Gradual Reform or a Turning Point in Russian Military Transformation: How Russian Air Power has developed through Conflict and Reform from 1991 - 2012

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Since the fall of the USSR the Russian military has faced a significant period of transition. This paper examines the challenges of air power development within the context of wider Russian military reform. After a brief review of initial post-Cold War context this paper will consider how air power was utilized in recent combat operations in Chechnya and Georgia with variable success. It will evaluate the structural reforms that have taken place between the two conflicts in terms of force structure, training and budget as well as equipment modernization. This paper will then briefly consider the lessons learned from the Georgia conflict before detailing the extensive military reform that has been initiated since. Finally, it will discuss the nature of the reforms and assess the utility of modern Russian air power capabilities regarding regional security and in Russia's relations with the international community. In doing so this paper will judge the importance of Russian air power reform on security now and in balancing against future threats.

Introduction

Since the fall of the USSR the Russian military has faced a challenging period of transition. After 1991 Russia retained only about 65 per cent of the Soviet fleet of combat aircraft whilst many of the most modern airframes, together with vital elements of the logistical and support structure, remained outside of the Russian Federation.[1] The powerful force that had once rivalled the US had also suffered from years of underfunding and a subsequent decline in professional training and combat skills. This deterioration, together with poor equipment serviceability, significantly impacted the capability of Russian air power.

In the 1990's the focus of Russian attention also shifted from geostrategic threats to more localized civil unrest. This was coupled with the development of air power thinking within the military. Historically a supporting activity to enable the advance of tank battalions, the role of air power as a designated strike capability was influenced by both Russian and international experience. These factors, together with ongoing budget restrictions have influenced the direction of ongoing Russian military reforms and set the context for the use of air power in Chechnya and in Georgia. The reforms that followed in the wake of the Georgian conflict in 2008 marked a turning point in Russian military transformation. From this point the organization and command of Russian air power has been remodelled in a modern image.

This paper examines the challenges of air power development within the context of wider Russian military reform since the fall of the Berlin wall to the present day. After a brief review of initial post-Cold War context this paper will consider in detail how air power was utilized in recent combat operations in Chechnya and Georgia with variable success. It will highlight the limitations and successes of the use of air power firstly in the Chechen conflicts, with consideration of the lessons learned between the first to the second Chechen wars. It will then evaluate the extent to which the lessons learned from Chechnya were then employed in the Georgian war. It will consider the structural reforms that have taken place between the two conflicts in terms of force structure, training and budget as well as equipment modernization. This paper will then briefly consider the lessons learned from the Georgia conflict before detailing the extensive military reform that has been initiated since, under the leadership of Defence Minister Anatolii Serdyukov. In so doing it will evaluate the impact of reform on: structure, training, personnel, equipment and the budget of the Russian air force, considering the positive developments and challenges of the reforms to date. Finally, it will discuss the nature of the reforms and different motivations purported to have influenced them in order to inform the debate on the utility of modern Russian air power capabilities for security in the region and in Russia's relations with the international community.
By considering the nature of Russian air power reform this paper seeks to inform readers interested in Eurasian security now and in Russia's ability to balance against future threats. The reader is invited to note that in the main this paper has not drawn on evidence from original Russian sources due to language constraints and that the Russian material that is cited, including print media, was translated from the original Russian source.

Early Post-Soviet Reform

Before the collapse of the USSR the Russian military totalled 4.9 million active duty servicemen and a further one million were attributed to the Warsaw Treaty Organization. After 1991, severe budgetary cuts made this force utterly unsustainable and led to significant cuts to personnel and equipment. These reforms came out of necessity to amalgamate the remaining forces rather than being motivated by a desire to improve efficiency or organizational structures, as such they were poorly managed and failed to properly integrate the remaining forces.[2]

Military aviation suffered from steady deterioration after the forced dislocation of the former Soviet air forces' structures when the new Russian Air Force (*Voenno-Vozdushnye Sily* (VVS) was formed after the breakup of the USSR. In addition to significant immediate aircraft losses, the VVS and aviation assets of the land and maritime components continued to be reduced in the years that followed. The decline in the number of aircraft platforms from a high of 13,000 in 1990 also reflected the steady decline of the Russian economy during the early post-Soviet period. Russia's gross domestic product (GDP) declined, on average, by nine per cent annually from 1990.[3] In terms of equipment, the average annual purchase of 400 new aircraft during the 1980s was significantly reduced to only 77 new aircraft by 1992. This number continued to reduce throughout the decade.[4] New aircraft development was also severely constrained. Sukhoi's development of the T-60, (required to replace the SU-24 and Tu-22M3 medium bombers) ceased and production of the Tu-160 heavy bomber was cancelled in 1992 after only 38 of the planned 100 platforms were built. Of those that were built, many remained in Ukraine after the fall of the USSR.[5]

