RUSSIAN NATIONAL INTERESTS AND OUTER SPACE

Evaluating Russian Grand Strategy, the status of Russia's space program, making inferences into Russia's space doctrine, and making comparisons to U.S. priorities in space

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DISCLAIMER

The author conducted this study as part of the program of professional education at the Frank Batten School of Leadership and Public Policy, University of Virginia. This paper is submitted in partial fulfillment of the course requirements for the Master of Public Policy degree. The judgments and conclusions are solely those of the author, and are not necessarily endorsed by the Batten School, by the University of Virginia, or by any other agency.

HONOR PLEDGE

On my honor as a student, I have neither given nor received unauthorized aid on this assignment.

Ryan Everhart

Signed electronically: Ryan Everhart
April 8, 2022

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I would like to thank my parents and my sister for their unwavering support, which refreshed and revitalized me when I needed it most.

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Sincerely,

Ryan Everhart

DEDICATION

This applied policy project is dedicated to the brave citizens of Ukraine, to the thousands of families who have lost husbands, wives, brothers, sisters, fathers, mothers, sons, daughters, aunts, uncles, and grandparents in the defense of their homeland. Thank you for showing that no matter the cost, brave men and women will stand and fight for their freedoms, their right to self-determination, and their sovereignty. My thoughts are with those American Ukrainians like my friend Maria Vennikov, who turned on the television on the evening of February 24 on the east coast to find their families' lives in danger, and have lost many nights of sleep guiding their families out of danger, and to support them in their times of angst and doubt. Your sacrifice and heart have inspired the world.

Glory to Ukraine. Glory to the heroes.

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EXECUTIVE SUMMARY

This paper explains the historical motivations for Russia's national interests and grand strategic goals, while providing insight into the mentality of Russian leadership as they look out beyond the walls of the Kremlin. Russia has three main ends in mind: establishing a sphere of influence in its near-abroad, serving as a counterbalancing force to the United States and the Western liberal international order, and regaining its status as a global power. To achieve these ends, I describe Russia's ways and means, focusing on defining and explaining that terms like the Gerasimov Doctrine and hybrid warfare all generally describe Russia's willingness to use the full breadth of their national power to achieve its goals.

The paper then turns to an exploration of Russia's space program, with an eye towards analyzing potential areas of weakness. We find that Russia suffers budgetary constraints thanks to the financial stresses of military modernization, as well as the restrictive nature of a virtually entirely state-run space program. Russian infrastructure is discussed, relying largely on Florien Vidal's assessment of the Russian space program to designate future weaknesses, including the lack of a productive labor base, aging infrastructure inherited from the Soviet era, the unattractiveness of the sector to young Russians, and the lack of laws to regulate the sector and provide for accountability.

Next, American priorities in space are briefly discussed, along with an assessment of the strength of America's bottom-up space enterprise supported by a multitude of young, private firms. These provide the United States with flexibility and innovation in a rapidly-accelerating field, where barriers to entry are only decreasing.

Lastly, recommendations are made to SPACECOM as to how to further American advantage in space, and how to potentially engage with Russia in areas of common interest in space.

PROBLEM STATEMENT

The United States Space Command wishes to better understand the intentions of their Russian competitors in space, and whether those intentions have changed given Russia's 2021 National Security Strategy. They wish to understand where the American and Russian space doctrines differ, and where that can be exploited to America's advantage.

CLIENT OVERVIEW

The United States Space Command is one of eleven joint combatant commands in the United States' Department of Defense (DOD). SPACECOM is a geographic command, responsible for all military operations in outer space, specifically all operations 100 kilometers above mean sea level. U.S. Space Command "conducts operations in, from, and to space to deter conflict, and if necessary, defeat aggression, deliver space combat power for the Joint/Combined force, and defend U.S. vital interests with allies and partners." (U.S. Space Command, 2022) Russia is the third largest spacefaring nation in the world, behind the United States and China. (NASIC, 2019) As we move into a historical period characterized by great power competition, it is critical for the warfighting mission of SPACECOM that it understands its main adversaries' goals and mindsets if it is to ensure the safety America's national interests.

INTRODUCTION

The original impetus for this paper was Russia's release of its 2021 National Security Strategy (NSS). U.S. Space Command (USSPACECOM) wanted to assess Russia's grand strategy and whether this new document represented changes thereof. Over the course of two semesters' research on this topic, it became a project dedicated to assessing Russian doctrine in space, comparing this to American space goals and doctrine, and giving SPACECOM the most information possible to better inform future policymaking. This paper will trace the modern history of Russian grand strategy, and use that knowledge, as well as conditioning factors such as Russia's space-industrial capacity, to infer as much as possible about Russian goals and doctrine as they pertain to the space domain. I will attempt to paint the picture of the mindset and worldview of those who created the 2021 NSS, using historical examples as well as expert analysis of the text itself. Furthermore, Russia has never published its goals and intentions for space; there is no corollary to our strategic vision document which was released by SPACECOM in January 2021. (USSPACECOM, 2021) Therefore we must use what we do know, what literature is public, to make inferences about logical Russian goals, intentions, and general mindsets towards the modern warfighting domain of space.

This Applied Policy Project (APP) will be quite different from those of my peers. There have been no quantitative studies on the effects of various policies on some outcome; there will be no regression analysis. We are dealing with a question of statecraft and diplomacy, of war and peace, seeking to understand a great power competitor. As Sun Tzu said, "if you the enemy and know yourself, you need not fear the result of a hundred battles." (Sawyer, 1994) I must pierce the veil of a country long shrouded in often self-induced fog, a country once hidden behind the iron curtain, a country currently waging war against its neighbor, Ukraine, where the Russian state was born in 882 as Kievan Rus'. (Britannica, T. Editors of Encyclopaedia, 2016) How do I intend to do this? Winston Churchill famously referred to Russia as "a riddle, wrapped in a mystery, inside an enigma." (Cowell, 2008) Less famously, he would go on to say that "perhaps there is a key. That key is Russian national interest." (Fridman, 2019) This paper will begin by providing the historical background to Russia's national interests and defining them, as without an understanding of a country's interests, one cannot understand the country.

