



DEFENSE INTELLIGENCE AGENCY

RUSSIA

MILITARY POWER

BUILDING A MILITARY *to*
SUPPORT GREAT POWER ASPIRATIONS

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PREFACE

For more than 50 years, DIA officers have met the full range of security challenges facing our great nation. Our intelligence professionals operate across the globe, and our work supports customers from the forward-deployed warfighter to the national policymaker. DIA is united in a common vision—to be the indispensable source of defense intelligence expertise—and for the past five decades we have done just that.

As part of this vision, DIA has a long history of producing comprehensive and authoritative defense intelligence overviews. In September 1981, Secretary of Defense Caspar Weinberger asked the Defense Intelligence Agency to produce an unclassified overview of the Soviet Union’s military strength. The purpose was to provide America’s leaders, the national security community, and the public a complete and accurate view of the threat. The result: the first edition of *Soviet Military Power*. DIA produced over 250,000 copies, and it soon became an annual publication that was translated into eight languages and distributed around the world. In many cases, this report conveyed the scope and breadth of Soviet military strength to U.S. policymakers and the public for the first time.

Today, we are faced with a complexity of intelligence challenges from multiple threats that we cannot afford to misunderstand. In the spirit of *Soviet Military Power*, DIA is proud to produce an unclassified defense intelligence overview of the military capabilities associated with the challenges we face—beginning with Russia. This product is intended to foster a dialogue between U.S. leaders, the national security community, partner nations, and the public about the challenges we face in the 21st century.



Vladimir Putin’s address to the Russian Federal Assembly following the referendum on annexation of Crimea, 18 March, 2014:

“The USA prefers to follow the rule of the strongest and not by the international law. They are convinced that they have been chosen and they are exceptional, that they are allowed to shape the destiny of the world, that it is only them that can be right. They act as they please. Here and there they use force against sovereign states, set up coalitions in accordance with the principle: who is not with us is against us.”

The international order established after the Second World War and developed throughout the Cold War largely ensured widespread peace and stability even as it saw new conflicts—large and small—take place in different regions of the world. This post-war era, underwritten primarily by the strength of the United States, also gave rise to the greatest period of prosperity in history, witnessing countries rebuild from war and emerge from colonialism to become vibrant and valuable members of the international community. Following the collapse of the Soviet Union, the United States emerged as a world leader militarily, economically and diplomatically. Today, however, the United States faces an increasingly complex array of challenges to our national security.

The resurgence of Russia on the world stage—seizing the Crimean Peninsula, destabilizing eastern Ukraine, intervening on behalf of Syrian President Bashar al-Assad, and shaping the information environment to suit its interests—poses a major challenge to the United States. Moscow will continue to aggressively pursue its foreign policy and security objectives by employing the full spectrum of the state’s capabilities. Its powerful military, coupled with the actual or perceived threat of intervention, allows its whole-of-government efforts to resonate widely.

Russia continues to modernize its extensive nuclear forces and is developing long range precision-guided conventional weapons systems. It is manipulating the global information environment, employing tools of indirect action against countries on its periphery and using its military for power projection and expeditionary force deployments far outside its borders. Its ultimate deterrent is a robust nuclear force capable of conducting a massed nuclear strike on targets in the United States within minutes.

Within the next decade, an even more confident and capable Russia could emerge. The United States needs to anticipate, rather than react, to Russian actions and pursue a greater awareness of Russian goals and capabilities to prevent potential conflicts. Our policymakers and commanders must have a complete understanding of Russia’s military capabilities, especially as U.S. and Russian forces may increasingly encounter each other around the globe. DIA will continue to provide our leaders decision-space, ensuring they have the time and information necessary to protect our nation. The wrong decisions—or the right ones made too late—could have dire consequences.

This report examines a resurgent Russia’s military power to foster a deeper understanding of its core capabilities, goals, and aspirations in the 21st Century.



Vincent R. Stewart

Lieutenant General, USMC
Director
Defense Intelligence Agency

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Kremlin Guards in 2017. Military power has always been regarded as of critical importance by Russian and Soviet leaders, but after the collapse of the USSR, Moscow was left with a dramatically weakened military.

Introduction/Historical Overview

1991-Present: Fall and Rise of the Russian Military

Following the collapse of the USSR in 1991, the Russian Federation inherited several formidable tasks and challenges from its Soviet predecessor. For the newly-formed Russian Ministry of Defense, the most immediate challenge was to relocate military equipment and personnel from the newly independent states of the former USSR and countries of the disbanded Warsaw Pact into a new Russian state.¹ The assets of the Soviet Union's

nuclear arsenal were of particular importance. Russia, Ukraine, Belarus, and Kazakhstan, the four states with nuclear weapons in their territory, eventually reached an agreement to dismantle all tactical and strategic nuclear weapons in the non-Russian republics or return them to Russia.² The issue of conventional military forces was much more problematic. Forces returning from Eastern Europe had to be reintegrated into the new Russian military, while

those in the newly independent states were viewed as the basis for building national militaries for new sovereign countries.³

Returning military forces from Eastern Europe were often shipped piecemeal back to unprepared bases in the Russian Federation.⁴ Other units located in the territory of the former Soviet Union were absorbed by the newly independent states. In certain cases, units such as the Black Sea Fleet in Ukraine or the 14th Army in Moldova actively resisted the attempts by the Soviet successor states to absorb these forces. Some of these stranded units became embroiled in ethnic conflicts in Moldova, Georgia, and Tajikistan.⁵ Most significantly for the new Russian military, interior military districts, which under the Soviet Union contained low-readiness mobilization forces such as the Moscow and North Caucasus Military Districts, now became “front-line” districts bordering foreign states.⁶ The Russian Federation emerged from the collapse of the Soviet Union with a much smaller military and an entirely new set of security challenges.⁷

Russia’s new military faced dramatic budgetary, readiness, and personnel shortfalls, as well as uncertainty of its role as Moscow struggled to determine its place in the post-Cold War world.^{8,9} Russia cut military spending drastically during the decade of post-Soviet economic turbulence. Fielding of new weapons systems slowed to a trickle and eventually halted; the huge former Soviet arms industry struggled, focusing on gaining hard currency by selling its most modern weapons to foreign buyers.¹⁰ At the same time, Russian military units lacked



Troops gathered around a fire for warmth during the Chechen conflict; the difficulties Moscow’s weakened military faced during its operations against the separatist republic underscored its deterioration during the 1990s.

Image Source: Shutterstock

funding and fuel to train and exercise, and pay was often months in arrears. The readiness of the force was minimal, and the popular image of the Russian military of the 1990s remains ships rusting at pier side, pilots unable to fly, and Russian officers moonlighting with second jobs to make ends meet.¹¹

Moscow also had difficulty manning its military. Press reports on military life that began to appear during the *glasnost* (openness) era of the late 1980s highlighted the harshness of the conscript’s lot, and in particular the brutal and sometimes deadly *dedovschina* hazing of new draftees. Draft evasion became endemic, with many young Russian men using any and all legal or illegal measures to avoid military service.^{12,13}

Russian generals voiced complaints about the poor quality of the conscripts they actually received, as they were often unhealthy, poorly educated, and sometimes arrived with criminal records.¹⁴ The military's most painful trial, however, was caused by insurgency within the borders of the Russian Federation. From 1994 to 1995, undermanned and poorly trained Russian forces struggled to take and secure the breakaway Chechen Republic in the North Caucasus.¹⁵ The military's problems and limitations were widely publicized by the Russian and international press, further undermining its reputation and reinforcing the desire of young Russians to avoid service.

Throughout the post-Soviet era, there was a recognized need to reform and modernize the military.¹⁶ Not only did the Russian military suffer from the readiness and manpower



Russian SS-25 ICBM launcher; given the weakened state of its conventional forces in the years after the collapse of the USSR, Moscow prioritized the maintenance of its nuclear capabilities.

Image Source: Shutterstock

shortfalls outlined above, but Moscow's forces retained their cumbersome Soviet-era organization, designed for the mobilization of massive numbers of reservists to conduct deep mechanized theater operations in the context of a major war.¹⁷ The 1990s and first decade of the 21st century saw a series of military reform efforts announced, discussed, and only abortively implemented. Russia's first Minister of Defense, General Pavel Grachev, (1992–1996) posited the creation of a fully manned and equipped small “mobile force” component that could rapidly move to a conflict area and hold the line until additional forces mobilized;^{18, 19, 20} Minister of Defense Igor Sergeyev (1997–2001) created a new strategic nuclear deterrence force based on his previous service, the Strategic Rocket Forces;^{21, 22} and Minister of Defense Sergey Ivanov (2001–2007) and Chief of the General Staff Yuriy Baluyevsky (2004–2008) pushed for the establishment of new regional theater commands and filling the military's ranks with professional “contract” personnel.^{23, 24} By the late 2000s, these reform plans remained largely unimplemented, unsuccessful, or abandoned.

One arguable exception to this series of military reform failures was the effort during the late 1990s to create “permanently ready forces,” a subset of the Russian force structure made up of units with better manning and equipment levels.^{25, 26} These units were created and used during the second Chechen conflict (1999–2004) and enabled Moscow to intervene more rapidly and with more capable forces than during the first Chechen War (1994–1995).²⁷

Despite modest improvements and a measure of success in the second Chechen conflict, the Russian military still entered the first decade of the 21st century with a Soviet-era mobilization force structure almost completely equipped with dated Soviet-era equipment. Shortfalls in modern command, control, communications, computers, and intelligence, surveillance, and reconnaissance (C4ISR) equipment and capabilities were particularly notable. Russian military limitations were fully on display during the August 2008 “five-day war” with Georgia.²⁸ Russian forces prevailed and defeated their relatively weak Georgian opponents, but after-action analysis by the Russian military highlighted many failings. Air and artillery strikes missed their targets, an army commander had to resort to a cell phone to contact a higher headquarters,²⁹ and several aircraft were lost to Georgian air defenses. While internationally



Minister of Defense Shoygu at the 2014 Victory Day Parade; since 2012, Shoygu has presided over the continued modernization of the Russian military as well as its operations in Ukraine and Syria.

Image Source: Shutterstock

Transition to the New Look Program

Moscow’s limitations in modernizing its military had led to heavy dependence on its aging nuclear forces to defend the state. But while the presence of a robust nuclear deterrent dissuaded potential aggressors from directly attacking the Russian Federation, it was not flexible enough for Moscow to use in small, local conflicts such as Georgia or as a tool of power projection. The New Look program was a comprehensive and massive effort, aimed to change the Russian military from a Cold War-style mobilization force to a more ready, modern, and professional military able to respond to 21st century conflicts.³⁰ Partially-manned Soviet-style divisions were reorganized into what were planned to be fully-manned brigades; officer ranks were trimmed from 350,000 billets to initially 150,000, although later the number rose to 220,000; the contract Manning effort was reshaped and reinvigorated, with a goal of 425,000 professional enlisted personnel in the force by 2017;³¹ the six extant military districts were reshaped initially into four joint strategic commands, which controlled all military assets in their areas in peace and war; and lastly, a massive state armaments program was initiated, allocating 1.1 trillion rubles over 10 years, aiming at fielding a Russian military with 70% new or modernized equipment by 2020.^{32, 33, 34, 35, 36, 37}

many were impressed by the ability of the Russian military, so derelict in the 1990s, to accomplish its mission, Moscow was spurred by what it viewed as critical shortfalls in Georgia to rapidly push forward a whole new set of reforms—known as the “New Look”—which had been under discussion before the conflict.³⁸

The New Look was controversial and painful for many in or associated with the Russian military establishment.^{39,40,41} Even military education and medical support organizations became targets for major reductions. In late 2012, the unpopular Minister of Defense associated with the reform effort, Anatoliy Serdyukov, left office and the former head of the Emergency Situations Ministry, Sergey Shoygu, took over.⁴² Shoygu proved adept at easing some of the most unpopular aspects of the New Look while largely retaining and refining the essence of the reform program.⁴³

The years of Shoygu’s tenure have seen the New Look military engaged in a series of active operations. In early 2014, Russian naval infantry, special forces, and airborne troops rapidly seized control of the Crimean Peninsula.⁴⁴ While they faced almost no opposition, the operation gave the world its first look at a military that appeared surprisingly disciplined and well-equipped for those whose image of

Russian forces was formed during the years of decay in the 1990s. Although their presence was denied by Moscow, Russian special forces and troops operated to mobilize, lead, equip, and support separatist militias in the Donbas region of eastern Ukraine from spring 2014 to the present. Ukrainian forces have stressed the capabilities of the Russian-enabled separatist units, especially with respect to C4ISR, artillery firepower, and air defense.^{45,46} In September 2015, Moscow launched its first expeditionary operation since the Soviet era, deploying fixed-wing and helicopter aviation assets to Syria. Combined with other military support to the Asad regime such as intelligence information, advisors, ammunition, and artillery, Russian action arrested the decline in the Syrian regime’s military position.⁴⁷

The Russian military today is on the rise—not as the same Soviet force that faced the West in the Cold War, dependent on large units with heavy equipment, but as a smaller, more mobile, balanced force rapidly becoming capable of conducting the full range of modern warfare. It is a military that can intervene in countries along Russia’s periphery or as far away as the Middle East. The new Russian military is a tool that can be used to underpin Moscow’s stated ambitions of being a leading force in a multipolar world.



Russia has established five Joint Strategic Commands (Obyedinennoye Strategicheskoye Komandovaniye - OSK) to deal with perceived threats from the west, south, east, and Arctic.⁴⁸

Russia National Military Overview

Russia's Threat Perceptions

Since returning to power in 2012, Russian President Putin has sought to reassert Russia as a great power on the global stage and to restructure an international order that the Kremlin believes is tilted

too heavily in favor of the United States at Russia's expense.⁴⁹ Moscow seeks to promote a multi-polar world predicated on the principles of respect for state sovereignty and non-interference in other states' internal affairs, the

primacy of the United Nations, and a careful balance of power preventing one state or group of states from dominating the international order.⁵⁰ To support these great power ambitions, Moscow has sought to build a robust military able to project power, add credibility to Russian diplomacy, and ensure that Russian interests can no longer be summarily dismissed without consequence.⁵¹

Russia's assertive promotion of its national interests, punctuated by its military actions in Ukraine and Syria, demonstrates a more confident and somewhat less risk averse Kremlin, but it also has revived international concerns about the re-emergence of a more militaristic Russia. Russian military forces played a key role in the seizure of Crimea and fomenting an artificial separatist revolt in eastern Ukraine, blunting Kyiv's aspirations to join NATO, at least for the foreseeable future.⁵² Additionally, Russia's military intervention in Syria has changed the entire dynamic of the conflict, bolstering the Assad regime and ensuring that no resolution to the conflict is possible without Moscow's agreement. Nevertheless, these actions also belie a deeply entrenched sense of insecurity regarding a United States that Moscow believes is intent on undermining Russia at home and abroad.⁵³

Moscow undoubtedly views the United States and its NATO partners as the principle threat to Russian security, its geo-political ambitions, and most importantly, the Kremlin's continued hold on power. This perception of vulnerability vis-à-vis the United States is most clearly evident in the latest Russian National

Security Strategy published in December 2015. The document identifies the United States and its NATO allies as Russia's main threat, and accuses the West of pursuing a deliberate policy of containment against Russia to sustain its domination of the post-Cold War international order and deprive Moscow of its rightful place on the world stage.^{54,55} It explicitly states, "the Russian Federation's implementation of an independent foreign and domestic policy is giving rise to opposition from the United States and its allies, who are seeking to retain their dominance in world affairs." The security strategy also cites the buildup of NATO military capabilities closer to the Russian border, the deployment of U.S. missile defense capabilities in Europe, and the ongoing U.S. pursuit of strategic non-nuclear precision weapon systems as a serious threat to Russian security.⁵⁶

Russia also has a deep and abiding distrust of U.S. efforts to promote democracy around the world and what it perceives as a U.S. campaign to impose a single set of global values. Moscow worries that U.S. attempts to dictate a set of acceptable international norms threatens the foundations of Kremlin power by giving license for foreign meddling in Russia's internal affairs. The December 2015 National Security Strategy warns of the importance of preserving traditional Russian spiritual and cultural values against foreign Western ideas and influences aimed at undermining Russia from within.⁵⁷ The Kremlin is convinced the United States is laying the groundwork for regime change in Russia, a conviction further reinforced by the events in Ukraine. Moscow views the United States as the critical driver behind the crisis in

Ukraine and the Arab Spring and believes that the overthrow of former Ukrainian President Yanukovich is the latest move in a long-established pattern of U.S.-orchestrated regime change efforts, including the Kosovo campaign, Iraq, Libya, and the 2003–05 “color revolutions” in Georgia, Ukraine, and Kyrgyzstan.⁵⁸

Russian threat perceptions are not limited to the United States, and Moscow views the danger posed by Islamic militants and terrorists with grave concern.⁵⁹ The Kremlin is particularly sensitive to the growth and spread of these ideologies and their potential to further radicalize Russian Muslims in the turbulent North Caucasus and other Muslim areas of central Russia. Russian military operations in Syria are also intended to eliminate jihadist elements operating there that originated in the territory of the former Soviet Union, to prevent them from returning home and posing a threat to Russia. At the same time, Moscow remains anxious about the deteriorating situation in Afghanistan and the potential for Afghan-based Islamic extremists to spill over into the Central Asian states of the former Soviet Union and ultimately into Russia.⁶⁰

Russian threat perceptions with regard to China are more divided and nuanced. Russian officials regularly praise the cooperative nature of the bilateral relationship, and Putin himself has declared that the current Russian-Chinese relationship is the best it has been in decades. In fact, the Russian National Security Strategy lists developing a strategic partnership with China as one of Russia’s most important goals.⁶¹ Moscow and Beijing share a common interest in weakening U.S. global influence and are actively coop-

erating in that regard.^{62,63} Military cooperation between the two countries is slowly expanding, as are economic ties.⁶⁴ Nevertheless, some Russians are keenly aware of the growing power disparity between Russia and an ascendant China and worry that Moscow is at risk of becoming Beijing’s junior partner.⁶⁵ Others continue to harbor suspicions that China over the longer term will once again become a military threat to Russia.^{66,67}

National Security Strategy

Russia’s current National Security Strategy was signed by President Vladimir Putin on 31 December 2015 as an update to the previous National Security Strategy published in 2009. The National Security Strategy is the Kremlin’s foundational planning document and is intended for domestic and external audiences.⁶⁸ It codifies Moscow’s strategic interests and national priorities for at least the next 6 years. The national priorities were consistent with those identified in previous strategies; however, the tone of this update was harsher than the 2009 strategy, reflecting Moscow’s view of worsening relations with the West.

The 2015 strategy identifies Russian national interests as strengthening the country’s defense, ensuring political and social stability, raising the living standard, preserving and developing culture, improving the economy, and strengthening Russia’s status as a leading world power. These national interests are to be achieved through concentration on eight strategic national priorities:

- National defense
- State and public security

- Economic growth
- Science, technology, and education
- Healthcare
- Culture
- Ecology of living systems and rational use of natural resources
- Strategic stability and equal strategic partnership

In the 2015 document, the sections on national defense, internal stability, economy, and culture were significantly expanded.⁶⁹ Moscow identified new threats to state and public security posed by foreign nongovernmental organizations (NGOs), “color revolutions,” and the use of social media to foment unrest and undermine political and social stability,⁷⁰ reflecting Russian officials’ allegations that Western powers seek to provoke regime change in Russia.⁷¹ The culture priority contains some of the strategy’s most significant revisions, emphasizing the need to preserve and strengthen “traditional Russian spiritual and moral values,” and indicating that Moscow views culture, language, and history as a tool for influence.

Unlike the 2009 version, the new National Security Strategy directly accuses the United States and NATO of pursuing actions that cause instability and threaten Russian national security.⁷² The importance of a strong military for a leading world power is acknowledged; the strategy states that “the role of force as a factor in international relations is not declining.” The new strategy reiterated key concepts outlined in Russia’s 2014 military doctrine on the importance of deterrence and conflict prevention, nuclear and nonnuclear deterrence, and the need to improve

Russia’s mobilization process.⁷³ The National Security Strategy reflects a Russia more confident of its ability to defend its sovereignty, resist Western pressure, and contribute to the resolution of conflicts abroad (or insecurity).

Stability Issues

The Kremlin views internal political stability as a critical component of national strength and projecting power abroad, as evidenced by the emphasis placed on it in the National Security Strategy. Since returning to the presidency in 2012, Russian President Putin has worked to consolidate power. His efforts to further centralize control have been challenged by a slowing economy, lower energy prices, and growing public discontent with a system that lacks any genuine pluralism.⁷⁴ Putin has tried to deflect from these concerns by promising to restore Russia to great power status, on par with the United States, to mobilize public support and secure his legitimacy.^{75, 76}

The Kremlin has taken steps to neutralize political opposition by expanding laws to impose harsh sentences that discourage public protests and encourage self-censorship.⁷⁷ It has also restructured its internal security forces to ensure a more loyal and responsive apparatus. Russia maintains security forces that are not subordinate to the military to conduct a range of internal security and policing functions. Nonetheless, the Kremlin will likely face continuing challenges to its rule from democracy and anti-corruption activists, labor unrest, as well as the ever present threat of terrorism emanating from Russia’s restive North Caucasus region.

Ministries with Internal Security Missions

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Ministry/Agency	Mission	Personnel (Number of Troops)
National Guard	Regime and internal security, federal law enforcement	(200,000) ⁷⁸
Ministry of Internal Affairs (MVD)	Civil policing and local law enforcement	904,800 ⁷⁹
Federal Security Services (FSB) Border Troops	Border security: ground and maritime	(170,000) ^{*80}
Ministry of Justice (UIN)	Civil judicial system, prison guarding	32,000 ^{*81}
Ministry of Emergency Situations (EMERCOM)	Civil defense, disaster response, humanitarian relief, firefighting	289,000 (7,500) ⁸²
Federal Protection Service (FSO)	Presidential, VIP, and regime protection	20,000 ⁸³
<i>*Estimate</i>		

Insurgency in the South

Russia's enduring insurgency in its restive North Caucasus region continues at a consistent but low level. Stemming directly from its two conflicts in Chechnya in 1994–96 and then re-igniting in 1999, Moscow largely declared an end to major operations by 2009, although it still retains a sizeable military and security force structure and counterterrorism regime in the region.⁸⁴ Still a volatile region, a general level of order is maintained via a mix of local and federal-level Russian forces, including Chechen forces loyal to Moscow headed by Chechen President Ramzan Kadyrov.⁸⁵

Once the center of insurgent activity, levels of instability in Chechnya gradually have plateaued over the years, while those in its neighboring Muslim provinces such as Dagestan and Ingushetia have experienced sporadic upswings in activity over time. Although large groups of insurgents are now primarily a thing of the past, smaller bands still exist with affiliations to various nationalist and extremist groups such as ISIS-Caucasus and the Imarat Kavkaz. These groups and their members conduct small-scale operations and bombings against Russian forces—primarily from the Ministry of Internal Affairs (MVD) police or the National Guard. Although daily attacks have largely abated since late 2013, pervasive socio-economic issues, corruption, and heavy-handedness (real or perceived) by Russian authorities will continue drive feelings of disenfranchisement amongst the populace, providing a steady source for radicalization in the region.

External Defense Relations

The Commonwealth of Independent States (CIS) was a regional coordination body created among a number of the former Soviet states in the wake of the dissolution of the former Soviet Union. Nine states remain members, with Ukraine and Turkmenistan retaining associate member status. Russia's most important defense and security relationships are with its allies in the CIS Collective Security Treaty Organization (CSTO)—Belarus, Armenia, Kazakhstan, Kyrgyzstan, and Tajikistan. Based on the 1992 Tashkent Collective Security Agreement, the CSTO was established in 2002 as part of a larger Russian effort in the post-Soviet environment to create a more structured military organization capable of implementing the security guarantees stipulated in the agreement. Since then, the CSTO has developed a bureaucratic staff under the organization's secretary general and a rapid reaction force to respond to various contingencies that might impact the security of the member states. The CSTO conducts yearly joint military exercises addressing various scenarios such as peacekeeping or counterterrorism operations.⁸⁶ Russia also maintains an airbase at Kant, Kyrgyzstan, under the auspices of the CSTO.

Nonetheless, Russian efforts to build the CSTO into a more structured and capable organization on par with NATO largely have floundered. Some of the non-Russian member states worry that Moscow is using the organization to undermine their sovereignty and

independence and are cautious of deepening military cooperation with Russia, as evidenced by Uzbekistan's withdrawal in 2007. Differing threat perceptions, an absence of trust amongst the members, and funding shortfalls have further plagued the organization.^{87, 88, 89, 90}

Russia also is building cooperative defense relationships with other various countries throughout the Middle East, Latin America, Africa, and Asia, but its engagement is far less robust than in the former Soviet Union. Moscow appears to no longer be interested in funding Soviet-style patronage relationships, and Russian policy remains largely transactional aimed at expanding arms sales and other Russian economic interests, which has contributed to the limited nature of these ties.^{91, 92} Nevertheless, the Kremlin continues to view its military outreach to these countries as important to enhancing its global stature and strengthening its regional influence.

Defense Budget

Russian government spending on national defense has generally grown over the last decade and in 2016 reached a post-Soviet record. This increase in defense spending was enabled by both a general increase in the size of Russia's GDP and a political decision to increase the defense burden—the share of national wealth devoted to defense.

In 2015, Russian defense spending reached a then-record \$52 billion (in 2017 dollars) and the defense burden was nearly 4% of GDP.

The 2016 budget, which was initially to decrease defense spending, was amended late in the year to increase defense spending to \$61 billion, a 4.5% defense burden on GDP.^{93,94,95} By contrast, in 2006 defense spending was \$27 billion, and the defense burden was 2.4%.^{96,97}

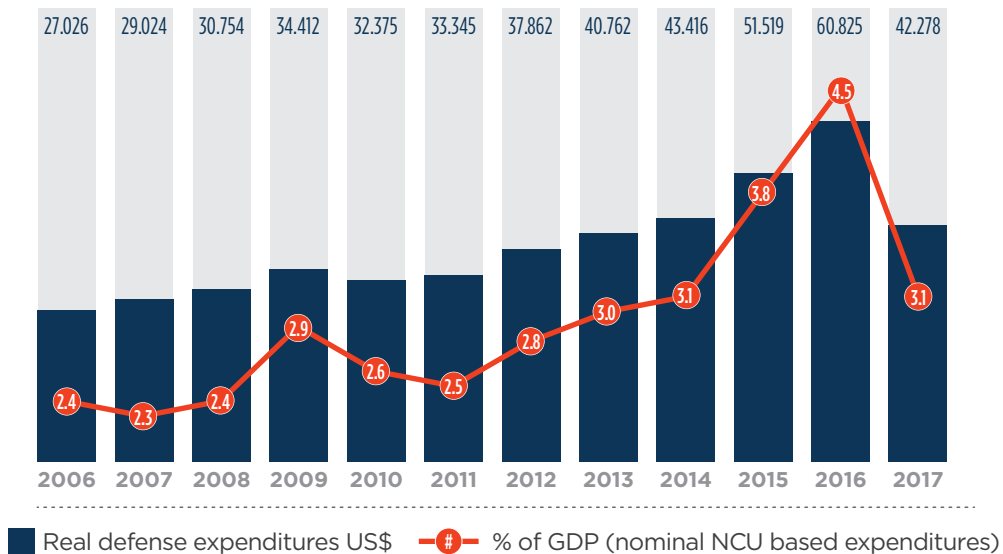
Moscow's ambitious rearmament program has driven the increase in defense spending. The Strategic Armament Program (SAP) called for spending 19.4 trillion rubles (equivalent to \$285 billion) to rearm Ministry of Defense forces from 2011 through 2020. Each year the SAP is implemented through the State Defense Order (SDO), Moscow's purchase of new weaponry, investment in weapons-related research

and design, and expenditure on modernization and repair of existing weaponry.¹⁰¹ Funding for the 10 year program was heavily back-loaded such that just 31% was to be spent in the first 5 years (2011–2015) and nearly 70% was to be spent from 2016 to 2020.¹⁰² In order for Moscow to meet its original target for SAP spending and maintain its operational spending at current levels, defense spending from 2016 through 2020 will have to increase substantially over 2011–2015 levels.

Russian defense spending, however, is poised to decrease in 2017.¹⁰³ The 2017 budget calls for 2.8 trillion rubles to be spent on national defense, equivalent to \$42 billion.¹⁰⁴ This constitutes a 30% real cut in defense spending

Russia's Official Defense Spending 2006-2017 (billions of 2017 dollars)^{98, 99, 100}

1612-11108



from 2016 levels, and if it is not amended to increase funds mid-year, it would be the lowest budget for national defense since 2013.^{105,106,107} According to Russian press and Ministry of Finance announcements, from 2017 through 2019 Russian defense spending will be essentially frozen in nominal terms—and therefore declining in real terms.^{108,109}

Russian government revenues are highly dependent on oil prices, and Moscow's deci-

sion to base its budget for 2017–2019 on low projected oil prices in 2017–2019 is largely responsible for the glum outlook for government revenue and low projected GDP growth rates.¹¹⁰ According to the International Monetary Fund and a number of prominent economists, Russia faces a growth ceiling; absent structural reforms, Russian GDP growth would probably reach only 1 to 2 percent per year, even were oil prices to increase significantly.^{111,112}

Military Doctrine And Strategy

Russian Perceptions of Modern Conflict

Since at least 1991, the Russian perception of the nature of modern conflict has evolved. Russia views wars as often undeclared, fought for relatively limited political objectives, and occurring across all domains, including outer space and the information space.¹¹³ Russian leaders have noted the tendency for crises to arise quickly and develop impetuously, and to potentially escalate from local wars into global ones.^{114, 115} In addition, Moscow judges that modern conflicts are characterized by a destructive and rapid “initial period of war”—a subject on which Russian military leaders and theorists have written extensively since the 1920s—which is becoming more decisive than ever before. In modern cyber-enabled information and battlefield spaces, this destructive non-kinetic initial period can be reduced to milliseconds, and kinetically to hours.¹¹⁶

Moscow fears that the speed, accuracy, and quantity of non-nuclear strategic precision-guided weapons can achieve strategic effects on par with nuclear weapons,¹¹⁷ one of the primary reasons that since at least 1993 (and most recently codified in the 2014 Military Doctrine) Russia has reserved the right to a nuclear response to a non-nuclear attack that threatens the existence of the state.^{118, 119, 120} In addition to rejecting no-first-use, Moscow has discussed using nuclear weapons to de-escalate

a conflict.^{121, 122} While most military theorists and leaders believe great-power conflict is unlikely, they nevertheless express concern about the usability of the information space to achieve state goals.¹²³ Russia has tied this decisive and shortened initial period to the idea that only more proactive or even preemptive action is required to counter it.^{124, 125, 126} Russian developments in precision-guided munitions indicate a desire for “deep strike” capability to preempt attacks from an adversary.

Russia’s Military Doctrine, last updated in December 2014, contained several new elements not in the 2010 Doctrine, which reflect Moscow’s military focus and threat perceptions. First codified in the doctrine was the concept of non-nuclear deterrence, an idea that has been evolving since the Soviet period. The doctrine also underscored perceived threats to Russia’s domestic security and described the military’s requirement to inflict unacceptable damage on any adversary at any time. This requires the military to calculate or understand what level of damage would constitute unacceptable damage to an adversary.^{127, 128, 129} Mobilization readiness of the state was stressed, as were measures to unify state, societal, and individual efforts to protect Russia and increase the effectiveness of military-patriotic indoctrination of citizens and their preparation for military service.¹³⁰

The concepts of readiness, non-nuclear deterrence, and unacceptable damage are closely linked in Russian thinking; Russian military leaders judge that a highly ready non-nuclear force, able to inflict unacceptable damage on an aggressor—including against its economy—at any moment, is its own deterrent.^{131, 132, 133, 134} For Moscow, the word translated as “deterrence” (сдерживание) is more closely linked to a concept of active restraint, or literally to hold back something moving with force.¹³⁵ In the West, deterrence is often seen as an established condition, whereas in Moscow it is an active, flexible process that continues throughout the conflict spectrum.

The Russians define *strategic deterrence* as a package of coordinated political, diplomatic, economic, ideological, moral, spiritual, informational, scientific, technological, military, and other actions taken by a country to demonstrate the decisiveness of the political leadership to tap all instruments of state power consecutively or simultaneously—to stabilize the military, political, and strategic environment, to anticipate aggression, and to deescalate military conflict.^{136, 137, 138, 139, 140} Some Russian theorists break deterrence down further into non-forceful and forceful means and even into deterrence by “type” (economic, military, nuclear, non-nuclear, etc.).¹⁴¹

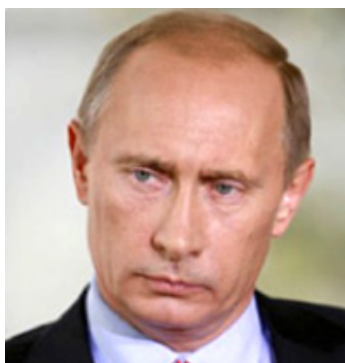
Closely linked to strategic deterrence is the concept of strategic stability. At its basic level, Russia’s concept of deterrence, appropriately applied in its view, assures strategic stability. Strategic stability is the sum total of political, economic, military, and other measures (e.g.,

force) retained by states in a stable balance whereby neither side has the opportunity, interest, or intent to carry out military aggression.¹⁴²

Russia has observed modern conflicts and incorporated aspects of these observations into its deterrence and warfighting strategies. Russia seeks to shape the environment in peacetime to avoid or deter conflict and, if war does occur, will use its military force to establish a favorable outcome for Moscow.^{143, 144} Moscow’s warfighting strategy includes use of indirect action and asymmetric responses, including using technical and psychological operations to disrupt technical systems, influence public opinion, and “erode the opponent’s resolve.”^{145, 146, 147} The modernization of its nuclear and conventional forces to include precision-guided strike weapons provide it a major military force to shape the outcome of war along the entire spectrum of modern conflict.