Despite the necessity of the reforms there continued to be resistance to learning and those in positions of power and influence held tightly to their traditional structures and practices, in large part to retain their own influence. The culture of fixation on logged procedures and resistance to change characterized the Soviet air forces leadership during the Afghan war when returning squadrons of aircrew were split-up and redeployed to dispersed postings in order to reduce the strength of their calls for changes to standard operating tactics and techniques, based on their recent experiences. The desire to transform the air forces was seen as a potential threat to the existing senior air force leadership, who silenced the operational lessons to preserve their own authority. This failure to learn from the flexible employment of air power in irregular warfare was a significant shortcoming of the leadership at the time and symbolic of the continued resistance to transformational change in the early post-Soviet era.[6]

The Wars in Chechnya

Background

With a history of Chechen resistance to Russian occupation dating back to the nineteenth century tsarist expansion, calls for autonomy grew in intensity after the fall of the USSR. In 1991 the Chechen people elected their own leader and declared independence from Russia. Russia took no direct action against the secession until 1994 when President Yeltsin acted

in support of the opposition to President Dudayev and initiated an economic blockade of Chechnya. The growth of Russian sponsored opposition ignited deeply held clan rivalries and led to the outbreak of civil war. Although Russia supplied military hardware to the opposition, they failed to make significant progress. Russia finally issued an ultimatum, which subsequently led to the beginning of the first Chechen war. Despite significantly superior military power, however, Russia failed to gain the initiative and was forced to sign a truce in 1996.

From 1996 – 99 Russia restrained itself from involvement in Chechen affairs, but the failure to provide economic support to help rebuild Chechnya, exacerbated by the underlying factors of clan allegiance and historical aversion to Russia, resulted in the decline of Chechnya's economic and political situation. By September 1999 Chechnya was considered a significant enough threat to the North Caucasus to justify a second Russian military action.

The Utility of Air Power

In the first Chechen war the Russian air component principally consisted of 140 VVS fixed-wing combat fighters and 55 army aviation (*Aviatsiya Sukhoputnykh Vooysk,* (ASV)) helicopters. Each formed ad hoc air groups and, significantly, remained under separate command. Air power was utilized in three phases: reconnaissance and transport in preparation for the war, Counter-Air Operations (CAO) to achieve air superiority and freedom of movement for troops on the ground and finally supporting the advancing land forces through Offensive Air Support (OAS) operations against designated ground targets.

The main success of air power in the first Chechen war was the effective use of CAO, which allowed Russia to quickly gain air superiority and to maintain it throughout the campaigns. At the outset of the first Chechen war, the Russian forces easily defeated the very limited Chechen air defences, (which consisted of only 5 combat aircraft and 2 helicopters), in just three attacks within a 24 hour period on 1 December 1994. Additionally, the Chechen's did not have an integrated air defence system, but relied on small numbers of anti-aircraft artillery and man portable air defence systems (MANPADS).[7] With the Chechen air force destroyed, Russian aircraft maintained air superiority through combat air patrols, enabling their aircraft complete freedom of movement and preventing the possibility of Chechen air support (form adjacent countries) that might threaten Russian nuclear and other military assets and industries from attack.[8] A successful tactical strike by a Russian Frogfoot also resulted in the death of the Chechen President on 22 April 1996 and dealt a strategic blow to the Chechen military and political leadership.[9]

However, despite the advantages of air superiority, the first air campaign failed to effectively prepare the battle-space for the arrival of ground troops. When Russian ground troops entered Chechnya on 11 December they met with significant armed resistance. Despite having Control of the Air (COA) it took a month for Russian forces to fight through to the outskirts of the Chechen capital. When Russian troops finally began their assault on the

city of Groznyy on New Years Eve, they were still not able to achieve victory. They were not trained or equipped for irregular, urban warfare. They were unable to use their large mechanized formations and therefore resorted to relentless aerial bombardments, with significant civilian casualties, to try to break the will of the Chechen people and gain access into the city.[10]

