territory but also to intervene in neighbouring countries which it considers to be in its sphere of influence. Therefore, it is also a signal to Ukraine, Georgia, and Moldova intended to discourage them from moving forward with integration into Euro-Atlantic structures, especially NATO, as well as becoming closer with Western countries. It also serves as a warning against any attempt to interfere with Russia's presumed geographical area. Moreover, ultra-modern technologies, such as hypersonic weapons, in the development of which Russia intends to invest in the coming years, are meant to be a direct military challenge for the U.S. On the other hand, Russia's growing capabilities to conduct expeditionary activities indicate that the Russian authorities may consider undertaking military operations in regions where the U.S. or NATO are actively engaged, such as in the Middle East or North Africa.

It is also worth noting that the implementation of the next SAP will be an important stimulus for the development of the Russian arms industry. The guarantee of such significant financing is also intended to support this branch of the economy.

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[56] A. Ramm, "Kuda letit bespilotnaya aviatsiya," *Nezavisimoye Voyennoye Obozreniye*, 25 January 2021, https://nvo.ng.ru/armament/2021-01-21/1_1125_aviation.html.

[57] A.M. Dyner, A. Legieć, "The Military Dimension of the Conflict over Nagorno-Karabakh," *PISM Bulletin*, No. 241 (2173), 26 November 2020, www.pism.pl/publications/The_Military_Dimension__of_the_Conflict_over_NagornoKarabakh.

[58] "Voinskiye chasti obshchevoyskovoy armii ZVO v 2021 godu primut uchastiye v SKSHU «Zapad-2021»," *Ministerstvo Obororony Rossiyskoy Federatsii*, 2 January 2021, https://function.mil.ru/news_page/country/more.htm?id=12332886@egNews.

8. CONSEQUENCES FOR RUSSIA'S FOREIGN AND DEFENCE POLICY

The Armed Forces play a special role not only in Russian security policy but also in foreign policy. According to Russian decision-makers, the importance of force in international relations has only grown over the past decade, hence the need to maintain an efficient army capable of not only defending its own territory but also carrying out operations outside the country.

The implementation of SAP 2011-2020 shows that despite the difficulties related to, among others, the financial crisis, sanctions imposed by Western countries after 2014, or the COVID-19 pandemic, the Russian authorities are determined to increase the combat capabilities of the Armed Forces. They are a determinant of the state's position and the ability to intervene not only in the immediate international environment but also in other regions important to global security (such as the Middle East), and they are crucial for maintaining its role as a superpower. Thanks to the development of the Armed Forces, Russia strives to achieve strategic balance with the U.S. and aims to gain an advantage in some military capabilities, for example, hypersonic weapons.

Focusing on the development of its Strategic Forces secures Russia's security interests, including maintaining its status as a superpower in a situation where the country—compared to the U.S., but also to China—has many fewer resources, not only for the development of its own forces but also activities related to soft-diplomacy, such as the promotion of culture or language.

The development of hypersonic systems, which were not officially included in SAP 2011-2020, indicates that Russia is actively looking for opportunities to maximise its advantages in the field of rocket and space technologies for the development of systems that, given the country's lack of financial resources, will be able to compensate for the unfavourable balance of power with the U.S. and NATO.

The significant effort related to the rearming of the Aerospace Forces is associated with increasing the ability to rapidly conduct military operations and easily and quickly transfer necessary units and equipment. It was also the result of identifying NATO and the U.S. as the greatest threats, including the possibility of a missile attack, to Russia.

New or deeply modernised equipment was directed primarily to units stationed in the west of Russia. In 2019, the commander of the Western MD confirmed that armoured forces had been completely rearmed with T-72B3M tanks. This is where the modernised T-80BWM tanks, BTRR-82A armoured vehicles, BMP-3 IFVs, Iskander systems and new ships for the Baltic Fleet were first directed.[59] Modern and modernised equipment also went to the Southern MD. As with the Western MD, the Southern MD received mainly T-72B3 tanks, BMP-3s, BTR-82As, and ships for the Black Sea Fleet and Caspian Flotilla.[60]

[59] "Tankovaya armiya ZVO zavershila perevooruzheniye na tanki noveyshey modernizatsii T-72B3M," *Ministerstvo Obororony Rossiyskoy Federatsii*, 6 September 2019, https://function.mil.ru/news_page/country/more.htm?id=12251159@egNews.

[60] "Boleye 1,2 tys. yedinits novogo vooruzheniya i tekhniki postavleno v voyska YUVO v 2019 godu," *Ministerstvo Obororony Rossiyskoy Federatsii*, 5 January 2020, https://function.mil.ru/news_page/country/more.htm?id=12269635@egNews.

The deployment of modern A2/AD systems, such as the Bal and Bastion systems, in Kaliningrad Oblast or annexed Crimea, retrofitting the Baltic and Black Sea fleets, and the creation of new groupings in the Western and Southern MDs indicate that the Russian authorities still consider NATO the greatest challenge to the country's security.