Military and Security Leadership

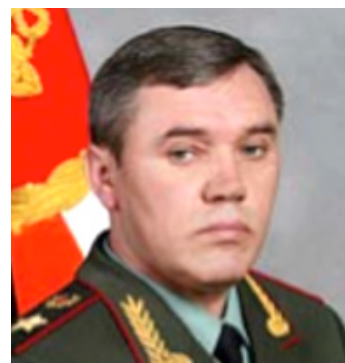
Decisionmaking in Russia is highly centralized, and President Vladimir Putin dominates Russia’s decisionmaking, including for military and security issues. His constitutional responsibilities include appointing the prime minister, chairman of the Central Bank, government ministers, and judges; he may announce State Duma elections or dissolve it. His annual address to the Federal Assembly sets guidelines for national internal and foreign policies, and he resolves internal governmental disputes. The Russian president



President Vladimir Putin



Defense Minister Sergey Shoigu



Gen-Army Valeriy Gerasimov

Image Source: Open source

governs foreign policy, signs international treaties, forms and heads the Security Council, and approves military doctrine.¹⁴⁸ The Russian president serves as the Supreme Commander in Chief of the Russian military, and in times of emergency he may introduce martial law.¹⁴⁹

The Russian Ministry of Defense is subordinate to President Putin as Supreme Commander in Chief and is charged with implementing presidential policy within the military, overseeing all readiness, manpower, and procurement issues.^{150,151,152} The defense minister has the legal authority to oversee and direct operations of the General Staff.¹⁵³

Defense Minister Sergey Shoigu was appointed Defense Minister on 6 November 2012, after 18 years leading the Ministry of Emergency Situations.¹⁵⁴ Shoigu's introduction of frequent strategic-level, no-notice inspections in Russia's military districts, unprecedented in number and scope for the post-Soviet Russian military, has been critical in assessing and increasing combat readiness in the armed forces, as well in as refining defense reforms.¹⁵⁵

The General Staff's primary mission is to ensure the military security of the Russian Federation (RF), that is, to protect the vital interests of the state and society from internal and external threats. The General Staff is responsible for monitoring and characterizing the threat environment and developing strategic and operational plans to equip, mobilize, employ, command, and control the armed forces.^{156,157} According to a 2013 presidential edict describing General Staff missions and functions, its range of responsibilities was broadened to include coordination of all activity undertaken by federal executive organizations to ensure defense capability and security.¹⁵⁸

The chief of the General Staff, Gen-Army Valeriy Gerasimov, serves as the military head of the Russian Armed Forces.¹⁵⁹ Gerasimov previously served as deputy chief of the General Staff from December 2010 until May 2012, when he was appointed commander of the Central Military District.¹⁶⁰ He became chief of the General Staff in November 2012. He is a respected armor officer with substantial combat experience and time in command in Russia's restive North

Caucasus region.^{161, 162, 163} Since his appointment, Gerasimov has focused largely on dealing with military readiness, modifying defense reforms carried out by his predecessor, and preparing for security concerns.^{164, 165, 166, 167}

Main Operations Directorate

The Main Operations Directorate (GOU) of the General Staff has operational control of the armed forces, organizes strategic and operational force planning; executes military exercises and operational training, and engages with multilateral military-security organizations such as the CSTO, CIS, and Shanghai Cooperation Organization.¹⁶⁸ The GOU shapes the Defense Plan of the Russian Federation, identifies sources of threats to Russia for strategic planning, and works with the General Staff's Military-Scientific Committee (VNK) to draft the State Armament Program.^{169, 170, 171, 172, 173}



Gen-Lt Sergey Rudskoy

Image Source: Open source

General Lieutenant (Gen-Lt, two stars) Sergey Rudskoy served as first deputy chief of the GOU for 9 years before becoming its chief in November 2015, Rudskoy has been the General Staff's senior representative at international forums, and he will likely leverage this experience to enhance coordination with other militaries operating in Syria.^{174, 175}

National Military Command and Control

At the pinnacle of Russian military command and control is the Russian president, Vladimir Putin, who serves as the Supreme Commander in Chief of the armed forces. As such, he is the primary decisionmaker and is authorized to assume direct command and control during times of crisis and martial law.^{176, 177} The minister of defense is appointed by the president and is charged with implementing presidential policy within the Ministry of Defense. This includes overseeing all hiring, equipping, training, care, and feeding of military personnel. With the implementation of Russia's New Look military reforms, the minister of defense now has legal authority to oversee and direct operations of the General Staff.¹⁷⁸ The chief of the General Staff is also appointed by the president and serves as the military head of the armed forces.¹⁷⁹ The General Staff's primary mission is to ensure the military security of the Russian Federation and is responsible for monitoring and characterizing the threat environment and developing strategic and operational plans to equip, mobilize, employ, command, and control the armed forces.^{180, 181} The service chiefs

have the responsibility of organizing, training, and equipping their forces to meet current and future national security challenges.¹⁸²

The Russian military has established a redundant and survivable command and control (C2) system to control its forces that serves as a force-enabler. Russia's C4ISR complex uses multiple capabilities ranging from technologically advanced systems to mechanically simple, legacy Soviet devices intended to centralize control of the military while providing intelligence support to speed up decisionmaking cycles and carry out joint operations.^{183, 184}

Russia's C2 system has six key characteristics:

- **Centralized.** The president of the Russian Federation is the commander in chief of the armed forces and is authorized to assume direct C2 over the military via the Ministry of Defense and General Staff during times of crisis and martial law.¹⁸⁵
- **Redundant.** Multiple C2 systems are used at each echelon to disseminate commands and for the transmission of orders.¹⁸⁶
- **Geographically dispersed.** Russia's key C2 nodes and facilities are distributed throughout the country to increase survivability and limit single points of failure.¹⁸⁷
- **Secure.** Moscow is upgrading C2 systems to take advantage of modern and secure digital communications networks.¹⁸⁸
- **Reliable.** Russia routinely conducts snap and other training exercises to test the systems' capabilities to pass information and increase decisionmaking efficiency.¹⁸⁹

- **Built for the worst case scenario.** Russian C2 systems are designed to enable the dissemination of launch orders while under nuclear attack through several C2 systems, including Perimetr, sometimes referred to as the "Dead Hand."¹⁹⁰

Russian Nuclear Command and Control

Maintaining control of its nuclear arsenal is of critical importance to Moscow. During the Cold War, Russia developed a centralized nuclear C2 system capable of meeting its three primary requirements: reliability, speed, and security.

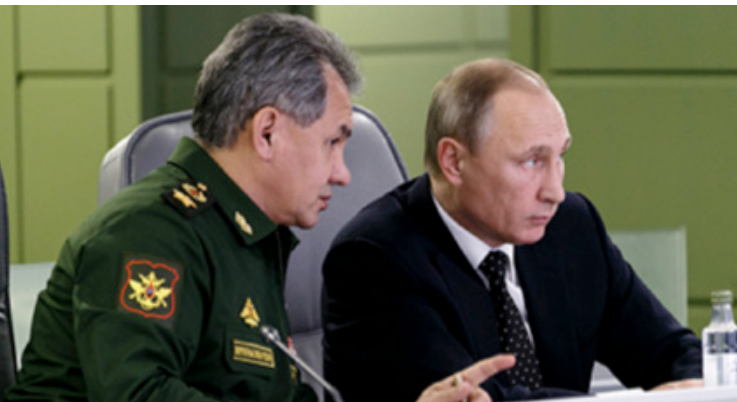


President Putin with the nuclear briefcase.

Image Source: Russia Ministry of Defense/Creative Commons 4.0 Copyright

To accomplish these goals, strategic planners designed a complex system-of-systems that protects weapons from unauthorized or accidental use and centralizes command authority at the highest echelon, while guaranteeing the ability to quickly launch when necessary.¹⁹¹

Russian military doctrine underscores the central role of the Russian president in authorizing the use of nuclear weapons. He uses the nuclear briefcase, which is carried by officers who always remain near the president. The General Staff monitors the status of the weapons of the nuclear triad and will send the direct command to the launch crews following the president's decision to use nuclear weapons. The Russians send this command over multiple C2 systems, which creates a redundant dissemination process to guarantee that they can launch their nuclear weapons. Moscow also maintains the Perimetr system, which is designed to ensure that a retaliatory launch can be ordered when Russia is under nuclear attack.^{192, 193, 194}



President Putin and Defense Minister Shoygu at the NTsUO, November 2015.

Image Source: Russia Ministry of Defense/Creative Commons 4.0 Copyright



National Defense Management Center (NTsUO), November 2015.^{195, 196}

Image Source: Russia Ministry of Defense/Creative Commons 4.0 Copyright

Command and Control of Joint Forces

Moscow Implemented a Joint Strategic Command (OSK) structure in 2010 to better facilitate joint military operations. Russia converted its six military districts into four OSKs.^{197, 198} In 2015, Russia created a fifth OSK, the OSK Northern Fleet, to improve its capability to project military power into the Arctic and to take advantage of the opening of the Russia's Northern Sea Route.¹⁹⁹

In contrast to pre-reform military districts that were primarily land force commands, the new OSKs are joint force elements that have control in times of peace and war over all general purpose forces stationed in—or deployed to—their territories. The phrase “military district” still exists and refers to specific geographic boundaries, but an OSK is the command element for that area. For example, the Eastern Military District covers

the geographic territory from eastern Siberia to the Pacific Ocean, but it is commanded by OSK East.^{200,201} These reforms resulted in a reduced command structure, both vertically and horizontally, which is more streamlined, efficient, and flexible.^{202,203}

Moscow's National Defense Management Center (NTsUO), which came online in 2014,

is a key component of the overall Russian C2 system. The NTsUO works with subordinate regional and territorial defense management centers to coordinate ministry and department activities among lower echelons in accordance with national defense and security directives while liaising with municipal authorities.²⁰⁴



Image Source: AFP

Dolgorukiy Class Nuclear Powered Ballistic Missile Submarine.

Core Russian Military Capabilities

Nuclear Forces and Weapons

Russia is one of the oldest nuclear powers, first detonating a nuclear device in 1949.²⁰⁵ As heir to the former Soviet Union's nuclear arsenal, Russia has one of the world's two largest inventories of strategic weapons. While participating in strategic arms reduction treaties (START) with the United States, Russia is also committed to maintaining and modernizing its nuclear forces. Land-based intercontinental ballistic missiles are controlled by the Strategic Rocket Forces (SRF), and the sea-based and air stra-

tegic systems are managed by the Navy and Aerospace force, respectively. Moscow plans to spend about \$28 billion by 2020 to upgrade the capacity of its strategic nuclear triad.²⁰⁶

- In the first leg of the triad the SRF operates three older ICBM systems for more than half of their land-based nuclear delivery vehicles. The oldest ICBMs in the arsenal are the silo-based liquid-fueled SS-18 (deployed in 1988–92) and SS-19 (deployed in 1979–84). These missiles carry, respectively, 10 and 6 multiple independently-targeted

reentry vehicles (MIRVs). The solid-propellant, single-warhead SS-25 was deployed in 1985–92 as a road-mobile ICBM. As these aging missiles reach the end of their operational lives, they will be withdrawn from service by 2019–2021 and replaced with newer, modern road-mobile and silo-based ICBMs by 2020. The SRF's missile inventories will be equally split between road-mobile and silo-based ICBMs.²⁰⁷

- The second element of the nuclear triad is a fleet of at least 10 nuclear-powered ballistic missile submarines (SSBN) under administrative control of the Naval High Command. The Russian strategic Navy is modernizing, mainly by building and deploying the DOLGORUKIY-class SSBN platform for the new SS-N-32 BULAVA sea-launched ballistic missile (SLBM).²⁰⁸
- The third element of the nuclear triad is the Russian Aerospace Force's fleet of strategic bombers, which forms the core of the Long-Range Aviation (LRA) Command. Like other components of the triad, the LRA is modernizing, to continue operating Tu-95



Russian SS-27 Mod 2 road-mobile ICBM.

Image Source: AFP



Russian Tu-160 heavy bomber and Il-78M tanker.

Image Source: AFP

BEAR and Tu-160 BLACKJACK bombers beyond 2030. The last “new” BLACKJACK was added to the fleet in 2005, and all existing Tu-160s will be upgraded to Tu-160M1 or M2. Russia has announced that it will resume production of Tu-160M2 bombers and complete development of a new generation bomber (Russian designation: PAK-DA) within a decade, but timelines for both programs may slip if financial difficulties arise. The new bomber design is expected to have some stealth and short- or rough-runway capabilities, and employ both conventional and nuclear armament.^{209, 210}

The main function of strategic forces is effective, reliable deterrence. Scenarios for the use of strategic nuclear forces fall into three main categories: preemptive strike (first strike), counterstrike (launch on warning, prior to impact in-country), and retaliatory strike (response to impacts in-country). Because the retaliation option imposes the most difficult situation on the strategic forces—which must respond even

after an enemy's strategic strike has impacted and disabled elements of the force—strategic forces, weapons, and battle management systems are designed and built to be hardened, stealthy, redundant, and reliable—and trained to function in a WMD-degraded environment.²¹¹

Russia continues to retain a sizable nuclear stockpile even after several decades of arms reduction treaties. Russia has a large nuclear weapons infrastructure and a production base capable of producing large numbers of new nuclear weapons annually.^{212, 213}

The U.S.-Russia New Strategic Arms Reduction Treaty (New START), signed on 8 April 2010, sets for each country a limit of 1,550 warheads on strategic platforms, including one warhead attributed to each heavy bomber. There is also a combined limit of 800 deployed and non-deployed ICBM and SLBM launchers and heavy bombers equipped for nuclear armaments, and a separate limit of 700 deployed strategic systems overall. The treaty will last 10 years, with central limits to be met by 2018 with the option for a single extension of another 5 years. Colonel General Sergey Karakayev, commander of the SRF, has stated that an arsenal of 1,500 nuclear warheads would provide Russia a sufficient deterrent against attack.²¹⁴ According to Russia's New START Treaty data provided on 1 April 2017, Russia declared 1,765 warheads on 523 deployed ICBMs, SLBMs, and heavy bombers.²¹⁵

Russia currently has an active stockpile of approximately 2,000 non-strategic nuclear weapons. These include air-to-surface missiles, short-range ballistic missiles, gravity

bombs, and depth charges for medium-range bombers, tactical bombers, and naval aviation, as well as anti-ship, anti-submarine, and anti-aircraft missiles, and torpedoes for surface ships and submarines. There may also be warheads remaining for surface-to-air and other aerospace defense missile systems.^{216, 217}

Russia's nuclear forces modernization goals include: replace Soviet-legacy systems with modern nuclear weapons, maintain rough parity with the U.S. nuclear arsenal, improve the survivability and efficiency of its nuclear weapons, and maintain prestige on the international stage. Russia's nuclear modernization includes both strategic and non-strategic nuclear weapons.^{218, 219, 220, 221}

Biological and Chemical Weapons

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In 1992, then-Russian President Boris Yeltsin admitted having an offensive biological weapons program and publicly committed to its termination. Subsequently, the Russian government reversed itself and now claims neither the Soviet Union nor Russia has ever pursued an offensive biological weapons program.²²²

In 1997, Moscow declared the world's largest stockpile of chemical agents and munitions—40,000 metric tons of agents—under the Chemical Weapons Convention (CWC). The declared inventory consisted of a comprehensive array of traditional chemical warfare agents filled in munitions such as artillery, bombs, and missile warheads, as well as stored in bulk.²²³

As a state party to the CWC, Russia is obligated to destroy its chemical weapon stockpile.

As of January 2017, Russia had destroyed 96.4% of its declared chemical weapons stockpile, according to press reporting.²²⁴ Russia intends to complete destruction of its remaining declared stockpile by 2020.²²⁵ Moscow has completed destruction activities and closed the facilities in Gornyy, Kambarka, Maradykovskiy, Leonidovka, Schchuch'ye, and Pochep and continues destruction of its remaining chemical weapons stockpile at a facility in Kizner.²²⁶

Russia used chemical incapacitants to resolve the Dubrovka Theater hostage situation in 2002 and may consider using them in other counterterrorism actions.²²⁷

Anti-Access/Area Denial

Anti-access/area denial (A2/AD) refers to preventing an adversary from operating in a particular region or area. Russia repeatedly cites in open source literature the need to repel or defend against a Western aerospace attack. Russia would seek to deter any Western use of aerospace power against Russia using its conventional, non-strategic nuclear, and, in extreme circumstances, its strategic nuclear forces. Russian military theorists have examined the likelihood of a great power war arising out of a local conflict, similar to the events leading up to World War I, and escalating to combat with U.S./NATO or another peer.²²⁸ Based on insight gleaned from studies of warfare since 1991, Russia would seek to limit the capability of an adversary to conduct aerospace strikes on its territory.^{229, 230}

Russian strategy for A2/AD would focus on a combination of various elements that military planners and theoreticians have identified as critical to the development of a comprehensive approach to A2/AD.^{231, 232} These involve the incorporation of the following elements.

Information Operations

Information operations are seen as a critical capability to achieve decisive results in the initial period of conflict with a focus on control of the information spectrum in all dimensions of the modern battle space. Authors often cite the need in modern warfare to control information—sometimes termed “information blockade” or “information dominance”—and to seize the initiative early and deny an adversary use of the information space in a campaign so as to set the conditions needed for “decisive success.” Russia continues to emphasize electronic warfare and other information warfare capabilities, including denial and deception as part of its approach to all aspects of warfare including A2/AD.²³³

Strategic Air Operations

Russian military theorists continue to emphasize the key importance of strategic air operations in modern war. This concept originated in the 1920s, where Soviet planners viewed the initial period of war as the time that aviation would strike deep in enemy rear areas to destroy mobilization and concentration areas. At the same time, air forces would also prioritize the defense of the country against enemy air attack and conduct close air support of

ground operations, achieving air supremacy in the first days of the war using all means.²³⁴ This concept was underscored in 1993, when Defense Minister Grachev indicated that “war will begin with an offensive aerospace operation on both sides.”²³⁵ Russian planners have indicated that in such a war there will be no front and no rear, with space emerging as an independent theater of military operations. Russian doctrine, down to the present day, continues to emphasize that strategic objectives can be achieved with mass aerospace strikes early in a conflict with victory achieved without the seizure and occupation of territory by forces.²³⁶

Russian planners have analyzed U.S. operations such as DESERT STORM, NOBLE ANVIL, and IRAQI FREEDOM for insight, observing military art at the strategic, operational, and tactical levels in campaigns that displayed U.S. aerospace capabilities and underscored the importance of developing comparable indigenous capabilities that can be employed defensively.^{237, 238} This emphasis on strategic air operations is reflected in long-term procurement goals of platforms and weapons focused on space, aerospace defense, and precision-guided munitions.^{239, 240}

Integrated Air Defense System

Russian doctrine places a great deal of emphasis on aerospace defense as a key component in its overall A2/AD strategy.^{241, 242} Though still in development, Russia’s 21st century integrated air defense system will be designed to integrate future and existing systems around a central command structure that is designed



Russian S-400 Surface-to-air missile systems – a key component of Moscow’s A2/AD strategy.

Image Source: AFP

to promote the interaction of all air defense forces and weapons.^{243, 244} Capabilities optimized against cruise missiles are key to this defense component, not just those optimized to target aircraft.

Modern Precision Strike Capabilities: Air and Sea Systems in Combination with Older Technologies^{245, 246}

Russia continues to develop a variety of sea- and aerospace-based programs that offer a variety of offensive and defensive capabilities that could enable the implementation of its integrated A2/AD strategy.^{247, 248} These include the continued production and deployment of coastal defense cruise missiles, air/surface/sub-surface-launched anti-ship cruise missiles (ASCMs),²⁴⁹ submarine-launched torpedoes, and naval mines, along with Russian fighter, bomber, and surface-to-air missile capability.

These are intended provide Russia with the ability to limit access to its territory and extend its strategic depth by providing long range kinetic strike capability.

Precision Strike

Russian doctrine on Precision Strike is essentially a 21st century extension of the Russian doctrine of “deep battle” initially codified during the 1920s and 1930s by Chief of the General Staff Marshal Mikhail Tukhachevskiy and represents an attempt to incorporate new technology into traditional Russian strategic, operational, and tactical strategy. Deep battle was a strategic concept that focused on terminating, overwhelming, or dislocating enemy forces not only at the line of contact, but throughout the depth of the battlefield. Deep battle encompassed maneuvers by multiple Soviet Army front-size formations simultaneously. It was not meant to deliver a victory in a single operation; instead, multiple operations, which might be conducted in parallel or successively, would induce a catastrophic failure in the enemy's defensive system. Initially, deep battle focused on improved ground and air forces and was influential in Soviet operations in World War II from 1943 onward. Chief of the General Staff Marshal Nikolay Ogarkov, writing in the 1970s to 1980s, updated the deep battle concept to develop a more aerospace-centric approach in an attempt to incorporate traditional Russian doctrine with precision technology.²⁵⁰

Ogarkov theorized throughout his tenure as chief of the Soviet General Staff that conventional precision-guided munitions were part of a revolution in military affairs. In an influential 1983 *Krasnaya Zvezda* article, Ogarkov took notice of the impact of new types of precision weapons and micro-circuitry on the development of conventional capabilities. For Ogarkov, the development of new conventional forms of non-nuclear weapons would enable the sorts of multi-front operations that were envisioned in the original deep battle concept. On a theoretical basis, Ogarkov forecast that precision strike could exercise a direct and decisive outcome of a future war.^{251,252}

Despite enthusiasm by the Soviet General Staff, very little progress was made in the development of precision-guided munitions except at the theoretical level for the remainder of the Soviet period. In 1991, DESERT STORM provided the Soviet military with proof of concept regarding the use of precision-guided munitions. Former Soviet officials and Russian authorities argued that the DESERT STORM campaign demonstrated the capability of precision-guided airstrikes in the land attack role to paralyze the rear area and an adversary's economy. Targets could include vulnerable areas of the economy, command and control centers, and transportation centers. The introduction of precision-guided munitions changed the nature of modern war by reinforcing traditional concepts that emphasized decisive action during the initial stage of warfare and at the same time undermined the traditional Russian reliance on large ground force groupings to achieve tactical and strategic objectives.²⁵³

Russia was unable to achieve real progress in the development of precision strike until the first decade of the 21st century, when it was able to create a viable state armaments program that allowed prioritization of certain key components of 21st-century warfare. Between 2010 and 2015, Russia's strategic forces, space and aerospace defense platforms, and precision-guided munitions²⁵⁴ such as ISKANDER, KALIBR, or KH-101 were defined as priorities, and system development, production, and testing occurred. The effectiveness of precision-guided munitions are being tested in a variety of settings, including Command Staff exercises KAVKAZ-2012, VOSTOK-2014, and KAVKAZ-2016, as well as operationally against targets in Syria beginning in 2015.^{255, 256, 257}

Space/Counterspace

The Russian General Staff postulates that modern warfare is increasingly reliant on information, particularly from space, because of the expansion of the geographic scope of military action and the information needs of high-precision weapons.²⁵⁸ Russia has a significant constellation of satellites in orbit. According to Colonel Sergey Marchuk, chief of the Main Test Space Center, Russia has more than 130 spacecraft, civilian and military, performing communications, navigation, geodetic survey support, meteorological, reconnaissance, and intelligence gathering missions.²⁵⁹

Russia's space program is both formidable and in a state of rebuilding. Moscow seeks to maintain the health of its current constellations



Kh-101/102 air-launched cruise missiles on a Tu-95MS heavy bomber; Moscow first used its precision strike arsenal in combat during a series of 2015 strike operations by sea- and air-launched cruise missiles against targets in Syria.

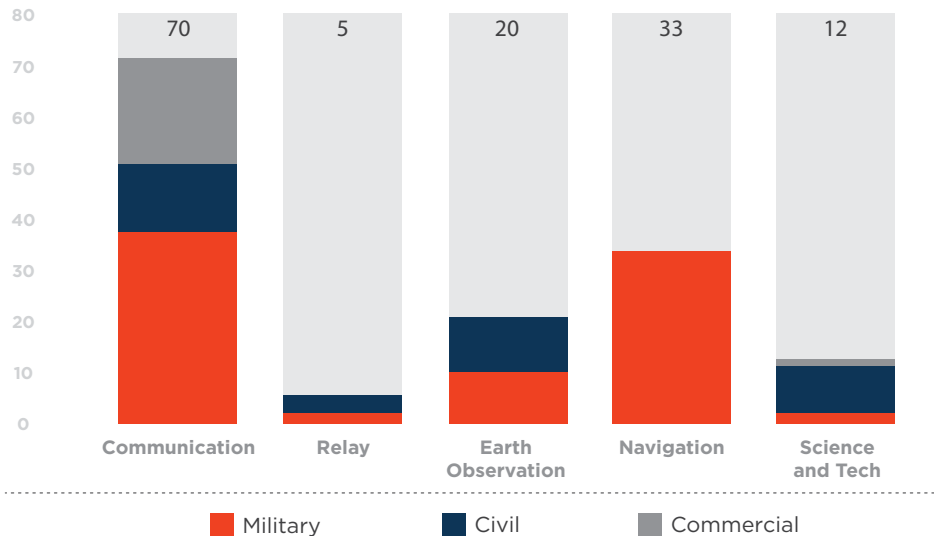
Image Source: Shutterstock

while deploying a next-generation architecture on par with Western space systems. Over the next several years, Russia will prioritize the modernization of its existing communications, navigation, and earth observation systems, while continuing to rebuild its electronic intelligence and early warning system constellations.

Russia's current systems provide an array of capability including high-resolution imagery, terrestrial and space weather, communications, navigation, missile warning, electronic intelligence, and scientific observations. With a long-standing heritage in space, Russia gains a sense of national pride from its space program, which has included manned missions and leading the world in space launches. Currently ranked third in total number of satellites in orbit behind the United States and China, the figure below displays a breakdown of Russia's satellites in orbit.

Russian satellites in orbit, 5 October 2016²⁶⁰

1612-11112



Russia has concluded that gaining and maintaining supremacy in space has a decisive impact on the outcome of future conflicts.²⁶¹ According to Russia's 2010 military doctrine, militarization of outer space is a "main external military danger."²⁶² The 2014 update to Russia's military doctrine calls out Western global strike capability by name.²⁶³ Russia, in military journals, has observed that Western operations have shifted to non-contact operations that rely on long-range, space-supported precision-guided munitions.^{264, 265, 266} Russia has been very vocal expressing its concerns about Western precision strike capabilities and missile defense plans. Deputy Prime Minister Dmitry Rogozin compared U.S. ballistic missile defense efforts in Eastern Europe to the Strategic Defense Initiative of 1983 and stated

that such an effort justifies the development of Russian counterspace programs.

The Russian General Staff argues for pursuing in wartime such strategies as disrupting foreign military C2 or information support because they are so critical to the fast-paced, high-technology conflicts characteristic of modern warfare.^{267, 268} Russia believes that having the military capabilities to counter space operations will deter aggression by space-enabled adversaries and enable Russia to control escalation of conflict if deterrence fails.²⁶⁹ Military capabilities for space deterrence include strikes against satellites or ground-based infrastructure supporting space operations.²⁷⁰

On 1 August 2015, Russia created the Russian Federation Aerospace Forces by merging

the former Air Force and Aerospace Defense Troops. Defense Minister Shoygu stated the change was “prompted by a shift in the center of gravity... towards the aerospace sphere” and as a counter to the U.S. Prompt Global Strike doctrine.^{271,272} This merged force includes Russia’s space forces who have the mission of conducting space launches and maintaining the ballistic missile early warning system, the satellite control network, and the space object surveillance and identification network.^{273,274,275}

Russia also reorganized its space industry responsible for space research, design, and production. Russia merged the government-owned United Rocket and Space Corporation (ORKK),

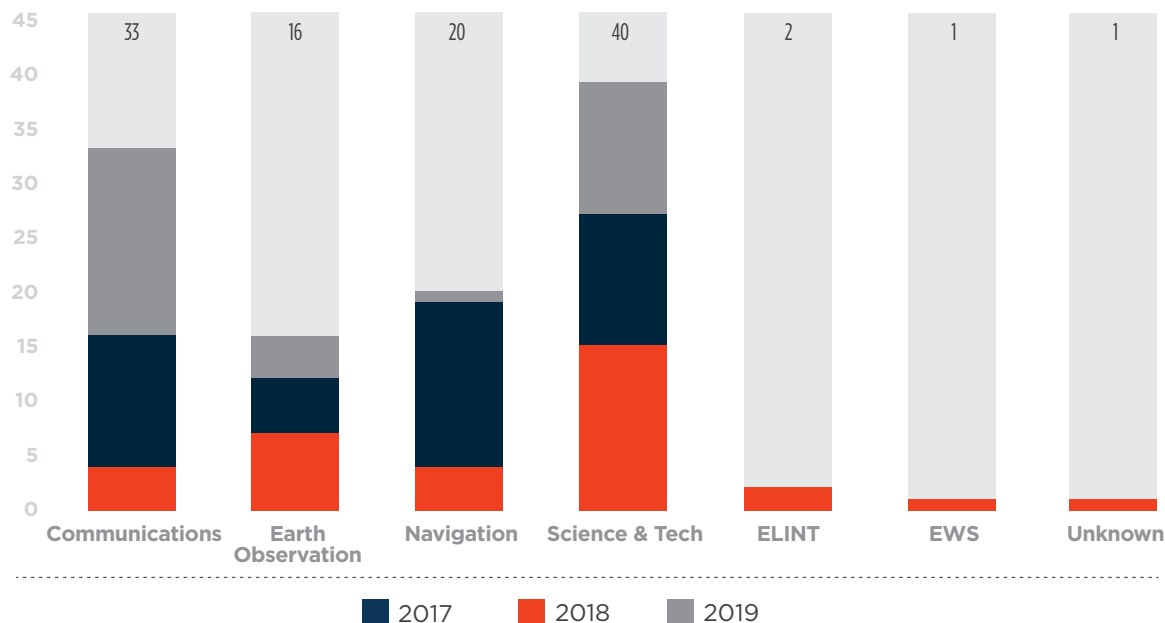
which previously absorbed the majority of the space industry corporations in 2013, with the Federal Space Agency.^{276,277} President Putin finalized the dissolution of the Federal Space Agency on 1 January 2016, naming the joint organization the Roscosmos State Corporation.

Cyber

Russia views the information sphere as a key domain for modern military conflict.^{278,279} Moscow perceives the information domain as strategically decisive and critically important to control its domestic populace and influence adversary states. Information warfare is a key

Russia’s planned space launches through 2019²⁸⁰

1612-11105



means of achieving its ambitions of becoming a dominant player on the world stage.²⁸¹

Since at least 2010, the Russian military has prioritized the development of forces and means for what it terms “information confrontation,”^{282,283} which is a holistic concept for ensuring information superiority, during peacetime and wartime.²⁸⁴ This concept includes control of the information content as well as the technical means for disseminating that content. Cyber operations are part of Russia’s attempts to control the information environment.

The weaponization of information is a key aspect of Russia’s strategy and is employed in time of peace, crisis, and war. In practice, information battles draw upon psychological warfare tactics and techniques from the Soviet Era for influencing Western societies.²⁸⁵ Moscow views information and psychological

warfare as a measure to neutralize adversary actions in peace to prevent escalation to crisis or war.

Chief of the General Staff Gerasimov announced that “information operations troops” were involved for the first time in the Kavkaz-2016 strategic command staff exercise in September 2016, demonstrating Russian military commitment to controlling the information domain.^{286,287,288}

Propaganda Helps Shape The Information Environment

Russian propaganda strives to influence, confuse, and demoralize its intended audience, often containing a mixture of true and false information to seem plausible and fit into the preexisting worldview of the intended audience. Russian propaganda targets a wide variety

Information Confrontation

“Information confrontation,” or IPb (*informatsionnoye protivoborstvo*), is the Russian government’s term for conflict in the information sphere. IPb includes diplomatic, economic, military, political, cultural, social, and religious information arenas, and encompasses two measures for influence: informational-technical effect and informational-psychological effect.^{289,290}

- Informational-technical effect is roughly analogous to computer network operations, including computer-network defense, attack, and exploitation.
- Informational-psychological effect refers to attempts to change people’s behavior or beliefs in favor of Russian governmental objectives.

IPb is designed to shape perceptions and manipulate the behavior of target audiences. Information countermeasures are activities taken in advance of an event that could be either offensive (such as activities to discredit the key communicator) or defensive (such as measures to secure Internet websites) designed to prevent an attack.

of audiences, including its own population, selected populations of other countries, domestic and foreign political elites, and the West writ large.^{291, 292} The variety of techniques for disseminating Russian propaganda include pro-Kremlin “news” websites and TV and radio channels such as *Russia Today* and *Sputnik News*, bots and trolls on social media, search engine optimization, and paid journalists in Western and other foreign media.

Cyber-Enabled Psychological Operations

One of the newest tools in Russia’s information toolkit is the use of cyber-enabled psychological operations that support its strategic and tactical information warfare objectives. These new techniques involve compromising networks for intelligence information that could be used to embarrass, discredit, or falsify information. Compromised material can then be leaked to the media at inopportune times.

- **Hactivists.** Russian intelligence services have been known to co-opt or masquerade as other hacktivist groups. These groups

appeal to Russia due to the difficulty of attribution and the level of anonymity provided. It is widely accepted that Russia, via patriotic hackers, conducted a cyber attack on Estonia in 2007.²⁹³ Under the guise of hacktivism, a group called “CyberCaliphate,” seemingly ISIS associated, conducted a hack against French station TV5 Monde in January 2015. The CyberCaliphate group was later linked to Russian military hackers. The same group hijacked the Twitter feed of the U.S. Central Command.²⁹⁴

- *CyberBerkut* – A False Persona. Russian hackers also use false personas. CyberBerkut is a front organization for Russian state-sponsored cyber activity, supporting Russia’s military operations and strategic objectives in Ukraine.²⁹⁵ CyberBerkut employs a range of both technical and propaganda attacks, consistent with the Russian concept of “information confrontation.” Since emerging in March 2014, CyberBerkut has been implicated in multiple incidents of cyber espionage and attack, including distributed denial of service attacks against NATO, Ukraine, and German

Major themes of Russian propaganda include:

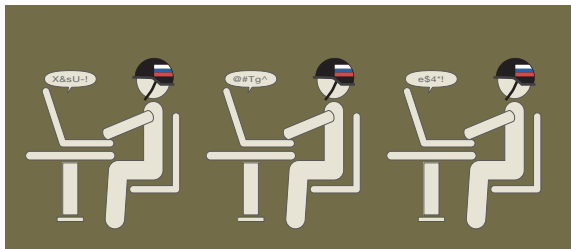
The West’s liberal world order is bankrupt and should be replaced by a Eurasian neo-conservative post-liberal world order, which defends tradition, conservative values, and true liberty.²⁹⁶

The West demonizes Russia, which is only trying to defend its interests and sovereignty and act as an indispensable nation in world affairs.

The United States is determined to interfere with and overthrow sovereign governments around the world.²⁹⁷

government websites. More recently, it has focused on the online publication of hacked documents, ostensibly obtained from the Ukrainian government and political figures' computers. CyberBerkut uses information gained through these hacks to discredit the Ukrainian government. The intent is to demoralize, embarrass, and create distrust of elected officials.^{298, 299, 300, 301, 302, 303}

- **Trolls.** Russia employs a troll army of paid online commentators who manipulate or try to change the narrative of a given story in Russia's favor. Russia's Troll Army, also known as the Internet Research Agency, is a state-funded organization that blogs and tweets on behalf of the Kremlin.³⁰⁴ Trolls typically post pro-Kremlin content and facilitate heated discussions in the comments sections of news articles. Their goal is to counter negative media and "Western influence." While the goal of some trolls is to simply disrupt negative content, other trolls promote completely false content.³⁰⁵
- **Bots.** Another way Russia manipulates the information space is through the use of bots. Bots are automated pushers of content on



Russia uses a Troll Army to disseminate and overwhelm blogs and twitter communications.

Image Source: DIA, D3 Design



CyberBerkut Arm Patch.

Image Source: Russia Ministry of Defense/Creative Commons 4.0 Copyright

social media. These bots vary in sophistication and can continuously push content or imitate real life patterns. Bots can drown out unwanted content or push a specific message. Bots have the ability to overwhelm the information space and discourage readers from looking for real content.^{306, 307}

Information Defense

The Russian Federation Security Council's 2016 Information Security Doctrine mandates protecting Russian citizens from outside threats to the information sphere. The doctrine aims to secure Russian information freedom and protect information technologies from foreign influence, cyberattacks, intelligence collection, and terrorism. The doctrine emphasizes the need to develop a national system for government control of the Russian Internet, information warfare forces, and cyber weapons.³⁰⁸

Since at least 1999, Russia has attempted to gain consensus on international governance of the Internet and international norms and rules



The Internet Research Agency in St. Petersburg.

Image Source: Russia Ministry of Defense/Creative Commons 4.0 Copyright

guiding the behavior of states in the information space. A major component of the proposal pertains to a state’s ability to govern its information space as a means of maintaining state sovereignty and preventing an arms race in cyberspace. Although state sovereignty traditionally refers to domestic enforcement law, Russia commonly uses this term to denounce other nations meddling in their internal affairs. Russia also proposed a code of conduct for cyberspace with specific dictums regarding non-state cyber-actors, such as criminal hackers involved in cyber activities.^{309, 310}

***Media Laws -
A Hedge Against Instability***

In the past decade, Russia has implemented numerous laws curbing domestic media in broadcast, print, and cyber media, taking an abrupt turn from the post-Soviet glasnost policies of media “openness” and its own constitutional guarantees of freedom of speech.³¹¹ The use of social media to organize opposition street protests in

2011 and 2012 prompted a reappraisal of official internet policy. Since then, the authorities have treated the Internet as a serious threat, pushing through laws increasing government controls over technology and content giving the state powers to block content, ban websites, monitor online activity, and limit media ownership.³¹² The ultimate goal of this policy appears to be to create what some have called a "sovereign internet."³¹³

The Kremlin's strategy of reducing foreign influence on the media has not been confined to the internet. Numerous other pieces of legislation have been passed restricting the level of foreign ownership of the media, impeding the work of the foreign NGOs supporting independent media in Russia and forcing Russian media to account for any foreign funding they receive. A recent law has even banned foreign companies from conducting TV audience research in Russia.³¹⁴

Indirect Action

Indirect action is a component of Russia’s strategic deterrence policy developed by Moscow in recent years. Its primary aim is to achieve Russia’s national objectives through a combination of military and non-military means while avoiding escalation into a full blown, direct, state-to-state conflict.³¹⁵ Drawing on a combination of facets from Russia’s whole-of-government or interdepartmental strategy and overt or covert military means, indirect action seeks to exploit weaknesses and fissures in target countries in order to fulfill Moscow’s desired national goals.³¹⁶

In Ukraine, indirect action manifested itself in non-military measures first, with less visible efforts taken to exert pressure on Kiev, like restricting food imports to Russia, but then broadening to wider actions involving financial, economic, and information warfare. Later, this was followed by unconventional military action involving Russian Spetsnaz and other non-attributable military units in Crimea and eastern Ukraine.³¹⁷ This phase involved the actual seizure of facilities and infrastructure by these covered units, along with the use of local agents, sympathizers, and irregular forces in the vicinity to cause unrest and subversion, all of which are distinct hallmarks or evolutions of Soviet-era Spetsnaz wartime operations.³¹⁸

Electronic Warfare

Based on authoritative military academic writings, the Russian military views electronic warfare as an essential tool for gaining and maintaining information superiority over its adversaries. Russia's world-class electronic warfare forces support denial and deception operations and allow identification, interception, disruption, and, in combination with traditional fires, destruction of adversary command, control, communications, and intelligence capabilities.