Significantly, the lack of a unified air component command led to failures in the joint use of VVS and ASV air assets in the first Chechen war. However, this was a key lesson that the Russian military leadership learned from and employed in the second Chechen war. In 1999, the newly amalgamated and centralized VVS command enabled the better coordination of all military aviation, in conjunction with other military assets. This time the war began with a dedicated four-week air campaign that targeted military installations and key infrastructure. During this second campaign the VVS leveraged the advantage of air superiority and better prepared the battle-space for Russian ground troops to advance. Operating under a unified command significantly improved the coordination of the air component and as the campaign progressed the improved command and control of the joint forces drew effectively on a more considered, pre-planned strategy.[11]

However, the economic limitations that characterized Russian air power in the first Chechen war, continued throughout the second Chechen conflict. By February 2000 the war had already used 60 per cent of the VVS annual budget.[12] Communication failures continued as a result of poor radio equipment and procedures. Russian radio transmissions continued to be intercepted by the Chechens throughout the Chechen wars. Ground commanders were reluctant to inform aircrews where their troops were positioned and Chechen forces sent inaccurate instructions to Russian aircrew. These interceptions severely undermined Russian command and control of air operations in both of the Chechen wars.[13] Both insufficient training and poor equipment serviceability also impacted flying operations, which were exacerbated by the lack of recent flying experience. The average annual flying hours of VVS pilots was only 30 per year, significantly below the internationally recognized minimum.[14] Inadequate flying hours also contributed to the average of one helicopter loss per month during the second Chechen war.[15] Furthermore, multiple incidents of fratricide, such as the destruction of the special police unit, which was wiped out by VVS in March 2000, were also due to the insufficient air-land integration that characterized the poor application of air power throughout the Chechen wars.[16] On reviewing the operations in Chechnya, Kornukov, the VVS commander, recognized the necessity to implement a range of further improvements including "maintenance of aircraft and equipment, training and the number of pilots and troops, upgrading aircraft…, combat readiness of units and airbases, command and control structure of air power as well as directives on the application of air power".[17] However, funding restrictions prevented the implementation of his proposals.

The use of air power in Chechnya was also limited politically by the negative strategic impact of the significant number of civilian casualties in both of the Chechen wars. The lack of precision

guided munitions (PGMs), which amounted to only 2.3 per cent of the munitions used, as well as insufficient night and all weather capability meant that collateral damage resulting from aerial bombardments in urban areas was unavoidable.[18] Due to a combination of domestic and international pressure, President Yeltsin ordered that aerial bombardments be halted on numerous occasions for fear of loosing Russian public support.[19] Yet, despite the large number of civilian casualties, the bombardments did not discourage the Chechen fighters or destroy the will of the Chechen people and therefore the use of air power in this context was unable to achieve a decisive effect.

Overall, the use of air power in the first Chechen war was limited organizationally, economically and politically. Some lessons were successfully adopted in the second Chechen conflict, most notably improvements in command and control. However, limited funding meant that there was insufficient money available to make the more costly improvements to deliver better combat readiness and more modern equipment. As such there was little change in the use of weaponry and tactics in the second Chechen war due to ongoing budgetary pressures.[20]

Structural Reforms

Organizational Structure

After the poor performance in the first Chechen conflict, the merger of the VVS and Russia's independent Air Defence Forces (*Voiska Protivivozdushnoi Oborony* (VPVO)) began in 1998. The merger sought to transform the force from "extreme disrepair, ill-equipped, ill-trained, ill-disciplined, significantly corrupted, criminalized and demoralized," and create a single more effective and capable command.[21] At the time the merger was seen as the largest restructuring in the history of the Russian military and had been strongly resisted by the leadership of each service, as it also involved downsizing (from 225,000 personnel in 1998 to 185,000 by 2000).[22] However, the unification and reduction of force structure from 100 to 70 aircraft regiments, made practical sense to improve efficiency and to raise the serviceability rate of the remaining aircraft.[23] In 1998 serviceability was a major issue across the aircraft fleets, of note the bomber fleet was only 50 per cent in-commission, with 75 per cent of the Tu-95 aircraft in need of major servicing and only six Tu-160's able to fly.[24]

The merger, brought together the nation's air "sword" and "shield", simplifying the processes to "coordinate interaction between formations and units in their joint interests and to maintain combat readiness with stringent constraints on all types of resources".[25] By 1999 the former Long Range Aviation command assets and all the military transport aircraft were allocated to the Supreme High Command in Moscow. In addition to the establishment of two independent air corps the former VVS fighters and ground attack aircraft and the former VPVO interceptors were reorganized to form four new air armies.[26] However, the over-complex organizational structure of the air forces was only one of the factors that had limited the effectiveness of air power in the Chechen campaigns. Despite improvements in the structure, challenges remained regarding equipment, training and funding that would continue to limit the new VVS throughout the next decade.