These activities will also continue in the Arctic in the coming years, proof of which can be seen in the creation of the Northern Fleet MD. This new MD will be a challenge for the countries of the Northern Flank of the Alliance because Russia will want to continue to try to intimidate NATO countries and engage in dialogue with them from a position of strength. It will also want to build up its position as an important player in other regions.

At the same time, Russian experts point out that the units of the Eastern and Central MDs, which territorially cover over 80% of Russian territory, have outdated equipment, and they receive only the newest armaments last and in small quantities.[61]

The development of individual weapon systems indicates that Russia will continue to try to increase the possibilities of conducting military operations in its immediate neighbourhood. Efficient and equipped with modern equipment, the Armed Forces guarantee Russia will maintain the *status quo* in its claimed sphere of influence and control frozen conflicts in the former USSR (Abkhazia, South Ossetia, Nagorno-Karabakh, Transnistria, Donbas, and Crimea).

Moreover, while efforts to rearm the Navy have not been successful, Russia is gradually restoring its ability to conduct deep-sea operations. Taking into account that the modernisation efforts will be focused on this area in the coming years, it can be assumed that Russia will increase its military presence far beyond its immediate neighbourhood, attracting partners from Africa, Asia, and the Middle East. In resurrecting the former Soviet naval and air base in Syria in 2015, Russia increased its military presence in the Eastern Mediterranean, and with the signing of an agreement on a naval base with Sudan in 2020, it tried to extend it to the Red Sea basin. In the coming years, the Russian authorities likely will make efforts to establish naval bases in other countries, for example, in Libya or Myanmar.

The role and importance of the Armed Forces in Russia's foreign policy will continue to grow. It will use its military capabilities to conduct operations both in its near neighbourhood and in other countries in an attempt to shape their foreign policy. Moreover, it will try to create challenges for the U.S. and other NATO countries. Wherever possible (for example, in Syria, somewhat in Libya, and in Nagorno-Karabakh[62]), it will offer a commitment to conflict resolution, using the possibility that it will use its Armed Forces to control the situation. At the same time, Russia will want to use the rearming of its forces and demonstrate their combat capabilities to increase arms exports and generate additional income.

It is also worth emphasising that the strengthening of the Armed Forces serves the purpose of consolidating Russian society. In August 2020, 66% of surveyed Russians expressed confidence in the military, which placed the Armed Forces first among state institutions.[63] Moreover, during the implementation of SAP 2011-2020, the percentage of Russians surveyed who believe that the Army is able to defend the state increased significantly, from 17% in 2011 to 53% in 2019.

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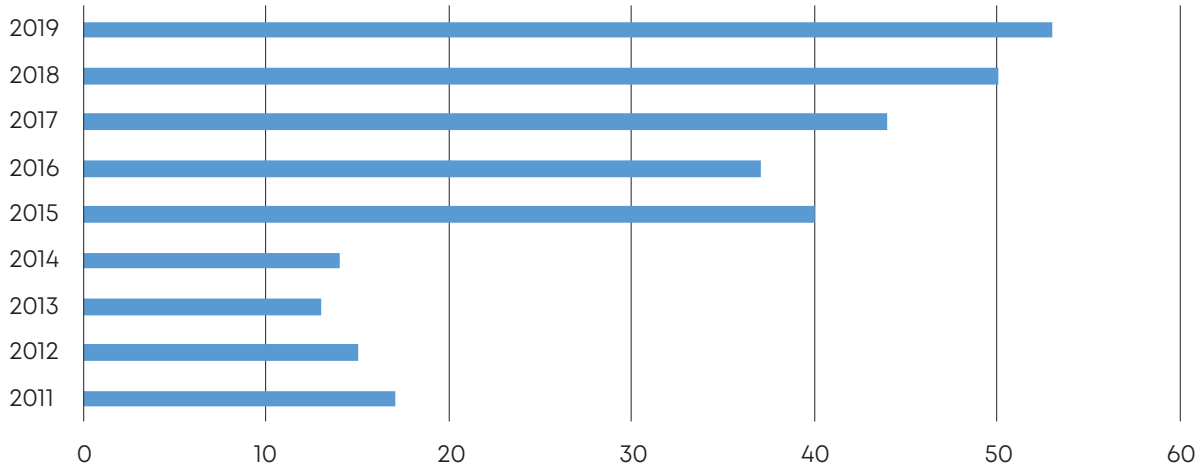
[61] See: A. Khramchikhin, "Vostochnomu voyennomu okrugu nuzhna sovremennaya tekhnika," *Nezavisimoye Voyennoye Obozreniye*, 9 October 2020, https://nvo.ng.ru/nvo/2020-10-09/12_1112_advantages.html.

[62] A. Legieć, ""Russian Truce": The Tense Future of Nagorno-Karabakh," *PISM Bulletin*, No. 246 (2178), 30 November 2020, www.pism.pl/publications/Russian_Truce_The_Tense_Future_of_NagornoKarabakh.

[63] "Doveriye institutam," *Tsentr Levady*, www.levada.ru/2020/09/21/doverie-institutam/.