In addition to technical disruption, effective use of electronic warfare can confuse adversary commanders and decisionmaking at any or all levels, demoralize opposing troops, and allow Russian forces to seize the operational initiative.^{319, 320, 321} Russia has fielded a wide range of ground-based

electronic warfare systems to counter GPS, tactical communications, satellite communications, and radars.³²² Further, military academics have suggested that electronic warfare fuse with cyber operations, allowing electronic warfare forces to corrupt and disable computers and networked systems as well as disrupt use of the electromagnetic spectrum.^{323, 324} Russia has aspirations to develop and field a full spectrum of electronic warfare capabilities to counter Western C4ISR and weapons guidance systems.

Power Projection

Moscow continues to prioritize modernizing its military forces, viewing military power as critical to achieving key strategic objectives and global influence. Russian acquisition plans for its ground, air, naval, and missile forces are designed to enable the ability to conduct out of area operations during peacetime and to contest



Russian jammer on display at Kubinka in 2016; Moscow has invested heavily in developing sophisticated electronic warfare capabilities.

Image Source: Shutterstock

U.S./NATO military superiority in the event of a regional conflict. The rebuilt Russian military includes modernized, agile general purpose forces, vital to limited out-of-area power projection. While the objectives of the Russian military do not suggest a return to the Cold War posture, Moscow intends to use its military to promote stability on its own terms and to assert its great power status.

Russia's State Armaments Program will continue to emphasize priority programs related to the development of a viable 21st-century military, prioritizing strategic forces, space, precision-guided munitions, and aerospace defense capabilities. Russia's strategic triad along with the increasing capability of its conventional forces remains a critical deterrent in preventing an attack. Russian long-range aviation remains a priority for Russian leadership as a key part of its strategic deterrent capability, while also providing an advanced conventional option to rapidly project power well beyond Russian borders. Russia is also modernizing its naval forces, which conduct operations globally in order to "show the flag" and contribute to Moscow's narrative of Russia's re-emergence as a global power. Russia is also focused on enhancing its C4ISR capabilities, which will enable improved targeting and timely responses to perceived threats.

- **Long-Range Aviation:** Russia periodically deploys assets of its LRA bomber force to conduct limited out-of-area operations as a power projection tool. LRA operations have included activity in the Pacific, the Arctic, and even as far south in 2008 as Venezuela. The capabilities of LRA aircraft allow for missions as far as 5,000–10,000 kilometers away.³²⁵

- **Naval Forces:** The Russian Navy will continue to conduct operations in parts of the world that are deemed important to national objectives. In recent times, these have included operations in the Mediterranean,³²⁶ the Arctic,³²⁷ and periodic deployments to the western hemisphere³²⁸ and the Indian Ocean.³²⁹ Russia's naval recapitalization program will focus on the development of modern general purpose submarines and surface combatants to enable continued out-of-area operations.^{330, 331}
- **Expeditionary Operations:** Along with more conventional power projection missions, Russia has displayed a new capability to field an expeditionary force capable of intervening in a foreign conflict. In Syria, Russia used a mix of maritime and air assets to forward deploy its forces, and Russia will almost certainly be able to logistically support its current level of operations in Syria via a mix of those means for the foreseeable future.³³²

After politically supporting the Syrian regime throughout the Syrian civil war, Moscow began to deploy military forces to Syria in September 2015, likely both to shore up the regime and assert Russia's status as a military player and powerbroker in the Middle East.³³³ The majority of Russian air strikes and artillery operations have supported regime ground offensives and focused on opposition targets, with an increased focus against Islamic State forces at certain points in their campaign.^{334, 335, 336}

Russia has also sought to use the Syrian intervention as a showcase for its military modernization program and advanced conventional weapons systems, including employing systems from out-

side of Syrian territory to demonstrate its power projection capacity. Moscow has launched Kalibr land-attack cruise missiles from naval units in the Caspian Sea and the Mediterranean Sea, demonstrated new capabilities with air-launched cruise missiles from its Tu-160M1 BLACKJACK and Tu-95MS BEAR H heavy bombers, forward-staged long-range Tu-22M3 BACKFIRE bombers for strikes from Iranian territory, and deployed some of its most advanced air and air defense systems to Syria.^{337, 338, 339, 340} These operations are meant to demonstrate strategic capabilities and message the West about the manner in which the Russian military could operate in a major conventional conflict, while also providing combat experience for the personnel and allowing the systems to be field tested.^{341, 342}



A Russian naval task force centered on its only aircraft carrier, the Admiral Kuznetsov, conducted a 5-month deployment to the Mediterranean to support strike operations in Syria.

Image Source: AFP

Underground Facilities

Russia inherited a vast underground facilities (UGFs) program from the Soviet Union, primarily designed to ensure the survival of the leadership and military command and control in wartime. This program involved the construction of underground bunkers, tunnels, secret subway lines, and other facilities beneath Moscow, other major Russian cities, and the sites of major military commands. Although the majority of these hardened facilities are near-surface bunkers, many critical sites are built deep underground and, in some cases, are hundreds of meters deep.³⁴³

Deep underground command posts both within and outside of Moscow are interconnected by a network of special deep subway lines that provide leadership a quick and secure means of evacuation. The leadership can move from their peacetime offices through concealed entryways to protective quarters beneath the city. A deep underground facility at the Kremlin and an enormous underground leadership bunker adjacent to Moscow State University are intended for the National Command Authority in wartime. They are estimated to be 200–300 meters deep and can accommodate an estimated 10,000 people.³⁴⁴

The leadership can remain beneath Moscow or travel along the special subway lines that connect these urban facilities to their preferred deep underground command posts outside the city, and possibly to the VIP terminal at Vnukovo Airfield, 27 kilometers southwest of the Kremlin. Two of the most important underground complexes for the National Command

Authority and General Staff are located some 60 kilometers south of the city.³⁴⁵

The support infrastructure for the UGFs in and around Moscow is substantial. A highly redundant communications system, consisting of both on-site and remote elements, allows the leadership to send orders and receive reports. Highly effective life support systems may permit independent operations for many months following a nuclear attack.³⁴⁶

Russian military officials suggest the UGF program has been retained. In October 2014, chief of the General Staff's Main Operations Directorate, General-Lieutenant Andrey Kartapolov, told a *Rossiyskaya Gazeta* correspondent that the new National Defense Management Center in Moscow is safe from a nuclear strike. The National Defense Management Center became operational in December 2014 and is at the apex of the national command structure. General Kartapolov noted that protection against nuclear strike is always considered in building the most important facilities.³⁴⁷

Denial and Deception

The Russian military relies on extensive use of denial and deception (*maskirovka*) to obscure intentions and conceal military movement. The family of capabilities that composed traditional *maskirovka* includes camouflage, deception, denial, subversion, sabotage, espionage, propaganda, and psychological operations.

Russian operational and tactical *maskirovka* is a form of operational combat support. It encompasses a set of interrelated organizational and

technical measures and practical actions of staffs, troops, and facilities intended to deceive foreign intelligence. *Maskirovka* promotes surprise, maintenance of combat capability, and survivability. For example, *maskirovka* in rocket units and subunits is organized and carried out for the purpose of ensuring that the enemy experiences maximum difficulty in collecting intelligence data to reduce the effectiveness of strikes, but is also carried out to create the false appearance of a combined unit in support of deception at the operational level of war.^{348, 349, 350, 351, 352, 353}

Moscow employed *maskirovka* at the beginning of the 2014 conflict in Ukraine, when media reported on the presence of “little green men” in Crimea who strongly resembled Russian soldiers although they wore uniforms without insignia identifying their origins. President Putin insisted they were “self-defense groups” or “volunteers.” By the time Moscow admitted to the presence of Russian troops in Crimea, this deception had created enough confusion to forestall significant international intervention in the conflict, and the ground reality was irreversibly tipped in Russia’s favor.^{354, 355, 356, 357, 358}



Moscow used troops without insignia – the “little green men” – to seize the Crimean Peninsula in early 2014, claiming these forces were local militia.

Image Source: Shutterstock

Outlook: A Modernizing Force

The Russian military has built on the military doctrine, structure, and capabilities of the former Soviet Union, and although still dependent on many of the older Soviet platforms, the Russians have modernized their military strategy, doctrine, and tactics to include use of asymmetric weapons like cyber and indirect action such as was observed in Ukraine.

One of Russia's biggest hurdles since the dissolution of the former Soviet Union has been its need to rely heavily on its nuclear forces to deter aggression, resulting in its stated willingness for first-use of nuclear weapons.^{359,360} Russia has been building its conventional force capability along with modernizing its nuclear forces to create a more balanced military. Moscow has stressed development of conventional precision-strike weapons, a critical gap in its inventory, and recently has tested them in combat in Syria, providing it with an advanced non-nuclear capability to impact the battlefield.

In 2009, after almost two decades of deterioration and neglect of the Russian military, Moscow began developing a more modern military force capable of power projection outside Russia's borders. The New Look reforms instituted structural and organizational reforms and the State Armaments Program emphasized development of modernized platforms and weapons' systems. In 2013, readiness became an additional area of emphasis with institution of no-notice "snap" exercises and accompanying mobilization and deployments. Moscow's long-term goal is build-

ing a military prepared to conduct the range of conflicts from local war through regional conflict to a strategic conflict that could result in massive nuclear exchange.

Recently, Russian forces have been involved in conflict in Ukraine and conducted an expeditionary deployment to Syria, providing experience in combat operations, and employing new tactics and advanced weapons systems. This more flexible and modern Russian force did not spring up overnight but is a result of years of concentrated effort to develop and field an improved military force.

Russia's desire to be a leader in a multipolar world and recapture the "great power" status it had in Tsarist times and the latter days of the Soviet Union requires a force capable of deterring aggression, fighting the range of conflicts from local crises to nuclear war, projecting power and employing force if necessary to intervene in conflicts across the globe. Despite an economic slowdown that will affect the Russian military's timeline for building all of its planned capabilities, Russia is rapidly fielding a modern force that can challenge adversaries and support its "great power" aspirations.

Russia's commitment to building its military is demonstrated by its retention of the draft. All Russian males are required to register for the draft at 17 years of age and all men between the ages of 18 and 27 are obligated by law to perform one year of military service.

Appendix A: Russian Strategic Rocket Forces

The Strategic Rocket Forces (SRF) (Russian name: *Raketniye Voyska Strategicheskovo Naznacheniya* [RVSN]), is one of the most potent missile forces in the world.^{361, 362} The SRF was established as a separate military service in December 1959 to operate the first nuclear-armed intercontinental-range land-based ballistic missile (SS-6), as the third element of Russia's growing strategic nuclear force deterrent triad.^{363, 364}

The Russian SRF headquarters is in Moscow. The SRF's three missile armies—the 27th, 31st, and 33rd—have a total of 12 subordinate missile divisions. Eight of the divisions operate road-mobile ICBMs, with the other four armed with silo-based missiles.^{365, 366} The Russian SRF have approximately 60,000 personnel.³⁶⁷

In 2016, the SRF had deployed 299 operational missiles, with half that number equipped with

Russia Strategic Rocket Forces

1612-11167



Image Source: DIA, D3 Design

Locations of Strategic Rocket Forces missile divisions.^{368, 369, 370}

multiple independently-targetable reentry vehicles (MIRV) payloads. The SRF arsenal includes three older ICBM types—46 SS-18s and 30 SS-19s in silos, and 72 road-mobile SS-25s—and two newer ICBM types—60 silo-based and 18 road-mobile SS-27 Mod 1s, and 73 of the most modernized SS-27 Mod 2s.^{371,372}

The development of new ballistic missile systems is a high priority for Russia. The Russian military has outlined that the SRF should be completely re-armed with modern (post-Soviet) missile systems by 2022.³⁷³ Russia has stated that it will soon begin testing a developmental, heavy, liquid-propellant ICBM called the Sarmat to replace the aging SS-18. Russia's goal is to begin Sarmat deployment in the 2018–2020 timeframe.

Russia has announced a new missile called the Rubezh (Border) or RS-26, which is smaller than the SS-27 Mod 2 ICBM and will be deployed in 2017.³⁷⁴ According to the SRF commander, the RS-26 is envisioned as a mobile system and has been referred to by Russian Vice-Premier Rogozin as a “missile defense killer.”³⁷⁵ Russian industry officials also claim development of the Barguzin rail-mobile ICBM is continuing. A decision on full development, production, and deployment will occur in the coming months.³⁷⁶

The currently deployed SS-18, which Russia plans to replace with the Sarmat, is a silo-based, 10-MIRV heavy ICBM first deployed in 1988; it needs to be replaced by 2018–2020, when the SS-18s' 27- to 30-year service lives expire.³⁷⁷ The SS-19 is a silo-based, six-MIRV ICBM that entered service in 1980, which the

SRF will replace with silo-based SS-27 Mod 2 by 2019, as the SS-19s retire.³⁷⁸

The SS-25 solid-propellant, single-warhead, road-mobile ICBM was first deployed in 1985 and will retire by 2019–2021, to be replaced by regiments of new production SS-27 Mod 2s, and possibly the two-stage, road-mobile RS-26 Rubezh.^{379,380}

In addition, Russian leadership claims a new class of hypersonic glide vehicle is being developed to allow Russian strategic missiles to penetrate missile defense systems. Hypersonic glide vehicles (HGVs) are maneuverable vehicles that travel at hypersonic (typically greater than Mach 5) speed and spend most of their flight at much lower altitudes than a typical ballistic missile. The combination of high speed, maneuverability, and relatively low altitude makes them challenging targets for missile defense systems.³⁸¹

Russia's overall number of strategic systems is constrained by the New Strategic Arms Reduction Treaty (START), which entered into force on 5 February 2011. This treaty limits the United States and Russia to no more than 1,550 deployed warheads each (including warheads on ICBMs and SLBMs, and counting each heavy bomber as one warhead) 7 years after entry into force.³⁸²

Russia retains about 1,200 nuclear warheads for ICBMs. Most of these missiles are maintained on alert, capable of being launched within minutes of receiving a launch order. Although the number of missiles in the Russian ICBM force

will continue to decrease because of arms control agreements, aging missiles, and resource constraints, Russia intends to retain the largest ICBM force outside the United States.³⁸³

Despite Russia’s modernization efforts, the size of the SRF may drop below 300 deployed ICBMs by the early 2020s, but most of those

missiles will be equipped with multiple warheads. The composition of the force is changing significantly to meet the deployed strategic warhead total limit of 1,550. Notably, prior to 2010, no SRF road-mobile ICBMs carried MIRVs; by the early 2020s, all will do so.³⁸⁴

*Russian ICBM Systems*³⁸⁵

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System	Number of Stages	Warheads	Propellant	Deployment Mode	Max Range km
SS-18 MOD 5	2 + PBV	10	LIQUID	SILO	10,000+
SS-19 MOD 3	2 +PBV	6	LIQUID	SILO	9,000+
SS-25	3 + PBV	1	SOLID	ROAD-MOBILE	11,000
SS-27 MOD 1	3 + PBV	1	SOLID	SILO and ROAD-MOBILE	11,000
SS-27 MOD 2	3 + PBV	Multiple	SOLID	SILO and ROAD-MOBILE	11,000

APPENDIX B: Russian Ground Forces

Russian Ground Forces

The Russian ground forces are composed of the Ground Troops, Airborne Troops (VDV), Naval Infantry, Coastal Troops, Coastal Missile Artillery Troops, and National Guard. The Russian Federation armed forces are geographically distributed across four military districts: Western, Southern, Central and Eastern. The Western Military District has three numbered combined-arms armies (CAAs), the Southern and Central Military Districts each have two, and the Eastern Military District has four.

The Ground Troops

The Ground Troops, or *Sukhoputniye Voyska*, are the land warfighting component of the Russian Ministry of Defense. The Ground Troops constitute the largest component of the Russian Federation armed forces. The Ground Troops are currently organized into approximately 40 active and reserve maneuver brigades and eight maneuver divisions.³⁸⁶ There are about 350,000 military personnel in the ground troops.³⁸⁷

According to Russia's Ministry of Defense, the roles of its Ground Troops include repelling enemy aggression and the protection of Russia's territorial integrity and Russian national interests.³⁸⁸ Its main peacetime missions include maintaining adequate combat readiness, participating in international peacekeeping operations, participating in disaster recovery efforts, and assisting in the maintenance of internal security,

if needed. Examples of what Moscow designates peacekeeping operations include ongoing efforts in breakaway enclaves in Georgia and Moldova.³⁸⁹

In times of heightened tension, the Ground Troops will mobilize forces, operationally deploy to threatened areas, call up and train reservists, and prepare for defensive operations. Finally, in a time of war, Russia's Ground Troops are charged to suppress military conflicts if possible, repulse enemy aggression, conduct defensive and counter-offensive operations to defeat the aggressor, and defend critical infrastructure.³⁹⁰

Organizationally, the Ground Troops are composed of main combat components—motorized rifle, tank, missile and artillery, and air defense units. Support elements for these units include



Russian armored fighting vehicles parade in Red Square; ground forces have historically played a dominant role in Russian military issues and leadership.

Image Source: AFP

reconnaissance, engineer, nuclear, biological and chemical defense, and signal troops.

- **Motorized Rifle Troops** units are the most abundant formations in Russia's Ground Troops. Essentially mounted infantry, these are highly mobile forces tasked with holding territory, repulsing enemy attacks, breaking through enemy defenses, capturing important areas, and defeating the enemy.³⁹¹
- **Tank Troops** are the main strike component of the Ground Troops. They support Motorized Rifle Troop missions with direct fires during meeting engagements.³⁹²
- **Missile Troops and Artillery** are the main means of indirect fires for Russian combined arms operations. Missile Troops and Artillery forces are organized into missile, rocket-artillery, and combined artillery units.³⁹³ Missile units operate close/short-range ballistic missiles. Rocket-artillery units operate multiple rocket launchers (MLRs), and combined artillery units operate composite towed or self-propelled artillery and MLRs.
- **Air Defense Troops** provide air defense for the Ground Troops. These units are equipped with anti-aircraft missiles, anti-aircraft artillery, anti-aircraft gun-and-missile systems, and portable anti-aircraft missile systems.³⁹⁴
- **Reconnaissance Troops** perform a wide range of tasks in order to provide decision makers with information about enemy strength, disposition, terrain, and weather conditions.³⁹⁵
- **Engineer Troops** perform a variety of specialized tasks, including the construction of fortifications, installation of obsta-

cles (mine fields, etc.), the preparation of field deployment locations, the preparation and maintenance of deployment routes, the construction of bridges and ferry crossings, and water purification.³⁹⁶

- **Nuclear Biological Chemical Defense Troops** are specialized forces tasked with mitigating the effects of nuclear, biological, or chemical contamination.³⁹⁷
- **Signal Troops** are specialized forces designed for the deployment and maintenance of mobile redundant command, control, and communications systems.³⁹⁸

The New Look Reforms and the Ground Troops

The centerpiece of the 2008–2009 New Look reforms was the elimination of the divisional/regimental structure and its replacement by the brigade. The Russian Ground Troops currently have about 40 combined arms brigades.³⁹⁹ In the winter of 2013, one motorized rifle brigade and one tank brigade were reformed as divisions, and in the spring of 2016, it was announced that four new divisions would be formed in the Western and Southern Military Districts and one in the Central Military District.⁴⁰⁰

The transition to the brigade structure was intended to optimize Russia's ground forces to fight in what the Russians call "local wars and armed conflicts," limited wars along Russia's periphery, which the Russian General Staff believes to be very likely under modern conditions. In November 2011, then-Chief of the General Staff Nikolai Makarov said: "The possibility of local armed conflicts virtually

along the entire perimeter of the border has grown dramatically."⁴⁰¹ The Russian ground forces fielded brigades of this type that had been field tested in Afghanistan (1979–1989) and had proved to be quite effective in combat.⁴⁰²

Another development that had received great impetus in the Afghanistan war was the reinforced battalion, or battalion tactical group (BTG), a motorized rifle or tank battalion, strengthened by other assets, such as artillery, reconnaissance, and air defense resources. BTGs are similar to NATO battalion task forces and are ad-hoc organizations, individually created and optimized to fulfill a particular mission.⁴⁰³

The new Russian divisions are much smaller than their Soviet predecessors. While a Soviet motorized rifle division numbered around 13,000 officers and soldiers, Russia's new motorized rifle divisions number around 9,000.

A proponent of the mixed division-brigade ground forces, then-acting chief of the ground forces, General Lieutenant Vladimir Popov, stated that Russia's combined arms brigades "in terms of structure are intended for fighting in local wars," but that they also "can be successfully employed in large-scale wars. They differ from divisions by lesser numbers of personnel and military equipment and are capable of executing missions with the very same high effectiveness as divisions, but in a smaller zone of responsibility."⁴⁰⁴ The re-introduction of some smaller divisions may be based more on their potential intimidation value than they are on their potential value in combat.

These positive developments have led some analysts to claim that Russia is developing entirely new military concepts. Modern Rus-

sian tactics show a strong continuity with past practices. Recent Russian activity in eastern Ukraine, for example, demonstrates a creative use of their traditional combined arms and reconnaissance-strike tactics combined with a more aggressive application of information warfare concepts that date back to the Soviet period. Russian ground forces troops have cooperated with non-traditional semi-military forces such as partisans and Cossacks for centuries.⁴⁰⁵ Regardless, the contemporary Russian ground forces pose a serious challenge to U.S. military planners, and they should be seen as neither a simple continuation of past Soviet practices, nor an entirely new force employing entirely new military concepts, but a highly nuanced and adaptive combination of both.⁴⁰⁶

The main combat power of the Ground Troops is centered in tank and motorized rifle divisions and separate tank and motorized rifle brigades that are normally subordinate to combined arms armies. Although Russia's military strategy is officially defensive, the Russian Ground Troops basic principle of land warfare is violent, sustained, and deep offensive action, just as it was during the Soviet era. Mechanized and armored formations supported by aviation and artillery are to seize the initiative at the outset of hostilities, penetrate the enemy's defenses, and drive deeply and decisively into the enemy's rear area.

Combined Arms Armies

The combined arms army is an operational and administrative organization that forms the basis of the Russian field army. A typical combined arms army includes two to four combined arms brigades, usually motorized rifle

brigades and in a few cases a tank brigade, plus artillery, missile, air defense, engineer, chemical defense, communications, intelligence and reconnaissance, and rear support units. By altering the mix of motorized rifle and tank formations and artillery and missile support, the army can operate in either offensive or defensive roles in different geographical areas and under various operational constraints.

The Tank Army

The Russian armed forces currently only have one tank army, the First Guards Tank Army (1st GTA). It, like the combined arms army, is both an operational and administrative

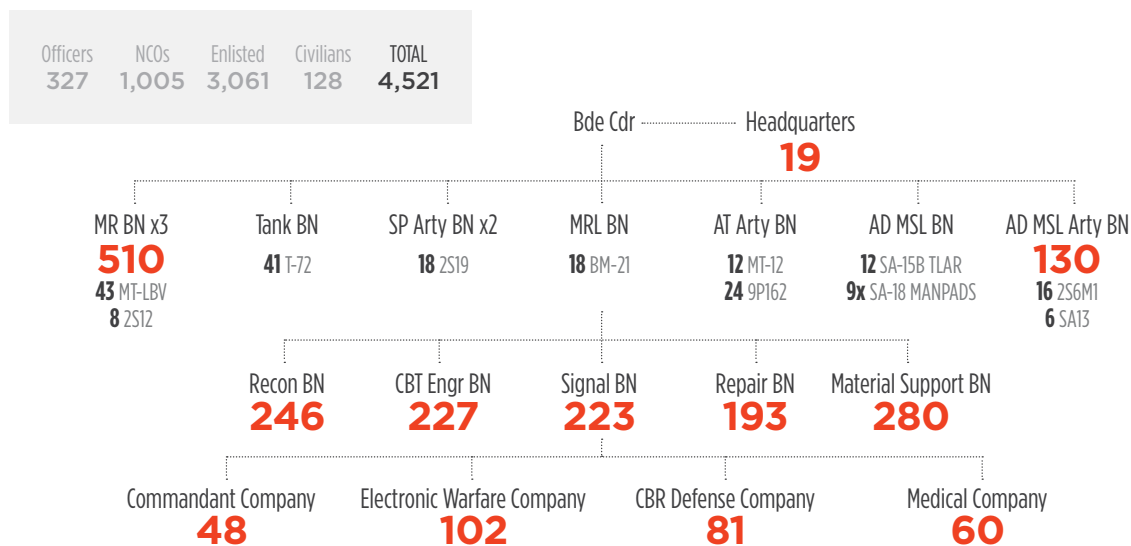
unit. Currently, the 1st GTA includes a tank division, a motorized rifle division, and a tank brigade, plus artillery, missile, air defense, engineer, chemical defense, communications, intelligence and reconnaissance, and rear support units. The traditional role of a tank army is to exploit penetrations deep into the enemy's rear areas.

The Separate Combined-Arms Brigade

The primary combat formation of the Ground Troops is the separate combined-arms brigade, either motorized rifle (MR) or tank. There are three basic tables of organization and equip-

New Look Motorized Rifle Brigade Table of Organization and Equipment: Primary and Supporting Subunits⁴⁰⁷

1612-11131



ment (TO&Es) for separate MR brigades and one for separate tank brigades. All Russian combined-arms brigades, however, regardless of specific primary combat vehicle, are organized in essentially the same manner.⁴⁰⁸

Tank and MR brigades differ in organization in that where the MR brigade has three MR battalions, one tank battalion, and an anti-tank (AT) battalion, the independent tank brigade reverses this basic structure with three tank battalions, one motorized tank battalion, and no AT battalion.⁴⁰⁹ The three MR TO&Es differ from one another in their primary combat vehicle, either wheeled armored personnel carrier (APC) or tracked infantry fighting

vehicle (IFV).⁴¹⁰ The organizational structure of a typical tracked APC-equipped independent MR brigade is shown in the accompanying illustration.⁴¹¹ In addition, the primary equipment of a separate motorized rifle brigade is shown in the table below.

Battalion Tactical Groups

BTGs are task-organized battalion-plus-sized tactical combat entities that are capable of performing independent combined-arms combat missions. They are similar in purpose, structure, and tactical use to U.S. Army battalion task forces. Most, if not all, New Look maneuver brigades

Russian Separate Motorized Rifle Brigade Personnel and Primary Offensive Equipment⁴¹²

1612-11142

Nomenclature	Quantity
Personnel	4521
T-72B3 Main Battle Tank	41
BMP-3 Infantry Fighting Vehicle or	129
BMP-2 Infantry Fighting Vehicle or	129
MT-LBV Tracked Armored Personnel Carrier	129
BTR-82A Wheeled Armored Personnel Carrier	129
2S19 152-MM SP Howitzer	18
BM-21 Multiple Rocket Launcher	18

have one BTG, manned entirely or mostly with contract soldiers, that is used to perform the most difficult or complicated combat tasks assigned to the brigade. An order issued on 19 September 2012 required all maneuver brigade commanders to create a contract-manned BTG within the brigade if they had not already done so.⁴¹³

The need to have effective BTGs is a primary driver of the New Look structural reforms. BTGs have their theoretical origins in the late Soviet period, where they were envisioned to fight against NATO on both a nuclear or non-nuclear battlefield in a nonlinear, large-scale environment. BTGs have been used in every local war or armed conflict in which Soviet and Russian forces have been involved since the Afghanistan War (1979–1989).⁴¹⁴ The tactical use of BTGs in combat has impacted the tactical principles that govern their construction and use. BTGs currently serve—and will continue to serve—as Russia's primary tactical fighting unit in all tactical circumstances, both in large-scale and small-scale conflicts, well into the future.

The Airborne Troops

Russia's Airborne Troops, or VDV (*Vozdushno-Desantniye Voyska*), is an independent arm of service within the Russian Federation armed forces. It is composed of four maneuver divisions, four maneuver brigades, and a separate special purpose (Spetsnaz) reconnaissance brigade.⁴¹⁵ The VDV serves as Russia's high-mobility initial invasion and rapid response force.^{416,417} In its role as rapid response or initial assault forces, the VDV may be used to achieve specific objectives that shape the battlespace for

follow-on ground forces. These may include:

- Seizing key terrain (i.e., bridges, airports, and seaports)
- Establishing blocking positions and vertical envelopment of a retreating enemy
- Disrupting enemy logistical supplies, communications, and command centers
- Destroying high value targets⁴¹⁸

Maneuver formations within the VDV are designated as either parachute or air assault, the primary difference being in whether they arrive at their objective via airdrop or overland means. In all cases, VDV personnel are trained to operate both ways. Major VDV formations are:

- Two parachute divisions – the 98th Guards and 106th Guards
- Two air assault divisions – the 7th Guards Mountain and 76th Guards
- Four air assault brigades – the 11th, 31st, 56th, and 83rd
- One special-purpose reconnaissance brigade – the 45th Spetsnaz⁴¹⁹

In line with its highly mobile function, the VDV is equipped with a large number of amphibious air droppable combat vehicles, the BMD-series IFVs and BTR-D series APCs. The VDV's increased mobility comes at the expense of armor and firepower; its primary combat vehicles are generally lighter than their Ground Troops counterparts. In late 2016, however, the air assault divisions and brigades received up to a company (10 to 13) of T-72-series main battle tanks. The tank companies within these air assault units will very likely increase to tank

battalions (30 to 42) by the end of 2018.^{420, 421} The MBTs are not intended for air drops, but will accompany VDV ground maneuver formations to increase firepower and lethality.

Naval Infantry

Russian Naval Infantry is organized into units that are operationally subordinate to fleet commanders. Naval Infantry is focused on amphibious assaults, coastal defense, counterterrorism, anti-piracy, and ship security missions. The organization and equipment of Naval Infantry units are generally similar to that of motorized rifle units in the Ground Troops.⁴²²

The Naval Infantry consist of four independent brigades, one separate brigade, and three separate battalions.⁴²³

Coastal Troops

The Russian Coastal Troops consist of Coastal Missile Artillery Forces (CMAF) and Coastal Troops. CMAF consist of three independent brigades, two independent regiments, and one independent battalion.

The Coastal Troops are organized as ground forces but are subordinate to the Navy. The Coastal Troops consist mainly of motorized rifle brigades and artillery brigades. Their primary mission is coastal and regional defense.⁴²⁴ The Navy Ground and Coastal Troop Headquarters, a command unit based in Moscow, heads the Coastal Troop force, but coastal missile units likely take operational orders from their respective fleets.^{425, 426, 427}

Russia’s coastal missile and artillery forces provide anti-ship defenses for Russia’s coast-

Russian VDV Primary Combat Vehicles

1612-11144

System	Function	Capacity (Crew/Dismounts)
BMD-2	Infantry Fighting Vehicle	2/5
BMD-4M	Infantry Fighting Vehicle	3/5
BTR-D	Tracked APC	3/10
BTR-MDM	Tracked APC	3/10
2S9	120-mm SP Combination Gun	3
2S25	125-mm Tracked SP Antitank Gun	3



BASTION Coastal Defense Missile Launcher.

Image Source: AFP

line and littoral regions. Coastal missile defense in Russia is primarily centered on anti-ship missile systems. Most units are still dependent on two systems that entered production in the late 1970s to early 1980s—the

STYX and SEPAL. Efforts are underway to rearm the coastal missile force with new, longer-range missile systems.⁴²⁸ These systems include the BAL and BASTION, and they are slowly being introduced to the force.⁴²⁹

APPENDIX C: Russian Aerospace Forces

The former Russian Federation Air Forces and Aerospace Defense Troops merged to create the Russian Federation Aerospace Forces (VKS) in August 2015. The merger places former space and aerospace defense assets vital to strategic aerospace operations under one organizational structure.^{430, 431} The Russian Aerospace Forces include four tactical air armies, which are aligned with the military districts. They also contain the

Long-Range Aviation (LRA) and Military Transport Aviation (VTA), as well as the Space Troops, which are not subordinate to the military districts but to Aerospace Command in Moscow.⁴³² Overall manpower for the Russian Aerospace Forces is listed at 148,000 including conscripts.

The 6th Air Force and Air Defense Army (AFADA) is subordinate to the Western Military

*Russian Air Forces Air Bases*⁴³³

1612-11135



Image Source: DIA, D3 Design

District, the 14th Air Force and Air Defense Army to the Central Military District, the 11th Air Force and Air Defense Army to the Eastern Military District, and the 4th Air Force and Air Defense Army to the Southern Military District.

Long Range Aviation: The LRA is the bomber force of the Russian Aerospace Forces and operationally subordinate to the Supreme High Command of the Russian armed forces. The LRA is tasked with long-range bombardment of strategic targets with conventional

or nuclear weapons. Currently, TU-95MS aircraft are being modernized to include the Kh-101/102 missile system.⁴³⁴ The LRA has an inventory of 16 Tu-160, 60 Tu-95MS, and more than 50 Tu-22M3 bombers.⁴³⁵

Military Transport Aviation: The VTA is subordinate operationally to the Supreme High Command of the Russian armed forces and is the main provider of the air lift for Russian troops and equipment. The recent Ukraine and Syria conflicts have resulted in heavy

*Russian Air Forces Order-of-Battle*⁴³⁶

1612-11136

Aircraft Type	Total Number	Most Capable
Bomber	141	Tu-160
Fighter	420	MiG-29
Fighter Ground Attack	345	Su-35S
Attack	215	Su-25SM
ELINT	32	Il-22M
Airborne Warning and Control	22	A-50
C2	6	Il-86VKP
Tanker	15	Il-78M
Heavy Transport	122	An-124
Training	198	Yak-130

use of the VTA forces, allowing pilots to gain significant flight hours. The primary aircraft operated by the VTA include the Il-76, An-124, An-22, An-26, An-72, and An-12. The various sizes of aircraft allow the VTA to support many different missions from VIP flights, to small cargo, to transporting tanks and aircraft. Additionally, these aircraft tend to have larger fuel tanks allowing for extended missions without refueling to increase efficiency.⁴³⁷

Space Troops:⁴³⁸ These forces within the Aerospace Forces have the mission of conducting space launches and maintaining the ballistic missile early warning system, the satellite control network, and the space object surveillance and identification network.^{439, 440, 441}

Russian Combat Aircraft – Fighters^{442, 443, 444, 445, 446}

1612-11138

Fighter Aircraft	Entered Service	Role
Operational		
Su-35S	2014	Multi-Role Fighter
Su-30SM	2014	Multi-Role Fighter
Su-34	2012	Multi-Role Fighter-Bomber
MiG-31BM	2012	Fighter Interceptor
Su-27SM3	2011	Multi-Role Fighter
MiG-29K/KUB	2009	Multi-Role Naval Fighter
Yak-130	2009	Light Attack Fighter-Trainer
MiG-29N/SE	2009	Multi-Role Fighter
MiG-29SMT	2006	Multi-Role Fighter
MiG-29UBT	2006	Multi-Role Fighter
Su-27SM	2006	Fighter Interceptor
Su-30M2/MK2	2003	Multi-Role Fighter
Su-33	1994	Naval Multi-Role Fighter
Su-27P/S	1986	Fighter Interceptor
Su-27UB	1990	Fighter Interceptor
MiG-29	1983	Multi-Role Fighter
MiG-31	1981	Fighter Interceptor
Developmental		
MiG-29M/M2	2018	Multi-Role Fighter
MiG-35S	2018	Multi-Role Fighter
PAK-FA	2020	5th Generation Multi-Role Fighter
LMFS	Circa 2030	Light Weight Multi-Role Fighter
PAK-DP	Circa 2030	Multi-Role Fighter Interceptor

Bomber Aircraft	Entered Service	Role
Tu-95MSM BEAR	2015	Modified Strategic/Tactical Bomber
Tu-160M BLACKJACK	2014	Modified Strategic/Tactical Bomber
Tu-22M3M BACKFIRE	2014	Modified Regional Bomber
Tu-160	1987	Legacy Strategic Bomber
Tu-95MS	1983	Legacy Strategic Bomber
Tu-22M3	1981	Legacy Regional Bomber
Developmental		
Tu-160M2	2020	New Build Strategic/Tactical Bomber
PAK-DA	2025+	Future Strategic/Tactical Bomber

Integrated Air Defense System

Russia employs what is considered to be among the very best of modern military integrated air defense systems. Historically, Russia has been a leader in developing technologically advanced detection and engagement elements. During the 1990s, Russia largely maintained its research

and development programs for air defense equipment.⁴⁵² During this period, Russia purchased very few of these systems for domestic use.⁴⁵³ However, the State Armaments Program of 2015, and the subsequent 2020 plan, significantly enhanced support for the purchase and employment of the newest and most capable air defense equipment including radar, surface to air mis-

siles, command and control, and electronic warfare equipment. Concurrent to the acquisition plan, Russia continues to support research and development efforts in the air defense realm.⁴⁵⁴

The military integrated air defense system kill chain provides the framework for the Russian design, deployment, and command hierarchy of deployed air defense assets. The kill chain con-








tains the seven elements that a fully functional Russian military integrated air defense system would employ in an air defense scenario.