BACKGROUND

HOW HISTORY INFORMS GRAND STRATEGY

To understand the mindset of the Russian governing elite, hidden behind the walls of the Kremlin, we must study history. Russia's goals are motivated by deep-seated insecurity generated by thousands of years of foreign invasion. The topography of Russia lends itself to invasion, providing no natural borders aside from the Ural mountains which are sloping and of moderate height, posing no real barrier. (Wesson, 1985, pp. 2) These geographic realities, as well as the historical practices of rapid expansion and accession of disparate ethnic and religious minority groups adopted from the Mongol Empire, led the eventual Russian Empire to adopt expansionary policies designed to extend its borders as far from the central regions of the Empire as possible. This expansion was only stopped in the mid-19th century by the defeat of the Russian military in the Crimean War. The slavophile Nicholas Danilevsky wrote in the nineteenth century that the Russian state to that point had been "gradually, irresistibly spreading on all sides, settling neighboring unsettled territories, and assimilating into herself and her national boundaries foreign populations." (Wesson, 1985, pp. 3)

It was nothing short of imperative to keep increasing the size of the Russian state, particularly southward and westward, to secure the Russian heartland. A certain buffer zone was needed to protect against potential encroachment by strong European powers. Imperial leaders shared this focus with their Soviet successors, namely "the belief the porous western frontiers presented the most serious threat to the security of the state." (Rieber, 2007, pp. 229) We can see this focus on western borderlands even today as Russia mounts an increasingly costly war over Ukraine, a country which represents the border between Russia and the West, encoded in its very name as *krai* is the word for "edge" in Russian, prefixed by *u*, denoting the meaning "near." Buffer zones and careful management of Russia's "near abroad" are clear interests of Russian foreign policy since

the state's inception. Interests, as Lord Palmerston famously said, are "eternal and perpetual, and those interests it is our [a state's] duty to follow." (Palmerston, 1841)

This focus on maintaining control of and stability in Russia's borderlands is informed by Russia's long history of invasion by European powers. In 1708, Charles XII of Sweden crossed the Vistula River in modern day Poland with 40,000 men, only to be ground down by the Russian winter, eventually losing to the Russian army at the Battle of Poltava in modern day Ukraine. In 1812, Napoleon and his army crossed the Niemen in Belarus into Russia. Attrition warfare was employed, and despite Napoleon's occupation of Moscow, he was forced to retreat back to France, ending his goal of total dominance of the European continent. Of the 600,000 strong French invasion force, only 50,000 made it back to France. (Hill, 2003, pp. 27) In 1941, Nazi Germany's Operation Barbarossa saw a German invasion of Russia across a vast front including the Baltic states, occupied Poland, and modern day Ukraine. Once again, a fortuitously brutal winter and overextended supply lines saved the Russian state from an invasion from a continental European power, this time at the cost of 27 million Russian lives.

By the collapse of the Soviet Union, some believed that the very nature of international relations had changed forever, and that state interests would be subsumed by acceptance of liberal international principles, the rule of law, and acceptance of the sovereignty of neighboring states. Famously, Frances Fukuyama declared the end of history. Unfortunately for us all, these liberal dreams were never realized. Privatization of the Russian Federation failed miserably. In 1991 alone, gross domestic product dropped by about one-sixth. Many of the benefits of privatization would only ever be felt by Yeltsin's close circle, who would become today's oligarchs. (Britannica) Meanwhile, NATO, Russia's modern idea of a European threat, began to expand eastward up to Russia's borders, with Poland, Hungary, and the Czech Republic joining the alliance by the end of the decade. (Perlez, 1999) Bulgaria, Estonia, Latvia, Lithuania, Romania, Slovakia, and Slovenia would join the alliance in 2004. (NATO, 2004)

Russian historical interests had not changed, but Russia was too weak to stop these perceived encroachments on its sphere of influence. Indeed, they had attempted to negotiate against the expansion of NATO, and during discussions of German reunification, in February 1990 U.S. Secretary of State James Baker told Soviet leader Mikhail Gorbachev that "there would be no extension of NATO's jurisdiction for forces of NATO one inch to the east" and agreed with Gorbachev's statement that "Any extension of the zone of NATO is unacceptable." (Goldgeier, 2019) In 1994, then Secretary of State Warren Christopher would travel to Moscow to reassure Boris Yeltsin that the United States would not support new members joining the alliance. (Goldgeier,

2019) Yeltsin expressed his displeasure with the idea of NATO expansion later that year, stating "NATO was created in Cold War times. Today, it is trying to find its place in Europe, not without difficulty. It is important that this search not create new divisions, but promote European unity. We believe that the plans of expanding NATO are contrary to this logic. Why sow the seeds of distrust? After all, we are no longer adversaries, we are partners." (Goldgeier, 2019) Russia perceived future NATO expansion as a betrayal of the United States' previous promises and this, combined with the failure of Western-implemented and guided economic reforms, inculcated a sense of distrust and disaffection with the West that remains powerful today. The United States' lack of interest in catering to Russia's security concerns during its unipolar moment reinforced Russia's perception that it had lost a great deal of respect and influence after the collapse of the Soviet Union. Indeed, Russia was dealing with a crisis within its own borders, the First Chechen War, and could hardly assert its interests on its near abroad.

Russia's litany of grievances against the West continued into the 21st century, when Boris Yeltsin's hand-selected replacement Vladimir Putin took the stage as President of the Russian Federation. The relationship with the United States started strong, with President Bush famously saying he had gotten a sense of Vladimir Putin's soul during the latter's visit to the United States. Indeed, Russia and the United States cooperated in the War on Terror, with Russia sharing intelligence and maps on Afghanistan. However, Russia's expectation of what Dmitri Trenin would refer to as "an equal partnership of unequals" (Stent, 2021) would not be realized. The United States saw itself as helping to enhance Russian security by "cleaning up its backyard" while staying silent about the Second Chechen War and helping Russia join the World Trade Organization. Russia hoped for more than this: a recognition of Russia's own privileged sphere of influence in its near abroad, and a return to what Angela Stent calls the "global board of directors" after a "humiliating post-Soviet decade of domestic and international weakness." (Stent, 2021)

Instead, Russia would find itself chafing at Washington's unilateral withdrawal from the Anti-Ballistic Missile Treaty, Bush's "Freedom Agenda," and U.S. support for "color revolutions" in former Yugoslavia, Georgia, Ukraine, and Kyrgyzstan. Russia believes that these "color revolutions" are the "product of machinations by the United States and other Western powers" and pose a vital threat to its statehood and national security. (Bolt, 2018) Many mark Vladimir Putin's 2007 speech at the Munich Security Conference as the most open sign of Russian displeasure with the current architecture of the international system since the collapse of the Soviet Union, advancing beyond asserting Russian interests in its near abroad. Through that speech, Russia became openly

hostile to the American-led, hegemonic world order. As Ted Carpenter remarks, in that speech, Putin rejected the notion that the world was unipolar, and that Washington's power was unchallengeable. As Putin put it, "However one might embellish this term, at the end of the day it refers to one type of situation, namely one center of authority, one center of force, one center of decision-making. It is a world in which there is one master, one sovereign." (Carpenter, 2022) Putin made it clear that this conception of the world order was not to Russia's liking. As Franco describes, Putin described the liberal international order as a projection of the US will to dominate the world. (Franco, 2021) This same conception of affairs can be found in the November 2016 Foreign Policy Concept and the December 2015 National Security Concept of the Russian Federation. (Franco, 2021)