Equipment

Although the single organization did simplify command and control, the VVS still sought to maintain a significant aircraft inventory. Without the funds for new aircraft the large and aged fleet continued to stretch resources beyond their means and threatened block obsolescence. The acquisition of new platforms had declined dramatically throughout the 1990s. In 1997 VVS was only able to purchase 6 new aircraft and this reduced to zero the following year.[27] The agreement in 1999 by Ukraine, after extensive negotiations, to transfer 11 of their most serviceable aircraft (eight TU-160 and three Tu-95 MS bombers), and 575 Kh subsonic cruise missiles, to Russia, was a unique windfall for the VVS and enabled the Service to fully equip one heavy bomber regiment consisting of 15 aircraft.[28]

Despite recognition of the requirement shortfalls during the Chechen campaigns, there was little improvement in the paucity of equipment upgrades. By 2001 it was estimated that less than half of the VVS inventory was serviceable, with 32 per cent believed to be permanently unserviceable, and the situation was expected to deteriorate as many aircraft moved closer to their out of service dates. This led to the routine practice of aircraft cannibalization, even though it was known to result in a higher flight safety risk. During the reorganization, there were instances where engines were removed in their entirety after one aircraft had been relocated so that the engine could be returned to the original base by road, and then fitted into a different airframe to enable that to fly to the new base.[29] Moreover, after years of underfunding, a significant number of Russia's airfields were in dire need of repair work. Although there were some future aircraft development programmes ongoing, notably those to produce a competitive Russian fifth generation fighter, these also seemed to have little prospect of reaching operational capability.[30]

Training

The lack of adequate professional training, which had been a significant issue during the Chechen campaign, was further restricted by the reduction of resources, which resulted from the structural reorganization of the air force. The undergraduate pilot training programme was further shortened to reduce costs, placing additional pressure on frontline units who were in receipt of aircrew with very limited skill sets. One key area where more training was required was the provision of flying hours for pilots. The vastly inadequate training and lack of currency were significant contributing factors to the Russian average of one air accident every 30,000 hours, in comparison to the US average of an incident every 80,000– 100,000 hours flown and little was done following the Chechen campaign to address the shortfall.[31] Indeed, there was a marked decline in continuation training from two million hours flown in 1990 to just 200,000 hours across the whole VVS in 1999.[32]

The further reduction of training also affected engineering, which led to greater errors in serviceability, degraded flight safety and reduced combat readiness. The merger significantly reduced the number of training establishments under the single command. In 1999 six of the training establishments belonging to the former VVS and VPVO were closed. It was also

no longer possible to offer profitable training for foreign students in its military education institutions, as they were scarcely adequate for Russian requirements, let alone worthy of payment by foreign customers.[33] There were also new issues that arose from the different levels of training and experience of aircrews from the separate establishments. While VVS crews were able to deploy to alternate operating regions, VPVO had limited experience that focused on operations from a single base. As such the merger highlighted various issues including the different organizational cultures, assorted equipment types and levels of experience; these all challenged the efficiency and interoperability of the new structure.

Budget

After years of steady decline, Russia's GDP began to rise again in 1999 by just over three per cent in real terms. This was in large part due to a rise in commodity prices, especially oil, enhanced by the devaluation of Russian currency against the dollar in 1998, which raised the competitiveness of the Russian export market.[34] However, despite Russia's improving economic situation, this did not immediately translate to a fully funded military. Russia's defence budget for 2000 was still only $5 billion and the new united air force received less than half of its requested budget in its first year, most of which was required to pay for its reorganization.[35]

With limited funding there was little scope for new procurement, which declined further in the late 1990's, with a further negative impact on the defence industrial sector, which depended on military procurement as its mainstay. The limited military budget was also a significant factor in poor morale and inadequate provisions for personnel. In 1998 there were reportedly over 30,000 military personnel and families without adequate housing, with an average waiting time for entitled accommodation between six and seven years. There are also repeated examples of units failing to receive pay for several months.[36] The officers in the air transport regiment highlighted the severity of the situation by going on hunger strike in protest of not receiving their full wages for 11 months.[37]

To bolster their funding, the VVS were able to use their transport aircraft to earn income from commercial passenger and cargo flying, however, this drew on already limited military resources for maintenance and reduced the flying hours available for training and military activities. Moreover, the money earned went little way to pay for the costly exercise of the structural transition and for underfunded airfield and equipment repairs as well as personnel costs such as housing. Russia's inability to adequately fund the necessary personnel, equipment and training reforms to modernize their military aviation continued to be a significant issue.