To support the kill chain (outlined below), Russia employs redundant and overlapping systems.⁴⁵⁵

Russia employs its military integrated air defense system at home and abroad. The military inte-

Russian Military Integrated Air Defense System Kill Chain

1612-11110

Kill Chain Element	Associated Equipment/Process
 Indications and warning	Human intelligence, signals intelligence, open-source information, over-the-horizon radar
 Detection	Air surveillance radar, airborne early warning and control radar, passive Detection system, ship-based radar, visual observation, secondary surveillance radar
 Identification	Secondary surveillance radar, visual identification, non-conformity with approved routes
 Tracking	Integration of detection data into data processing and command & control elements to maintain positional data on an airborne threat
 Assignment	Command & control (variable echelon, based on threat condition and other factors) takes track data and assigns target tracks to weapons platforms
 Engagement	Surface to Air Missiles, Air to Air Missiles, Air Defense Artillery, Electronic Warfare
 Assessment	Verification of engagement: air surveillance radar, airborne early warning and control radar, passive detection system, ship-based radar, visual observer, secondary surveillance radar in conjunction with command & control elements

grated air defense system also plays a significant role in Russia's domestic defense and expeditionary operations.⁴⁵⁶ Russia's initial deployments to Crimea and Syria included the Pantsir and S-300 air defense systems. These systems allowed Russia to build an echelon-based air defense system in the Crimean Peninsula.⁴⁵⁷ At a later point in the Crimean and Syrian operations, Russia

deployed long-range strategic surface to air missile systems in both countries.⁴⁵⁸

Unmanned Aerial Vehicles

In 2008, Russia lagged behind the world in development of UAVs. However, the 2008 Georgia conflict accelerated efforts with initial require-

Russian Unmanned Aerial Vehicles^{459,460}

1612-11113

UAV	Entered Service	Role
Operational		
Pchela-1K	2009	Tactical UAV
Zala 421-08 Grusha / Granat-1	2010	Tactical UAV
Zastava	2013	Tactical UAV
Orlan-10	2013	Tactical UAV
Forpost	2013	Tactical & Strategic UAV
Rubezh-20 / Granat-4	2013	Tactical UAV
Takhion	2014	Tactical UAV
Developmental		
Orion/Inokhodets	2018	Tactical & Strategic UAV
Altius-M	2019	Strategic UAV
Gonshchik	2020+	Tactical & Strategic UAV
Okhotnik-B/U	2025+	Medium WeightUCAV

ments focused on tactical reconnaissance systems that currently dominate inventory. Russia has introduced a class of mini-UAVs for use by the military, but the most significant defense developments are occurring with larger, more capable systems for tactical and strategic use. Russia is also working on unmanned combat aerial vehicles (UCAVs).⁴⁶¹

Russia's fleet of aircraft is aging, but they are rapidly modernizing their air force as well as their air defense systems. When the Soviet Union collapsed in 1991, Russia's air force entered a decline as industry and operational units languished. Since 2008, however, the Russian Air Force and Navy have invested unprecedented financial resources toward airpower to include the upgrade and/or new build of approx-

imately 700 combat fighter/bomber aircraft through 2020 to replace legacy systems.^{462, 463, 464}

Newly modified aerodynamic systems in Syria demonstrate that Russian airpower has returned in limited numbers. Similar efforts with newly upgraded air combat systems have been used in the Crimea/Black Sea and Baltic regions with Russian expectations that provocative moves by the United States and/or NATO will be met with more capable Russian air power. Finally, a slowly improved strategic bomber force (i.e., Tu-95MS BEAR and Tu-160 BLACKJACK) is again using Cold War concepts to conduct international flights that impinge upon the sovereign borders of foreign nations.⁴⁶⁵

APPENDIX D: Russian Navy

The disintegration of the Soviet Union in 1991, as well as the economic stagnation that followed, led to a severe downsizing for the Navy. Naval construction ground to a halt, and the fleet fell into disrepair and obsolescence.⁴⁶⁶ Under Vladimir Putin, however, the Russian military's capabilities have undergone significant improvement, and the Navy is no exception.

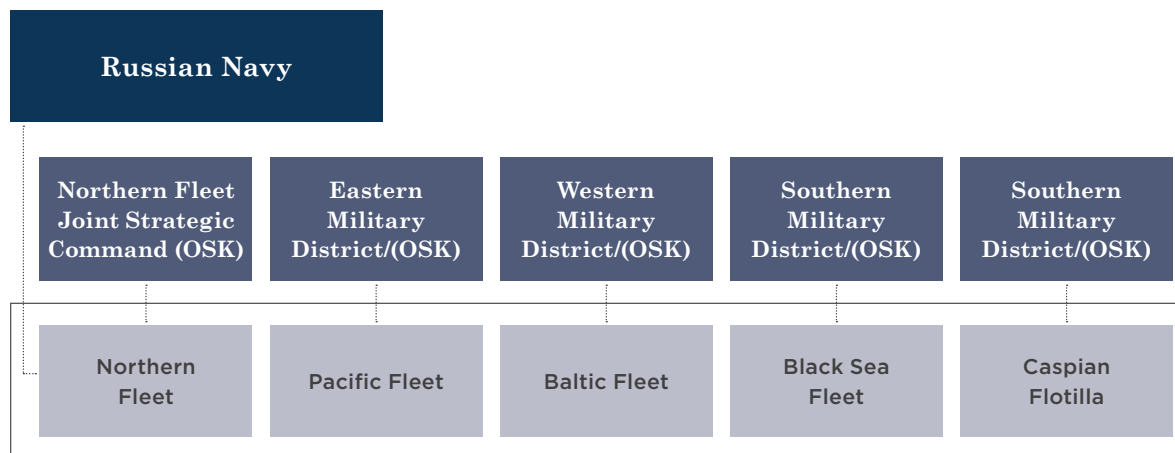
The Russian Navy has approximately 130,000 personnel.⁴⁶⁷ The combined major forces of the current Russian Navy number about one-sixth to one-quarter of what was the Soviet Navy in its heyday. That legacy force today has an average age exceeding 20–25 years. With the economic stabilization of the Russian Federation in the early 2000s, the past

10 years have seen a steady increase in the maintenance, training, and deployment activity of the Navy and, more importantly, the activation of a broad submarine and ship construction program to recapitalize the fleet. The Navy's missions remain focused on strategic deterrence and homeland defense. Periodic distant deployments support the Russian Federation's global foreign policy interests.

The Navy operates nuclear-powered ballistic missile submarines, which are an essential arm of Russia's nuclear triad and capable of delivering nuclear warheads from thousands of kilometers away. This strategic capability puts the Russian Navy in the top tier of foreign navies.⁴⁶⁸

Russian Navy Organization

1612-11111



Structure

The headquarters of the Russian Navy is located in St. Petersburg. The Russian Federation Navy consists of four fleets (Baltic, Black Sea, Northern, and Pacific) and a flotilla in the Caspian Sea. The fleets receive administrative orders and guidance from the Navy Staff in St. Petersburg, whereas operational orders are issued from the various Joint Strategic Commands (OSKs).⁴⁶⁹ Each fleet and the Caspian Flotilla is operationally subordinate to one of these OSKs.



GRIGOROVICH frigate.

Image Source: AFP

Northern Fleet

The Northern Fleet is Russia's most capable naval force. Based in Severomorsk, located in the Kola Gulf (the only ice-free direct access to the North Atlantic), its seven operational ballistic missile submarines provide the bulk of the firepower for the Navy's arm of the stra-

tegic nuclear triad.⁴⁷⁰ Russia's only operational aircraft carrier is also based in the Northern Fleet, along with the Navy's only nuclear-powered heavy cruiser.⁴⁷¹ Surface combatants and submarines deploy worldwide from the Kola Gulf, playing an active role in the ongoing Syria crisis, conducting counter-piracy patrols off the Horn of Africa, along with power projection in the North Atlantic and Caribbean. The Northern Fleet's two primary missions are to provide strategic deterrence with its ballistic missile submarines and to defend the maritime approaches to northwest Russia.⁴⁷²

Pacific Fleet

The Pacific Fleet lags behind the Northern Fleet in terms of maintenance and overall capability; however, it is still able to conduct strategic nuclear strikes against the U.S. mainland, and its surface units are active from the Pacific region to the Horn of Africa.⁴⁷³ The Pacific Fleet has its headquarters in Vladivostok, but its forces are split between two main locations with the majority of surface ships and diesel powered submarines in the Vladivostok region and the nuclear powered submarines, including the SSBNs, located in Petropavlovsk-Kamchatskiy.^{474, 475} The workhorses of the PACFLT are four UDALOY-class destroyers, which are regularly deployed throughout the region.⁴⁷⁶

Black Sea Fleet

The Black Sea Fleet for years has been a fleet in decline, forced to operate with a handful of Soviet-era vessels. Beginning in 2014 after the occu-

pation of Crimea, new units began to enter the order of battle including modern coastal missiles and naval infantry.⁴⁷⁷ Then in 2015, new submarines and surface combatants began to arrive to bolster the fleet. Now armed with the KALIBR missile system, the Black Sea Fleet is a significant force in the region and over the next few years could have as many as six new attack submarines and six new surface ships, which can not only exert control on the Black Sea, but can operate in the Mediterranean to counter NATO forces and support operations in Syria.⁴⁷⁸

Baltic Fleet

The majority of Baltic Fleet vessels are located at Baltiysk in the Kaliningrad Oblast with a handful further north near St. Petersburg.⁴⁷⁹ Headquartered at Kaliningrad, the fleet's mission focuses on specifically ensuring sea-lines of communication and trade are open between Kaliningrad and St. Petersburg, and in countering NATO forces in the region.^{480, 481} The Baltic Fleet has also been a key player in support of Russian interests in the Eastern Mediterranean Sea and Horn of Africa.⁴⁸² With the arrival of two KALIBR-equipped vessels in 2016, the Baltic fleet presents a significant long-range precision conventional and theater nuclear strike threat to Western Europe.

Caspian Sea Flotilla

The Caspian Sea Flotilla is the dominant naval force on the Caspian Sea and was the first Russian surface force operationally equipped with the KALIBR missile system. Russia's naval superiority ensures Moscow has leverage in

regional economic disputes. The KALIBR land attack cruise missile gives Moscow a precision strike weapon that can range targets in Central Asia, the Middle East, and parts of Europe, as evidenced by strikes into Syria in October 2015.⁴⁸³ Most of the flotilla's combat power (all of the KALIBR shooters) are based at Makhachkala, possibly to be closer to regional threats and also to avoid having to navigate the Volga River Delta to reach the sea, as is the case with ships based at Astrakhan.^{484, 485}

Naval Aviation

Naval aviation assets are spread through four fleet air forces, each with composite regiments under their command. The main missions of naval aviation are to track and destroy enemy submarines and warships and also help achieve air superiority where the fleet is operating.⁴⁸⁶ Most naval aviation aircraft are land-based; the only aircraft carrier, ADMIRAL KUZNETSOV, can accommodate 22 strike aircraft and 17 attack helicopters.⁴⁸⁷

Submarine Forces

Russia's sea-based strategic deterrent is deployed in the Northern and Pacific Fleets. There are six DELTA IV SSBNs, one DOLGORUKIY SSBN, and one remaining TYPHOON SSBN used as a test platform in the north. Three DELTA III and two DOLGORUKIY SSBNs are in the Pacific. All sea-launched ballistic missiles (SLBMs) carried by these submarines—SS-N-18 (DELTA III), SS-N-23 (DELTA IV), and SS-N-32 (DOLGORUKIY)—can reach U.S. targets from their home-

base piers and, if required, could be launched with the submarines on the surface.

These SSBNs are protected by nuclear-powered cruise missile and torpedo attack submarines, which also engage enemy surface and submarine forces and pose a land attack cruise missile threat against an enemy homeland. In the Northern Fleet, these attack submarines include three OSCAR II and one SEVERODVINSK SSGNs and three VICTOR III, six AKULA I/II, and four SIERRA SSNs. The SEVERODVINSK class is new, extremely quiet and is armed with a wide range of advanced cruise missiles to destroy enemy ships and targets ashore. The Pacific Fleet has five OSCAR II SSGNs and four AKULA I SSNs. It will eventually receive SEVERODVINSK SSGNs. A new fifth-generation general purpose nuclear-powered submarine is under development.

Non-nuclear diesel-electric submarines round out the Russian submarine forces. These units are assigned to all fleets for close-in area defense missions in adjacent seas. Older and newer versions of the KILO class comprise most of this force: six in the Northern Fleet, two in the Baltic, three new KALIBR-equipped units in the Black Sea, and eight older KILO class in the Pacific. The newest KILO version continues in construction with three more units destined for the Black Sea Fleet and eventually another six for the Pacific Fleet. A single PETERSBURG-class improved design experimental unit is in the Northern Fleet with two additional units to be completed. A future non-nuclear, KALINA design, likely having an air independent propulsion plant, is in development with construction projected after 2020.

Surface Forces

The Russian Navy's major combatant surface ships, frigates and larger, comprise some 32 units assigned across all 4 fleets.

- The Northern Fleet has Russia's only aircraft carrier (KUZNETSOV), one nuclear-powered KIROV-class cruiser, one conventionally powered SLAVA-class cruiser, and four UDALOY-class destroyers. The first new GORSHKOV-class (KALIBR) guided missile frigate was recently commissioned with more expected. This fleet also has 12 minor anti-ship and anti-submarine combatant ships, as well as 4 ROPUCHA-class amphibious assault ships.
- The Baltic Fleet has nine major ships—two older SOVREMENNY-class destroyers and seven frigates: one KRIVAK-class, two NEUSTRASHIMYY-class, and four new STEREGUSHCHIY-class units. It recently received two SVIYAZHNSK-class (KALIBR) guided missile patrol ships. These are supplemented by 18 minor combatants and 4 amphibious assault ships.
- The Black Sea Fleet has one SLAVA-class cruiser, one 47-year-old KASHIN-class destroyer, two older KRIVAK-class frigates, and the first of a planned six new GRIGOROVICH-class (KALIBR) frigates. More new construction units are expected for the Black Sea Fleet. The fleet is supplemented by 15 minor combatants and 7 amphibious assault ships.
- The Caspian Flotilla has two GEPARD-class frigates (one with KALIBR) and recently received two new ASTRAKHAN-class patrol ships and three SVIYAZHNSK-class (KALIBR-capable) guided missile patrol ships.

- Finally, the Pacific Fleet has seven major ships: one SLAVA-class cruiser, four UDALOY-class and two SOVREMENNYIY-class destroyers. These are supplemented by 24 minor anti-ship and anti-submarine combatants and 4 amphibious assault ships.

The Russian Navy has several weapons upgrade programs in progress. The new SS-N-32 BULAVA submarine launched ballistic missile is being produced for the DOLGORUKIY-class SSBNs. The most consequential development is that Russia plans to deploy KALIBR capability on all new design construction nuclear and non-nuclear submarines, corvettes, frigates, and larger surface ships. KALIBR provides even modest platforms, such as corvettes, with significant offensive capability and, with the use of land attack missiles, all platforms have a significant ability to hold distant fixed ground targets at risk using conventional warheads. The prolif-

eration of this capability within the new Russian Navy is profoundly changing its ability to deter, threaten, or destroy adversary targets.

Although the Navy is mainly made up of Soviet-era surface ships and submarines, an extensive modernization program is underway, focusing first on the submarine force.^{488, 489, 490} Progress in submarine modernization is underway; however, the majority of the naval inventory still consists of aging units from the 1980s and 1990s. While more new classes of ships are planned, the Navy will have to maintain its older fleet for several years until these new vessels come online. Despite this, Russia is still capable of deploying its assets worldwide, best evidenced by continuous support to Russian operations in Syria since 2012 and recurring counter-piracy deployments to the Gulf of Aden since 2008.^{491, 492}

APPENDIX E: Russian Special Operations Forces

Russia's special operations forces are popularly known by the abbreviation "Spetsnaz," short for *Spetsial'noye naznacheniyе*, a term meaning "special purpose." Spetsnaz, although similar to special operations forces in Western countries, retains a slightly different set of roles and missions than those commonly found elsewhere. The current incarnation of Spetsnaz traces its origin back to naval and ground units created back in the mid-1950s to establish a dedicated special purpose force to operate with the armed forces, although its wider lineage can be attributed to counterrevolutionary and partisan units formed during the Russian Revolution and World War II, respectively.⁴⁹³

These predecessor units became pivotal in defining the hallmark missions of the modern Spetsnaz force, from diversionary acts conducted by partisan units behind German lines in World War II to deep reconnaissance and intelligence collection, reflecting the post-war perception of a potential conflict with the West during the Cold War.⁴⁹⁴ These tra-

ditional missions—with slight modifications and variations—still manifest themselves in Spetsnaz doctrine and are associated with Moscow's recent strategy of using indirect action, albeit with the wider aim of achieving goals while avoiding a large-scale conflict.

Within Russia, the term Spetsnaz is often misappropriated and misattributed. Moscow's true Spetsnaz force is a relatively small, select group of mission-dedicated special purpose forces, primarily belonging to the military and its Main Intelligence Directorate (GRU) (e.g., the Defense Ministry's ground and naval Spetsnaz units), and to a lesser extent, the security services of the National Guard, Federal Security Service (FSB), Foreign Intelligence Service (SVR), and Justice and Emergency Situations Ministries.⁴⁹⁵ Estimated to number 20,000–30,000 personnel, Spetsnaz units in these organizations all retain distinct and separate missions from one another. The single largest contingent with which recent and visible exploits of Spetsnaz are attributed reside with the GRU.

APPENDIX F: Russian Intelligence Services

Russia has three primary intelligence services: the Federal Security Service (FSB), the Foreign Intelligence Service (SVR), and the Main Intelligence Directorate of the General Staff (GRU). The FSB and SVR trace their lineage to the old Soviet Committee of State Security (KGB). Although the FSB and SVR are considered military services under Russian federal law, they are more akin to civilian intelligence agencies.⁴⁹⁶

The Federal Security Service

The FSB has three primary missions: countering foreign intelligence services, combatting organized crime, and ensuring economic and financial security. It is also the Russian lead counterterrorism organization.⁴⁹⁷ President Vladimir Putin launched a major reorganization of the FSB during his first term, placing the organization under the president's direct control. The FSB has continued to grow, integrating the Border Guard Service of Russia and the Federal Agency of Government Communication and Information (FAPSI).

The Foreign Intelligence Service

The SVR is Russia's main external intelligence agency; it focuses on civilian affairs, whereas the GRU focuses on military affairs. According to Russian law, the SVR is authorized to carry out the following missions:⁴⁹⁸

- Conduct intelligence.
- Implement active measures (disinformation, propaganda, etc.) to ensure Russia's security.
- Conduct military, strategic, economic, scientific, and technological espionage.
- Protect employees of Russian institutions overseas and their families.
- Provide personal security for Russian government officials and their families.
- Conduct joint operations with foreign security services.
- Conduct electronic surveillance in foreign countries.

Responsibilities of Russian Intelligence Services^{499, 500, 501, 502}

1612-11140

	Political Intelligence	Economic Intelligence	Military Intelligence	Measures of Support	Counter-Intelligence	Political Security	Law Enforcement
Soviet KGB	●	●	●	●	●	●	●
Main Intelligence Directorate (GRU)	●	●	●	●	●		
Federal Security Service (FSB)	●	●	●	●	●	●	●
Foreign Intelligence Service (SVR)	●	●	●	●	●	●	
Federal Protection Service (FSO)					●	●	●
Interior Ministry (MVD)					●	●	●
National Guard (developing)				●		●	●

● Main Role ● Subsidiary Role



GRU Headquarters Moscow.^{503, 504}

Image Source: Russia Ministry of Defense/Creative Commons 4.0 Copyright

The Main Intelligence Directorate of the General Staff

The GRU is the Ministry of Defense's foreign intelligence organization that provides military intelligence for the General Staff, Ministry of Defense, and senior government officials.^{505, 506, 507, 508} The GRU's responsibilities include providing senior political and military leadership with all-source intelligence, including indications and warning of strategic threats and information to assist leadership in making decisions regarding Russia's armaments program.^{509, 510} GRU operations abroad involve human intelligence (HUMINT)

collection on potential enemies' military-industrial capabilities, troop movements, and weapon systems.^{511, 512} The GRU manages military attachés, intelligence analysis, cryptanalysis, space-based assets, telecommunications intercept capabilities, and radio-electronic and telecommunications-based offensive capabilities.^{513, 514} It also oversees Spetsnaz units and special operations forces.^{515, 516, 517, 518} GRU operational combat and advisory roles have expanded dramatically in the past decade, involving military operations in Ukraine's Crimea region, eastern Ukraine, and Syria.^{519, 520, 521, 522, 523, 524, 525, 526}

APPENDIX G: Defense Industry and Modernization Programs

Russia's huge defense industrial complex focuses predominantly on weapons production, though the goal is to move toward a combination of military and non-military products.⁵²⁷ President Vladimir Putin and Deputy Premier Dmitriy Rogozin, whose government portfolio covers the defense industry, have said that high levels of spending on the military and defense industrial complex will benefit the entire economy.^{528, 529} In April 2016, Putin announced Russia's arms sales from the last year had been higher than planned, totaling \$14.5 billion, with additional orders for \$56 billion, the highest since 1992.^{530, 531} However, while Moscow's pursuit of arms trade deals abroad may help partially offset challenging financial conditions and support continued military modernization goals, significant problems remain.

Challenges, partly due to Western sanctions, have slowed production for some weapons and equipment. Russian industry's dependence on weapons production, the depreciation of the ruble, and growing interest rates on industrial loans, which are used to finance facility modernization and production expenses, have increased business costs for Russian defense firms.⁵³² Russian economists have warned that the resulting imbalance between civilian and military spending could be problematic.^{533, 534, 535, 536}

Russia's 2011–2020 State Armaments Program reflects President Putin's ambitious mandate that 70% of Russia's weapons inventory consist of new or upgraded equipment by 2020.^{537, 538} In pursuit of that goal, Putin personally makes decisions about the defense industry's weapons modernization, production, and financing. Putin reestablished the Military Industrial Commission (VPK) in 2007 to better manage state control of defense production and acquisition.^{539, 540}

Since May 2013, Putin has chaired week-long working groups with the Defense Ministry and defense industry leadership twice a year to monitor program implementation and oversee adjustments.^{541, 542, 543} By 2014, Putin decreed himself Chairman of the VPK, probably to ensure that defense modernization efforts were fulfilled within economic constraints.^{544, 545} At the same time, Defense Minister Shoygu set up a half dozen new Defense Ministry scientific and technical organizations, headed by military scientists, to place priority on defense orders that were cutting-edge, Russian-made, and technologically feasible.^{546, 547}

The following are examples of weapons systems in active production, testing, or assimilation into military use, indicating current Russian leadership priorities for defense industry.

Ballistic Missile Sector

A key area of development detailed in Russia's 2011–2020 State Armament Program are the ballistic missile forces, which form the backbone of Moscow's nuclear triad.^{548,549} Russia has three competent bureaus that specialize in the design and development of ballistic missiles.⁵⁵⁰ Russia's modernization efforts are driven by an aging missile inventory, the need to maintain a credible launch capability, and concern with the deployment of anti-missile defense systems by the United States.⁵⁵¹ As of 2015, modernized systems only made up 56% of the missile force; they are scheduled to reach 100% by 2022.⁵⁵²

Intercontinental Ballistic Missiles (ICBM)

Russia has several legacy ICBMs in its active inventory, including the SS-18, SS-19, and SS-25 that are being replaced by the SS-27, Sarmat, and SS-27 Mod 2; replacements should be completed by 2022.^{553,554,555}

The SS-27 is a solid-propellant ICBM (silo and mobile variants), which uses a delivery vehicle made by the Minsk Heavy Wheeled Vehicle Factory in Belarus with launch equipment added by TsKb Titan in Volgograd. The SS-27 missile was designed by several institutes: the



SS-27 Mod 2 ICBM.

Image Source: Shutterstock

Moscow Institute of Thermal Technology for the overall design, NPO Soyuz in Lubertsy for the three solid rocket motors, the All-Union Scientific Research Institute of Experimental Physics in Sarov for the nuclear warhead, and GPO Votkinskiy Mekhanicheskiy Zavod in Votkinsk for final assembly.^{556,557,558}

The Sarmat heavy ICBM is still in testing with the State Missile Center Makeyev and is scheduled to complete development around 2018.⁵⁵⁹ The missile will be manufactured by the Krasnoyarsk Machine Building Plant, while the NPO Energomash-designed motor will be produced by Proton-PM based in Perm.⁵⁶⁰

A new solid-propellant ICBM, the RS-26 (Rubezh), was developed as a lighter version of the SS-27 and will only be deployed as a mobile variant sometime in 2017.⁵⁶¹ The missile's lower weight increases mobility and survivability, and the RS-26 will make use of various countermeasures to penetrate anti-missile defense systems.⁵⁶²

In addition, Russian officials claim a new class of hypersonic vehicle is being developed to allow Russian strategic missiles to penetrate missile defense systems. Hypersonic glide vehicles are maneuverable vehicles that travel at hypersonic (typically greater than Mach 5) speed and spend most of their flight at much lower altitudes than a typical ballistic missile. Press reporting claimed a successful test of this system from an SS-19 booster occurred in April 2016.⁵⁶³

Submarine-Launched Ballistic Missiles (SLBM)

The SS-N-18 SLBM, first deployed in 1978, is a two-stage liquid-propellant system designed to be launched from a DELTA III submarine. The latest version, the SS-N-18 Mod 3, can carry up to three warheads to a maximum range of over 5,500 kilometers.⁵⁶⁴

The SS-N-23, initially deployed in 1989, is a three-stage, liquid-propellant missile designed by the State Missile Center Makeyev. It can carry four warheads to a range of over 8,000-km and is launched from Delta IV submarines.⁵⁶⁵ An upgrade of the SS-N-23, known as SINEVA, was completed in 2007 by the Krasnoyarsk Machine Building Plant.⁵⁶⁶

The SS-N-32 BULAVA is a solid-propellant, sea-launched ballistic missile that underwent a 19-year development cycle at the Moscow Institute of Thermal Technology.⁵⁶⁷ The BULAVA can carry up to six independent nuclear warheads to a range of around 8,000 kilometers, is

in service on the DOLGORUKIY-class submarines, and is replacing older SLBMs in the Russian inventory.^{568, 569}

Short-Range Ballistic Missiles (SRBM)

The SS-21 TOCHKA is a mobile, single-stage, solid-propellant missile; it originally entered service around 1976. The latest TOCHKA-U version entered service in 1990 and is the most capable system (maximum range of 120 kilometers, inertial navigation with GLONASS updates, and radar or optical terminal guidance).^{570, 571}

SS-26 ISKANDER-M is a mobile, single-stage, solid-propellant missile that is replacing the SS-21. The ISKANDER is equipped with an inertial/GLONASS guidance system and either radar, electro-optical, or infrared image matching terminal guidance system, enabling it to strike moving targets.⁵⁷²



Russian ISKANDER-M missile system.

Image Source: AFP

Cruise Missile Sector

Russia's 2011–2020 State Armament Program also places a priority focus on the development and production of highly capable cruise missile systems.⁵⁷³ Russia has invested heavily in the development of air-, ground-, and sea-launched cruise missiles, and the development or refurbishment of associated launch platforms.⁵⁷⁴ In addition to developing domestic variants, Russia is focused on producing export variants of several cruise missile systems to remain competitive in the international arms market.⁵⁷⁵

Russia's Tactical Missile Corporation

Russia's Federal Target Program for "Restructuring and Development of [the] Defense Industry (2002–2006)" and a Presidential decree in January 2002 prompted the establishment of the Tactical Missile Corporation (KRTV). The corporation, which has oversight of 30 weapon manufacturing enterprises, is Russia's largest developer and producer of anti-ship, anti-radar, and multipurpose missiles for tactical airborne, shipborne, and coastal cruise missile systems.^{576, 577}

In 2014, the General Director of KRTV reported that the corporation received about \$1 billion from the Federally Targeted Program for the Development of the Defense Industry (OPK) through 2020 to help modernize and re-equip production facilities.^{578, 579} To increase production capacity, Russia focused on improving production facilities in anticipation of the high production demands under the State Armament Program 2020.⁵⁸⁰

Air-Launched Cruise Missiles (ALCM)

Russia is in the process of refurbishing its long-range strategic bombers to carry the newest air-launched cruise missiles, the Kh-101 (conventional) and the Kh-102 (nuclear-variant). These missiles were developed by the Raduga Science and Production Association [Machine-Building Design Bureau], a Tactical Missile Corporation subsidiary located in Dubna.⁵⁸¹ The missiles are the follow-on system to the Kh-55, the main armament of Russia's Tu-95 and Tu-160 bombers.^{582, 583}

Sea-Launched Cruise Missiles (SLCM)

The KALIBR-family of cruise missiles are some of Russia's most capable systems. Designed by the Novator Design Bureau, a subsidiary of Almaz-Antey, the KALIBR-class missiles are the more capable domestic versions of the CLUB-family, which Russia has exported for several years.⁵⁸⁴ The KALIBR class of missiles reportedly has an operational range up to 2,500 kilometers and has a lower flight profile than other Russian cruise missile systems.^{585, 586} The 3M-14 (SS-N-30A) is a long-range, land-attack cruise missile capable of carrying conventional or nuclear warheads.⁵⁸⁷ The 3M-54 (SS-N-27A) is an anti-ship missile, capable of being launched from submarine and surface ships.⁵⁸⁸

The ONIKS (SS-N-26) anti-ship cruise missile is another capable weapon system produced in Russia that also has a land-based variant, the BASTION mobile shore-based missile complex.⁵⁸⁹

Russia is also developing and testing the TSIRKON, its first hypersonic anti-ship cruise missile. This missile, which is expected to enter service in 2018, will have a 500 to 1,000-km range.⁵⁹⁰ Once operational, the nuclear-powered guided missile cruiser ADMIRAL NAKHIMOV will be one of the first naval vessels to carry these cruise missiles.⁵⁹¹

Russia demonstrated some of its newest capabilities in military technology in its Syria campaign. Russia's use of the KALIBR sea-launched cruise missile, including launches from a submerged submarine, and of the Kh-101 air-launched cruise missile for the first time in a combat situation demonstrated its advancements in precision-guided munitions.⁵⁹²

Surface-to-Air Missiles (SAM)

Russia's surface-to-air missile (SAM) systems remain among the best in the world, and Russia maintains a robust production capacity to satisfy both domestic and export requirements. In recent years, Russia has also developed several highly-capable SAM systems and has invested in new infrastructure to support aggressive SAM production schedules.⁵⁹³ Many countries, including China, are interested in acquiring some of Russia's longer-range systems.⁵⁹⁴

Almaz-Antey is Russia's primary company responsible for development and production of air defense systems, including land-based and naval short, medium, and long-range air defense missile systems, ground surveillance radar stations, and automated control systems. Almaz-Antey formed in 2002 as a result of a merger between Antey Corporation and NPO Almaz.^{595, 596}

Long-Range SAMs

Russia is adding new defense infrastructure to increase production of its newest long-range SAM system, the S-400; S-400 (SA-21) regiments are operational throughout Russia.^{597, 598}



S-400 long-range SAM system.

Image Source: AFP

The ANTEY-2500 is a long-range air defense system that reportedly can engage short-and intermediate-range ballistic missiles, cruise missiles, precision-guided weapons, strategic and tactical aircraft, as well as early warning and electronic warfare aircraft.⁵⁹⁹



ANTEY-2500 long-range SAM system.

Image Source: AFP

Short-to-Medium Range Priority SAMs

The PANTSIR-S/S1 is a short-range air defense system developed by the KBP (Instrument Design Bureau) Tula. It is armed with 12 missiles and two 30-mm anti-aircraft guns; for target acquisition and tracking it uses two radars and an electro-optical system. It was designed to defend ground installations and longer-range SAM systems against a variety of weapon systems, including fixed-wing aircraft and helicopters, precision guided missiles and cruise missiles, and unmanned air vehicles.⁶⁰⁰ It is usually deployed as a battery of 4–6 combat vehicles per site and each combat vehicle can engage up to four targets simultaneously. Russian air force plans to acquire 100–120 PANTSIR-S/S1 combat vehicles by 2020.⁶⁰¹

Developmental Systems

The S-500 is a developmental system expected to have the capability to simultaneously engage 10 targets at a maximum range of 600 kilometers; it is expected to be operational around 2020.⁶⁰²

The Vityaz is a short-to-medium-range SAM system; Russia hopes to produce up to 30 systems by 2020.⁶⁰³ The Vityaz system reportedly can carry two types of missiles, the 9M96E missiles or the 9M100.

Air Sector

In 2006, Russia's United Aircraft Corporation (UAC) was created to consolidate aircraft design and production companies under one state controlled corporation. UAC con-

trols 18 companies responsible for the design and production of most military and civilian aircraft.^{604,605} UAC will have to deliver over 1,000 new airplanes and helicopters to Russia's military forces by 2020 to meet modernization goals established in the 2011–2020 State Armament Program.⁶⁰⁶

Bombers

Russia plans to upgrade and operate its fleet of Tu-160/BLACKJACK, Tu-95MS BEAR H, and Tu-22M/BACKFIRE bombers beyond 2030.^{607,608} The upgrades are intended to keep older aircraft operational until the fifth-generation PAK-DA bomber reaches production. The PAK-DA will have new navigation systems and the capability to deploy Kh-101/Kh-102 air-launched cruise missiles (ALCMs).^{609,610,611,612,613}

Russia has restarted Tu-160M2/BLACKJACK initial production to fill a critical gap in aircraft availability. Serial production of new Tu-160M2/BLACKJACK bombers is scheduled to begin no earlier than 2023 at the Kazan Aircraft Plant. The new bombers will have NK-32



PAK-FA (T-50) fighter.

Image Source: AFP

engines, which will be produced at the Samara-based enterprise Kuznetsov, currently being modernized to start production by 2020.⁶¹⁴

Fighters

Russian fighter production occurs at several plants, including the Sukhoi Aircraft-Manufacturing Plants in Komsomolsk, Irkutsk and Novosibirsk, which produce the Su-30SM, Su-34, and Su-35; the MiG plants in Lkhovitsy and Nizhniy Novgorod produce the MiG-29.⁶¹⁵

The fifth-generation fighter (PAK-FA) program began in 2008 and is a high-priority item for the Russian air force. Six flying prototype aircraft were completed through 2016, with additional prototype aircraft in testing by the end of 2016. The Ministry of Defense plans to start serial production this year with the goal of producing 12 for the air force by 2020.^{616, 617}

Helicopters

The state corporation Russian Helicopters operates five primary helicopter plants that produce the Ka 52 and Mi-28 attack variants, Mi-8/17, Mi-35, Mi-26, and ANSAT for the armed forces and for export.^{618, 619} Moscow’s previous reliance on helicopter engines produced in Ukraine has not adversely affected Russia’s ability to meet the needs of its military.⁶²⁰

Transport Aircraft

The UAC is responsible for operating two large aircraft production plants at Kazan and Ulyanovsk. Russia is producing its new transport, the Il-76MD-90A, which is a redesign of the

Il-76/CANDID transport, and plans to produce 39 Il-76MD-90A planes by 2020.⁶²¹ The Ilyushin Design Bureau has begun development of the Il-78MD-90A refueler and the Il-112 light military transport, based on Il-76 airframe design.^{622, 623}

Naval Sector

In an effort to streamline the design and construction of surface ships and submarines, President Putin established the United Shipbuilding Corporation in 2007 to provide oversight of all major domestic military and civilian shipbuilding. The corporation includes approximately 40 companies, including design bureaus and shipyards. Russia is currently upgrading and modernizing its naval fleet, constructing multi-role platforms with modular designs.⁶²⁴ However, some new platforms have taken up to, or over, a decade to complete construction and to enter into service as Russia’s shipbuilding industry is besieged by sanctions. Moscow is working to overcome the negative effects of international sanctions by becoming more self-reliant, indigenously producing components formerly purchased from foreign suppliers.⁶²⁵

Russia currently has eight operational shipyards dedicated to surface ship and submarine construction. While construction of patrol boats and corvettes has continued at a steady pace, major combatants and amphibious ships have encountered significant delays. For example, the Yantar Shipyard has faced difficulties meeting production deadlines during construction of the GRIGOROVICH FFG and IVAN GREN LST.