In that same speech, Putin would address NATO expansion, bringing up the guarantees Russia perceives it was offered after the dissolution of the Warsaw Pact, which NATO broke as it continued to expand eastward. He expressed Russian displeasure and confusion at the continued expansion, asking "against whom is this expansion intended?" (Carpenter, 2022) After that speech, Putin faced questions which we hear daily in our media today in the wake of Russia's invasion of Ukraine: isn't NATO expansion simply the self-determination of democratic states who want this? Putin clearly has a different view of NATO expansion. He replied "With respect to democracy and NATO expansion. NATO is not a universal organization, as opposed to the UN. It is first and foremost a military and political alliance, military and political!" (Carpenter, 2022) He would go on to question the need to put military materiel on Russia's borders. His understanding of NATO was also colored by the 1999 bombings of Serbia, which to Putin constituted something of an original sin. (McGlynn, 2022) After all, they happened in Putin's near abroad, and represented NATO military action not in defense of the territory of alliance members. His reaction to NATO's bombing campaign in Libya in in 2011 would be similar, and the event would reinforce Putin's staunch opposition to the alliance. Putin's strikingly realist thinking stands out even now against the backdrop of the then-dominant strand of liberal internationalist thinking adopted by the West. Russian interests remained unchanged, and Russia's President was again expressing centuries-old security concerns about its western borderlands. His way of thinking was discarded as dated, and his concerns were ignored while Russian displeasure with Western leadership festered.

The next year, President Bush offered Membership Action Plans to Georgia and Ukraine to join NATO. (Spetalnick, 2008) France and Germany had both long cautioned Washington against this step, which they felt was unnecessarily provocative to Russia,

and did little to ensure European security. Indeed, joining NATO was not a priority even for the Ukrainian people, where public support for joining the organization was only about 30%. (Spetalnick, 2008) Less than six months later, after Russian provocation, the Russo-Georgian War began, directly challenging Ukraine and Georgia's right to choose their future in regard to military alliances. (Dickinson, 2021) For the first time since the collapse of the Soviet Union, Russia used force to assert its interest in its near-abroad, while actively rejecting the foreign policy goals of the United States.

After its success in Georgia, Russia was not deterred from following that same course of action years later in Ukraine following the EuroMaidan Revolution and the toppling of Viktor Yanukovych's pro-Russian government. In February and March 2014, Russia's swift military operation secured the strategically critical port city of Sevastopol, Russia's only warm water port, and its path to the Mediterranean, along with the entire Crimean peninsula, and locked Russia into a longstanding conflict with Ukraine over the Donetsk and Donbas regions. Once again, Russia exercised an effective military veto of the pro-Western policy decisions of one of its neighbors. By this time, Russia had seen a NATO-led no fly zone and blockade be implemented against Libya in 2011 pursuant to United Nations Security Council (UNSC) Resolution 1973, from which Russia abstained. This resolution was later used to justify the military intervention/bombardment campaign led by NATO, which Russia felt outstripped the mandate of the UNSC resolution. It had now seen NATO engage in conflicts in Kosovo and Serbia, Afghanistan, and Libya. By the time Russia approved its 2015 National Security Strategy, the predecessor to the 2021 NSS, the lines in the sand were already clear: NATO was an enemy, further expansion was unacceptable, and the American-led international world order was not acceptable to Russia. In that document, Russia declared its desire to have a "role in shaping a polycentric world," and that it saw NATO intervention as "global functions pursued in violation of the norms of international law," with its expansion creating a threat to Russian national security. (Russian National Security Strategy, 2015)

The 2021 Russian National Security Strategy (NSS) lays out a view of a world undergoing transformation and turmoil as the hegemony of the West falters. Dmitri Trenin compares the mindset demonstrated by the document to Stalin's famous dictum of the sharpening of class struggle on the road to socialism, where "historical optimism (the imminent end of Western hegemony) [combines with] … deep concern (as it is losing, the West will fight back with even more ferocity)" (Trenin, 2021) The central feature of the document, Trenin says, is its focus on Russia itself, looking inward to root out potential inner causes of turmoil which are exacerbated by "foreign machinations aimed at provoking long-term instability in the country." (Trenin, 2021) This assessment

squares with the conception of Russia as a fundamentally paranoid state which is obsessed with the idea that it is under attack from the West across a variety of domains, including the informational domain, even spiritually. The NATO Defense College notes that reference to international cooperation in the fields of science and education were dropped from the NSS 2015 document, unsurprising given Russia's continuing distrust of the West. Compellingly, the NATO Defense College also points out that the NSS has no clear means of being operationalized: there are no mechanisms in place for its implementation aside from an annual report to the President by the Security Council. (Cooper, 2021) Instead, the document reads as a "defiant manifesto from the occupants of a besieged fortress." (Cooper, 2021) I read the document as a summation of 25 years of Russian gripes against the West, 25 years of growing distrust and paranoia, and a statement of the Hobbesian way in which Russia sees the world. In my view, it is nothing new, a natural continuation of Russian considerations of the West which have been described above. The situation does not look like it will improve any time soon, given Russia's invasion of Ukraine, which has only pushed formerly neutral powers such as Finland and Sweden to consider applying for NATO membership themselves. (Psaledakis, 2022)

It is worth mentioning the change in self-identity and assertiveness which Russia has undergone over the past 25 years. As Ofer Fridman pointed out in a 2019 article for the Institute for National Strategic Security of the National Defense University, while its 2000 Foreign Policy Concept stated that "the Russian Federation has a real potential for ensuring itself a worthy place in the world," by 2008 its concept proclaimed Russia as "the largest Euro-Asian power … one of the leading States of the world and a permanent member of the [United Nations] Security Council. By 2013, the concept included the assertion that "Russia's foreign policy … reflects the unique role our country has been playing over centuries as a counterbalance in international affairs and the development of global civilization." (Fridman, 2019)

To this point, I have painted the Russian perspective of much of the history of U.S./Western-Russian relations up to the adoption of the 2021 NSS. In telling the history of the Russian Empire and its quest to constantly expand in search of further borderlands to protect the heart of its empire, I have sought to demonstrate the historical antecedents to its modern goal of achieving a sphere of influence in its near-abroad, i.e. the post-Soviet space. In telling the history of Russia after the collapse of the Soviet Union, I have tried to demonstrate the weakness and loss of status which Russia felt, particularly during the 1990's. Since that time, it is demonstrable that Russia has resisted NATO expansion, and has sought to balance against American unipolarity with its interventions in Georgia

and Ukraine, as well as its clearly stated intentions in Vladimir Putin's 2007 Munich speech and its 2015 NSS. Today, Russia is myopically focused on the United States as its chief adversary, reflecting intense paranoia about American goals regarding the Russian state.