FIGURE 4. PERCENTAGE OF RESPONDENTS WHO ANSWERED "DEFINITELY YES" TO THE QUESTION WHETHER THE ARMY IS ABLE TO DEFEND RUSSIA



Source: Own figure based on: "Rossiyskaya Armiya", Levada Centre, www.levada.ru/2019/06/18/rossijskaya-armiya-3/.

At the same time, the poll conducted by the Levada Centre in May 2019 shows that as many as 82% of respondents were in favour of allocating more budget funds for social purposes, while the need to increase funds for financing the army was supported by only 12% of respondents.[64]

[64] "Rossiyskaya Armiya," *Tsentr Levady*, https://www.levada.ru/2019/06/18/rossijskaya-armiya-3/.

9. CONCLUSIONS FOR POLAND AND NATO

During the implementation of SAP 2011-2020, Russia focused on those capabilities that allowed it to maintain its status as a military superpower and presented the greatest challenge for NATO countries. The ongoing modernisation of the Armed Forces allows Russia to conduct at least one full-scale military operation (involving at least two armies), or two on a smaller scale (with less force involvement or with the use of one component, such as the Air Force).

New or modernised types of weapons were first delivered to units deployed in the western part of Russia. This applied to equipment for the Land Forces, Aerospace Forces, and the Navy.

The purpose of deploying anti-access systems in Kaliningrad Oblast and occupied Crimea was to significantly impede NATO's air and naval operations in the Baltic and Black seas in case of a crisis or deeper conflict. For the same purpose, in these regions, Russia has also deployed modern missile systems (such as Iskander) and radio-electronic warfare devices. The Kalibr missiles, used by the Black Sea, Baltic and Caspian fleets, are capable of hitting targets in most European NATO countries, including key installations and bases supporting a possible NATO operation on the Eastern Flank.

Russia's focus on strengthening its military potential in its western strategic direction will continue in the coming years and will have further consequences for NATO and Russia's European neighbours. Given that Russia has not stopped producing 9M729 medium-range missiles, these systems—highly mobile, because they use wheeled platforms—can be found in the west of the country at any time, posing a threat to almost all European NATO members, Ukraine, Sweden, and Finland. In turn, the Zircon missiles will be a challenge primarily for the countries of NATO's Northern Flank, because the ships from which they will be fired operate mainly in this region.

It is also worth emphasising that the decade of relatively successful technical modernisation of the Russian Armed Forces has significantly changed the security situation in Poland's immediate neighbourhood. Thanks to modern weapons, Russia has increased its capabilities to conduct a military operation in the western strategic direction. Particular attention should be paid here to missile systems—in 2011, Russia did not have Iskander system launchers in the Kaliningrad Oblast or Kalibr systems (Karakurt-class corvettes stationed in the Baltic Sea in the military port of Baltiysk are equipped with them).

This means that the Alliance, both in its defence planning and in its next strategic concept, should unequivocally recognise the threats posed by Russia as key to its security. Russia is constantly expanding the possibilities of horizontal escalation while simultaneously conducting actions against the states of the Alliance's Eastern, Northern and Southern flanks. Judging by the effects and plans of rearming, Russia will be capable of carrying out at least two simultaneous large military operations, one of which could be comprehensive in nature, involving significant parts of most types of the Armed Forces. Thus, the main task of NATO should remain ensuring the credible defence of member states by enhancing conventional and nuclear capabilities.

TABLE 3. THE MOST IMPORTANT TYPES OF RUSSIAN WEAPONS AND NATO REPORTING NAME

Russian Name	NATO Reporting Name
Missile and Air Defence Systems	
S-300	SA-10 Grumble
S-400	SA-10C
Khrizantema-S	AT-15 Springe
Buk-M2	Grizzly
Iskander-M	SS-26 Stone
Bal	SSC-6 Sennight
Bastion	SSC-5 Stooge
Ch-101	AS-23 Kodiak
RS-20 Voevoda	SS-18 Satan
RS-28 Sarmat	SS-X-30
RS-24 Yars	SS-29
RS-26 Rubezh	SS-X-31
Topol	SS-25 Sickle
Topol-M	SS-27 Sickle B
3M22 Zirkon	SS-N-33
9M729	SSC-8
Burevestnik	SSC-X-9 Skyfall
2M39 Poseidon	Kanyon
Kalibr	Club
Ships	
Okręt proj. 877 Płatus	Kilo
Aircrafts	
MiG-29	Fulcrum
MiG-31	Foxhound
MiG-35	Fulcrum-F
Su-25	Frogfoot
Su-27	Flanker-B
Su-30	Flanker-C
Su-35	Flanker-E
Su-57	Felon
Jak-130	Mitten
Tu-22M3	Backfire
Tu-95	Bear
Tu-160	Blackjack
Ił-20M	Coot-A
Ił-76	Candid
Ił-78	Midas
An-124 Ruslan	Condor
Helicopters	
Ka-52	Hokum-B
Mi-8	Hip
Mi-24	Hind
Mi-26	Halo
Mi-28	Havoc
Mi-35	Hind-D

Source: Own compilation.

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