Surface Combatants

Construction of the ADMIRAL GRIGOROVICH and GORSHKOV-class frigates, along with the STEREGUSHCHIY-class corvette, was to mark Russia's return as a shipbuilding power and are intended to become the backbone of the fleet. A total of 17 of the ships (6 GRIGOROVICH, 4 GORSHKOV, and 8 STEREGUSHCHIY) were ordered to be built. Final delivery of over half of these ships was disrupted due to the lack of gas turbine and diesel engines from Ukraine's Zorya-Mashproyekt State Gas-Turbine Manufacturing Enterprise.⁶²⁶

Delivery of three GRIGOROVICH and two GORSHKOV frigates were eventually cancelled because domestically-produced gas-turbine engines would not be ready before 2020. The imported engines for the STEREGUSHCHIY corvettes have been replaced by domestic diesel engines produced by the Kolomna Engine Plant in Moscow, allowing for the production of corvettes and patrol boats to continue at a steady pace in spite of construction delays to the larger ships.⁶²⁷



GORSHKOV-class Frigate.

Image Source: Shutterstock

The Russian Navy has one operational aircraft carrier in its inventory, the 26-year-old ADMIRAL KUZNETSOV, which is expected to enter a 2- to 3-year overhaul period beginning in 2018. This overhaul is not scheduled to consist of any major modernization or modifications and will keep the KUZNETSOV in the fleet until a new aircraft carrier becomes operational.⁶²⁸ The Murmansk Shipyard is planning to convert and enlarge its drydock to overhaul the KUZNETSOV and to provide maintenance/repair service for large commercial ships. When complete, the result will be the country's largest drydock (400 x 80 meters).⁶²⁹

Russia is planning to start the design of a nuclear-powered aircraft carrier (the Shtorm) in 2020, with completion by 2030. Based on a model mock-up and initial information, the carrier will have a beam of 40 meters and draft of 11 meters. Shtorm will be 330 meters in length, shorter than the U.S. Navy's newest carrier but 10% longer and wider than the KUZNETSOV. The Shtorm will have RITM-200 nuclear reactors, a catapult, and two ski-jump ramps for launching aircraft and will be able to carry up to 90 aircraft and helicopters.⁶³⁰

Submarines

Historically the backbone of the Russian Navy, 75% of the 61 operational submarines are over 20 years old and are slowly being replaced. Russia will continue production of its fourth-generation DOLGORUKIY-class submarines through 2020. There are currently three in

service, with an additional eight scheduled to enter service in the coming years. Russia is also planning to construct a fifth-generation strategic missile SSBN between 2031 and 2050.^{631, 632}

The YASEN-class SSGN (Project 855, aka SEVERODVINSK) will replace aging VICTOR III SSNs. The YASEN is produced at the Sevmash shipyard; the first of up to 10 hulls was delivered to the Navy in 2014, but the program has encountered delays. The flagship of the class (hull 1) required 16 years to complete; hull 2 should soon be completed after 7 years.⁶³³ Modernization and upgrade efforts are occurring on the OSCAR II SSGN and SIERRA II SSNs. The improved KILO SSK class (Project 636.3) is being produced without significant delays. The initial order of 6 was expanded to 12 in early 2016. The first three KILOS were delivered to the Black Sea Fleet in 2014–2015.⁶³⁴



YASEN SSGN Hull 1.

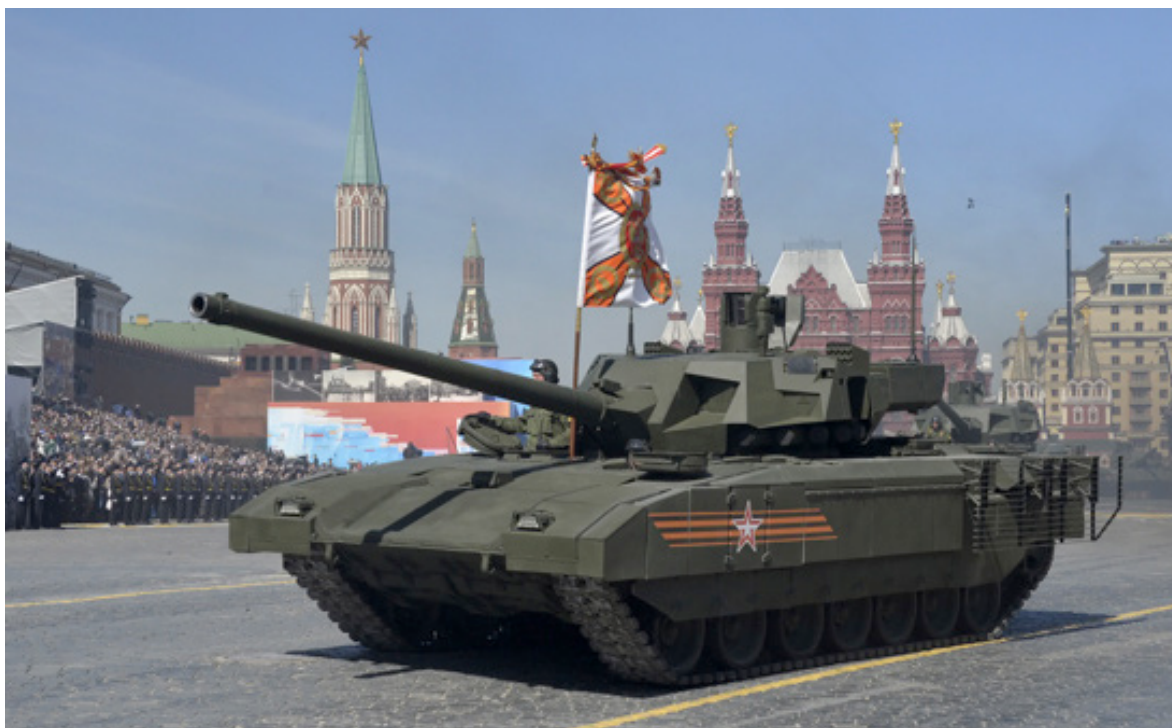
Image Source: Shutterstock

Ground Arms

Since 2010, there have been significant improvements in the condition of Russian ground arms, including the modernization and upgrade of the main battle tank (MBT) inventory. The active inventory includes the T-72, T-80U, and T-90 MBTs.⁶³⁵ The T-72 is one of Russia’s oldest active MBTs and has been upgraded to include substantial enhancements in explosive reactive armor, electronic components, and enhanced navigation systems.⁶³⁶ Russia’s newest in-service MBT, the T-90, features the new Sona-U sighting systems and Shtora soft-kill active protection system.⁶³⁷ While Russia’s Ministry of Defense planned to phase out the T-80, the Omsk Transport Machine Building Plant, one of Russia’s two MBT production and modernization facilities, is planning to upgrade the T-80U with Sosna-U, Relikt third-generation dynamic protection complex, and advanced radio and C2 systems.⁶³⁸

New Technology

The Uralvagonzavod (UVZ) Corporation is Russia’s primary MBT production and modernization center and is responsible for the production of Russia’s newest MBT (the Armata) to fulfill part of the 2020 and 2025 State Armament Program.^{639, 640} The new-generation T-14 Armata MBT is being used as a common chassis for the Army’s heavy armored vehicles, including the T-15 Armata heavy infantry fighting vehicle (IFV) and the Koalitsiya-SV 2S35 self-propelled howitzer.⁶⁴¹ This universal platform offers the Russian defense industry a more streamlined



T-14 Armata Tank.

Image Source: AFP

means of armored vehicle production and will reduce maintenance and modernization costs in the future.

Like the Armata, the Kurganets-25—slated to begin production in 2018—will provide a lighter, universal tracked platform for new IFVs and armored personnel carriers.⁶⁴² The Bumerang wheeled armored personnel carrier has completed preliminary testing as of June 2016.^{643,644} Russia will continue to field the BMP-3 (~700 units), BMP-2 (~1,800 units), and BMP-1 (~500 units) while new systems are designed and produced.⁶⁴⁵ The BMP-3 is Russia's most modern IFV in service.⁶⁴⁶

Russian artillery modernization efforts include the Koalitsiya-SV 2S35 152-mm self-propelled howitzer, which is intended to be the future of Russian self-propelled artillery units and will ultimately phase out the 2S19 Msta-S.⁶⁴⁷ Several of Russia's multiple rocket launchers (MRLs) have also been improved: the URAGAN 220mm MRL, the SMERCH 300mm MRL, and the new TORNADO-2 300 MRL, which is a modernized version of the SMERCH.⁶⁴⁸ Russian MRLs are produced in large quantities for the Russian Army and export customers worldwide.⁶⁴⁹

APPENDIX H: Arms Sales

Russia remains the second largest arms exporter worldwide, in terms of the annual value of both its export contracts and equipment deliveries. Russia's arms export strategy included planning \$13 billion in annual sales through 2016, and thereafter seeking growth until 2020.⁶⁵⁰ In 2016, Russian officials announced that Moscow exported \$14.5 billion in military products in 2015.⁶⁵¹

Russia is an exporter of nearly every category of conventional military equipment, from small arms to long-range air defense systems and submarines. Moscow sees great prospects in the global arms marketplace for many of its products. In the aircraft sector, Su-35, Su-30 and MiG-29 fighter aircraft, Yak-130 combat trainers, and a variety of Mil and Kamov helicopters are key products. In the air defense sector, S-400 TRIUMF, ANTEY-2500, BUK-M2E, and TOR-M2E surface-to-air missile systems, the PANTSIR-S1 air defense missile/gun system, and IGLA-S MANPADS are top sellers. Frigates, submarines, and patrol boats are best-selling naval exports. Russia's land warfare products are centered on T-90 tanks, BMP-3 infantry fighting vehicles, and Tigr armored cars.⁶⁵²

Marketing, contracting, and exporting Russian defense products is executed by state company Rosoboronexport (ROE). ROE typically accounts for approximately 85% of Russia's total exports of weapons and military hardware. It ships Russian defense products to about 70 countries and cooperates with

over 700 Russian defense industry companies. ROE is incorporated into Rostec (formerly known as Russian Technologies or Rostechologii), the state corporation established in 2007 to promote the development, production, and export of civilian and military high technology products.⁶⁵³ Although ROE manages the majority of Russian arms trade, over 15 companies are authorized to export products abroad directly, most often spare parts and maintenance services, and these contracts account for about \$2 billion annually.⁶⁵⁴

Russia's largest export markets for arms are the Middle East/North Africa and the Asia-Pacific regions. Russia also maintains sales in Sub-Saharan Africa, Latin America, and some parts of Europe, although at a much lower level.⁶⁵⁵ Moscow is seeking to grow its market share in Southeast Asia and Latin America especially. Russia also is committed to expanding high-level military technical cooperation with other member states of BRICS (Brazil, Russia, India, China, and South Africa).^{656, 657}

Russia is taking steps to overcome challenges and remain competitive in the global arms market. ROE increasingly has been offering commercial credit for arms transactions, especially to countries in Asia and Sub-Saharan Africa that cannot afford to purchase expensive equipment or upgrade their armed forces without financial assistance. Similarly, Russian officials have acknowledged that exchanging arms for access to customers' natural resources may be

necessary to stave off competition from other suppliers.⁶⁵⁸ President Putin has expressed Moscow's willingness to improve financing options for contracts, expand offerings for joint production and local assembly of defense equipment in customers' countries, and improve upon post-sale support and equipment servicing.⁶⁵⁹

Moscow casts itself as a reliable and predictable arms trade partner that does not make

its commitments dependent on market preferences or political trends.⁶⁶⁰ Russia also is touting the effectiveness of its combat operations in Syria and using this to add cachet to its military products for export. Moscow believes that advertising many of its weapons systems as combat-proven will generate additional interest and orders from customers.⁶⁶¹

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REFERENCES

- ¹ Dick, Charles J. "A Bear Without Claws: The Russian Army in the 1990s." *The Journal of Slavic Military Studies*, vol. 10, no. 1, March 1997, pp. 1–2.
- ² Miller, Steven E. "Moscow's Military Power: Russia's Search for Security in an Age of Transition." *The Russian Military: Power and Policy*, edited by Steven E. Miller and Dmitri V. Trenin, MIT Press, 2004, pp. 2, 7.
- ³ Dick, p. 2.
- ⁴ Dick, pp. 1–2.
- ⁵ Allison, Roy, "Russia, Regional Conflict, and the Use of Military Power." *The Russian Military: Power and Policy*, edited by Steven E. Miller and Dmitri V. Trenin, MIT Press, 2004, pp. 132–133.
- ⁶ Dick, p. 2.
- ⁷ Miller, p. 1.
- ⁸ Arbatov, Alexei G, "Military Reform: From Crisis to Stagnation." *The Russian Military: Power and Policy*, edited by Steven E. Miller and Dmitri V. Trenin, MIT Press, 2004, p. 100.
- ⁹ Dick, pages 3–4.
- ¹⁰ Shurygin, Vladislav. "The Russian Army: Chronicle of Collapse." Internet Aгенство Federalnykh Rassledovaniy, 6 Nov 2006, www.apn.ru/publications/print1253.htm. Accessed 7 Jan 2007.
- ¹¹ Unattributed. "Army Officers Moonlighting to Avoid Starvation." Moscow Russian Television Network, 27 Oct 1996. Accessed 27 Oct 1996.
- ¹² Golts, Aleksandr, "The Social and Political Condition of the Russian Military." *The Russian Military: Power and Policy*, edited by Steven E. Miller and Dmitri V. Trenin, MIT Press, 2004, pp. 73–74.
- ¹³ Dick, p. 4.
- ¹⁴ Dick, pp. 4–5.
- ¹⁵ Barabanov, Mikhail, "Hard Lessons Learned: Russian Military Reform up to the Georgian Conflict." *Brothers Armed: Military Aspects of the Crisis in Ukraine*, edited by Colby Howard and Ruslan Pukhanov, East View Press, 2014, pp. 80–81.
- ¹⁶ Barabanov, "Hard Lessons," p. 75.
- ¹⁷ Barabanov, "Hard Lessons," p. 76.
- ¹⁸ Pallin, Carolina Vendil. *Russian Military Reform: A failed exercise in defense decision making*. Routledge, 2009, pp. 71–74.
- ¹⁹ Barabanov, Mikhail (ed), *Russia's New Army*. Centre for Analysis of Strategies and Technologies, Moscow, Russia, 2011, pp. 10–13.
- ²⁰ Barabanov, "Hard Lessons," pp. 79–80.
- ²¹ Pallin, pp. 94–96.
- ²² Pavlovskiy, Nikolay. "Good Bye, Soviet Army." *Boss Magazine*, 15 Feb 2010. Accessed 25 Feb 2010.
- ²³ Barabanov, "New Army," pp. 17–18.
- ²⁴ Barabanov, "Hard Lessons," p. 85.
- ²⁵ Barabanov, "New Army," pp. 13–14.
- ²⁶ Barabanov, "Hard Lessons," p. 82.
- ²⁷ Barabanov, "New Army," pp. 15–16.
- ²⁸ Barabanov, "New Army," pp. 19–20.
- ²⁹ Tamantsev, Yaroslav. "Where the Military Shambles in Russia Is Leading." Internet SEGODNYA.ru, 16 Dec 2008, www.segodnia.ru/content/19109. Accessed 29 Dec 2008.
- ³⁰ Shurygin, Vladislav. "Full text from the Press conference with General Makarov." *Kommersant-Vlast*, 13 Jul 2009, www.kommersant.ru/vlast. Accessed 16 Jul 09.
- ³¹ Unattributed, "The Contract Fad." *Nezavisimoye Voyennoye Obozreniye Online*, 22 Nov 2013, nvo.ng.ru/. Accessed 26 Nov 2013.
- ³² Telmanov, Denis. "General Staff Submitted a Modernization Plan to the State Duma." *Moscow Gazeta Online*, 13 Nov 2008, <http://gzt.ru/>. Accessed 18 Nov 2008.
- ³³ Barabanov, Mikhail. "Reform of the Combat Spirit." *Kommersant-Vlast*, 20 Oct 2008, www.kommersant.ru/vlast.aspx?issueid=41901. Accessed 21 Oct 2008.
- ³⁴ Unattributed. "Chief of Russian General Staff Army Gen Nikolay Makarov meets with foreign military attaches." *Moscow Interfax*, 21 Dec 2009, <http://www.militarynews.ru/>. Accessed 22 Dec 2009.

- ³⁵ Unattributed. "The General Staff Has Laid Out a New Strategy." *Nezavisimaya Gazeta*, 30 Dec 2009, www.Ng.ru/nvo/2009-12-30_genshtab.html. Accessed 31 Dec 2009.
- ³⁶ Barabanov, pp. 20–28.
- ³⁷ Unattributed, "The Contract Fad." *Nezavisimoye Voennoye Obozreniye Online*, 22 Nov 2013, nvo.ng.ru/. Accessed 26 Nov 2013.
- ³⁸ Rastopshin, Mikhail. "Unprepared for the Noncontact Operations of the 21st Century." *Nezavisimoye Voennoye Obozreniye*, 15 Aug 2008, www.nvo.ng.ru/wars/2008-08-15/8_ossetia.html. Accessed 29 Aug 2008.
- ³⁹ Kotenok Yuriy. "The Army Needs to Be Protected from Dilettantes." *Utro.ru*, 21 Oct 2008, www.utro.ru/articles/2008/10/21/776199.shtml. Accessed 22 Oct 2008.
- ⁴⁰ Khranchikhin, Aleksandr. "The Army is Cut Off at Its Knees: However, So Far There Are No Answers to the Questions: Why and to What End." *Moscow Nezavisimoye Voennoye Obozreniye*, 24 Oct 08. Accessed 3 Nov 2008.
- ⁴¹ Tamantsev, Yaroslav. "Where the Military Shambles in Russia Is Leading." *Internet SEGODNYA.ru*, 16 Dec 2008, www.segodnia.ru/content/19109. Accessed 29 Dec 2008.
- ⁴² Bratersky, Alexander and Earle, Jonathan. "Shoigu Inherits Armed Forces at Crossroads." *The Moscow Times*, 9 Nov 2012, <http://www.themoscowtimes.com/news/article/shoigu-inherits-armed-forces-at-crossroads/471212.html>. Accessed 9 Nov 2012.
- ⁴³ Nikolskiy, Aleksey, and Kostenko, Natalya. "Shoygu's Army." *Vedomosti Online*, 8 Nov 2012, <http://www.vedomosti.ru/>. Accessed 15 Nov 2012.
- ⁴⁴ Unattributed. "Analysis: Russian Military Manpower - Strengths, Weaknesses, Ukraine Standoff." *Caversham BBC Monitoring*, 15 May 2014, Bbc.co.uk. Accessed 15 May 2014.
- ⁴⁵ Unattributed. "Advanced Russian Weapons Deployed in Donbass." *Internet Kyiv Defense Express*, 17 Feb 2015, <http://www.defense-ua.com>. Accessed 17 Feb 2015.
- ⁴⁶ Unattributed. "More Russian Troops, Hardware Spotted in Ukraine." *5 Kanal TV in Ukrainian*. Accessed 3 Oct 2014.
- ⁴⁷ Sutyagin, Igor, "Detailing Russian Forces in Syria." *RUSI Defense Systems*, 13 Nov 2015, <https://rusi.org/publication/rus-defense-systems/detailing-russian-forces-syria>. Accessed 25 Oct 2016.
- ⁴⁸ "Northern Fleet." *Ministry of Defense of the Russian Federation*, <http://structure.mil.ru/structure/okrug/north/news.htm>.
- ⁴⁹ Frolov, Vladimir, president of LEFF Group, a government relations and PR company. "Putin Seeks entente Cordiale with the West." *Opinion: The Moscow Times Online*, 8 Mar 2016, <http://www.themoscowtimes.com>. Accessed 8 Mar 2016.
- ⁵⁰ Official President Edict. "Presidential Edict 683 approving appended text of 'The Russian Federation's National Security Strategy.'" *Official website of the Russian Federation President*, 31 Dec 2015, www.kremlin.ru. Accessed 5 Jan 2016.
- ⁵¹ Trenin, Dmitri. "The Revival of the Russian Military: How Moscow Reloaded," *Foreign Affairs*, May/Jun 2016, pp. 23–29.
- ⁵² Lukyanov, Fedor. "Putin's Foreign Policy: The Quest to Restore Russia's Rightful Place." *Foreign Affairs*, May/Jun 2016, pp. 30–38.
- ⁵³ Lukyanov, "Putin's Foreign Policy," pp. 30–38.
- ⁵⁴ Lukyanov, "Putin's Foreign Policy," pp. 30–38.
- ⁵⁵ Official President Edict. "Presidential Edict 683 approving appended text of 'The Russian Federation's National Security Strategy.'" *Official website of the Russian Federation President*, 31 Dec 2015, www.kremlin.ru. Accessed 5 Jan 2016.
- ⁵⁶ Trenin, "The Revival of the Russian Military," pp. 23–30.
- ⁵⁷ Official President Edict. "Presidential Edict 683 approving appended text of 'The Russian Federation's National Security Strategy.'" *Official website of the Russian Federation President*, 31 Dec 2015, www.kremlin.ru. Accessed 5 Jan 2016.
- ⁵⁸ Lukyanov, "Putin's Foreign Policy," pp. 30–38.
- ⁵⁹ Official President Edict. "Presidential Edict 683 approving appended text of 'The Russian Federation's National Security Strategy.'" *Official website of the Russian Federation President*, 31 Dec 2015, www.kremlin.ru. Accessed 5 Jan 2016.
- ⁶⁰ Unattributed. "Russian presidential representative to Afghanistan expressed his deep concerns regarding the expanding ISIL activities in Afghanistan." *TEHRAN (FNA)*, 24 Apr 2016, <http://www.english.farsnews.com>. Accessed 25 Apr 2016.
- ⁶¹ Government of the Russian Federation. "Deputy Secretary of the Russian Security Council Yevgeniy Lukyanov has issued a commentary on the most recent version of the National Security Strategy." *Official website of the Russian Federation Government*, 18 Jan 2016, <http://government.ru>. Accessed 18 Jan 2016.
- ⁶² Kashin, Vasily and Pyatachkova, Anastasiya. "On The Road to an Alliance? How Far Rapprochement Between Russia and China Could Go." *Internet: Moscow Lenta.ru in Russian*, 25 Aug 2016, <http://lenta.ru/>. Accessed 30 Aug 2016.
- ⁶³ Nechepurenko, Ivan. "Russia-China Alliance Could Launch New World Order." *The Moscow Times Online*, 14 Jun 2014, <http://www.themoscowtimes.com/>. Accessed 16 Jun 2014.

- ⁶⁴ Kashin and Pyatachkova, "On The Road to an Alliance? How Far Rapprochement Between Russia and China Could Go."
- ⁶⁵ Trenin, Dmitriy. "Russia's Foreign Policy in the Coming Five Years: Goals, Stimuli, Reference Points." *Politkom.ru*, 29 Apr 2016, <http://politkom.ru>. Accessed 10 May 2016.
- ⁶⁶ Cohen, Josh. "Putin's Fear of China Weakens Russia's Asia Pivot." *The Moscow Times*, 17 Dec 2014, <http://www.themoscowtimes.com/>. Accessed 24 Dec 2014.
- ⁶⁷ Melnikova, Kseniya citing experts Gabuyev, Aleksandr and Bordachev, Timofey. "Restless Neighborhood." *Moscow Lenta.ru* in Russian, 15 Jul 2015, <http://www.lenta.ru/>. Accessed 19 Jul 2016.
- ⁶⁸ Yegorov, Ivan. "Challenge Accepted; Nikolay Patrushev: National Security Strategy of the Russian Federation Has Been Updated." *Rossiyskaya Gazeta*, 22 Dec 2015, www.rg.ru/2015/12/22/patrushev-site.html. Accessed 28 Dec 2015.
- ⁶⁹ Official government document. "The Russian Federation National Security Strategy Through 2020." Russian Federation Security Council Website, 12 May 2009, www.scrf.gov.ru. Accessed 15 May 2009.
- ⁷⁰ Official President Edict. "Presidential Edict 683 approving appended text of 'The Russian Federation's National Security Strategy.'" Official website of the Russian Federation President, 31 Dec 2015, www.kremlin.ru. Accessed 5 Jan 2016.
- ⁷¹ Official President Edict. "Presidential Edict 683 approving appended text of 'The Russian Federation's National Security Strategy.'" Official website of the Russian Federation President, 31 Dec 2015, www.kremlin.ru. Accessed 5 Jan 2016.
- ⁷² Official government document. "The Russian Federation National Security Strategy Through 2020." Russian Federation Security Council Website, 12 May 2009, www.scrf.gov.ru. Accessed 15 May 2009.
- ⁷³ Official President Edict. "Presidential Edict 683 approving appended text of 'The Russian Federation's National Security Strategy.'" Official website of the Russian Federation President, 31 Dec 2015, www.kremlin.ru. Accessed 5 Jan 2016.
- ⁷⁴ Yaffa, Joshua. "What the Russian Protests Mean for Putin," 27 March 2017, www.thenewyorker.com.
- ⁷⁵ Yaffa, Joshua. "What the Russian Protests Mean for Putin," 27 March 2017, www.thenewyorker.com.
- ⁷⁶ Lipman, Maria. "How Putin Silences Dissent: Inside the Kremlin's Crackdown," *Foreign Affairs*, May/June 2016, pp. 38-47.
- ⁷⁷ Lipman, Maria. "How Putin Silences Dissent: Inside the Kremlin's Crackdown," *Foreign Affairs*, May/June 2016, pp. 38-47.
- ⁷⁸ Unattributed. "Russian National Guard to have central command point (Part 2)." *Moscow Interfax*, 9 Jul 2016, <http://www.interfax.com/>. Accessed 10 Jul 2016.
- ⁷⁹ Unattributed. "Maximal size of Russian Interior Ministry's staff cut to 904,800 - presidential order." *Moscow Interfax*, 19 Sep 2016, <http://www.interfax.com/>. Accessed 20 Sep 2016.
- ⁸⁰ Sokirko, Viktor. "Interview with Vladimir Pronichev." *Komsomolskaya Pravda Online*, 11 Oct 2011, <http://www.kp.ru/>. Accessed 15 Oct 2011.
- ⁸¹ Russia Federal Penitentiary Service. https://en.wikipedia.org/wiki/Federal_Penitentiary_Service. Accessed 25 Oct 2016.
- ⁸² Unattributed. "Putin caps Emergencies Ministry headcount." *Moscow TASS*, 30 Jul 2016, <http://tass.ru>. Accessed 31 Jul 2016.
- ⁸³ Wilson, Kyle. "Australia: The puzzle of Putin's insecurity: praetorian guards, Stalinist blueprints." *The Strategist*, 23 May 2016, <http://www.aspistrategist.org.au>. Accessed 24 May 2016.
- ⁸⁴ Unattributed. "Chechnya Move Worries Russian Press." *BBC News Online*, 17 Apr 2009, <http://news.bbc.co.uk/>. Accessed 17 Apr 2009.
- ⁸⁵ Milashina, Yelena. "How Putin Has Liquidated Kadyrov's Army. Edict on the Formation of the National Guard Will Have Colossal Consequences for Chechnya." *Novaya Gazeta Online*, 10 Apr 2016, <http://www.novayagazeta.ru/>. Accessed 26 Apr 2016.
- ⁸⁶ Unattributed. "CSTO peacekeepers in exercise in Belarus to practice creation of corridors for refugees." *Moscow Interfax*, 24 Aug 2016, <http://www.interfax.com/>. Accessed 25 Aug 2016.
- ⁸⁷ Unattributed. "CSTO's draft strategy views NATO approach toward CSTO states' borders as threat to their security – Russian envoy Vasilyev (Part 2)." *Moscow Interfax*, 29 Jun 2016, <http://www.interfax.com/>. Accessed 30 Jun 2016.
- ⁸⁸ Unattributed. "Soldiers from the Collective Security Treaty Organisation (CSTO) have called on simulated NATO peacekeeping forces to surrender as part of exercise 'Cooperation 2016.'" *Moscow Zvezda TV*, Ministry of Defense TV channel, 19 Aug 2016.
- ⁸⁹ Korostikov, Mikhail. "Tajik Mountains Can Barely Hold Out. Dushanbe Combating Terrorists and Drug Traffickers Using Chinese Jeeps and American Weapons." *Kommersant Online*, 29 Apr 2016, <http://kommersant.ru/>. Accessed 29 Apr 2016.
- ⁹⁰ Unattributed. "Hopeless Dead End. The Resolution of the Karabakh Conflict Requires a Minimum Trust, Which Is Completely Absent." *Nezavisimaya Gazeta*, 16 Oct 2016, www.Ng.ru/nvo/. Accessed 16 Oct 2016.

- ⁹¹ Karaganov, S.A. "A Strategy for Russia; Russian Foreign Policy: The End of The 2010s to the Beginning of the 2020s." Council for Foreign and Defense Policy, 6 Jun 2016, <http://www.svop.ru>. Accessed 22 Jul 2016.
- ⁹² Karaganov, Sergey. "Russian Foreign Policy: New Stage? – Group of Established Experts Have Presented Their View of the Priorities of Russian Foreign Policy." Rossiyskaya Gazeta Online, 24 May 2016, <http://rg.ru/>. Accessed 29 May 2016.
- ⁹³ Bocharova, Svetlana. "Siluanov Explained the Growth of the Classified Budget Expenditures." RBC.ru, 17 Oct 2016. www.rbc.ru. Accessed 20 Oct 2017.
- ⁹⁴ Economist Intelligence Unit. Russia GDP, Exchange Rate, GDP deflator. eiu.com. Accessed Jun 2017.
- ⁹⁵ Unattributed. "Putin signs 2016 Budget Amendments, Deficit Rises to 3 Trillion Rubles." Interfax, 24 Nov 2016, <http://www.interfax.com/>. Accessed 24 Nov 2016.
- ⁹⁶ Economist Intelligence Unit. Russia GDP, Exchange Rate, GDP deflator. eiu.com. Accessed Jun 2017.
- ⁹⁷ Russian Federation Ministry of Finance. "Annual information about execution of the federal budget (data from 1 January 2006)." National defense line item, <http://minfin.ru/statistics/fedbud/#>. Accessed 28 Nov 2016.
- ⁹⁸ Economist Intelligence Unit. Russia GDP, Exchange Rate, GDP deflator. eiu.com. Accessed Jun 2017.
- ⁹⁹ Russian Federation Ministry of Finance. "Annual information about execution of the federal budget (data from 1 January 2006)." National defense line item, <http://minfin.ru/statistics/fedbud/#>. Accessed 28 Nov 2016.
- ¹⁰⁰ State Duma draft law 2428-7. "On introducing amendments in the Federal Law 'On the Federal Budget in 2016,'" Appendix No. 3 of Explanatory Note, "Expenditures of the Federal Budget in 2016 in Framework of Sections and Subsections of Categories of Expenditures of the Federal Budget." duma.gov.ru. Accessed 31 Oct 2016.
- ¹⁰¹ Cooper, Julian. "Russian State Armament Programme to 2020: a quantitative assessment of implementation 2011–2015." SIPRI, Mar 2016, p. 20.
- ¹⁰² Cooper, p. 14.
- ¹⁰³ Prokopenko, Aleksandra. "Расходы прорвали линию обороны." Vedomosti Online, 9 Sep 2016.
- ¹⁰⁴ Bocharova, "Siluanov Explained the Growth of the Classified Budget Expenditures."
- ¹⁰⁵ Economist Intelligence Unit. Russia GDP, Exchange Rate, GDP deflator. eiu.com. Accessed Jun 2017.
- ¹⁰⁶ Russian Federation Ministry of Finance. "Annual information about execution of the federal budget (data from 1 January 2006)." National defense line item, <http://minfin.ru/statistics/fedbud/#>. Accessed 28 Nov 2016.
- ¹⁰⁷ State Duma draft law 2428-7, "On introducing amendments in the Federal Law 'On the Federal Budget in 2016,'" Appendix No. 3 of Explanatory Note, "Expenditures of the Federal Budget in 2016 in Framework of Sections and Subsections of Categories of Expenditures of the Federal Budget." duma.gov.ru. Accessed 31 Oct 2016.
- ¹⁰⁸ Unattributed. "Russian Finance Ministry suggests 5% budget cuts in 2017." ITAR-TASS News Agency, 7 Jul 2016. Accessed 7 Jul 2016.
- ¹⁰⁹ Kuvshinova, Olga. "Доходы бюджета в 2019 году снизятся до 20-летнего минимума" [Budget Outlays in 2019 Will Sink to 20-Year Low]. Vedomosti Online, 4 Sep 2016, www.vedomosti.ru. Accessed 13 Sep 2016.
- ¹¹⁰ Unattributed. "Potential exists for Bashneft sale, but timing of Rosneft privatization needs analysis." Interfax, 22 Jun 2016, www.interfax.com. Accessed 23 Jun 2016.
- ¹¹¹ "Interfax Russia & CIS Banking and Finance Weekly." Interfax, 12 Aug 2016, www.interfax.com. Accessed 12 Aug 2016.
- ¹¹² Prokopenko, Alexandra. "Experts Predict 'Lost Decade' for Russia's Stagnating Economy." The Moscow Times, 19 Aug 2016, themoscowtimes.com/articles/experts-proclaim-lost-decade-for-russias-stagnating-economy-55039. Accessed 19 Aug 2016.
- ¹¹³ Gerasimov, Valery. "Ценность Науки В Предвидении Новые Вызовы Требуют Переосмыслить Формы И Способы Ведения Боевых Действий" [The Value of Science is in Foresight: New Challenges Demand Rethinking of the Forms and Methods of Conducting Combat Actions]. Military-Industrial Courier, 27 Feb 2013.
- ¹¹⁴ Unattributed. "Russian Chief of General Staff Makarov Addresses Academy of Military Sciences." Moscow Nezavisimoye Voyennoye Obozreniye, 19 Feb 2012, <http://nvo.ng.ru/>. Accessed 19 Feb 2012.
- ¹¹⁵ Unattributed. "Numerous military conflicts may develop into full-fledged war – Makarov (Part 2)." Interfax-AVN Online in English, 7 Dec 2011, <http://www.militarynews.ru>. Accessed 7 Dec 2011.
- ¹¹⁶ Chekinov, Sergey.G. and Bogdanov, Sergey A. "Initial Periods of Wars and Their Impact on a Country's Preparations for a Future War." Military Thought, 31 Dec 2012.
- ¹¹⁷ Gerasimov, "The Value of Science is in Foresight."