BACKGROUND

GRAND STRATEGY: RUSSIA'S ENDS

In 1996, Andrei Kozyrev, the Russian foreign minister who once posited that "The greatest achievement of Russian foreign policy in 1993 was to prevent NATO's expansion eastward to our borders" was replaced by Yevgeny Primakov. (Goldgeier, 2019) It was Primakov who changed Russia's path toward the more confrontational posture we see today, toward the ability to assert itself and protect what it saw as its historical interests. No longer would Russia idly sit by as the West expanded and exerted its hegemonic influence. He put to words and deed the foundational principles of Russia's grand strategy today. In the words of current foreign minister Sergei Lavrov, "Russia left the path of our Western partners … and embarked on a track of its own." (Rumer, 2019) That track is now known as the Primakov Doctrine. Scholars seem to agree on the appointment of Primakov being a major turning point, with his doctrine being articulated repeatedly by military and political leaders over the next 25 years. (Franco, 2021) The Primakov Doctrine posits that the unipolar world dominated by the United States is unacceptable to Russia. Russia should strive towards a multipolar world managed by a concert of major powers that can counterbalance U.S. unilateral power. Russia should insist on its primacy in the post-Soviet space and lead integration there. Russia should resist NATO expansion eastward. Since Primakov's time, Russian interests have remained largely unchanged, and form the basis of Russia's grand strategy today.

Russia's ends, the goals of its grand strategy, are nicely laid out in a 2019 Strategic Multilayer Assessment of Russian Strategic Intentions:

1) *Sphere of Influence: Russia hopes to reclaim and secure its influence over its near abroad, i.e. the former Soviet nations.*
2) *Counterbalance: Russia wishes to serve as a balancing force to U.S. influence and control in the world, and to portray itself as "a reliable actor, a key regional powerbroker, and a successful mediator (Katz; Borshchevskaya) in order to gain economic, military, and political influence over nations*

worldwide and to refine the liberalist rules and norms that currently govern the world order (Lamoreaux)" (SMA White Paper, 2019)

3) *Status: Russia seeks worldwide recognition as a great power, which it feels it lost after the collapse of the Soviet Union.*

This strategy has been largely consistent for the past 25 years. Of course, resets and diplomatic means of assuring these Russian interests were attempted on multiple occasions. All failed. This framework, which finds its roots in the Primakov doctrine, is capable of explaining Russian actions during the past 25 years, particularly in recent years. Russia's desire to serve as a counterbalancing force explains its assistance of the Assad regime in Syria, its meddling in American elections, and its actions in Venezuela. (Monaghan, 2020) It wishes to serve as an indispensable power which can serve as a stabilizing influence, particularly in its perceived backyard, as in Syria. We have seen Russia step in to quell domestic unrest in its near abroad in Belarus and in Kazakhstan over just the past two years, indicating its desire for stability, and its willingness to support status-quo powers for fear of further "color revolutions." Each time Russia intervenes, particularly in its near abroad, it signals that it has returned as a global player of status. As it defends authoritarian rulers, it demonstrates a departure from the liberal interests and norms which define Western intervention.

Russian ends having been stated, its ways and means deserve further discussion, as the reader may be aware of the wide array of literature discussing concepts such as gray zone conflict, hybrid warfare, and the Gerasimov doctrine. In the next section, I will address how Russia attempts to get what it wants on the international stage.

BACKGROUND

RUSSIA'S WAYS AND MEANS

Since at least 2014, Western analysts have sought to understand Russian thinking on conflict and the nature of war, in light of their military efforts in Ukraine and Syria. (Friedman, 2019) The "Gerasimov Doctrine" became a popular term, named after Valery Gerasimov, current Chief of Staff of the Armed Forces of the Russian Federation and first Deputy Defense Minister. It is closely wedded to the term "Russian hybrid warfare." These terms often serve to confuse the Western reader as to the Russian approach to war and interstate conflict and competition. There is little which a reader in the DOD would can consider "new" in Gerasimov's thinking. Bartles, in his summary of Gerasimov's 2013 article "The Value of Science Is in the Foresight," which spawned the Western fascination with Gerasimov and his purportedly new way of understanding war and conflict, sagely writes that "Gerasimov's view of the future operational environment is in many ways very similar to our own. Like us, he envisions less large-scale warfare; increased use of networked command-and-control systems, robotics, and high-precision weaponry; greater importance placed on interagency cooperation; more operations in urban terrain; a melding of offence and defense; and a general decrease in the differences between military activities at the strategic, operational, and tactical levels." (Fridman, 2019)

In 2019, Gerasimov delivered another speech which included several refences to the increasing importance of the informational domain in interstate conflict, another concept which is very familiar to us in the West. He has further spoken to the development of modern technologies such as hypersonic missiles, to the necessity of modernizing Russia's nuclear weapons capabilities, and to the continued development of a highly professional officer corps. In sum, Fridman says, "There is one message that Gerasimov tries to communicate between the lines of his speech: that Russia needs to create doctrinal and material capability of a highly professional intervention force with the potential to act worldwide, under the protection of a highly effective, modernized

nuclear umbrella." (Fridman, 2019) Non-military means are only effective because they are backed by technologically advanced military capacity. (Kofman et. al, 2021) This concept of modern warfare has led some to coin the phrase "hybrid warfare" in describing Russia's military approach. While this term can be useful, I would stress that it is nothing terribly new, and instead reflects Russia's commitment to using the full scale of its national power to get what it wants. Its non-military elements are backed by the potential use of Russia's military, which proved effective in Syria and Russia's 2014 operation in Ukraine, and its willingness to use its military in stabilizing its near-abroad, and preventing those states from sliding to a more pro-Western posture, should not be forgotten or underestimated, nor should it be surprising.

Russia, like the United States, is committed to using all elements of national power in support of a its strategic goals, fusing hard and soft power into a whole of government approach. The DOD is more than familiar with terms like DIME, addressing a nation's total capabilities diplomatically, informationally, militarily, and economically. It is also very aware of the spectrum of conflict between war and peace, and how that line has become blurred in recent decades. Gerasimov simply presented his views on how the operational environment has developed. Western military thought has not missed these developments. Anyone seeking to understand Russian military thinking should not be confused by terms like hybrid warfare or the Gerasimov Doctrine. Their concepts are not dissimilar whatsoever from Western thinking on modern warfare. All that the critical reader must do to understand Russian actions is to listen to their words, they tell us all that we need to know about how Russia intends to achieve its goals.

It is important to note that Russia perceives itself as in conflict with the West, at least in part stemming from its historical insecurity. Clark offers a concise view of Russian military thinking in this perceived conflict. (Clark, 2020) Russia believes that the United States has been engaged in information warfare in its support of "color revolutions," the Arab Spring, and the 2014 EuroMaidan Revolution. It sees the United States as undermining the sovereignty of various states around the globe through military and non-military means, citing Belarus, Iraq, Libya, Ukraine, and Venezuela. (Clark, 2020) However we wish to think about our interests and actions in these states, Russia perceives them as hostile acts utilizing the full spectrum of American power, hard and soft. They are determined to respond similarly, using the full breadth of the Russian state's capabilities. This competition or conflict with the West, and particularly the United States, is non-linear, asymmetrical, interdomain, links the military with other means of influence, blurs the line between war and peace, and often operates at the level of low intensity competition. All of these DOD buzzwords and newspaper article titles

can be useful, but I find it simpler to repeat that Russia is prepared to use the full extent of its national power to achieve its goals and, in its mind, defend against Western aggression across the DIME spectrum. We should not be surprised by this. To coordinate these efforts, in 2014, Russia created a new structure for whole of government management, the National Defense Control Center, which was operationalized in 2017. *Red Star* reports that NDCC connects 73 federal executive authorities, authorities from all 85 of Russia's federation subjects, and 1,320 state corporations and defense enterprises into "a single system of interdepartmental interaction." (Clark, 2020) This serves as bureaucratic infrastructure for the operationalization of broad spectrum conflict against the United States.