Georgian Conflict

Background

After coming to power in the Rose Revolution in 2003, Mikhail Saakashvili invested significantly in the Georgian military, with financial assistance from the international community.

However, the Georgian ambition to join NATO, in the context of US recognition of Kosovan independence, was a significant challenge to Russian authority in the post Soviet space. There were months of heightening tensions between Georgian troops and the armed factions in the self-proclaimed republics of Abkhazia and South Ossetia. Finally, the Georgian artillery assault on Tskhinvali, South Ossetia's capital, provided an opportunity for Russian peacekeeping troops to make a stand and to try to rebalance the power in the region.

The Utility of Air Power

Characterized by the Russian political leadership as a "peacekeeping mission", the conflict that began on 8 August 2008 lasted just five days.[38] During this period, Russian aircraft completed several hundred sorties, targeting key military installations, including Georgian airfields, in order to restrict Georgian mobility and to gain COA. The nature of the air campaign altered as the conflict progressed from a focus on pre-identified targets to Close Air Support (CAS) as Russian troops advanced. Unlike the Chechen air defenses, Georgia possessed a modern Surface to Air Missile (SAM) threat which was much more difficult to counter than in the Chechen campaigns, but despite this, the Russian air campaign in Georgia helped to secure a decisive military advantage for Russia in a very limited time-frame.[39]

The air campaign was a success because Russia employed many of the lessons learned from the conflicts in Chechnya in their action in Georgia. In particular, operations were directed through a coordinated command and control platform, which enabled Russia to more effectively use air power for locally targeted bombardments to give Russian forces the advantage on the ground.[40] The speed and coordination of the Russian forces was a significant factor in their success. "Within three days a powerful alignment of forces and equipment was assembled under extremely difficult natural conditions, capable of effective action and inflicting quick defeat on a numerically equivalent enemy".[41] Even before the war began Russian air assets were involved in intelligence gathering and defensive maneuvers that enabled them to rapidly seize the advantage when hostilities broke out. Despite the modern Georgian military, and in contrast to the Chechen experience, the Russian action was "quick, energetic, and sustained", likened to "a powerful blitzkrieg".[42] Improved coordination between air and ground troops enabled much more effective CAS in the final phase of the conflict and ultimately enabled the "demoralization and retreat" of Georgian ground forces.[43]

Despite the overall success of the Russian military during the five-day war, the VVS had not been able to fully implement all the lessons from the Chechen wars, principally as a result of the underfunding of training and new equipment. First, there were a high number of Russian aircraft losses which demonstrated the persistent limitations in aircrew flying hours and aircraft serviceability. Although better than in the Chechen conflict, Air-Land integration was still incoherent due to inadequate procedures, training and equipment.[44] Despite improvements in joint command and control, the Georgian example demonstrates the repetition of fatal mistakes in coordination and the same "insufficient coherence at the tactical level" that was seen in the Chechen examples.[45]

Political limitations restricted aerial strikes to military targets in order to limit damage to civilian infrastructure; however, aerial attacks still resulted in some civilian casualties. Although collateral damage was much reduced in comparison to the all-out bombardments of the Chechen campaign, this was mainly the result of the limited number of offensive sorties rather than the improved tactics or the use of PGMs. Air power in Abkhazia was focused primarily on supporting fighters in their advance up the Kodori Gorge, but in supporting the ground troops, the air strikes reportedly went "beyond the minimum", signifying the failure of Russian aircrews to employ appropriate proportionality and to minimize collateral damage.[46] Although to a lesser extent in Georgia than in the Chechen examples, the continued use of indiscriminate weaponry, (especially the use of cluster munitions), and lack of modernized PGMs, together with heavy-handed tactics, resulted in potentially avoidable civilian casualties.[47]

Lessons Learned

Although there is evidence of improvements in the application of air power in the conduct of the Georgia war, there were also a number of limitations that need to be addressed. One key weaknesses of Russian air power in this campaign was the insufficient attention paid to the Suppression of Enemy Air Defences (SEAD). This had not been applicable against the limited air defence capability of the Chechen Forces. However, in Georgia the lack of recent experience against sophisticated enemy air defences meant that SEAD was not carried out to the full extent necessary and, therefore, the Georgian forces continued to be able to limit Russia's COA throughout the campaign. The Georgia war served to highlight the deficiencies in Russian training, equipment and tactics when faced with the more sophisticated capabilities of a technologically advanced opponent.