- ¹¹⁸ President of the Russian Federation. "Military Doctrine of the Russian Federation, approved by Russian Federation President V. Putin." Official website of the Russian Federation president, 31 Dec 2014, <http://www.kremlin.ru>. Accessed 31 Dec 2014.
- ¹¹⁹ Unattributed. "К Вопросу о Ядерном Сдерживании" [On the Question of Nuclear Deterrence]. *Military Thought*, 1 Dec 2002.
- ¹²⁰ Felgengauer, Pavel. "Rybkin's Preventive Strike." *Moscow Segodnya*, 14 Feb 1997.
- ¹²¹ Unattributed. "Russia Classifies Information on Pre-emptive Nuclear Strikes – Military." *Interfax-AVN Online*, 5 Sep 2014, <http://www.militarynews.ru>. Accessed 5 Sep 2014.
- ¹²² Unattributed. "On Employing Nuclear Weapons to De-Escalate Military Operations." *Military Thought*, 1 May 1999.
- ¹²³ President of the Russian Federation. "Military Doctrine of the Russian Federation, approved by Russian Federation President V. Putin." Official website of the Russian Federation president, 31 Dec 2014, <http://www.kremlin.ru>. Accessed 31 Dec 2014.
- ¹²⁴ Malashenko, E.I. "Creation and Employment of Strategic Reserves." *Military Thought*, vol. 1, 2006.
- ¹²⁵ Garayev, M.A. "Lessons and Conclusions Drawn from the Experience of the Great Patriotic War for Building Up and Training the Armed Forces." *Voyennaya Mysl*, 5 May 2010.
- ¹²⁶ Bogdanov, S.A. "Features of The Initial Period of Past and Future Wars." *Voyennaya Mysl*, 1 May 2003.
- ¹²⁷ President of the Russian Federation. "Military Doctrine of the Russian Federation, approved by Russian Federation President V. Putin." Official website of the Russian Federation president, 31 Dec 2014, <http://www.kremlin.ru>. Accessed 31 Dec 2014.
- ¹²⁸ President of the Russian Federation. "2010 Military Doctrine of the Russian Federation." 5 Feb 2010, <http://www.kremlin.ru>. Accessed 5 Feb 2010.
- ¹²⁹ Radchuk, V.A. "Determination of Levels of Unacceptable Damage to State Economic System: A Methodological Approach." *Military Thought*, vol. 3, 2008.
- ¹³⁰ President of the Russian Federation. "Military Doctrine of the Russian Federation, approved by Russian Federation President V. Putin." Official website of the Russian Federation president, 31 Dec 2014, <http://www.kremlin.ru>. Accessed 31 Dec 2014.
- ¹³¹ President of the Russian Federation. "Military Doctrine of the Russian Federation, approved by Russian Federation President V. Putin." Official website of the Russian Federation president, 31 Dec 2014, <http://www.kremlin.ru>. Accessed 31 Dec 2014.
- ¹³² Burenok, F.M. and Achasov, O.B. "Russia: Non-Nuclear Deterrence." *Military Thought*, 1 Jan 2008.
- ¹³³ Chekinov, S.G. and Bogdanov, S.A. "Strategic Deterrence and Russia's National Security Today." *Military Thought*, 1 Jan 2012.
- ¹³⁴ Radchuk, V.A. "Determination of Levels of Unacceptable Damage to State Economic System: A Methodological Approach." *Military Thought*, vol. 3, 2008.
- ¹³⁵ Ozhegov, S.I. and Shvedova, N.Yu. *Encyclopedic Dictionary of the Russian Language*. Russian Academy of Science Institute of the Russian Language, 1999, p. 707.
- ¹³⁶ Unattributed. "К Вопросу о Ядерном Сдерживании" [On the Question of Nuclear Deterrence]. *Military Thought*, 11 Jan 2002.
- ¹³⁷ Unattributed. "Strategic Deterrence and Russia's National Security Today." *Military Thought*, 3 Aug 2012.
- ¹³⁸ Unattributed. "Issues of Strategic Deterrence in Current Conditions." *Military Thought*, 17 Feb 2010.
- ¹³⁹ Barynkin, V.M. "Assessment of Effectiveness of Measures to Resolve Military Conflicts in the Early Stages of Their Development." *Military Thought*, 1 Mar 1996.
- ¹⁴⁰ Tsgychko, V.N. "Balance of Forces' Category in Potential Military Conflicts." *Military Thought*, Mar 2002.
- ¹⁴¹ Unattributed. "К Вопросу о Ядерном Сдерживании" [On the Question of Nuclear Deterrence]. *Military Thought*, 11 Jan 2002.
- ¹⁴² Unattributed. "К Вопросу о Ядерном Сдерживании" [On the Question of Nuclear Deterrence]. *Military Thought*, 11 Jan 2002.
- ¹⁴³ President of the Russian Federation. "Military Doctrine of the Russian Federation, approved by Russian Federation President V. Putin." Official website of the Russian Federation president, 31 Dec 2014, <http://www.kremlin.ru>. Accessed 31 Dec 2014.
- ¹⁴⁴ Official President Edict. "Presidential Edict 683 approving appended text of 'The Russian Federation's National Security Strategy.'" Official website of the Russian Federation President, 31 Dec 2015, www.kremlin.ru. Accessed 5 Jan 2016.
- ¹⁴⁵ Chekinov, S.G. and Bogdanov S.A. "Asymmetrical Actions to Maintain Russia's Military Security." *Military Thought*, 20 Jun 2013.
- ¹⁴⁶ Bikkenin, R. "Questions of Theory: Information Conflict in The Military Sphere: Basic Elements and Concepts." *Information Conflict in Military Sphere*, 18 Sep 2003, pp. 38–40.
- ¹⁴⁷ Giles, Keir. "Russia's New Tools for Confronting the West." Research Paper, Chatham House, Mar 2016, <https://www.chathamhouse.org/sites/files/chathamhouse/publications/research/2016-03-21-russias-new-tools-giles.pdf>. Accessed 28 Mar 2016.

- ¹⁴⁸ “Constitution of Russia, chapter 4. The President of the Russian Federation.” Wikisource, amended 30 Dec 2008, https://en.wikisource.org/wiki/Constitution_of_Russia#CHAPTER_4._THE_PREIDENT_OF_THE_RUSSIAN_FEDERATION. Accessed 14 Dec 2016.
- ¹⁴⁹ Unattributed. “1.18 The Powers of the Russian-Federation President in the Sphere of Command and Control of the Russian-Federation Armed Forces in Peacetime and Wartime.” Chernyye Dyr V Rossisykom Zakondatelstve, 1 Oct 2007, www.K-press.ru/bh. Accessed 8 Nov 2007.
- ¹⁵⁰ Unattributed. “Defense Minister General of the Army Sergey Shoygu Conducted a Teleconference with Armed Forces Key Personnel.” Ministry of Defense of the Russian Federation, 8 Apr 2013, www.mil.ru. Accessed 8 Apr 2013.
- ¹⁵¹ Unattributed. “Ministry of Defense Concludes First Contract for Delivery of Over 100 Armata Tanks.” Moscow RIA Novosti, 6 Sep 2016, www.rian.ru. Accessed 7 Sep 2016.
- ¹⁵² Unattributed. “Russian Federation Ministry of Defense: Russia is Preparing a Response to USA Prompt Global Strike.” ITAR-TASS, 2 Jun 2014, <http://www.itar-tass.com/>. Accessed 3 Jun 2014.
- ¹⁵³ Unattributed. “Defense Minister General of the Army Sergey Shoygu Conducted a Teleconference with Armed Forces Key Personnel.” Ministry of Defense of the Russian Federation, 8 Apr 2013, www.mil.ru. Accessed 8 Apr 2013.
- ¹⁵⁴ Yershov, Yevgeniy. “Shoygu the All-Purpose and... the Only.” Moscow Polit.ru, 6 Nov 2012, <http://polit.ru/>. Accessed 7 Nov 2012.
- ¹⁵⁵ Unattributed. “General of the Army Sergey Shoygu, Russian Defense Minister, Has Summed Up the Outcome of Snap Inspections of the Combat Readiness of the Troops (Forces).” Ministry of Defense of the Russian Federation, 3 Aug 2015, <http://www.mil.ru>. Accessed 4 Aug 2015.
- ¹⁵⁶ Miranovich, Gennadiy. “Defense of the Country: Scientific Approach.” Moscow Krasnaya Zvezda, 31 Jan 2014, <http://www.redstar.ru>. Accessed 19 Feb 2014.
- ¹⁵⁷ President of the Russian Federation. “Military Doctrine of the Russian Federation, approved by Russian Federation President V. Putin.” Official website of the Russian Federation president, 31 Dec 2014, <http://www.kremlin.ru>. Accessed 31 Dec 2014.
- ¹⁵⁸ President of the Russian Federation. “Statute on the Russian Federation Armed Forces General Staff.” Official website of the Russian Federation president, 25 Jul 2012, <http://www.kremlin.ru>. Accessed 30 Jul 2013.
- ¹⁵⁹ Unattributed. “1.18 The Powers of the Russian-Federation President in the Sphere of Command and Control of the Russian-Federation Armed Forces in Peacetime and Wartime.” Chernyye Dyr V Rossisykom Zakondatelstve, 1 Oct 2007, www.K-press.ru/bh. Accessed 8 Nov 2007.
- ¹⁶⁰ Unattributed. “GEN. Gerasimov Becomes Central Military District Commander.” Moscow Interfax, 11 May 2012, <http://www.interfax.com>. Accessed 11 May 2012.
- ¹⁶¹ BBC Monitoring. “BBCM Profile: Russia's New Armed Forces Chief, Valeriy Gerasimov.” BBC Monitoring, 9 Nov 2012, www.monitor.bbc.co.uk. Accessed 9 Nov 2012.
- ¹⁶² Unattributed. “Traditions will be Continued.” Moscow Krasnyy Voin, 3 Apr 2009. Accessed 4 Apr 2009.
- ¹⁶³ Unattributed. “Gerasimov Will Bring Better Organization to General Staff – Experts.” Moscow Interfax-AVN, 9 Nov 2012, <http://www.militarynews.ru>. Accessed 9 Nov 2012.
- ¹⁶⁴ Unattributed. “The General Staff Planned a Complex of Measures for Strategic Deterrence for the Provision of Military Conflicts - Chief of the General Staff.” Moscow Interfax-AVN, 27 Jan 2014, <http://www.militarynews.ru>. Accessed 5 Feb 2014.
- ¹⁶⁵ Unattributed. “Russian General Staff Chief Outlines 'Problematic Issues' with NATO.” Moscow Rossiya 24 TV, 23 Jan 2014, [Vesti.ru](http://vesti.ru). Accessed 23 Jan 2014.
- ¹⁶⁶ Gerasimov, Valeriy. “First Main Test: Russia's Nuclear Arsenal Remains the Most Important National Security Guarantee.” Voenno-Promyshlennyy Kuryer (VPK), 3 Sep 2014, <http://vpk-news.ru/articles/21648>. Accessed 5 Sep 2014.
- ¹⁶⁷ Unattributed. “Russia Taking Measures to Prevent US, NATO military superiority.” Moscow Interfax-AVN, 30 Jan 2015, <http://www.interfax.ru/>. Accessed 30 Jan 2015.
- ¹⁶⁸ Unattributed. “Functions of the Main Operations Directorate of the General Staff.” Ministry of Defense of the Russian Federation, 30 May 2013, <http://www.mil.ru>. Accessed 31 May 2013.
- ¹⁶⁹ Unattributed. “Chief of Main Operations Directorate Sergey Rudskoy Speech During Briefing on Terrorism.” Ministry of Defense of the Russian Federation, 2 Dec 2015, <http://www.mil.ru>. Accessed 3 Dec 2015.
- ¹⁷⁰ Tikhonov, Aleksandr. “Where the Threats to Peace Come from.” Moscow Krasnaya Zvezda, 28 May 2014, <http://www.redstar.ru>. Accessed 2 Jun 2014.
- ¹⁷¹ Unattributed. “Out of 550 Proposals for RDT&E Costing 120 Billion, Only 146 Costing About 20 Billion Were Included in Gosoboronzakaz-2011.” Moscow Interfax-AVN, 4 Mar 2011, <http://www.militarynews.ru>. Accessed 4 Mar 2011.

- ¹⁷² Unattributed. "Russian General Gives Data On Military Research." Moscow Interfax-AVN, 4 Mar 2011, <http://www.militarynews.ru>. Accessed 6 Mar 2011.
- ¹⁷³ Unattributed. "Russian Army Revises State Defense Order, Suspends Military Education Reform." Moscow Interfax-AVN, 14 Nov 2012. <http://www.militarynews.ru>. Accessed 14 Nov 2012.
- ¹⁷⁴ Unattributed. "Russia, Syria did not strike at areas agreed on in Geneva in past week – Rudskoi." Interfax in English, 19 Sep 2016, <http://www.interfax.com/>. Accessed 19 Sep 2016.
- ¹⁷⁵ Unattributed. "Russia, U.S. exchange info on ceasefire in Syria - Russian Defense Ministry." Interfax in English, 27 Feb 2016, <http://www.interfax.com/>. Accessed 27 Feb 2016.
- ¹⁷⁶ Russian Ministry of Defense. "Biography of Russian President Putin." <http://eng.mil.ru/en/management/leader.htm>. Accessed 14 Oct 2016.
- ¹⁷⁷ Unattributed. "1.18 The Powers of the Russian-Federation President in the Sphere of Command and Control of the Russian-Federation Armed Forces in Peacetime and Wartime." Chernyye Dyry V Rossisykom Zakondatelstve, 1 Oct 2007, www.K-press.ru/bh. Accessed 8 Nov 2007.
- ¹⁷⁸ Petrov, Ivan. "Young and Stern: The Generals Will Be Discharged by a 42-Year-Old Veteran of the State Emergency Committee." RBK Daily, 6 Nov 2008.
- ¹⁷⁹ Unattributed. "1.18 The Powers of the Russian-Federation President in the Sphere of Command and Control of the Russian-Federation Armed Forces in Peacetime and Wartime." Chernyye Dyry V Rossisykom Zakondatelstve, 1 Oct 2007, www.K-press.ru/bh. Accessed 8 Nov 2007.
- ¹⁸⁰ President of the Russian Federation. "Military Doctrine of the Russian Federation, approved by Russian Federation President V. Putin." Official website of the Russian Federation president, 31 Dec 2014, <http://www.kremlin.ru>. Accessed 31 Dec 2014.
- ¹⁸¹ Miranovich, Gennadiy. "Defense of the Country: Scientific Approach." Moscow Krasnaya Zvezda, 31 Jan 2014, <http://www.redstar.ru>. Accessed 19 Feb 2014.
- ¹⁸² Unattributed. "Personnel Training System for Russian Ground Forces Will Be Improved – Commander-in-Chief." Moscow Interfax-AVN, 3 Oct 2014, <http://www.interfax.com/>. Accessed 3 Oct 2014.
- ¹⁸³ Yarynich, Valery E. "C3: Nuclear Command, Control, Cooperation." Conference paper, 2003. Source is former Russian General Staff officer and SRF member.
- ¹⁸⁴ Bozhov, Oleg. "How They Will Wage War in the Future: Tanks Rumbled Across the Sky." MK Online, 13 Aug 2016, <http://mk.ru/>. Accessed 13 Aug 2016.
- ¹⁸⁵ Unattributed. "1.18 The Powers of the Russian-Federation President in the Sphere of Command and Control of the Russian-Federation Armed Forces in Peacetime and Wartime." Chernyye Dyry V Rossisykom Zakondatelstve, 1 Oct 2007, www.K-press.ru/bh. Accessed 8 Nov 2007.
- ¹⁸⁶ Yarynich, "C3: Nuclear Command, Control, Cooperation."
- ¹⁸⁷ Yarynich, "C3: Nuclear Command, Control, Cooperation."
- ¹⁸⁸ Litovkin, Dmitriy. "The Military Go on the Net." Izvestiya Online, 18 Oct 2010. <http://www.izvestia.ru/>. Accessed 18 Oct 2010.
- ¹⁸⁹ Yarynich, Valery E. "Russian Missile Programs, The MTCR and the Future of U.S. Russian Arms Control." Conference paper. 21 Jul 1995.
- ¹⁹⁰ Yarynich, "C3: Nuclear Command, Control, Cooperation."
- ¹⁹¹ Yarynich, "C3: Nuclear Command, Control, Cooperation."
- ¹⁹² President of the Russian Federation. "Military Doctrine of the Russian Federation, approved by Russian Federation President V. Putin." Official website of the Russian Federation president, 31 Dec 2014, <http://www.kremlin.ru>. Accessed 31 Dec 2014.
- ¹⁹³ Yarynich, "C3: Nuclear Command, Control, Cooperation."
- ¹⁹⁴ Hoffman, David E. *The Dead Hand: The Untold Story of the Cold War Arms Race and its Dangerous Aftermath*. Doubleday, 2009.
- ¹⁹⁵ Russian Ministry of Defense. http://function.mil.ru/news_page/country/more.htm?id=12066124@egNews&_print=true. Accessed 17 Nov 2015.
- ¹⁹⁶ Russian Ministry of Defense. http://function.mil.ru/news_page/country/more.htm?id=12066124@egNews&_print=true. Accessed 17 Nov 2015.
- ¹⁹⁷ Unattributed. "President Signs Decree On Four Joint Strategic Commands in Russia." ITAR-TASS in English, 15 Jul 2010.
- ¹⁹⁸ Belousov, Yuriy and Tikhonov, Aleksandr. "From the Volga to the Yenisey." Krasnaya Zvezda Online, 10 Nov 2010, <http://www.redstar.ru>. Accessed 10 Nov 2010.
- ¹⁹⁹ Stepanov, Aleksandr. "Russia Expands Arctic Military Grouping. Air Force and Air Defense Army to Be Part of Northern Fleet." MK Online, 3 Aug 2015, <http://mk.ru/>. Accessed 3 Aug 2015.
- ²⁰⁰ Belousov and Tikhonov, "From the Volga to the Yenisey."
- ²⁰¹ Unattributed. "Organization of Russia's new operational-strategic commands will be over in 2010." Interfax-AVN, 12 Jun 2010, <http://www.militarynews.ru>. Accessed 12 Jun 2010.
- ²⁰² Belousov and Tikhonov, "From the Volga to the Yenisey."

- ²⁰³ Unattributed. "Organization of Russia's new operational-strategic commands will be over in 2010." *Interfax-AVN*, 12 Jun 2010, <http://www.militarynews.ru>. Accessed 12 Jun 2010.
- ²⁰⁴ Unattributed. "Russia opens regional defense control center in Yekaterinburg." *Interfax*, 31 Mar 2014, <http://www.interfax.com/>. Accessed 31 Mar 2014.
- ²⁰⁵ Дуаченко, А.А. *Опаленные В Борьбе При Создании Ядерного Щита Родины: Научно-Публицистическая Монография*. Chapter 4: Nuclear Test Site in The Arctic. Edited by V.N. Mikhaylov, Moscow, 2008, pp. 465–471.
- ²⁰⁶ Unattributed. "Jane's, Sentinel Security Assessment – Russia and the CIS, Strategic Weapon System, Russian Federation." *IHS Jane's 360*, 25 Apr 2016, www.janes.com. Accessed 6 Sept 2016.
- ²⁰⁷ Unattributed. "Jane's, Sentinel Security Assessment – Russia and the CIS, Strategic Weapon System, Russian Federation." *IHS Jane's 360*, 25 Apr 2016, www.janes.com. Accessed 6 Sept 2016.
- ²⁰⁸ Unattributed. "Jane's, Sentinel Security Assessment – Russia and the CIS, Strategic Weapon System, Russian Federation." *IHS Jane's 360*, 25 Apr 2016, www.janes.com. Accessed 6 Sept 2016.
- ²⁰⁹ Unattributed. "Jane's, Sentinel Security Assessment – Russia and the CIS, Strategic Weapon System, Russian Federation." *IHS Jane's 360*, 25 Apr 2016, www.janes.com. Accessed 6 Sept 2016.
- ²¹⁰ Unattributed. "Upgraded Russian-made Tu-160M2 bomber to perform first flight in 2019." *TASS World Service*, 2 Mar 2016.
- ²¹¹ Podvig, Pavel, et al. "Russian Strategic Nuclear Forces." Center for Arms Control, Energy and Environmental Studies at the Moscow Institute of Physics and Technology, English language edition supported by the Security Studies Program at the Massachusetts Institute of Technology, MIT Press, 2001. pp. 50–51.
- ²¹² Rosatom Annual Report – 2014.
- ²¹³ Unattributed. "Medvedkov: The Creation of Infrastructure for the Nuclear Deterrence Forces Is our Main Administration's Key Task." *Interfax*, 3 Aug 2016, <http://www.interfax.com/>. Accessed 16 Aug 2016.
- ²¹⁴ Unattributed. "Jane's, Sentinel Security Assessment – Russia and the CIS, Strategic Weapon System, Russian Federation." *IHS Jane's 360*, 25 Apr 2016, www.janes.com. Accessed 6 Sept 2016.
- ²¹⁵ U.S. Department of State. "Bureau of State, Bureau of Arms Control, Verification, and Compliance, New START Treaty Aggregate Numbers of Strategic Offensive Forces, Fact Sheet, Washington, DC." 1 April 2017, <http://www.state.gov/t/avc/newstart/269496.htm>.
- ²¹⁶ Sutyagin, Igor. "Royal United Services Institute Occasional Paper; Atomic Accounting: A New Estimate of Russia's Non-Strategic Nuclear Forces." Nov 2012, p. 5.
- ²¹⁷ Arbatov, Alexei. "Nuclear Threat Initiative. A Russian Perspective on the Challenge of U.S., NATO, and Russian Non-Strategic Nuclear Weapons." NATO Parliamentary Assembly, Science and Technology Committee, www.nti.org/media/pdfs/NTI_Framework_Chpt8b.pdf. Accessed 13 Oct 2015.
- ²¹⁸ Unattributed. "Report: Russian Military Modernization 176 STC 15 E." 11 Oct 2015.
- ²¹⁹ Andreyev, Oleg. "RVSN Given Six Years to Rearm; Moscow Adjusts Plans to Enhance Combat Readiness of the Armed Forces." *Nezavisimaya Gazeta*, 18 May 2016, <http://www.ng.ru/>. Accessed 19 May 2016.
- ²²⁰ Unattributed. "Source Names Timeframe for Troops to Get New Sarmat Missile." *Moscow Lenta.ru*, 5 Sep 2016, <http://lenta.ru/>. Accessed 15 Sep 2016.
- ²²¹ Bodner, Matthew. "Kremlin Threatens Response to U.S. Nuclear Bomb Deployment in Germany." *Moscow Times Online in English*, 23 Sep 2015, <http://www.themoscowtimes.com>. Accessed 24 Sep 2015.
- ²²² Leitenberg, M and Zilinskas, R. *The Soviet Biological Weapons Program: A History*. Harvard University Press, 2012.
- ²²³ "Note by The Director General Overall Progress with Respect to the Destruction of the Remaining Chemical Weapons Stockpiles." OPCW, EC-80/DG.22, 28 Sep 2015.
- ²²⁴ "Update on destruction of Russian chemical weapons released", 12 January 2017, *BBCMIR2017*, 12 January 2017
- ²²⁵ "Report of the Visit by the Chairperson of the Executive Council and Representatives of the Executive Council to the Kizner Chemical Weapons Destruction Facility the Russian Federation, 25–29 Apr 2016." OPCW, EC-82/1, 30 May 2016.
- ²²⁶ "Remarks by Director-General Ahmet Üzümcü Closing Ceremony of Maradykovsky Chemical Weapons Destruction Facility." OPCW, 30 Oct 2016.
- ²²⁷ Riches, James. "Analysis of Clothing and Urine from Moscow Theatre Siege Casualties Reveals Carfentanil and Remifentanil Use." Technical analysis from Porton Down, 2012.
- ²²⁸ Zaretsky, B.L. "Russia's Aerospace Security." *Moscow Military Thought*, vol. 24, no. 3, 2015, pp. 24–30.

- ²²⁹ Cherednikov, I.Yu., et al. "Protection of Critical Assets from Missile Attacks by Sabotage and Reconnaissance Groups." *Moscow Military Thought*, vol. 24, no. 1, 2015, pp. 39–44.
- ²³⁰ Khmara, Yu, Lutovinov, V. "Military Security of the Russian Federation: How to Ensure It under Present Conditions." *Moscow Military Thought*, vol. 25, no. 1, 2016, pp. 26–40.
- ²³¹ Belomytsev, A.V., et al. "How to Fight an Enemy Coming from Aerospace." *Moscow Military Thought*, no. 5, 2014, pp. 41–43.
- ²³² Falichev, Oleg. "We Cannot Allow Ourselves to Purchase Bad Armaments." *Voyenno-Promyshlenny Kuryer*, 2 Mar 2011, <http://vpk-news.ru/>. Accessed 2 Mar 2011.
- ²³³ Cheltsov, B.F. "Approaches to the Creation of the National Aerospace Defense System in Light of Future Network-Centric Wars." *Moscow Military Thought*, vol. 4, 2008, pp. 1–11.
- ²³⁴ "Questions of strategic and Operational Art in Soviet Military Labor (1917–1949)" [Вопросы стратегии и оперативного искусства в советских военных трудах (1917–1949). М.: Воениздат]. *Moscow Military Publishers*, 1965, p. 636.
- ²³⁵ Fitzgerald, Mary. "The New Revolution in Russian Military Affairs Royal United Services Institute for Defense Studies." *Whitehall Paper Series*, 1994, p. 3.
- ²³⁶ "Questions of strategic and Operational Art in Soviet Military Labor (1917–1949)" [Вопросы стратегии и оперативного искусства в советских военных трудах (1917–1949). М.: Воениздат]. *Moscow Military Publishers*, 1965, p. 636.
- ²³⁷ Aleksandrov, A. Ye. "Prospects for the Introduction of Network-Centric Concepts." *Moscow Military Thought*, vol. 23, no. 2, 2014, pp. 49–58.
- ²³⁸ Kalinkin, D.A., et al. "Strategic Deterrence against the U.S. Global ABM System and Prompt Global Strike Capabilities." *Moscow Military Thought*, Vol. 24, no. 1, 2015, pp. 1–7.
- ²³⁹ Oya, Yelena. "Interview: Star Wars. How Russian Air Defenses Will Respond to the Latest Threats from the Skies. The Deputy Commander in Chief of the Russian Federation's Aerospace Forces Has Told Life.ru About New Armament in Service with the Russian Army." *Russkaya Sluzhba Novostey Online (RSN)*, 21 Aug 2016, <http://www.rusnovosti.ru/>. Accessed 28 Aug 2016.
- ²⁴⁰ Falichev, Oleg. "We Cannot Allow Ourselves to Purchase Bad Armaments." *Voyenno-Promyshlenny Kuryer*, 2 Mar 2011, <http://vpk-news.ru/>. Accessed 2 Mar 2011.
- ²⁴¹ Solovyov, I.Ye and Tsurilov, Yu.N. "Executive Planning Principles for the Development of the CIS Joint Air Defense System." *Moscow Military Thought*, vol. 23, no. 3, 2014, pp. 132–140.
- ²⁴² Akhmerov, D.Ye, et al. "Antiaircraft Defense Task Forces in Strategic Areas." *Moscow Military Thought*, vol. 24, no. 4, 2015, pp. 62–69.
- ²⁴³ Unattributed. "Advanced control systems to strengthen Russian air defense systems." *Interfax*, 9 Oct 2015, <http://www.interfax.com/>. Accessed 9 Oct 2015.
- ²⁴⁴ Zakharov, V.A., "Antiaircraft Forces in an Active Global Defense System." *Moscow Military Thought*, no. 4, 2014.
- ²⁴⁵ Ilyin, Yu.D., et al. "Development Outlook for High-Precision Ammunition." *Moscow Military Thought*, Vol. 23, no. 2, 2014, pp. 98–111.
- ²⁴⁶ Litvinenko, V.I. "Generalized Assessment of the Effectiveness of Conventional Arms and Weapons Based on New Physical Principles." *Moscow Military Thought*, vol. 24, no. 4, 2015, pp. 69–77.
- ²⁴⁷ Kiselyov, V.A. and Vorobyov, I.N. "Trends in the Tactics of Network-Centric Operations." *Moscow Military Thought*, vol. 23, no. 2, 2014, pp. 33–41.
- ²⁴⁸ Korabelnikov, A.P. "Promising Trends in the Development of Aerospace Defense Forms and Methods in the Russian Federation." *Moscow Military Thought*, vol. 24, no. 4, 2015, pp. 145–155.
- ²⁴⁹ Litvinenko, V.I. and Rusanov, I.P. "Basic Trends in Firepower Employment in Modern-Day Operations (Combat Actions)." *Moscow Military Thought*, vol. 23, no. 4, 2014, pp. 40–48.
- ²⁵⁰ Simpkin, Richard. *Deep Battle: The Brainchild of Marshal Tukhachevsky*. Brassey's Defence, 1987.
- ²⁵¹ Ogarkov, N.V. "A Reliable Bastion of Socialism and Peace." *Krasnaya Zvezda*, 23 Feb 1983, p. 2.
- ²⁵² Fitzgerald, Mary. "Marshal Ogarkov on the Modern Theater Operation." *Center for Naval Analysis*, CRM 86-238, Nov 1986.
- ²⁵³ Fitzgerald, Mary. "The Soviet Military and the New Air War in the Persian Gulf." *Airpower Journal*, 1991.
- ²⁵⁴ Falichev, Oleg. "We Cannot Allow Ourselves to Purchase Bad Armaments." *Voyenno-Promyshlenny Kuryer*, 2 Mar 2011, <http://vpk-news.ru/>. Accessed 2 Mar 2011.
- ²⁵⁵ Khayrullin, Shamil. "Salvos Thunder in the Caspian..." *Krasnaya Zvezda Online*, 17 Jan 2013, <http://www.redstar.ru>. Accessed 18 Jan 2013.
- ²⁵⁶ Mukhin, Vladimir. "Wars and Armies: Putin Saw the Maneuvers through Shoygu's Eyes: They Verified the Effectiveness of the Nuclear and Precision-Guided Weapons Platforms at the Vostok-2014 Exercises." *Nezavisimaya Gazeta*, 24 Sep 2014, <http://www.ng.ru/>. Accessed 25 Sep 2014.

- ²⁵⁷ Unattributed. "Kalibr Missile Launches in Kavkaz-2016 Exercise." Moscow Zvezda TV, 9 Sep 2016, <http://www.tvzvezda.ru/tv>. Accessed 9 Sep 2016.
- ²⁵⁸ Ganin A.V. and Korolyov I.I. and Pavlov, V.N. "Electronic Information Blockades by Combined-Arms EW Forces." Moscow Military Thought, vol. 22, no. 3, 2013, pp. 17–25.
- ²⁵⁹ Koybletskiy, Oleg. "From Above We Can See Everything!" Moscow Oriyentir Online, 14 Sep 2016, <http://orientir.milportal.ru/>. Accessed 5 Oct 2016.
- ²⁶⁰ UCS Satellite Database. Union of Concerned Scientists. http://www.ucsusa.org/nuclear-weapons/space-weapons/satellite-database#.V_Uj1TZf0-4, 5 Oct 2016.
- ²⁶¹ Morozov, Igor Vitalyevich. "Space and the Nature of Contemporary Military Operations: Gaining and Maintaining Supremacy in the Information and Space Spheres Has a Decisive Impact on the Course and Outcome of a Contemporary High-Tech Armed Confrontation." *Vozdushno-Kosmicheskaya Oborona*, 14 Jul 2009, <http://www.vko.ru/>. Accessed 25 Aug 2009.
- ²⁶² President of the Russian Federation. "2010 Military Doctrine of the Russian Federation." 5 Feb 2010, <http://www.kremlin.ru>. Accessed 5 Feb 2010.
- ²⁶³ President of the Russian Federation. "Military Doctrine of the Russian Federation, approved by Russian Federation President V. Putin." Official website of the Russian Federation president, 31 Dec 2014, <http://www.kremlin.ru>. Accessed 31 Dec 2014.
- ²⁶⁴ Raskin, Aleksandr, "Are Net 'Battles' Coming? We Continue the Discussion on the Nature and Look of Possible Wars of the Future." *Armeyskiy Sbornik*, monthly journal of the General Staff of the Russian Federation Armed Forces, 30 Sep 2005. Accessed 15 Dec 2005.
- ²⁶⁵ Rog, Valentin. "Will We Respond to The Challenges of the Time?" *Armeyskiy Sbornik*, 1 Apr 2005, ed. 4, pp. 10–13.
- ²⁶⁶ Khudoleyev, Victor. "Troops for the Battle in the Ether." *Krasnaya Zvezda*, 15 Apr 2014, <http://redstar.ru/index.php/newspaper/item/15511-vojska-dlya-srazheni>. Accessed 23 Apr 2014.
- ²⁶⁷ Kupriyanov, G.P. "Principal Trends in The Evolution of Space Warfare." Moscow Military Thought, vol. 14, no. 1, 2005.
- ²⁶⁸ Chekinov, S.G. and Bogdanov S.A. "Asymmetrical Actions to Maintain Russia's Military Security." *Military Thought*, 20 Jun 2013. Accessed 21 Jun 2013.
- ²⁶⁹ Bogdanov S.A. and Chekinov, S.G. "Strategic Deterrence and Russia's National Security Today." Moscow Military Thought, no. 3, 2012, pp. 11–20.
- ²⁷⁰ Oleinikov, I.I., et al. "A Space Monitoring System as Part of Strategic Deterrence." Moscow Military Thought, vol. 24, no. 3, 2015, pp. 16–23.
- ²⁷¹ Unattributed. "New branch of Armed Forces, Aerospace Forces, created in Russia – Shoygu." Interfax, 3 Aug 2015. <http://www.interfax.com/>. Accessed 3 Aug 2015.
- ²⁷² Golts, Alexander. "Russia's Aerospace Forces Will Never Take Off." The Moscow Times Online, 10 Aug 2015, <http://www.themoscowtimes.com/>. Accessed 13 Aug 2015.
- ²⁷³ Bodner, Matthew. "Russian Military Merges Air Force and Space Command." The Moscow Times Online, 3 Aug 2015, <http://www.themoscowtimes.com/>. Accessed 3 Aug 2015.
- ²⁷⁴ Unattributed. "Russia's Space Troops: Armaments and Facilities." *Voyennoye Obozreniye*, 25 Mar 2011, <http://topwar.ru/>. Accessed 29 Mar 2011.
- ²⁷⁵ Durnovo, Aleksey. "Aerospace Defense Troops Space Command's Primary Mission Is to Ensure Russia's Security in Space." *Ekho Moskvy Online*, 9 Dec 2014, <http://www.echo.msk.ru>. Accessed 9 Dec 2014.
- ²⁷⁶ Unattributed. "Yury Vlasov Appointed Acting United Rocket and Space Corporation General Director." Interfax, 2 Feb 2015, <http://www.interfax.com/>. Accessed 2 Feb 2015.
- ²⁷⁷ Unattributed. "Yury Vlasov Appointed Acting United Rocket and Space Corporation General Director." Interfax, 28 Dec 2015, <http://www.interfax.com/>. Accessed 29 Dec 2015.
- ²⁷⁸ Unattributed. "The Army: We Are Awaiting Assistance from Military Science and the Defense Industrial Complex: We Will Not Manage to Create State-Of-The-Art Armed Forces Without this." *Voyenno-Promyshlennyy Kuryer*, 8 Feb 2012, <http://vpk-news.ru>. Accessed 19 Feb 2012.
- ²⁷⁹ Chekinov, S.G. and Bogdanov S.A. "Asymmetrical Actions to Maintain Russia's Military Security." *Military Thought*, 20 Jun 2013. Accessed 21 Jun 2013.
- ²⁸⁰ "Plan of Russian Space Launches (part 2)." NASA Spaceflight Forum, 5 Oct 2016, <http://forum.nasaspaceflight.com/index.php?topic=26990.880>.
- ²⁸¹ Chekinov, S. and Bogdanov, S. "The Nature and Content of a New Generation War." *Voennaya Mysl*, no. 4, 2013.
- ²⁸² President of the Russian Federation. "Military Doctrine of the Russian Federation." Official website of the Russian Federation president, 5 Feb 2010, <http://www.kremlin.ru>. Accessed 9 Feb 2014.

- ²⁸³ President of the Russian Federation. "Military Doctrine of the Russian Federation, approved by Russian Federation President V. Putin." Official website of the Russian Federation president, 31 Dec 2014, <http://www.kremlin.ru>. Accessed 31 Dec 2014.
- ²⁸⁴ Prudnikov, D. P. "State Information Policy in the Defense Area: An Initial Definition." *Military Thought* 2008
- ²⁸⁵ Darczewska, Jolanta. "The Anatomy of Russian Information Warfare. The Crimea Operation, a Case Study." *OSW Point of View*, no. 42, May 2014.
- ²⁸⁶ Solopov, Maksim. "Kavkaz with A Syrian Bias: The General Staff Has Summed Up the Results of the Kavkaz-2016 Exercises." *Gazeta.ru*, 13 Sep 2016, <http://www.gazeta.ru/>. Accessed 20 Sep 2016.
- ²⁸⁷ Russian Federation Security Council. "Information Security Doctrine of the Russian Federation (Draft)." Security Council of the Russian Federation, 23 Jun 2016, <http://www.scrf.gov.ru>. Accessed 20 Jun 2016.
- ²⁸⁸ President of the Russian Federation. "Military Doctrine of the Russian Federation, approved by Russian Federation President V. Putin." Official website of the Russian Federation president, 31 Dec 2014, <http://www.kremlin.ru>. Accessed 31 Dec 2014.
- ²⁸⁹ Rozhkov, Roman. "Many Troubles, One Runet. Prospects for Russia's 'Digital Sovereignty.'" *Kommersant Online*, 6 Jan 2015, <http://kommersant.ru>. Accessed 25 Dec 2016.
- ²⁹⁰ Unattributed. "Putin signs law on industrial policy." *Moscow Interfax*, 31 Dec 2014, <http://www.interfax.com/>. Accessed 30 Nov 2016.
- ²⁹¹ Haines, John R. "Russia's Use of Disinformation in the Ukraine Conflict." *Foreign Policy Research Institute*, 17 Feb 2015.
- ²⁹² Darczewska. "The Anatomy of Russian Information Warfare. The Crimea Operation, a Case Study."
- ²⁹³ Denning, Dorothy. "The Rise of Hacktivism." *Georgetown Journal of International Affairs*, 8 Sep 2015, <http://journal.georgetown.edu/the-rise-of-hacktivism/>. Accessed 2 Sept 2016.
- ²⁹⁴ Leyden, John. "IT'S WAR: Hacktivists Throw in Their Lot with Spies and the Military." *The Channel Register*, 20 Apr 2015, http://www.channelregister.co.uk/2015/04/20/Hactivists_and_spies_feature_isis_anonymous. Accessed 30 Aug 2016.
- ²⁹⁵ Unattributed. "Russia's Use of Disinformation in the Ukraine Conflict. Russian strategy analysis." *Eurasia Review*, 18 Feb 2015, <http://www.eurasiareview.com/18022015-russias-use-of-disinformation-in-the-ukraine-conflict-analysis/>. Accessed 19 Mar 2015.
- ²⁹⁶ Darczewska. "The Anatomy of Russian Information Warfare. The Crimea Operation, a Case Study."
- ²⁹⁷ Pomerantsev, Peter and Weiss, Michael. "The Menace of Unreality: How the Kremlin Weaponizes Information, Culture, and Money." *The Interpreter*, Institute of Modern Russia, 22 Nov 2014, p. 5, http://www.interpretermag.com/wp-content/uploads/2014/11/The_Menace_of_Unreality_Final.pdf. Accessed 2 Aug 2015.
- ²⁹⁸ Haines, "Russia's Use of Disinformation in the Ukraine Conflict."
- ²⁹⁹ Unattributed. "CyberBerkut – The New Russian Proxy?" *SecuInsight*, 12 Jun 2014, <http://www.secuinsight.fr/2014/06/12/is-cyberberkut-the-new-russian-proxy/>. Accessed 18 Mar 2015.
- ³⁰⁰ Unattributed. "Pro-Russian Hackers Claim 1,100 Ukrainian Soldiers Killed in Past Two Weeks." *RIA Novosti*, 28 Jan 2015, <http://ria.ru/>. Accessed 28 Jan 2015.
- ³⁰¹ Unattributed. "Ukrainian Presidential Election: Security Service Thwarts Cyber Plot to Rig Results." *Kyiv Post Online*, 25 May 2014, <http://www.kyivpost.com/>. Accessed 25 May 2014.
- ³⁰² Unattributed. "Ukrainian State Agency Refutes Reports of Hacker Attack on Central Elections Commission Website." *UNN Online*, 25 Oct 2014, <http://www.unn.com.ua/>. Accessed 25 Oct 2014.
- ³⁰³ Unattributed. "Alert: Ukrainian State Agency Confirms DDoS Attack on Central Elections Commission Website." *UNN Online*, 25 Oct 2014, <http://www.unn.com.ua/>. Accessed 25 Oct 2014.
- ³⁰⁴ Chen, Adrian. "The Agency." *New York Times*, 2 Jun 2015, http://www.nytimes.com/2015/06/07/magazine/the-agency.html?_r=0. Accessed 2 Sept 2016.
- ³⁰⁵ Walker, Shaun. "Salutin' Putin: Inside a Russian Troll House." *Guardian*, 2 Apr 2015, <http://www.guardian.co.uk>. Accessed 2 Apr 2015.
- ³⁰⁶ Garfield, Leanna. "5 Countries that use bots to spread political propaganda." *Tech Insider*, 16 Dec 2015, <http://www.techinsider.io/political-bots-by-governments-around-the-world-2015>. Accessed 28 Sep 2016.
- ³⁰⁷ Chen, Adrian. "The Agency." *New York Times*, 2 Jun 2015, http://www.nytimes.com/2015/06/07/magazine/the-agency.html?_r=0. Accessed 2 Sept 2016.
- ³⁰⁸ Yegorov, Ivan. "Network Requires Protection. New Information Security Doctrine to Be Adopted This Year." *Rossiyskaya Gazeta Online*, 18 Jul 2016, <http://rg.ru/>. Accessed 29 Sep 2016.