To aid our future analysis of Russia's space doctrine, it may prove useful to briefly discuss Russian military strategy in response to a potential NATO invasion, the great fear of the Russian military. Russia knows it is technologically behind the West in the event of an all-out war. Per CNA's 2021 analysis of Russian Military Strategy, Russia anticipates an integrated massed air strike against targets of critical military, economic, and political significance in Russia. Russian strategy seeks to deflect that initial attack, and employ strategic weapons such as long-range precision weapons and electronic warfare to are to shape the enemy's political calculus through long-range strikes against critical targets in order to degrade the enemy's military and economic potential, and will to fight. Russia will seek to conduct maneuver defenses with its ground forces, focusing on drawing NATO into an attrition based conflict while preserving the Russian force for as long as possible. (Kofman et. al, 2021) Much more can be said about Russia's idea of conflict with NATO, but I will highlight the fact that this war is assumed to be conducted on the defensive, in an environment where Russia is not technologically superior. Russia seeks to respond to and parry the advantages of its enemy and then adapt to circumstances, rather than forcefully assert its own advantages at the start of a conflict. This strategy of negative action designed to negate enemy advantage will recur in Russia's idea of conflict in space.

BACKGROUND

THE RUSSIAN SPACE PROGRAM

Russia has a long and illustrious history in outer space. The Soviet Union put the first satellite, Sputnik-1, and the first man, Yuri Gagarin, into space. (DIA, 2019) During the Cold War, space was a domain of great power competition between the Soviet Union and the United States, then the only two spacefaring nations. Today, space helps Russia project an image that is part of a nostalgic image of greatness in the past. Therein, space connects with Russia's desire for status, to be seen as a great power. Space has also become a warfighting domain, both in U.S. and Russian conceptions. (McClintock, 2020) Despite this, in the policy domain, Russia supports space arms control agreements to prevent the weaponization of space. (DIA, 2019)

Russian views American reliance on space as an "Achilles heel." (DIA, 2019) Indeed, the U.S. Defense Space Strategy Summary refers to space-based capabilities as an indispensable component of U.S. military power. (Defense Space Strategy Summary, 2020) In a global conflict the United States' command and control, intelligence, synchronization of movement and maneuver, and force sustainment would all be coordinated using space-based systems. (Space Force, 2020) Russia's capabilities in space lag behind the United States', given Russian difficulties funding its space program while simultaneously attempting to modernize its military. (DIA, 2019)

In light of the importance of space to U.S. military operations, as well as Russia's relative technological disadvantages in space, Russian military doctrine in space is thought to focus on denying U.S. advantages. Dr. Eugene Kogan believes that Russian military doctrine on the use of space is based on two principles: opportunities for jamming, and radio intelligence maintenance of its C3 (command, control, and communication) systems and offensive capabilities against ground-based space infrastructure. Their goal is to prevent adversaries from using their space-related infrastructure. (Kogan, 2021) Florien Vidal concurs, citing the possibilities of jamming and radio interference, and offensive capabilities against ground-based space

infrastructures as the guiding principles of Russian military doctrine on the use of space. (Vidal, 2021) Alexei Arbarov, former member of the Russian Duma as a representative of the Yabloka party, discusses the deterrent effect of possessing counterspace capabilities. Given that the effectiveness of highly advanced modern weapons are increasingly dependent on elements in space, and the high cost of modern multi-purpose space systems, their role in the global economy, and the relative lack of defensive capabilities in space from a range of hostile actions, the threat of destroying an enemy's space systems can be a very effective deterrent, or an effective tool in controlling conflict escalation. (Arbatov, 2019) To carry this out, Russia possesses a suite of modernized counterspace capabilities, including kinetic weapons, directed energy weapons, electronic warfare capabilities, orbital threats, and cyberspace threats. (DIA, 2019)

What, then, are Russia's priorities in space, other than the denial of American advantages? Arbatov hypothesizes that firstly, Russia wishes to preserve its early warning satellites, the newest generation of which are known as TUNDRA type satellites, which orbit in high elliptical orbit (HEO), providing the ability to detect U.S. ballistic missile launches early enough to ensure a Russian response. Secondly, Russia will seek to protect its high orbit GLONASS satellites, of the Kosmos series, which are used in Russia's version of the global positioning service (GPS). These satellites will be crucial for advanced Russian missiles, such as the hypersonic boost-glide systems of the Avangard type, which depend on space navigation during the middle phase of their flight in the stratosphere. Given hypersonic missiles' expected ability to penetrate U.S. missile defense systems, this will prove particularly important for ensuring Russia's nuclear deterrent credibility. Lastly, Russia will seek to preserve its space support systems crucial for the guidance of long-range conventional cruise and hypersonic missiles. GLONASS satellites provide high orbit navigation, while low orbit reconnaissance and target-acquisition spacecraft and communication satellites at low and high orbit all play a role in Russia's ability to use these weapons. (Arbatov, 2019) See Arbatov's article on Arms control in outer space for more specific detail on the specific Russian satellites in question.

Now, let us delve into the structure of the Russian space sector and analyze the conditioning factors to which Russia's space efforts are subject. Russia's state-sponsored space activities fall under two main organizations: Roscosmos and the Russian Aerospace Forces (RAF). The RAF is the subsection of the Russian military responsible for space activities, and includes the Russian Space Force, created in 1992 as the world's first space force. It is responsible for monitoring all space-based assets, military launches, and threats to space systems. Roscosmos is the civil side of the equation, and has long

partnered with NASA, particularly on the International Space Station (ISS). (CSIS, 2021) Florien Vidal provides the most comprehensive look into the structure of Russia's space sector, and discusses its many deficiencies. (Vidal, 2021) His analysis centers on Roscosmos, headed by Dmitri Rogozin, and created in 2015 after a long period of aborted reforms of Russian space governance beginning in 2004. (Vidal, 2021) The organization is divided into eight operating areas: 1) manned space flights; 2) launch systems; 3) unmanned spacecraft; 4) rocket propulsion; 5) military missiles; 6) space avionics; 7) special military space systems, and 8) flight control systems. It is made up of many public companies which operate at each level of the industry value chain – from R&D to commercialized products. (Vidal, 2021) These subsidiaries make up virtually the entire Russian space ecosystem, with private companies being virtually nonexistent. Those which show promise are quickly absorbed into the state effort. To provide the reader with some context on the size of Russia's private space efforts, Russia possesses about one percent share of the world space services market. Meanwhile, the United States' space industry was valued at $156 billion in 2016. (U.S. Bureau of Economic Analysis, 2019)

Roscosmos operates on a rent-based system in order to attempt to post a profit. The organization charges Western states for seats on their Soyuz rockets, which have been the only rockets taking ISS astronauts to the station for some time. (Moltz, 2019) Now that SpaceX is capable of launching astronauts under NASA's Commercial Crew Program, this period of dependency is coming to an end. (Speck, 2022) Russia's other major export in this sector was its RD-180 engines, which Dmitri Rogozin has stated Russia will no longer sell to states sanctioning Russia in the wake of the invasion of Ukraine. (Speck, 2022) Jeff Bezos' Blue Origin is slated to produce an alternative which the United States can use to power its Altas rockets. (Ferster, 2014)

Private space firms face significant obstacles in Russia. Roman Zhits, Executive Secretary of the Spacenet Subgroup of the Aeronet Association, identifies the limitations and imperfections of Russian laws regarding space firms, the lack of private investment and state support of private space companies, and a lack of smoothness in support of private companies from Russian organs of power like Roscosmos, the Ministry of Education and Science, and the Ministry of Transportation. (Konstantinova, 2019) One must understand that Roscosmos is not like NASA. It is expected to turn a profit. Therefore, at a certain point, any private company having success becomes a competitor to Roscosmos. Under President Dmitri Medvedev, Russia established the Skolkovo Innovation Center near Moscow to serve as a hub for private Russian space activity. Their activities remain minor due to the institutional obstacles described above, as well as the aforementioned competition with state-run organizations. (Moltz, 2019) Furthermore,

the model of privatization in Russia is not popular following the poor transition from state-owned to privately-held businesses in the 1990's. (Vidal, 2019)

Funding is a recurring problem for Russia's efforts in space. During the immediate post-Soviet period, Russia's space program fell on hard times amidst the economic crisis of the 1990's. The health of Russian space infrastructure declined considerably, with Russia losing the capability of its GLONASS system in the late 1990's. It would take until October of 2011 to restore the full global coverage of the system. (Shilov, 2011) In 2016, the Russian government approved a new funding plan for the Federal Space Program for the period 2016-2025, eventually settling on a budget of $19.8 billion. Behind the United States and China, Russia's budget size ranks third globally. (Vidal, 2021) In 2020, U.S. military spending increased to $26.6 billion. (Space Foundation, 2021) We should note that the Ministry of Defense is a key stakeholder in Russia's space program. It possesses a great deal of latitude in determining Roscosmos' priorities, and serves as a core financial supporter of the organization. (Vidal, 2021)

Despite the appearance of such a healthy budget for Russia's space efforts, corruption and embezzlement loom as systemic forces. The largest current project being undertaken by Roscosmos is the construction of a new cosmodrome, Vostochniy, in eastern Russia in order to replace the Baikonur cosmodrome in Kazakhstan as part of an effort to relocate Russia's space infrastructure within the territory of the Russian Federation instead of relying on aging infrastructure sprawled across the former Soviet Union. It is the second largest infrastructure project which Vladimir Putin has embarked upon, behind only the $4 billion land bridge connecting the Russian mainland to the Crimean Peninsula. (Bodner, 2019) Vostochniy has been under construction since 2007, and is still not complete. Over 150 billion rubles have been spent on the project since its inception. Russia's Prosecutor General Office said that between 2014 and 2019 alone, 10 billion rubles have been stolen or lost. (Bodner, 2019) Vidal cites one contractor alone who diverted nearly 16 billion rubles which were allocated to the project to other ends. (Vidal, 2021)

As if that were not enough, Vidal points to four particular deficiencies from which the Russian space sector suffers. First, Russia's space sector infrastructure is obsolete and scattered throughout the territory. He notes that the infrastrutcture is based on an industrial fabric built in the Soviet era. The various sites were constructed in closed cities scattered along the Trans-Siberian railroad. 90% of this infrastructure was more than 20 years old by 2013. Development and operating facilities were often organized around separate entities, leading to redundancies. (Vidal, 2021) Second, Russia lacks a sound system of controls and traceability in its space industry, leading to technical failures

without consequences for those responsible. The government bears the cost of these failures, as the companies responsible were not legally liable. Third, Russia's industrial workforce in its space sector is aging and experiencing reduced productivity. "The sector is preparing for the retirement of part of its workforce over the next decade. With just under 250,000 people, the space sector will require at least 100,000 highly qualified professionals by 2030 to maintain the current workforce (i.e., a 40% turnover rate)." (Vidal, 2021) Fourth, the sector is unattractive to young Russians, who can find greater profits in the oil and gas industries, further exacerbating the space sector's aging crisis.

In sum, Vidal posits that Russia is losing the race in space. It relies on legacy infrastructure and history of achievement while the pace of innovation only increases, and the cost of being in space decreases, with new state and nonstate actors constantly entering the domain. Its aging work force and lack of competitive private companies stymie innovation, which Vidal sees as critical to the expanding market of the space sector. This situation does not appear to be improving, as sanctions, both since 2014 after Russia's invasion of Crimea, Donetsk, and Donbas, and in the past month since Russia's full invasion of Ukraine, have cut off Russia's ability to source key technological inputs necessary for its space program. (Department of Commerce, 2022) Where before this year one could point to space as an area of cooperation between Russia and the West, this has changed in the wake of the invasion of Ukraine. In February and March, Dmitri Rogozin threatened to allow the International Space Station to fall out of orbit and crash into the Earth if Western sanctions were not lifted. (Doherty, 2022) Just this week, on April 4, Rogozin threatened to end all cooperation with the West on the ISS if sanctions were not lifted. (Huet, 2022) In the wake of Russia's invasion of Ukraine, the European Space Agency suspended a large joint venture with Russia, the ExoMars astrobiology program. (ESA, 2022) If events continue in this direction, there is a very real possibility of continued decline in Russian cooperation with the West in space, one of few remaining bright spots in the relationship.

As Vidal's analysis helps us demonstrate, Russia will likely struggle in space in the coming years. Increased economic isolation as a result of its war in Ukraine will harm Russia's ability to both modernize its military and to continue to develop space capabilities. What money Russia is able to find to put into its space program will likely be inefficiently spent, given the infrastructural realities in the system, as well as the massive scale of corruption in Russia's space industry. Meanwhile, the cost of reaching space is declining, allowing more opportunity for non-great power countries to increase their own footprint in space. In light of Russia's reduced ability to compete in the space

domain, they remain likely to focus on negative action designed to deny U.S. advantages in space.