- ³⁰⁹ Baikova, Tatyana. "It Would Be Better for America to Ratify the Comprehensive Nuclear-Test-Ban Treaty." *Izvestiya*, 10 Sep 2016.
- ³¹⁰ Unattributed. "Central Asia Military." Highlights: Central Asia Military Issues, 17 Aug 2016, <http://www.interfax.com/>. Accessed 4 Nov 2016.
- ³¹¹ Unattributed. "Russia's Duma Adopts Revised Anti-Terror Bill." *RIA Novosti*, 24 Jun 2016, <http://ria.ru/>. Accessed 24 Jun 2016.
- ³¹² Afanasyeva, Anna. "With Share of Loyalty. Why State Is Taking Control Not Just of Media." *Kommersant Online*, 30 Dec 2016, <http://kommersant.ru/>. Accessed 4 Jan 2017.
- ³¹³ Unattributed. "Communications Ministry Mulls Total Control over Russian Sector of the Web - Reports." *RT Online*, 19 Aug 2016, <http://rt.com/>. Accessed 19 Aug 2016.
- ³¹⁴ Unattributed. "Putin Bans Foreigners from Russian TV Audience Research." *TASS*, 4 Jul 2016, <http://tass.ru/>. Accessed 4 Jul 2016.
- ³¹⁵ Rogozin, D.O. Ed. "War and Peace: Terms and Definition—Voyna I Mir V Terminakh I Opredeleniyakh." *Military-Political Dictionary*, ProRog, 2011.
- ³¹⁶ Rogozin, "War and Peace: Terms and Definitions—Voyna I Mir V Terminakh I Opredeleniyakh."
- ³¹⁷ Borkovskyy, Antin. "Andriy Illarionov on Prospects for Cease-Fire, Putin's 'Ukrainian Plan,' Likelihood of Use of Nuclear Weapons." *Espresso TV Online*, 26 May 2015, <http://www.espresso.tv>. Accessed 26 May 2015.
- ³¹⁸ Suvorov, Viktor, "Chapter 8: The Agent Network." *Spetsnaz: The Inside Story of the Soviet Special Forces*. W.W. Norton, 1988.
- ³¹⁹ Kuznetsov, V.I., et al. "Electronic Warfare and Information Warfare: How They Compare." *Military Thought*, vol. 1, 1 May 2013.
- ³²⁰ Dvornikov V.A., et al. "Tactics of Electronic Warfare Forces." *Military Thought*, vol. 1, 2015.
- ³²¹ Donskov, Col. Yu. Ye. and Nikitin, Lt. Col. O. G. "Special Information Operations in Armed Conflicts." *Military Thought*; 30 Sep 2005. The authors are leading Russian military scientists.
- ³²² Melnikov, Igor. "Weapons of Assymetrical Response." *Rostov-na-Donu Voyennyy Vestnik Yuga Rossii*, 11 Apr 2015.
- ³²³ Donskov "Special Information Operations in Armed Conflicts."
- ³²⁴ Dvornikov, "Tactics of Electronic Warfare Forces."
- ³²⁵ Durnovo, Aleksey. "Long Range Aviation -- Air Force's Main Strike Force." *Ekho Moskvy Online*, 26 Feb 2016.
- ³²⁶ President of Russia. "Visit to the Armed Forces Central Command Centre, 6 Jun 2013." Official Website of the Russian Federation President, 7 Jun 2013, <http://eng.kremlin.ru/>. Accessed 7 Jun 2013.
- ³²⁷ Ministry of Defense of the Russian Federation. "The Navy Begins the Implementation of the Long-Range Maritime Zone Support Vessel Renewal Program." Russian Federation Ministry of Defense Information and Press Service Directorate, 21 Jan 2013, <http://www.mil.ru>. Accessed 21 Jan 2013.
- ³²⁸ Unattributed. "Russia, Venezuela to Have Joint Naval Drill in Atlantic Ocean." *Agentstvo Voyennykh Novostey*, 8 Sep 2008, www.militarynews.ru. Accessed 8 Sep 2008.
- ³²⁹ Unattributed. "The Large ASW Ship Severomorsk Is Escorting Another Convoy of Three Ships." *Severnny Flot*, 22 Mar 2013, <http://pressa-sf.livejournal.com/>. Accessed 22 Mar 2013.
- ³³⁰ Unattributed. "The Large ASW Ship Severomorsk Is Escorting Another Convoy of Three Ships." *Severnny Flot*, 22 Mar 2013, <http://pressa-sf.livejournal.com/>. Accessed 22 Mar 2013.
- ³³¹ Unattributed. "The Large ASW Ship Severomorsk Is Escorting Another Convoy of Three Ships." *Severnny Flot*, 22 Mar 2013, <http://pressa-sf.livejournal.com/>. Accessed 22 Mar 2013.
- ³³² Unattributed. "Syria Conflict: US Presses Russia on Military Buildup." *BBC*, 16 Sep 2015.
- ³³³ Unattributed. "Russia starts ground operations in Syria." 23 Nov 2015, *Al Bawaba Business*.
- ³³⁴ Quinlivan, James T. "War on the Rocks—Artillery Returns to the Battlefield in the War Against ISIL." 11 Jan 2016.
- ³³⁵ Unattributed. "RPT – Fight for Syria's Aleppo Exposes Limits of Russian Air Power." *Reuters*, 30 Aug 2016.
- ³³⁶ Unattributed. "Syria: Russia's continuing war." *BBC*, 27 Apr 2016.
- ³³⁷ McInnis, J. Matthew. "What does Iran Really Want in Yemen?" *AEI Ideas*, 13 Apr 2015.
- ³³⁸ Unattributed. "Fight for Syria's Aleppo Exposes Limits of Russian Air Power." *Channel Newsasia*, 29 Aug 2016.
- ³³⁹ Unattributed. "Russian Cruise Missiles Target Syria." *Zaman al-Wasl*, 19 Aug 2016. Accessed 19 Aug 2016.
- ³⁴⁰ Unattributed. "Syria: Russia's continuing war." *BBC*, 27 Apr 2016.
- ³⁴¹ Kozhanov, Nikolay. "What's at stake for Russia in Syria?" *BBC*, Chatham House, 21 Sep 2015.

- ³⁴² Lavrov, Anton and Ramm, Aleksey. "Retribution without Refueling: Operation in Syria Reveals Weak Points in Aerospace." *Voyenno-Promyshlenny Kuryer*, 6 Apr 2016, <http://vpk-news.ru/>. Accessed 13 Apr 2016.
- ³⁴³ 1991 Military Forces in Transition. U.S. Department of Defense, Sep 1991, p. 41.
- ³⁴⁴ 1991 Military Forces in Transition. U.S. Department of Defense, Sep 1991, p. 40.
- ³⁴⁵ 1991 Military Forces in Transition. U.S. Department of Defense, Sep 1991, p. 40.
- ³⁴⁶ 1991 Military Forces in Transition. U.S. Department of Defense, Sep 1991, p. 40.
- ³⁴⁷ Gavrillov, Yuriy. "The Order Will Come from the Center: National Defense Management Center, a Top-Secret Complex, Will Go On Alert Duty on 1 Dec." *Rossiyskaya Gazeta Online*, 27 Oct 2014, <http://rg.ru/>. Accessed 1 Nov 2014.
- ³⁴⁸ Military Encyclopedic Dictionary of the Strategic Rocket Forces. Ministry of Defense, 1999, p. 521.
- ³⁴⁹ V.D. Zabolotin and N.E. Dimitriev. "Operational-Tactical Maskirovka." *Slovar' voyennykh terminov* [Dictionary of Military Terms], 2000, p. 95. The Dictionary was the definitive General Staff Academy reference work on Russian military terminology at the time of publication.
- ³⁵⁰ Ministry of Defense. "Maskirovka." *Military Encyclopedia*, vol. 5, p. 23.
- ³⁵¹ V.D. Zabolotin and N.E. Dimitriev, "Surprise." *Slovar' voyennykh terminov* [Dictionary of Military Terms], 2000, p. 24.
- ³⁵² Pynnoniemi, Katri and Racz, Andraz, Eds. *Fog of Falsehood: Russian Strategy of Deception and the Conflict in Ukraine*. The Finnish Institute of International Affairs, Report 45, 2016.
- ³⁵³ Robert, James Q. "Maskirovka 2.0 Hybrid Threat, Hybrid Response." *Joint Special Operations University – Center for Special Operations Study and Research*, Dec 2015.
- ³⁵⁴ Pomerantsev and Weiss, "The Menace of Unreality."
- ³⁵⁵ Chekinov, S., Bogdanov, S., "The Nature and Content of a New Generation War," *Voennaya Mysl*, no. 4, 2013.
- ³⁵⁶ Shevchenko, Vitaly. "Little green men or Russian invaders?" *BBC News*, 9 Mar 2015, <http://www.bbc.com/news/world-europe-26532154>. Accessed on 9 Mar 2015.
- ³⁵⁷ President of the Russian Federation. "Military Doctrine of the Russian Federation, approved by Russian Federation President V. Putin." Official website of the Russian Federation president, 31 Dec 2014, <http://www.kremlin.ru>. Accessed 31 Dec 2014.
- ³⁵⁸ Darczewska, "The Anatomy of Russian Information Warfare. The Crimea Operation, a Case Study."
- ³⁵⁹ Website of the Russian President. "Military Doctrine of the Russian Federation." 31 Dec 2014.
- ³⁶⁰ Felgengauer, Pavel. "Rybkin's Preventive Strike." *Moscow Segodnya*, 14 Feb 1997.
- ³⁶¹ "Strategic Missile Troops (RVSN)." *Russian Military Analysis*, <http://warfare.be/db/catid/239/linkid/2244/>. Accessed 5 Sep 2016.
- ³⁶² "Russia Country Profiles." <http://www.nti.org/country-profiles/russia/>. Accessed 21 Sep 2016.
- ³⁶³ Podvig, Pavel, et al. "Russian Strategic Nuclear Forces." *Center for Arms Control, Energy and Environmental Studies at the Moscow Institute of Physics and Technology, English language edition supported by the Security Studies Program at the Massachusetts Institute of Technology, MIT Press, 2001. pp. 4–5.*
- ³⁶⁴ "Russian Strategic Missile Forces." www.ausairpower.net/APA-RVSN-Analysis.html. Accessed 6 Sep 2016.
- ³⁶⁵ "Russian Strategic Nuclear Forces." <http://russianforces.org/current/>. Accessed 6 Sep 2016.
- ³⁶⁶ "No plans to reduce the number of missile divisions." http://russianforces.org/blog/02/no_plans_to_reduce_the_number.shtml. Accessed 6 Sep 2016.
- ³⁶⁷ Unattributed. "No reductions planned in Russian Strategic Rocket Forces." *Interfax in English*, 18 Feb 2016, <http://www.interfax.com/>. Accessed 18 Feb 2016.
- ³⁶⁸ Unattributed. "Key Russian Strategic Missile Deployments." *Jane's CBRN Assessments*, 25 Apr 2016, www.janes.com. Accessed 25 Apr 2016.
- ³⁶⁹ Multiple location name searches. www.google.com/maps. Accessed 28 Nov 2016. "Google Maps" is a free online mapping service.
- ³⁷⁰ "Comprehensive Control Inspections of Results of Winter Training Period Have Commenced in Strategic Missile Troops." *Moscow Ministry of Defense of the Russian Federation*, www.mil.ru. Accessed 9 Apr 2015.
- ³⁷¹ "Russian Strategic Nuclear Forces." <http://russianforces.org/current/>. Accessed 6 Sep 2016.
- ³⁷² "Strategic Rocket Forces." <http://russianforces.org/misiles/>. Accessed 6 Sep 2016.
- ³⁷³ Andreyev, Oleg. "RVSN Given Six Years to Rearm; Moscow Adjusts Plans to Enhance Combat Readiness of the Armed Forces." *Nezavisimaya Gazeta*, 18 May 2016, <http://www.ng.ru/>. Accessed 19 May 2016.

- ³⁷⁴ Unattributed. "Rubezh Missile Will Enter Duty in a Year." Rossiyskaya Gazeta Online, 12 May 2016, <http://rg.ru/>. Accessed 12 May 2016.
- ³⁷⁵ Unattributed. "'Missile defense killer': Russia finalizes testing on prototype ICBM." RT, 8 Jun 2013, www.rt.com/news/misile-defense-killer-prototype-411/. Accessed 28 Mar 2017.
- ³⁷⁶ Litovkin, Viktor. "RS-26 Antimissile Defense 'Killer' Flies Where It Must." Nezavisimaya Gazeta Online, 9 Oct 2013, <http://www.ng.ru/>. Accessed 16 Oct 2013.
- ³⁷⁷ Unattributed. "Jane's, Sentinel Security Assessment – Russia and the CIS, Strategic Weapon System, Russian Federation." IHS Jane's 360, 25 Apr 2016, www.janes.com. Accessed 6 Sept 2016.
- ³⁷⁸ Unattributed. "Jane's, Sentinel Security Assessment – Russia and the CIS, Strategic Weapon System, Russian Federation." IHS Jane's 360, 25 Apr 2016, www.janes.com. Accessed 6 Sept 2016.
- ³⁷⁹ Unattributed. "Jane's, Sentinel Security Assessment – Russia and the CIS, Strategic Weapon System, Russian Federation." IHS Jane's 360, 25 Apr 2016, www.janes.com. Accessed 6 Sept 2016.
- ³⁸⁰ "Russian Nuclear Forces, 2016." <http://dx.doi.org/10.1080/00963402.2016.1170359>. Accessed 6 Sep 2016.
- ³⁸¹ Bozhyeva, Olga. "Sources: Russia Successfully Tested New Missile Superweapon: Developers Called Launch of Sarmat ICBM Warhead a 'Fantastic Success.'" MK Online, 21 Apr 2016. <http://mk.ru/>.
- ³⁸² NEW START TREATY Text. 8 Apr 2010.
- ³⁸³ Andreyev, Oleg. "RVSN Given Six Years to Rearm; Moscow Adjusts Plans to Enhance Combat Readiness of the Armed Forces." Nezavisimaya Gazeta, 18 May 2016, <http://www.ng.ru/>. Accessed 19 May 2016.
- ³⁸⁴ "Russian Nuclear Forces, 2016." <http://dx.doi.org/10.1080/00963402.2016.1170359>. Accessed 6 Sep 2016.
- ³⁸⁵ Unattributed. "Key Russian Strategic Missile Deployments." Jane's CBRN Assessments, 25 Apr 2016, www.janes.com. Accessed 25 Apr 2016.
- ³⁸⁶ "Russian Army Order of Battle." Globalsecurity.org, 27 Aug 2016. Accessed 29 Aug 2016.
- ³⁸⁷ "Chapter Five: Russia and Eurasia, The Military Balance," 2017, <http://dx.doi.org/10.1080/04597222.2017.1271211>, p. 211.
- ³⁸⁸ Russian Ministry of Defense. "Ground Troops." Website of the Russian Ministry of Defense, 2 Sep 2016, www.mil.ru. Accessed 2 Sept 2016.
- ³⁸⁹ Luca, Ana Maria. "Post-Soviet Russian Military Interventions." Beirut NOW, 21 Oct 2015, www.nowlebanon.com. Accessed 22 Oct 2015.
- ³⁹⁰ Russian Ministry of Defense. "Ground Troops." Website of the Russian Ministry of Defense, 2 Sep 2016, www.mil.ru. Accessed 2 Sept 2016.
- ³⁹¹ Russian Ministry of Defense. "Ground Troops." Website of the Russian Ministry of Defense, 2 Sep 2016, www.mil.ru. Accessed 2 Sept 2016.
- ³⁹² Russian Ministry of Defense. "Ground Troops." Website of the Russian Ministry of Defense, 2 Sep 2016, www.mil.ru. Accessed 2 Sept 2016.
- ³⁹³ Russian Ministry of Defense. "Ground Troops." Website of the Russian Ministry of Defense, 2 Sep 2016, www.mil.ru. Accessed 2 Sept 2016.
- ³⁹⁴ Russian Ministry of Defense. "Ground Troops." Website of the Russian Ministry of Defense, 2 Sep 2016, www.mil.ru. Accessed 2 Sept 2016.
- ³⁹⁵ Russian Ministry of Defense. "Ground Troops." Website of the Russian Ministry of Defense, 2 Sep 2016, www.mil.ru. Accessed 2 Sept 2016.
- ³⁹⁶ Russian Ministry of Defense. "Ground Troops." Website of the Russian Ministry of Defense, 2 Sep 2016, www.mil.ru. Accessed 2 Sept 2016.
- ³⁹⁷ "Ground Troops." Russian Ministry of Defense, 2 Sep 2016, structure.mil.ru. Accessed 2 Sep 2016.
- ³⁹⁸ "Ground Troops." Russian Ministry of Defense, 2 Sep 2016, structure.mil.ru. Accessed 2 Sep 2016.
- ³⁹⁹ Barabanov, Mikhail, Ed. *Novaia armia Rossii [The New Military of Russia]*. Moscow, Center for the analysis of strategy and technology, 2010.
- ⁴⁰⁰ First Tank Army and 2nd Taman Division resubordinated to 20th Army. "Russia Is Closing the 'Black Hole' on the Border with Ukraine." Vzglyad Online, 5 Jun 2015, <http://vzglyad.ru/>.
- ⁴⁰¹ Bridge, Robert. "Border Alert: Nuke risk rising." Russia Today, 17 Nov 2011, www.russiatoday.com. Accessed 19 Nov 2011.
- ⁴⁰² Grau, Lester W. and Gress, Michael (translated and edited). *The Soviet-Afghan War: How a Superpower Fought and Lost*. University of Kansas Press, 2002.
- ⁴⁰³ Vorob'ev I. and Kiselev V. "Taktika otriadno-gruppovogo boia" [The tactics of detachment-group combat]. *Armeiskiy sbornik, [Army Digest]*, no. 9, Sep 2013, pp. 11–13.

- ⁴⁰⁴ Popov, Vladimir. "Sukhoputnye voiska Rossii segodnia i zavtra" [The ground forces of Russia today and tomorrow]. *Rossiiskoe voennoe obozrenie* [Russian military review], no. 3, Mar 2016, pp. 10–13.
- ⁴⁰⁵ Kiselev, V. "Gibridnaia voina kak novyi tip voiny budushchego" [Hybrid warfare as a new type of future war]. *Armeyskiy Sbornik* [Army Digest], no. 12, Dec 2015; and Kiselev, V.A. and Vorob'ev, I.N. "Gibridnye operatsii kak noviy vid protivoborstva" [Hybrid warfare as a new type of confrontation]. *Voennaia Mysl* [Military Thought], no. 5, Apr 2015.
- ⁴⁰⁶ Giles, Keir. "Russia's New Tools for Confronting the West." Research Paper, Chatham House, Mar 2016, <https://www.chathamhouse.org/sites/files/chathamhouse/publications/research/2016-03-21-russias-new-tools-giles.pdf>. Accessed 28 Mar 2016.
- ⁴⁰⁷ Barabanov, Mikhail (ed). *Russia's New Army*. Centre for Analysis of Strategies and Technologies, 2011, pp. 23–24.
- ⁴⁰⁸ Anisimov, Vladimir. "Five Primary Missions: The Arrival of Over 3,000 Models of Arms and Military Equipment in the Ground Troops Is Planned in the Near Future." *Voyenno-Promyshlennyi Kuryer*, 1 Jul 2009, www.vpk-news.ru. Accessed 21 Jul 2009.
- ⁴⁰⁹ Anatoliy-K (forum moderator pseudonym). "Al'ternativnaya OShS Otdel'noy tankoviy batal'yon tankovoy brigady" [Alternative TOEs for Separate tank battalions of tank brigades]. *Voyniy Rubezh*, 2 Jun 2009. Accessed 2 Jun 2009.
- ⁴¹⁰ Anatoliy-K (forum moderator pseudonym). "Noviye Mototrelkoviye Brigady - 3 Chast" [New Motorized Rifle Brigades, Part 3]. *Voyniy Rubezh*, 26 July 2009. 26 July 2009.
- ⁴¹¹ Anatoliy-K (forum moderator pseudonym). "Noviye Mototrelkoviye Brigady - 3 Chast" [New Motorized Rifle Brigades, Part 3]. *Voyniy Rubezh*, 26 July 2009. 26 July 2009.
- ⁴¹² Anatoliy-K (forum moderator pseudonym). "Noviye Mototrelkoviye Brigady - 3 Chast" [New Motorized Rifle Brigades, Part 3]. *Voyniy Rubezh*, 26 July 2009. 26 July 2009.
- ⁴¹³ Kirichenko, Ivan. "Unready Brigades: The Military Reform ala Serdyukov and Makarov Has Returned to Where It Began." *Svobodnaya Pressa*, 20 Sep 2012, <http://svpressa.ru/society/article/58846/>. Accessed 20 Sep 2012.
- ⁴¹⁴ Mikhaylov, Viktor. "The Russian Military Brigade Contract." *Nezavisimoye Voyennoye Obozreniye*, 22 May 2009, <http://nvo.ng.ru/>. Accessed 28 May 2009.
- ⁴¹⁵ Gavrilov, Yuriy. "Tests of the Latest 'Rakushka' BTR Will Be Conducted near Tula." *Rossiyskaya Gazeta Online*, 7 Jan 2015, www.rg.ru. Accessed 7 Jan 2015.
- ⁴¹⁶ Unattributed. "The VDV Will in the Coming Years Become Part of the Rapid-Response Force." *Argumenty i Fakty*, 4 Jun 2015, www.aif.ru/society/army/vdv_v_blizhayshie_gody_voydut_v_sostav_voysk_bystrogo_reagirovaniya. Accessed 7 Jun 2015.
- ⁴¹⁷ "The Soviet Army: Special Warfare and Rear Area Support." U.S. Army, FM100-2-2, pp. 2-2–2-3.
- ⁴¹⁸ "The Soviet Army: Special Warfare and Rear Area Support." U.S. Army, FM100-2-2, pp. 2-2–2-3.
- ⁴¹⁹ "VDV ORBAT." globalsecurity.org, 2015.
- ⁴²⁰ Ptichin, Sergey. "Authority": "Air Assault Force Will Change to Tanks." *Moscow Rossiyskaya Gazeta online in Russian*, 24 May 2016.
- ⁴²¹ Unattributed. "All Airborne Assault Formations of the Airborne Troops will Receive Tank Companies." *Moscow Lenta.ru in Russian*, 1 Aug 2016.
- ⁴²² "The Soviet Army: Special Warfare and Rear Area Support; Amphibious Operations." U.S. Army, FM100-2-2, p. 4 1.
- ⁴²³ 2017 *Jane's World Navies*, <https://janes-ihs.com.pentagonlibrary.idm.oclc.org/WorldNavies/Display/1322754>.
- ⁴²⁴ Official Press Release. "Motorized Riflemen and Naval Infantrymen of the Baltic Fleet Are Performing Life-Fire Drills as Part of Squads." Moscow Ministry of Defense of the Russian Federation, 11 Jul 2016, function.mil.ru/news_page/country/more?id12089569@egNews. Accessed 12 Jul 2016.
- ⁴²⁵ Khudoleyev, Victor. "Country Celebrated Missile Troops and Artillery Day on 19 Nov": "Heading for a Reconnaissance-Fire Delivery System." *Krasnaya Zvezda Online*, 21 Nov 2014, <http://www.redstar.ru>. Accessed 12 Dec 2014.
- ⁴²⁶ Unattributed. "PF coastal troops redeployed as part of surprise checks into combat readiness." *Interfax*, 15 Sep 2014, <http://www.interfax.com/>. Accessed 15 Sep 2014.
- ⁴²⁷ 2017 *Jane's World Navies*, <https://janes-ihs.com.pentagonlibrary.idm.oclc.org/WorldNavies/Display/1322754>.
- ⁴²⁸ Avdeyev, Yuriy. "Navy Coastal Troops' Acquisition of New Missile Systems Continues." *Krasnaya Zvezda Online*, 2 Nov 2015, <http://www.redstar.ru>. Accessed 9 Nov 2015.
- ⁴²⁹ Unattributed. "Pacific Fleet Bal Coastal Missile System Battalion Starts Field Training in Primorye." Ministry of Defense of the Russian Federation, 17 Feb 2016, <http://www.mil.ru>. Accessed 3 Mar 2016.
- ⁴³⁰ Bodner, Matthew. "Russian Military Merges Air Force and Space Command." *The Moscow Times*, 3 Aug 2015.

- 431 Unattributed. "Russian Air Force/Aerospace Reorganization." *Fortuna's Corner*, 1 Jan 2015, <http://fortunascorner.com/2015/01/02/russian-air-force-reorganization/>.
- 432 "Aerospace Forces." Ministry of Defence of the Russian Federation, <http://eng.mil.ru/en/structure/forces/type/vks.htm>. Accessed 26 Oct 2016.
- 433 Air Forces Intelligence Database. 28 Sep 2016, www.airforcesintel.com.
- 434 Tuchkov, Vladimir. "The Strategic Aircraft, of Which the U.S. Is Frightened, Increases Its Might: With What Can America Counter the Tu-160M2 Missile-Equipped Aircraft." *Svobodnaya Pressa*, 10 Aug 2016, <http://www.svpressa.ru/>. Accessed 15 Aug 2016.
- 435 Tuchkov, Vladimir. "The Strategic Aircraft, of Which the U.S. Is Frightened, Increases Its Might: With What Can America Counter the Tu-160M2 Missile-Equipped Aircraft." *Svobodnaya Pressa*, 10 Aug 2016, <http://www.svpressa.ru/>. Accessed 15 Aug 2016.
- 436 "Chapter Five: Russia and Eurasia, The Military Balance." 2015, 115:1, 159-206.
- 437 Gordon, Yefim. *Russian Air Power. Military Transport Aviation*, 2009.
- 438 Unattributed. "New branch of Armed Forces, Aerospace Forces, created in Russia – Shoygu." *Interfax*, 3 Aug 2015, <http://www.interfax.com/>. Accessed 3 Aug 2015.
- 439 Bodner, Matthew. "Russian Military Merges Air Force and Space Command." *The Moscow Times Online*. 3 Aug 2015. <http://www.themoscowtimes.com/>. Accessed 3 Aug 2015.
- 440 Unattributed. "Russia's Space Troops: Armaments and Facilities." *Voyennoye Obozreniye*, 25 Mar 2011, <http://topwar.ru/>. Accessed 29 Mar 2011.
- 441 Durnovo, Aleksey. "Aerospace Defense Troops Space Command's Primary Mission Is to Ensure Russia's Security in Space." *Ekho Moskv Online*, 9 Dec 2014, <http://www.echo.msk.ru>. Accessed 9 Dec 2014.
- 442 "World Air Forces 2016." *FlightGlobal Insight*, 2016.
- 443 "The Military Balance." *International Institute for Strategic Studies*, 2014.
- 444 Newdick, Thomas. "Russia's New Air Force is a Mystery." *War is Boring*, 21 Feb 2014.
- 445 Butowski, Piotr. "Russian Airpower: Almanac 2015." *Air Force Magazine*, 2015.
- 446 "Russian Air Force." *Combat Aircraft*.
- 447 "World Air Forces 2016." *FlightGlobal Insight*, 2016.
- 448 "The Military Balance." *International Institute for Strategic Studies*, 2014.
- 449 "Russia's New Air Force is a Mystery" *Thomas Newdick, War is Boring*, 21 Feb 2014.
- 450 Butowski, Piotr. "Russian Airpower: Almanac 2015." *Air Force Magazine*, 2015.
- 451 "Russian Air Force." *Combat Aircraft*.
- 452 Dawisha, Karen and Parrott, Bruce. *Russia and the New States of Eurasia: The Politics of Upheaval*. Cambridge University Press, 1994, p. 170.
- 453 Unattributed. "Aerospace Forces/Russian Federation Aerospace Forces." *Milkavkaz.net*, 23 Dec 2015, www.milkavkaz.net. Accessed 12 Oct 2016.
- 454 Unattributed. "Chief of Russian air defence enterprise outlines plans for new Systems." *Moscow Vesti TV*, 11 Sep 2007, Vesti.ru. Accessed 15 Sep 2015.
- 455 Unattributed. "Aerospace Forces/Russian Federation Aerospace Forces." *Milkavkaz.net*, 23 Dec 2015, www.milkavkaz.net. Accessed 12 Oct 2016.
- 456 Unattributed. "Russia Transports Ultra-Modern OSA Air Defense Missile Systems to the Crimea: Russian Military Equipment is not Remaining in Place and it is Travelling Further to the Crimean Peninsula." *Kyiv UNIAN*, 18 Mar 2014, <http://www.unian.net/>. Accessed 18 Mar 2014.
- 457 Unattributed. "Russian Defense Ministry explains S-300 deployment in Syria citing need for protection of Russian military bases." *Interfax*, 10 Oct 2016, Interfax.com. Accessed 10 Oct 2016.
- 458 Unattributed. "Russian Defense Ministry explains S-300 deployment in Syria citing need for protection of Russian military bases." *Interfax*, 10 Oct 2016, Interfax.com. Accessed 10 Oct 2016.
- 459 "The Military Balance." *International Institute for Strategic Studies*, 2014.
- 460 Butowski, Piotr. "Unmanned Russia." *Air International*, Sep 2013, pp. 60-63.
- 461 Butowski, Piotr. "Unmanned Russia." *Air International*, Sep 2013, pp. 60-63.
- 462 Oxenstrierna, Susane and Westerlund, Fredrik. "Arms procurement and the Russian Defense Industry: Challenges Up to 2020." *Journal of Slavic Military Studies*, 2013.

- ⁴⁶³ Bender, Jeremy. "Russia is Modernizing its increasingly aggressive air force." *Business Insider*, 18 Mar 2015, www.businessinsider.com/russia-is-modernizing-its-air-force-2015-3.
- ⁴⁶⁴ Bender, Jeremy. "Russia is Modernizing its increasingly aggressive air force." *Business Insider*, 18 Mar 2015, www.businessinsider.com/russia-is-modernizing-its-air-force-2015-3.
- ⁴⁶⁵ Vaev, Pavel K. "Russian Air Power Tool Brittle for Brinkmanship." *Ponars Eurasia, Policy Memo 398*, Nov 2014.
- ⁴⁶⁶ Truffer, Patrick. "The Development of Russian Naval Capabilities After the Cold War." *CIMSEC*, 24 Nov 2015, <http://cimsec.org/development-russian-naval-capabilities-cold-war/20147>.
- ⁴⁶⁷ "Military balance 2015." *Annual periodical on World Military Forces*. Routledge, 2015.
- ⁴⁶⁸ Polmar, Norman. *Guide to the Soviet Navy*. Naval Institute Press, 1985.
- ⁴⁶⁹ Pasyakin, Vladimir. "At the Highest Level of Coordination." *Sevastopol Flag Rodiny*, 20 Dec 2014, www.sc.mil.ru/. Accessed 25 Jul 2016.
- ⁴⁷⁰ List of current ships of the Russian Navy – 2016. russianships.info, 8 Jun 2016, <http://russianships.info/eng/today>.
- ⁴⁷¹ List of current ships of the Russian Navy – 2016. russianships.info, 8 Jun 2016, <http://russianships.info/eng/today>.
- ⁴⁷² Flake, Lincoln Edson. "Russia's Security Intentions in a melting Arctic." *Military and Strategic Affairs Publication*, vol. 6, no. 1, Mar 2014.
- ⁴⁷³ Zhunusov, Oleg. "Rosneft' Is Taking 'Zvezda' From OSK: A Consortium Will Help the Primorskiy Shipbuilders." *Kommersant Online*, 22 Aug 2013, <http://kommersant.ru/>. Accessed 24 Aug 2013.
- ⁴⁷⁴ "Vladivostok." *Globalsecurity.org/Vladivostok*. Accessed 18 Aug 2016.
- ⁴⁷⁵ The split of forces can be observed on Google Earth. Accessed 17 Aug 2016.
- ⁴⁷⁶ "List of current ships of the Russian Navy." russianships.info, <http://russianships.info/eng/today>. Accessed 8 Jun 2016.
- ⁴⁷⁷ Zavolokin, Pavel. "The Crimea – Is Under Protection." *Krasnaya Zvezda Online*, 6 Feb 2015, <http://www.redstar.ru>. Accessed 6 Feb 2015.
- ⁴⁷⁸ Unattributed. "Russia to end production of Varshavyanka Kilo-class submarines." *Moscow RIA Novosti*, 4 Sep 2015, <http://ria.ru/>. Accessed 7 Sep 2015.
- ⁴⁷⁹ List of current ships of the Russian Navy – 2016. russianships.info, 8 Jun 2016, <http://russianships.info/eng/today>.
- ⁴⁸⁰ Yurov, Dmitriy. "Service Reinforced by the Way of Life." *Moscow Krasnaya Zvezda*, 16 May 2006, <http://www.redstar.ru>. Accessed 23 May 2006.
- ⁴⁸¹ Russiannavy.com. Information on tasks, roles, and missions. Accessed 18 Aug 2016.
- ⁴⁸² Unattributed. "Russian Navy to use up to ten civil vessels for military supplies to Syria." *Interfax*, 15 Oct 2015, Interfax.com. Accessed 15 Oct 2015.
- ⁴⁸³ Unattributed. "Caspian Flotilla ships carrying Kalibr-NK missiles depart for tactical drills." *Interfax*, 25 Apr 2016, Interfax.com. Accessed 25 Apr 2016.
- ⁴⁸⁴ Unattributed. "Caspian Flotilla force ends tactical exercises." *Interfax*, 8 Jul 2016, Interfax.com. Accessed 8 Jul 2016.
- ⁴⁸⁵ Unattributed. "Caspian Flotilla ships carrying Kalibr-NK missiles depart for tactical drills." *Interfax*, 25 Apr 2016, Interfax.com. Accessed 25 Apr 2016.
- ⁴⁸⁶ Unattributed. "Jane's, Sentinel Security Assessment – Russia and the CIS, Navy, Russian Federation." *IHS Jane's 360*, 10 Aug 2016, www.janes.com.
- ⁴⁸⁷ Wertheim, Eric. *The Naval Institute Guide to Combat Fleets of the World*, 16th Edition. Naval Institute Press, 2013, p. 573.
- ⁴⁸⁸ Litovkin, Dmitriy. "Deep Rising. Russia's Nuclear Submarine Fleet Is Being Rapidly Upgraded and Renewed." *Moscow Vzglyad*, 28 Jul 2014, <http://www.vz.ru/society/2014/7/28/697642.html>. Accessed 3 Aug 2014.
- ⁴⁸⁹ Unattributed. "Nuclear Submarine Severodvinsk Strikes Coastal Training Target from Barents Sea." *RIA Novosti*, 2 May 2016, <http://ria.ru/>. Accessed 2 May 2016.
- ⁴⁹⁰ Khodarenok, Mikhail. "Strategic Ocean Operations No Longer Are Being Planned: Current Russian Navy Status." *Moscow Gazeta*, 31 Jul 2016, <http://www.gazeta.ru/>. Accessed 6 Aug 2016.
- ⁴⁹¹ Blechschmidt, Peter. "War Ships Against Pirates." *Munich Sueddeutsche Zeitung*, 21 Nov 2008, Sueddeutsche.de. Accessed 21 Nov 2008.
- ⁴⁹² List of current ships of the Russian Navy – 2016. russianships.info, 8 Jun 2016, <http://russianships.info/eng/today>.
- ⁴⁹³ Suvorov, Viktor. "Chapter 3. A History of Spetsnaz." *Spetsnaz: The Inside Story of Soviet Special Forces*. Translated from Russian by David Floyd. Norton & Company, 1988.