BACKGROUND

U.S. PRIORITIES AND ADVANTAGES IN SPACE

The United States, like Russia, views space as a warfighting domain. (Defense Space Strategic Summary, 2020) Secretary of Defense Lloyd Austin has called space an "arena of great power competition." (Wall, 2021) American command and control systems (C2) and targeting systems for our most advanced missile systems rely on satellites. Of course, space is not only a warfighting domain. As mentioned in the above section, there are great private interests in space, and the United States is the pacing power in innovating in space through the private sector. (Moltz, 2019) Our interests in space are extensive. Average Americans use space-based infrastructure every day, whether they realize it or not. The United States operates the global positioning service, (GPS) which also serves to keep the global timer used by the entire global finance system as markets are opened, closed, and transactions are tracked. Electric grids use GPS to route electricity to American homes, while air traffic controllers rely on GPS to manage air traffic. (Fernholtz, 2017) We use satellites for a variety of other functions including predicting weather, researching and observing climate change, etc. America does not function as we know it without our space-based infrastructure, hence SPACECOM's "Space Truth" that "space is a vital interest that is integral to the American way of life and national security." (USSPACECOM, 2021)

The structure of the United States' space enterprise is necessarily different from the state-centric Russian space program, given our commercial advantages and wider range of stakeholders. We have vastly more private stakeholders, including the likes of SpaceX, ULA, Iridium, Digital Globe, and Virgin Galactic. We also have a broad range of civil space efforts, such as maintaining the Hubble telescope and working on the ISS, which are coordinated by the National Aeronautics and Space Administration (NASA)

the National Oceanic and Atmospheric Administration (NOAA). Our intelligence services such as the National Geospatial-Intelligence Agency (NGA) and National Reconnaissance Office (NRO) use satellites to provide image intelligence (IMINT) to relevant government consumers. These organizations do not suffer the same wasteful spending and corruption enjoyed by Russia's critical space organizations. On the military side, of course, United States Space Command is the joint combatant command responsible for the space domain. The efforts of our intelligence and military space efforts are coordinated by the National Space Council, chaired by Vice President Kamala Harris. The United States' priorities in space, per the December 2021 U.S. Space Priorities Framework, include:

- Maintaining U.S. leadership in space exploration and space science
- Advancing the development and use of space-based Earth observation capabilities that support action on climate change
- Fostering a policy and regulatory environment that enables a competitive and burgeoning U.S. commercial space sector
- Defending U.S. national security interests from the growing scope and scale of space and counterspace threats
- Protecting space-related critical infrastructure and strengthening the security of the U.S. space industrial base
- Investing in the next generation

These priorities are the United States' high level aims in the space domain, as designated by Biden Administration, which has identified space as a source of innovation and opportunity, as well as a source of American leadership and strength. (White House, 2021) The United States has always been a leader in space, and intends to continue in that role, chiefly by engaging with our allies. Space Command, for its part, has its own set of priorities, with the goal of achieving and maintaining space superiority by:

- Understanding the competition
- Building the command to compete and win
- Maintaining key relationships
- Maintaining digital superiority
- Integrating commercial and interagency organizations

James Moltz convincingly argues that the core strengths of the American way of approaching space are our vibrant commercial sector, capable of adaptation and innovation in a way state-run enterprises are not, and our ability to partner with space-proficient allies. (Moltz, 2019) He provides a model for 21st century space power which he calls "netocracy," as opposed to the "technocracy" of the Cold War era. "Netocracy"

is a new form of organization based on public-private partnerships, distributed architectures, rapid innovation, and the use of multiple commercial and allied partnerships. (Moltz, 2019) He sees this as more flexible, enabling the United States to extend its advantages in space. He also notes that we already enjoy solid technological advances over Russia, a 2019 study having concluded that up to 75 percent of electronic parts on certain current-generation satellites come from the United States. (Moltz, 2019) With companies like SpaceX and Blue Origin stepping in to provide the services Russia has enjoyed a near-monopoly in for almost a decade, namely heavy rocket production and human spaceflight, America's future in space looks prosperous and secure. See Moltz's article for more specific information regarding the capabilities being developed by private firms in the United States, including satellite constellations for Earth observation, advancements in the field of space situational awareness, space launch, and space manufacturing. (Moltz, 2019)

RECOMMENDATIONS AND CRITERIA

My recommendations fall along two parallel tracks: competition and engagement. I believe that these tracks should be pursued alongside one another. Today, we face the resurgence of great power competition. In this paper, I have demonstrated the historical Russian insecurities which have lead Russia to feel as though they are already under attack by the United States across the full DIME spectrum of national power, what some refer to as hybrid war, designed to subvert the Russian state and reorient the countries in its near abroad to a pro-Western mindset. They feel as though they are already competing, and our opportunities for engagement are lessening daily as the United States and the West sanction Russia and further cut it off from the Western-led system of institutions which have dominated the world since the end of the Cold War. Just yesterday, Congress voted to suspend normal trade relations with Russia, stripping it of its preferential trade status and banning the import of Russian energy into the United States in an incredibly rare 100-0 vote in the Senate. President Biden is sign the bill into law. (Edmonson, 2022) In this environment, the United States has little choice but to compete with Russia. To be clear, Russia has perceived this state of affairs as being operative for years, now, in the wake of Russia's invasion of Ukraine, is the time for the United States to actually engage in full competition. That said, there will be areas where U.S. and Russian interests align. In those particular areas, the United States should seek to work with Russia to establish red lines and ground rules for competition, similar to the balance established during the Cold War. We should also be aware of these interests in general, as stated above, to be better prepared for potentially strong Russian responses if we encroach upon Russia's strongly held interests/grand strategic goals.

Victory in this competition with Russia will require the whole of government approach Russia perceives as already being in effect. As far as SPACECOM is concerned, it must extend the advantages the United States already enjoys in the space domain. My recommendations to do this are as follows:

1) *Continue to leverage the U.S. commercial sector as a critical advantage over Russia's space-centric space program.*

As expanded upon by Moltz in his defense of "netocracy," and seizing upon an asymmetry recognized by Vidal, the United States is unique in its "bottom-up, net

centric, commercially led space innovation," defined in opposition to Russia's state-run program. (Moltz, 2019) We already enjoy a technological advantage in space, and should seek to continue and extend that. As Moltz identifies, continuing to create rules which favor the U.S. commercial sector, and allows for entrepreneurship and innovation will play to America's strengths. He also advocates for developing public-private partnerships to support the United States' civil space activity will serve to build U.S. leadership in the space sector. Lastly, enhancing the military's ability to partner with the commercial sector, especially start-ups, will support space resiliency and sustainability. This can be realized through expanded use of rapid acquisitions under "other transactional authorities" allowed under U.S. law. (Moltz, 2019)

2) *Continue to isolate Russia economically by maintaining our sanctions posture.*

Sanctions added most recently by the United States in response to Russia's invasion of Ukraine are designed to "degrade their aerospace industry, including their space program." (White House, 2022) These sanctions, designed to starve out areas of the Russian economy which are dependent on U.S. created technology, are actualized through the addition of new foreign direct product rules under the Export Administration Regulations, (EAR) as implemented on February 24, 2022 against Russia. (U.S. Department of Commerce's Bureau of Industry and Security, 2022)

3) *Continue to advocate for our allies to stop partnering with Russia in space. We must utilize our allies to our advantage, and partner more closely with them to fill any void left by Russia's exclusion.*

No whole of government response by the United States is complete if we are not leveraging our allies. Autocratic states suffer a great disadvantage relative to us thanks to their effective international isolation. We can use this to our advantage by further restricting Russia's ability to export its rocket engines in particular, and by weaning Europe off of its dependency on Russia for human spaceflight. The United States should be prepared to partner with the European Space Agency in any capacity necessary, including rejoining the ExoMars project which we left due to budget constraints in 2012. (Kremer, 2012)

4) *Continue to develop the ability to attribute negative actions in space to particular actors.*

Attribution is key in the space domain, where offensive action has such a great advantage relative to defensive capabilities in space. We must be able to identify specific actors

when they act contrary to U.S. interests in space in order to hold states accountable and enforce norms in space which benefit the United States.

5) *Develop capabilities to increase the resiliency of our critical space infrastructure.*

Russian military doctrine clearly stresses a desire to negate the technological advantages enjoyed by the United States. The obvious counter to this doctrine is in developing the resilience to maintain our C2, early warning, communication, and intelligence, surveillance and reconnaissance capabilities would serve to counter Russian doctrine.

As this competition plays out, it will be important to establish the rules of competition by engaging with Russia at whatever level possible. Even during the height of the Cold War, clear communication around high-level state interests lessened the risk of escalatory actions. Indeed, an understanding of Russian interests, both on the grand strategic level and in the space domain specifically, will lend itself to productive, sustained communication. These policy alternatives allow for the groundwork of a more positive, non-competitive relationship to be set where U.S. interests intersect with or complement Russian interests. My recommendations as to our engagement with Russia are as follows:

1) *Establish clear red lines around our C2 systems and other critical space systems.*

Declaring certain parts of our space infrastructure off-limits to Russian would serve to stabilize relations with Russia. President Biden previously established red lines around critical infrastructure to attempt to protect them from Russian cyber-attacks. (Soldatkin, 2021) SPACECOM can help him identify those red lines in the space domain.

2) *Respect Russian interests in the maintenance of their ballistic missile warning systems (TUNDRA satellites) and GLONASS system.*

As Alexei Arbatov and Eugene Kogan both identified, these are Russia's most important space systems. If there were an analogue to Russia's near abroad in space, these systems would be it. Respecting their own red lines around these systems will be imperative to maintain a stable relationship.

3) *Promote a reduction in space debris.*

While space debris are more harmful to the United States simply by nature of the much greater number of satellites the U.S. controls in outer space, both the United States and

Russia benefit from reducing the debris populating space which could harm either country's satellite constellations.

4) *Continue to adhere to the tenets of the Outer Space Treaty (OST).*

Maintaining one of the only treaties to which the United States and Russia are both parties will serve to maintain a baseline in our competition with Russia. Keeping outer space free of nuclear weapons, or other weapons of mass destruction, benefits both the United States and Russia.

My criteria to evaluate these alternatives are as follows:

1) *Effectiveness in either promoting American advantage or stability in our relationship with Russia. American advantage and stability will be measured by anticipating the Russian response. If the potential Russian response is inconsistent with America's national interest, then the policy cannot be described as maintaining stability.*
2) *Long-term viability: The policy must be sustainable, both in implementation and in maintaining domestic support for its existence. This will be measured based on the policy's perceived ability to survive changes in American domestic politics, and by how closely the policy supports American strategic goals.*
3) *Adaptability: The policy must have some degree of flexibility in order to respond to changing circumstances in the U.S.-Russian relationship. An adaptable policy functions more as a dimmer switch than a traditional on-off light switch, and can be ramped up or down based on the situation at hand.*
4) *Feasibility: The policy should be technologically or diplomatically feasible.*

All criteria will be judged on a scale of 1-3, with 1 representing a poor score, 2 representing a fair score, and 3 representing a good score.

Competition alternatives matrix:

	Effectiveness	Long-term viability	Adaptability	Feasibility
Commercial Sector	3	3	3	3
Sanctions	3	2	2	3
Allied Partnerships	3	2	1	2
Attribution	3	3	1	1
Resiliency	3	3	1	1

Engagement alternatives matrix:

	Effectiveness	Long-term viability	Adaptability	Feasibility
U.S. Red Lines	3	3	2	3
TUNDRA GLONASS	3	3	1	3
Space Debris	3	3	1	2
OST	3	3	1	3

To be clear, I believe that SPACECOM should strive to implement all of these recommendations as best they can. This is not a traditional outcome matrix from which I will select a "best" policy alternative and prescribe that to my client. These are all recommendations, and although they vary on specificity, I believe that they can provide a jumping off point for competing with, and engaging with, Russia in space in the future.

CONCLUSION

Russia perceives itself as under attack by the United States and the West across the full spectrum of national power. Since the collapse of the Soviet Union, Russia feels its national security interests have been ignored, and its status as a great power lost. In light of Russia's invasion of Ukraine, Russia seems to be actually receiving the full international isolation and ire it lambasted and feared. In this environment, competition with Russia has emerged as a guiding principle of U.S.-Russian relations.

SPACECOM is concerned with Russia's activities in the space domain. It is aware of Russia's counterspace capabilities, but seeks a greater understanding of Russia's motivations and goals. I posit that Russia perceives space as a means of promoting an image of Russian power inherited from the Soviet Union, and as a warfighting domain where their chief goals are to negate American advantage and preserve their own ballistic missile warning and GLONASS systems. Florien Vidal provides the analysis that Russia's space program is built on shaky institutional and infrastructural grounds, relying on legacy infrastructure from the Soviet period and a famously corrupt bureaucracy where great sums of money simply disappear. James Moltz compares America's space program to this, and finds significant American advantage in terms of the structure of our programs allowing for increased flexibility and innovation in a domain where technology is rapidly-accelerating. Based on these conclusions, I believe that the United States is in good position to win its competition with Russia, given that it will be able to consistently outspend Russia, the fact that its money will doubtless go further relative to Russia, and that our bottom-up, non-state dominated space enterprise has much greater growth potential than Russia's state-centric system.

I suggest several recommendations for SPACECOM to pursue and advocate for, delineated along two parallel tracks: competition and engagement. The policies along the former track seek to advance American policy goals in space and increase American advantage in the domain. The policies along the latter track seek to establish clear guard rails to steady the U.S.-Russian relationship in space, and try to find areas where our national interests overlap.

Doubtless, the United States' success or failure in future competition with Russia will depend on American understanding of our enemy, what he wants, and how he intends to get it. Hopefully this paper serves to provide some answers to those questions.

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