- ⁴⁹⁴ Suvorov, Viktor. "Chapter 3. A History of Spetsnaz." *Spetsnaz: The Inside Story of Soviet Special Forces*. Translated from Russian by David Floyd. Norton & Company, 1988.
- ⁴⁹⁵ Galeotti, Mark. "The rising influence of Russian special forces." *Jane's Intelligence Review*, 24 Nov 2014, <https://janes-ihs-com.pentagonlibrary.idm.oclc.org/Janes/Display/1729350>.
- ⁴⁹⁶ Федеральный конституционный закон "О Правительстве Российской Федерации" [Federal Constitutional Law "Directorates of the Russian Federation"]. 17 Dec 1997.
- ⁴⁹⁷ Schneider, Eberhard. "The Russian Federal Security Service under President Putin." *Politics and the Ruling Group in Putin's Russia*, Palgrave Macmillan UK, 2008, pp. 42–62.
- ⁴⁹⁸ Littell, Jonathan. *The Security Organs of the Russian Federation. A Brief History 1991–2004*. Psan Publishing House, 2006.
- ⁴⁹⁹ Galeotti, Mark. "Putin's Hydra: Inside Russia's Intelligence Services." *European Council on Foreign Relations*, May 2016, www.ecfr.eu.
- ⁵⁰⁰ "Tests Complete for New Staff Module for Russia Power Ministries." *RIA Novosti*, 13 Jun 2016.
- ⁵⁰¹ "In Russia the National Guard is Created." *Rossiiskoe Voennoe Obozrenie*, Issue 4; 30 Apr 2016.
- ⁵⁰² "National Guard Conducted RCB (NBC) Training of its Units in Volga NG Administrative District (MD)." *Vremenniy Informatsonniy Tsentri, FSBNGRF*, 27 Sept 2016.
- ⁵⁰³ "GRU." *Special Services*, <http://specialsluz.my1.ru/index/gru/0-13>.
- ⁵⁰⁴ Russian News Agency, <http://ru-an.info/новости/шпионские-тайны-гру/>.
- ⁵⁰⁵ Safronov, Ivan. "Intelligence to Remain In-House. Who Could Replace Igor Sergun in the Post of Chief of the GRU?" *Kommersant Online*, 14 Jan 2016, <http://kommersant.ru/>. Accessed 14 Jan 2016.
- ⁵⁰⁶ Unattributed. "GRU on 91st Anniversary." *Moscow Vzglyad*, 5 Nov 2009, www.vzglyad.ru. Accessed 7 Nov 2009.
- ⁵⁰⁷ Mikhaylov, Aleksey. "Control of the Main Strike. What Problems Can the New GRU Chief Resolve?" *Voyenno-Promyshlenny Kuryer*, 10 Feb 2016, <http://vpk-news.ru/>. Accessed 12 Feb 2016.
- ⁵⁰⁸ Galeotti, "Putin's Hydra: Inside Russia's Intelligence Services."
- ⁵⁰⁹ Unattributed. "GRU on 91st Anniversary." *Moscow Vzglyad*, 5 Nov 2009, www.vzglyad.ru. Accessed 7 Nov 2009.
- ⁵¹⁰ Mikhaylov, "Control of the Main Strike. What Problems Can the New GRU Chief Resolve?"
- ⁵¹¹ Unattributed. "GRU on 91st Anniversary." *Moscow Vzglyad*, 5 Nov 2009, www.vzglyad.ru. Accessed 7 Nov 2009.
- ⁵¹² Mikhaylov, "Control of the Main Strike. What Problems Can the New GRU Chief Resolve?"
- ⁵¹³ Unattributed. "GRU on 91st Anniversary." *Moscow Vzglyad*, 5 Nov 2009, www.vzglyad.ru. Accessed 7 Nov 2009.
- ⁵¹⁴ Mikhaylov, "Control of the Main Strike. What Problems Can the New GRU Chief Resolve?"
- ⁵¹⁵ Unattributed. "GRU on 91st Anniversary." *Moscow Vzglyad*, 5 Nov 2009, www.vzglyad.ru. Accessed 7 Nov 2009.
- ⁵¹⁶ Mikhaylov, "Control of the Main Strike. What Problems Can the New GRU Chief Resolve?"
- ⁵¹⁷ Unattributed. "Russian MP Antoshkin, Recently Back from Syria, says Airstrikes Exceptionally Precise." *Interfax*, 15 Oct 2015, <http://www.interfax.com/>.
- ⁵¹⁸ Gorbenko, Aleksandr. "The Russian Military Space Program of Tomorrow: What will This Be?" *Odnako Online*, 19 Jun 2013, <http://www.odnako.org/magazine/new>.
- ⁵¹⁹ Unattributed. "Russian Military Intelligence Chief Dies Unexpectedly." *Charter 97*, 5 Jan 2016, <http://www.charter97.org/en/news/>.
- ⁵²⁰ Galeotti, Mark. "The Unexpected Death of Russia's Military Intelligence (GRU) Chief, Igor Sergun." *Moscow's Shadows*, 4 Jan 2016, www.inmoscowsshadows.wordpress.com. Accessed 5 Jan 2016.
- ⁵²¹ Safronov, Ivan. "Intelligence to Remain In-House. Who Could Replace Igor Sergun in the Post of Chief of the GRU?" *Kommersant Online*, 14 Jan 2016, <http://kommersant.ru/>. Accessed 14 Jan 2016.
- ⁵²² Unattributed. "Russian GRU Military Spy Chief Igor Sergun dies." *BBC Online*, 5 Jan 2016, <http://www.bbc.co.uk>. Accessed 5 Jan 2016.
- ⁵²³ Unattributed. "More evidence that captured Russians were military intelligence officers." *Prava Lyudyny v Ukraini*, 25 Nov 2015, <http://khpg.org.ua>. Accessed 25 Nov 2015.
- ⁵²⁴ Pereborshchikov, Georgiy. "'You could say we proved ourselves.' War stories from Russians returned from fighting in eastern Ukraine." *Meduza*, 22 Feb 2016, <https://meduza.io/en>. Accessed 22 Feb 2016.
- ⁵²⁵ Unattributed. "Russia Ramps Up Syria Military Involvement: Pro-Assad." *Beirut NOW*, 27 Aug 2015, www.nowlebanon.com. Accessed 27 Aug 2015.

- ⁵²⁶ "On Zaslou in Syria." Russian Centre for Analysis of Strategies and Technologies (CAST). LiveJournal, 19 Oct 2015, Livejournal.ru. Accessed 25 Oct 2015.
- ⁵²⁷ Butrin, Dmitriy. "The Prime Minister's Eyes Opened to the Budget—The 'Open Government' Proposes to Buy Textbooks Rather Than Tanks." Kommersant Online, 10 Aug 2012, <http://kommersant.ru/>.
- ⁵²⁸ Hobson, Peter. "The Cost of Russia's War in Syria." The Moscow Times Online, 21 Oct 2015, <http://www.themoscowtimes.com/>. Accessed 21 Oct 2015.
- ⁵²⁹ Smirnov, Roman. "Russia's Defense Industry Complex Ready to Fire Salvo at The Crisis." Nezavisimoye Voennoye Obozreniye Online, 4 Oct 2015, <http://nvo.ng.ru/>.
- ⁵³⁰ "Weapons of mass Acquisition." Оборона и безопасность, 1 Apr 2016.
- ⁵³¹ "With a Key from the Sky—President." Оборона и безопасность, 1 Apr 2016.
- ⁵³² Zubarevich, Natalya. "Russian Economic Crisis Risks Stagnation, Degradation (Op-Ed)." Moscow Times Online in English, 25 Mar 2016, <http://www.themoscowtimes.com>. Accessed 31 Mar 2016.
- ⁵³³ Butrin, "The Prime Minister's Eyes Opened to the Budget"
- ⁵³⁴ Pismennaya, Yevgeniy, et al. "Medvedev's Concern That the Military Is Considered Too Expensive for the Country." Vedomosti Online, 22 Dec 2011, www.vedomosti.ru/newsline/news/1448040/oshibka_medvedeva. Accessed 22 Dec 2011.
- ⁵³⁵ Unattributed. "Russia's anti-crisis commission to soon consider support for auto industry." Interfax, 6 Feb 2015, www.interfax.com. Accessed 6 Feb 2015.
- ⁵³⁶ Ivankhnik, Aleksandr. "Resuscitation of Economic Council." Politkom, 22 Nov 2013, <http://politkom.ru/>.
- ⁵³⁷ Falichev, Oleg. "A Contingency Order." Voenno-Promyshlenny Kuryer, 26 Jan 2015, <http://vpk-news.ru/>. Accessed 26 Jan 2015.
- ⁵³⁸ Unattributed. "Russia is proud of you." Rossiya 24 Television, 17 Mar 2016. Accessed 17 Mar 2016.
- ⁵³⁹ Falichev, Oleg. "Soldiers to Order; Military Robots Being Rid of Outside Elements." Voenno-Promyshlenny Kuryer, 4 Jun 2015, <http://vpk-news.ru/>. Accessed 4 Jun 2015.
- ⁵⁴⁰ Russian Federation Defense Ministry Press Service and Information Directorate. "Specialists from the Russian Defense Ministry Main Directorate of Scientific Research Activity Are Taking Part in the Work of a Military Industry Conference on the Development of Robotics for the Security Agencies." Ministry of Defense of the Russian Federation, 2 Oct 2014, <http://www.mil.ru>. Accessed 2 Oct 2014.
- ⁵⁴¹ President of Russia. "Meeting on armed forces development on 9 Nov 2015 in Sochi." Official Website of the Russian Federation President, 10 Nov 2015, <http://eng.kremlin.ru/>. Accessed 10 Nov 2015.
- ⁵⁴² Unattributed. "Pace of fulfilling presidential instructions for military-industrial complex must be maintained - Putin." Interfax, 12 May 2015, <http://www.interfax.com>. Accessed 12 May 2015.
- ⁵⁴³ President of Russia. "Putin Chairs Meeting on Defence Procurement." Official Website of the Russian Federation President, 15 May 2014, <http://eng.kremlin.ru/>. Accessed 15 May 2014.
- ⁵⁴⁴ Safronov, Ivan. "Supreme decision-making commander." Kommersant Online, 5 Sep 2014, <http://www.kommersant.ru/doc/2559841>. Accessed 5 Sep 2014.
- ⁵⁴⁵ Safronov, Ivan and Kozichev, Yevgeniy. "The Supreme Decider-in-Chief: Vladimir Putin will also Head the Military Industrial Commission." Kommersant Online, 6 Sep 2014, <http://kommersant.ru/>. Accessed 6 Sep 2014.
- ⁵⁴⁶ Unattributed. "Russian Scientists Present Unique Projects to the Ministry of Defense." ITAR-TASS, 4 Dec 2012.
- ⁵⁴⁷ "Шойгу с Рогозиным Задумали Эксперимент." Nezavisimaia Gazeta, Issue 89, 29 Apr 2013. Accessed 29 Apr 2013.
- ⁵⁴⁸ "Russia will develop strike weapons to defeat US missile defences – Putin." Rossiya 24 Television, 10 Nov 2015.
- ⁵⁴⁹ Gorenburg, Dmitry. "How is Economic Crisis Affecting Russian Military Modernization?" Russia Insider, 14 Apr 2016, <http://russia-insider.com/en/how-economic-crisis-impacting-russian-military-modernization/ri13882>. Accessed 26 Aug 2016.
- ⁵⁵⁰ Marakhonov, Vladimir. "So Who Among Us Favors Strong Russia? Conflict with Ukraine Has Cost Our Country Half Its Nuclear Potential." Novaya Gazeta Online, 20 Jul 2015, www.novayagazeta.ru. Accessed 20 Jul 2015.
- ⁵⁵¹ Vyatkin, Yaroslav. "Hypersonic Weapons: Even Alien Invaders Have Failed to Help the United States." Argumenty Nedeli Online, 4 May 2016, <http://argumenty.ru>. Accessed 27 Jul 2016.
- ⁵⁵² Unattributed. "The Acceptance in the Inventory of the RS-26 'Yars-M' Missile Complex Is Planned in 2017." Vzglyad Online, 12 May 2016, www.vzglyad.ru. Accessed 12 May 2016.
- ⁵⁵³ Litovkin, "The Army: They Will Test Sarmat Near the Hawaiian Islands: They Will Lay Out a New Route for the New Ballistic Missile." Izvestiya Online, 4 Jul 2016, www.izvestiya.ru. Accessed 4 Jul 2016.

- ⁵⁵⁴ Unattributed. "Russia Test Fires ICBM to Target in Kazakhstan." Fars News Agency, 28 Dec 2013, <http://www.english.farsnews.com>. Accessed 21 Sep 2016.
- ⁵⁵⁵ Summary of Reporting on Russian and FSU Nuclear Issues. Los Alamos National Laboratory, 1 Dec 2014. Accessed 27 Nov 2016.
- ⁵⁵⁶ Marakhonov, "So Who Among Us Favors Strong Russia? Conflict with Ukraine Has Cost Our Country Half Its Nuclear Potential."
- ⁵⁵⁷ Litovkin, Dmitriy. "The Army: They Will Test Sarmat Near the Hawaiian Islands: They Will Lay Out a New Route for the New Ballistic Missile." Izvestiya Online, 4 Jul 2016, www.izvestiya.ru. Accessed 4 Jul 2016.
- ⁵⁵⁸ Russian Space Web. Topol-M, online missile guide, 2 Nov 2014, www.russianspaceweb.com/topolm.html. Accessed 10 Sep 2016.
- ⁵⁵⁹ Litovkin, "The Army: They Will Test Sarmat Near the Hawaiian Islands."
- ⁵⁶⁰ Unattributed. "Testing of heavy strategic missile 'Sarmat' to start promptly." Interfax, 10 Aug 2016, www.interfax.com. Accessed 11 Aug 2016.
- ⁵⁶¹ Unattributed. "The Acceptance in the Inventory of the RS-26 'Yars-M' Missile Complex Is Planned in 2017." Vzglyad Online, 12 May 2016, www.vzglyad.ru. Accessed 12 May 2016.
- ⁵⁶² Unattributed. "Rubezh Missile Will Enter Duty in a Year." Rossiyskaya Gazeta Online, 12 May 2016, www.rg.ru. Accessed 12 May 2016.
- ⁵⁶³ Gertz, Bill. "Russia Tests Hypersonic Glide Vehicle on Missile." The Washington Free Beacon, 22 Apr 2016, <http://freebeacon.com/national-security/russia-tests-hypersonic-glide-vehicle/>.
- ⁵⁶⁴ NASIC; "Ballistic & Cruise Missile Threat; 2013; <http://www.dtic.mil/dtic/tr/fulltext/u2/a582843.﻿pdf>
- ⁵⁶⁵ NASIC; "Ballistic & Cruise Missile Threat; 2013; <http://www.dtic.mil/dtic/tr/fulltext/u2/a582843.﻿pdf>
- ⁵⁶⁶ Unattributed. "Offensive weapons, Ballistic missiles, Russian Federation, R-29RM Shetal/Sineva (RSM-54/3M27)." Jane's Strategic Weapon Systems, 18 Dec 2015.
- ⁵⁶⁷ Litovkin, "The Army: They Will Test Sarmat Near the Hawaiian Islands."
- ⁵⁶⁸ Petrov, Vladimir. "Russia announces deployment plans for Bulava missile and Borey-class submarine." Jane's Defence Weekly, 30 Sep 2008, www.janes.com.
- ⁵⁶⁹ Kristensen, Hans and Norris, Robert. "Russian nuclear forces, 2016." Bulletin of Atomic Scientists, vol. 72, no. 3, 13 Sep 2016, pp. 125–134.
- ⁵⁷⁰ "OTR-21 Tochka." Wikipedia, https://en.wikipedia.org/wiki/OTR-21_Tochka. Accessed 16 Sep 2016.
- ⁵⁷¹ Unattributed. "SS-21 'Scarab' (OTR-21/9M79 Tochka)." Jane's Strategic Weapon Systems, 19 Jul 2005, www.janes.com.
- ⁵⁷² Unattributed. "SS-26 'Stone' (9M720 Tender/Iskander-E)." Jane's Strategic Weapon Systems, 19 Jul 2005, www.janes.com.
- ⁵⁷³ Barabanov, Mikhail. "The Reason We Need a Combat Aircraft." Odnako Online, 18 Aug 2011, <http://odnako.ru/>. Accessed 18 Aug 2011.
- ⁵⁷⁴ Unattributed. "RF Long-Range Aviation Will Test New Cruise Missiles in 2014." RIA Novosti Online, 28 Jan 2014, <http://ria.ru/>. Accessed 28 Jan 2014.
- ⁵⁷⁵ Khudoleyev, Konstantin, et al. "Serve Russia." Zvezda TV, 9 Feb 2014.
- ⁵⁷⁶ Unattributed. "Tactical Missiles Corporation to Showcase Modern Weapons." Aviapanorama, 21 Aug 2013, Accessed 21 Aug 2013.
- ⁵⁷⁷ Tactical Missile Corporation, http://eng.krtv.ru/about_eng. Accessed 18 Aug.
- ⁵⁷⁸ Unattributed. "V. Putin summarized series of Meetings, Dedicated to Fulfillment of the GOZ and Outfitting the [State Armaments Program] RF Armed Forces with Modern ViVT." Voyenno-Promyshlenny Kuryer, 9 Dec 2013, <http://vpk-news.ru/>. Accessed 9 Dec 2013.
- ⁵⁷⁹ President of Russia. "Russian leader, Defence Plant Chiefs Discuss Production, Overhaul of Facilities." Official website of the Russian Federation President, 29 Nov 2013, <http://eng.kremlin.ru/>. Accessed 29 Nov 2013.
- ⁵⁸⁰ President of Russia. "Russian leader, Defence Plant Chiefs Discuss Production, Overhaul of Facilities." Official website of the Russian Federation President, 29 Nov 2013, <http://eng.kremlin.ru/>. Accessed 29 Nov 2013.
- ⁵⁸¹ Yesin, Viktor. "Peace Vehicles—Part II: It Is Time to Eliminate the Gap Between Advanced Engineering Solutions and Defense-Industrial Complex Production Capabilities." Voyenno-Promyshlenny Kuryer, 27 Feb 2015, <http://vpk-news.ru/>. Accessed 27 Feb 2015.
- ⁵⁸² Mardasov, Anton. "Voyevoda and Stilet Will Reach America Without Ukraine. How Far the Rupture with Kyiv Threatens the Effectiveness of Russian ICBMs and Cruise Missiles." Moscow Svobodnaya Pressa, 24 Aug 15, <http://svpressa.ru/war21/article/130231/>. Accessed 30 Aug 2015.

- ⁵⁸³ "Cruise Missiles: Kh-101/102." Missile Threat: A Project of the George C. Marshall and Claremont Institutes, missilethreat.com. Accessed 18 Aug 2016.
- ⁵⁸⁴ Capaccio, Anthony. "Russia Deploys Advanced Cruise Missiles in Major Navy Reboot." Bloomberg, 30 Dec 2015, <http://www.bloomberg.com/news/articles/2015-12-30/russia-deploying-advanced-cruise-missiles-in-major-navy-reboot>. Accessed 18 Aug 2016.
- ⁵⁸⁵ Capaccio. "Russia Deploys Advanced Cruise Missiles in Major Navy Reboot."
- ⁵⁸⁶ "U.S. Debates Cruise Missile Procurement." Jane's Intelligence Review, 7 Jul 2016.
- ⁵⁸⁷ Akulov, Andrei. "Kalibr: Russia's Naval System Upping Cruise Missile Game." Strategic Culture Foundation, 24 May 2016, <http://www.strategic-culture.org/news/2016/05/24/kalibr-russia-naval-system-upping-cruise-missile-game.html>. Accessed 18 Aug 2016.
- ⁵⁸⁸ Akulov. "Kalibr: Russia's Naval System Upping Cruise Missile Game."
- ⁵⁸⁹ "Jane's P-800 Oniks/Yakhont (SS-N-26 Strobile)." Jane's Defense Industry-Weapons: Naval.
- ⁵⁹⁰ Vyatkin, Yaroslav. "Hypersonic Weapons: Even Alien Invaders Have Failed to Help the United States." Argumenty Nedeli Online, 4 May 2016, <http://argumenti.ru>. Accessed 27 Jul 2016.
- ⁵⁹¹ Vyatkin, Yaroslav. "Hypersonic Weapons: Even Alien Invaders Have Failed to Help the United States." Argumenty Nedeli Online, 4 May 2016, <http://argumenti.ru>. Accessed 27 Jul 2016.
- ⁵⁹² Unattributed. "Russian Defence Ministry Praises New Kalibr Missile launches on Syria targets." TASS Russian News Agency, 9 Dec 2015, <http://tass.ru/ed/defense/842799>. Accessed 20 May 2016.
- ⁵⁹³ Mukhin, Vladimir. "Russian Arctic Will Be Protected by the Triumph; Production of Aerospace Defense Assets Will Increase Tenfold in Near Future." Nezavisimaya Gazeta, 2 Mar 2016, <http://www.ng.ru/>. Accessed 4 Mar 2016.
- ⁵⁹⁴ Kozhin. "Negotiations on sale of S-400 surface-to-air missile systems to China and India ongoing, but priority their supply to Russian Armed Forces." Moscow Interfax, 18 Apr 16, <http://www.interfax.com>. Accessed 18 Apr 2016.
- ⁵⁹⁵ "Concern PVO "Almaz-Antey"/Concern Aerospace Defense [PVO]." GlobalSecurity.org, 29 Mar 2016 <http://www.globalsecurity.org/military/world/russia/concern-pvo.htm>. Accessed 23 Aug 2016.
- ⁵⁹⁶ "Aerospace and Defense: Company Overview of Joint-Stock Company Concern Almaz-Antey." Bloomberg, <http://www.bloomberg.com/Research/stocks/private/snapshot.asp?privcapid=34169028>. Accessed 23 Aug 2016.
- ⁵⁹⁷ Unattributed. "Jane's, Sentinel Security Assessment – Russia and the CIS, Russia-Air Force." IHS Jane's 360, 10 Aug 2016, www.janes.com.
- ⁵⁹⁸ Mukhin, Vladimir. "Russian Arctic Will Be Protected by the Triumph; Production of Aerospace Defense Assets Will Increase Tenfold in Near Future." Nezavisimaya Gazeta, 2 Mar 2016, <http://www.ng.ru/>. Accessed 4 Mar 2016.
- ⁵⁹⁹ "Antey-2500 Long-range Air Defense Missile System." Military Today, http://www.military-today.com/missiles/antey_2500.htm. Accessed 23 Aug 2016.
- ⁶⁰⁰ "Pantsyr S1 Close Range Air Defense System, Russia." Army-Technology.com, www.army-technology.com. Accessed 22 Aug 2016.
- ⁶⁰¹ Unattributed. "Jane's, Sentinel Security Assessment – Russia and the CIS, Russia-Air Force." IHS Jane's 360, 10 Aug 2016, www.janes.com.
- ⁶⁰² Unattributed. "Jane's, Sentinel Security Assessment – Russia and the CIS, Russia-Air Force." IHS Jane's 360, 10 Aug 2016, www.janes.com.
- ⁶⁰³ Unattributed. "Jane's, Sentinel Security Assessment – Russia and the CIS, Russia-Air Force." IHS Jane's 360, 10 Aug 2016, www.janes.com.
- ⁶⁰⁴ "Aircraft industry of Russia: Military aircraft." Wikipedia, https://en.wikipedia.org/wiki/Aircraft_industry_of_Russia#Military_aircraft. Accessed 2 Sep 2016.
- ⁶⁰⁵ "United Aircraft Corporation." Wikipedia, https://en.wikipedia.org/wiki/United_Aircraft_Corporation. Accessed 2 Sep 2016.
- ⁶⁰⁶ Gorengurb, Dmitry. "Russia's State Armaments Program 2020: Is the Third Time the Charm for Military modernization?" PONARS Eurasia policy memo, 12 Oct 2010.
- ⁶⁰⁷ "Modernized Strategic Bombers to Debut in Victory Day Parade Over Moscow." Jane's Defence Weekly, 14 Apr 2016, [janes.com](http://www.janes.com). Accessed on 4 Aug 2016.
- ⁶⁰⁸ Harress, Christopher. "Russia Tupolev 22M3 Bombers Upgrade: Modernized Jets to be in Service by the End of 2015." International Business Times, 17 Jul 2015, www.ibtimes.com.
- ⁶⁰⁹ "Modernized Strategic Bombers to Debut in Victory Day Parade Over Moscow." Jane's Defence Weekly, 14 Apr 2016, [janes.com](http://www.janes.com). Accessed on 4 Aug 2016.
- ⁶¹⁰ "Aircraft Upgrades/Tupolev Tu-160." Janes, 15 Dec 2015, [janes.com](http://www.janes.com). Accessed 8 Aug 2016.

- ⁶¹¹ Unattributed. "Russian Air Forces to Take Delivery of More than 10 Upgraded Tu-95 Bombers in Two Years." *Russian Aviation*, 30 Mar 2015, www.ruaviation.com. Accessed 9 Aug 2016.
- ⁶¹² Unattributed. "Russia Plans to Complete Tu-22M3 Bomber Modernization Program by 2019." *Russian Aviation*, 12 Jan 2016, www.ruaviation.com. Accessed 2 Aug 2016.
- ⁶¹³ "Development of PAK-DA Bomber Moved from Preliminary Design State to Research and Development Work." *Russian Aviation*, 2 Jul 2015, www.ruaviation.com. Accessed 8 Aug 2016.
- ⁶¹⁴ Jane's Information Group, "Kuznetsov NK-321." Jane's Aero-Engines, Aero-engines - Turbofan, Russian Federation, 4 May 16.
- ⁶¹⁵ Shapkin, Dmitriy. "They Have Pulled Out of the Dive: Combat Aircraft." *Kommersant Online*, 21 Aug 2013, <http://kommersant.ru>. Accessed 24 Aug 2013.
- ⁶¹⁶ Litovkin, Dmitriy. "The Army: The T-50 Fighter Aircraft Is Ready for Series Production: The Delivery of the Aircraft to the Troops Will Begin in 2017." *Moscow Izvestiya Online*, 15 Jun 2016, <http://www.izvestia.ru/>. Accessed 15 Jun 2016.
- ⁶¹⁷ Khodarenok, Mikhail. "Long Restrained, We Will Fly Quickly; Fifth-Generation Russian Fighter Will Be Serially Produced in 2017." *Moscow Gazeta.ru*, 1 Sep 2016. Accessed 13 Sep 2016.
- ⁶¹⁸ Unattributed. "Nothing critical happens to Russian Helicopters holding as result of imposition of Western sanctions." *Moscow Interfax*, 8 Sep 2016, <http://www.interfax.com/>. Accessed 8 Sep 2016.
- ⁶¹⁹ Kramnick, Ilya. "Preserving the Heights: A Series of Advanced Helicopters Must Help Russia to Not Lose Its Place in the World Market." *Moscow Vzgl'yad Online*, 10 Dec 2012, <http://www.vz.ru/>. Accessed 20 Dec 2012.
- ⁶²⁰ Unattributed. "Russian Helicopters business unaffected by extension of Ukrainian sanctions." *Moscow Interfax*, 25 Oct 2016, <http://www.interfax.com/>. Accessed 25 Oct 2016.
- ⁶²¹ Fedorov, Konstantin. "Modernization of Russian Military-Transport Aviation: Russia's Military-Transport Aviation: Need for Radical Renewal." *Moscow Segodnya.Ru*, 3 Jun 2015, <http://www.segodnia.ru/>. Accessed 5 Jun 2015.
- ⁶²² Fedorov, "Modernization of Russian Military-Transport Aviation."
- ⁶²³ Zhuravlev, Nataliya. "A Hope for a Trillion: Plans Were Expressed on the Sale of the Latest Version of the Veteran Transport." *Moscow Vzgl'yad Online*, 26 Dec 2012, <http://www.vz.ru/>. Accessed 5 Jan 2013.
- ⁶²⁴ "Jane's World Navies – Russian Federation." IHS Jane's, 30 Jun 2016, pp. 27–28.
- ⁶²⁵ Unattributed. "Soyuz Scientific Production Center Upgrades Test Stands for Ship Engines." *RIA Novosti*, 23 Aug 2016, www.ria.ru. Accessed 23 Aug 2016.
- ⁶²⁶ Ishchenko, Sergey. "Squadron Losing Way: Construction of 17 Surface Combatants for Our Navy Under Threat of Disruption." *Moscow Svobodnaya Pressa*, 19 Mar 2015, <http://www.svpressa.ru/>. Accessed 26 Mar 2015.
- ⁶²⁷ "Jane's World Navies – Russian Federation." IHS Jane's, 30 Jun 2016, pp. 27–28.
- ⁶²⁸ "Kuznetsov Overhaul Designed to Maintain Carrier Capability While Russia Considers Future Carrier Options." *Jane's Navy International*, 30 Jun 2016.
- ⁶²⁹ Litovkin, Dmitriy. "A Unique Dock Will Be Built to Accommodate the Aircraft Carrier Admiral Kuznetsov." *Izvestiya Online*, 7 Jun 16, <http://www.izvestia.ru/>. Accessed 12 Jun 2016.
- ⁶³⁰ Unattributed. "Shtorm aircraft carrier design to begin in 2020." *Moscow Interfax*, 30 Jun 16, <http://www.interfax.com>. Accessed 1 Jul 2016.
- ⁶³¹ "Russia's New Maritime Doctrine." *Jane's Defense Weekly*, 14 Aug 2015, p. 4.
- ⁶³² "Jane's World Navies – Russian Federation." IHS Jane's, 30 Jun 2016, p. 31.
- ⁶³³ "Jane's World Navies – Russian Federation." IHS Jane's, 30 Jun 2016, p. 30.
- ⁶³⁴ "Jane's World Navies – Russian Federation." IHS Jane's, 30 Jun 2016, p. 30.
- ⁶³⁵ de Larrinaga, Nick. "Return of the Bear: Russian Ground Forces Modernisation." *Jane's Defence Weekly*, 8 Mar 2016.
- ⁶³⁶ de Larrinaga, "Return of the Bear: Russian Ground Forces Modernisation."
- ⁶³⁷ de Larrinaga, "Return of the Bear: Russian Ground Forces Modernisation."
- ⁶³⁸ Koryakin, Oleg. "T-80 Tank Is Being Modernized with Relikt and Sosna-U: Omsk Armorers Took on Modernization of T-80BV Tank." *Rossiyskaya Gazeta Online*, 14 Jul 2016, <http://rg.ru/>. Accessed 15 Jul 2016.
- ⁶³⁹ Golts, Aleksandr. "Higher Arithmetic of the Russian Defense-Industrial Complex." *Moscow Yezhednevnyy Zhurnal*, 15 May 2015, www.ej.ru. Accessed 18 May 2015.
- ⁶⁴⁰ Frolov, Andrey. "An Obstacle for the Aircraft Carrier. The State Armaments Program to 2025 Fits Ill with Economic Realities." *VPK Voenno-Promyshlennyy Kuryer Online*, 16 Mar 2016, vpk-news.ru. Accessed 21 Mar 2016.

⁶⁴¹ de Larrinaga, "Return of the Bear: Russian Ground Forces Modernisation."

⁶⁴² Fedyushko, Dmitriy. "BMP-3's Second Youth. Vehicle Designed a Quarter of a Century Ago Has Become the Basis for the Newest Developments." VPK Voenno-Promyshlenny Kuryer Online, 23 Sep 2015, <http://www.vpk-news.ru/articles/27164>. Accessed 26 Oct 2015.

⁶⁴³ Frolov, Andrey. "An Obstacle for the Aircraft Carrier. The State Armaments Program to 2025 Fits Ill with Economic Realities." VPK Voenno-Promyshlenny Kuryer Online, 16 Mar 2016, [vpk-news.ru](http://www.vpk-news.ru). Accessed 21 Mar 2016.

⁶⁴⁴ Official government statement. "Preliminary Testing of State-of-Art Boomerang Armored Personnel Carrier Will Be Completed in 2016." Moscow TASS, 3 Jun 2016, tass.ru/. Accessed 6 Jun 2016.

⁶⁴⁵ de Larrinaga, "Return of the Bear: Russian Ground Forces Modernisation."

⁶⁴⁶ de Larrinaga, "Return of the Bear: Russian Ground Forces Modernisation."

⁶⁴⁷ de Larrinaga, "Return of the Bear: Russian Ground Forces Modernisation."

⁶⁴⁸ de Larrinaga, "Return of the Bear: Russian Ground Forces Modernisation."

⁶⁴⁹ "Ukraine mobility upgrades for Russian rocket launchers." Jane's International Defence Review, vol. 44, no. 3, Mar 2011, pp. 31–33.

⁶⁵⁰ "Rosoboronexport outlines 2020 strategy." Jane's Defence, Industry Market Intelligence, 18 Nov 2013.

⁶⁵¹ Safronov, Ivan and Dzhordzhevich, Aleksandr. "Demand Gives Rise to Armament -- Russian Military Exports Beat Records." Moscow Kommersant Online, 23 Mar 2017, <http://kommersant.ru/>. Accessed 29 Mar 2017.

⁶⁵² Safronov, Ivan. "'Our Goal is to Hold on to Russia's Second Place in the Arms Delivery Sphere.' Rosoboronexport General Director Anatoliy Isaykin Talks About 2013's Results and the Prospects for 2014." Kommersant Online, 27 Jan 2014, www.kommersant.ru. Accessed 27 Jan 2014.

⁶⁵³ Unattributed. "Rosoboronexport's sales reach \$6.5 bln in H1 (Part 2)." Interfax, 15 Aug 2013, www.interfax.com. Accessed 15 Aug 2013.

⁶⁵⁴ Unattributed. "Arms export costs account for \$2 bln - \$2.5 bln in Russia's arms exports – Military-Technical Cooperation Service." Interfax, 16 Jun 2015, www.interfax.com. Accessed 16 Jun 2015.

⁶⁵⁵ Unattributed. "Russia broadens geography of military produce exports in 2014 – service." Interfax, 26 May 2015, www.interfax.com. Accessed 27 Mar 2015.

⁶⁵⁶ President of Russia. "Russian President Addresses Arms Exports Commission Meeting." Russian Presidential Website, 27 Jan 2015, www.eng.kremlin.ru. Accessed 27 Jan 2015.

⁶⁵⁷ Unattributed. "Patrushev seeks broader military-technological cooperation within BRICS (Part 2)." Interfax, 26 May 2015, www.interfax.com. Accessed 26 May 2015.

⁶⁵⁸ Safronov, Ivan. "'Our Goal is to Hold on to Russia's Second Place in the Arms Delivery Sphere.' Rosoboronexport General Director Anatoliy Isaykin Talks About 2013's Results and the Prospects for 2014." Kommersant Online, 27 Jan 2014, www.kommersant.ru. Accessed 27 Jan 2014.

⁶⁵⁹ President of Russia. "Russian President Addresses Arms Exports Commission Meeting." Russian Presidential Website, 27 Jan 2015, www.eng.kremlin.ru. Accessed 27 Jan 2015.

⁶⁶⁰ President of Russia. "Russian President Addresses Arms Exports Commission Meeting." Russian Presidential Website, 27 Jan 2015, www.eng.kremlin.ru. Accessed 27 Jan 2015.

⁶⁶¹ Vlahovic, Branko. "Price Tag of Russian Weapons After Syria." Belgrade Vecernje Novosti, 4 Apr 2016, www.novosti.rs. Accessed 4 Apr 2016.

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