These ongoing issues demonstrate that campaign success in Georgia "should not be a cause for euphoria in Moscow, but rather a stimulus to accelerate military transformation including the mass procurement of modern armaments for the Russian Armed Forces".[48] The Russian political leadership heeded the warnings long advocated by the VVS leadership, recognizing the need to "focus on the modernization of our armaments" and in September 2008, President Medvedev set out five clear areas for improvements that marked a turning point in Russian military reform.[49]

Military Reforms in the Wake of the Georgian Conflict

Despite its expediency, the military limitations revealed during the Georgia war invigorated the Russian political and military leadership to renew their efforts to transform the capabilities of their armed forces. President Medvedev ordered that a "new configuration" of Russian armed forces was required to address the shortcomings exposed during the conflict, but also to counter the rising global threats, including US efforts to create global missile defences, NATO establishment of military bases in Russia's near beyond and further expansion into the post-Soviet space. It is also possible that the failure to address the earlier lessons from the Chechen conflicts provided motivation for the necessity of wider reaching reform.

The promotion of Lieutenant General Vladimir Shamanov, a veteran of the Chechen conflict, to commander of the elite Russian Airborne Forces has been regarded as evidence of this.[50]

At the outset of this new era of transformation, the Russian Defence Minister asserted that the reforms were a shift from a mass formation based on attritional warfare to a more capable, performance orientated, mobile and optimally armed force that could readily engage in at least three local and regional conflicts. They sought to go further than any of the previous plans. The reforms called for a reduction in the total size of the military from 1.2 million in 2008 to below one million by 2012. The main aims also included the acceleration of the planned reduction in the officer corps from 355,000 to 220,000, and the rejuvenation of training of non-commissioned officers (NCOs) to increase their effectiveness. The reforms aimed to further simplify the command structure, reducing it from a four-tier command hierarchy with military districts, armies, divisions and regiments, to a two-tier structure with a simple strategic command and subordinate, fully manned brigades which could maintain a higher readiness for combat. The VVS reforms reflected this overall strategy, prioritizing personnel restructuring and seeking to gradually re-equip the force with more modern aircraft by 2020.[51]

Organizational Structure

The most recent structural reforms have signified a distinct move away from the traditional Russian divisional-regimental organization to one based on brigades, more reflective of other modern militaries. This has been particularly apparent in the simplification of the command and control system, which has been reduced to a three-link structure from military district, operational command to brigade.[52] This has sought to amalgamate disparate, partially staffed units and to bring them together to form smaller, better trained and equipped more manoeuvrable units. The six existing military districts have been rationalized to four larger districts, which has affected all three of the military branches.[53] Of note, each of the commanders of the new districts or Joint Strategic Commands (JSCs) has authority to command the personnel and equipment located within their area of responsibility, regardless of their different military branches. This streamlining of the chain of command is designed to reduce bureaucracy and increase the control of communications especially during operations.

The additional organizational reforms, including the introduction of the brigade system, have affected all three military branches to differing degrees. During 2009 the Army was the branch most significantly affected by the restructuring when 203 partially staffed divisions were amalgamated to form 83 brigades, the number of tanks was reduced by almost half and the overall manpower was cut from 400,000 to 270,000 troops. The Navy was less affected by organizational changes, with the greatest emphasis on the new acquisition of surface vessels and submarines. As the air force had already undergone some effective restructuring, with the amalgamation of the VVS and VSPO, the change to the three-tier system, replacing divisions and regiments with airbases and squadrons, was less complex to implement after 2008. From 340 units in 2008, the VVS was reduced to 180 by 2012.

The introduction of combined, multiplatform bases was also a notable departure from the traditional single platform model. The VVS have amalgamated their forces at 15 bases, with between 150 – 200 aircraft at each one. This has provided benefits of greater command coordination, cohesive training and the rationalization of bases, but the unwillingness to fully close any of the abandoned bases may yet prove to be an expensive mistake. Even under minimal maintenance base running costs will continue to draw on limited funds and without adequate investment they are unlikely to provide a useful option for future basing. It is still early to say how effectively these complex joint bases will conduct operations. There have been some reports of how the significant numbers of different types of aircraft trying to operate on some bases have overly complicated both ground manoeuvre and airspace operations and led to fears over de-confliction and flight safety.

There have also been ongoing issues with some of the earlier joint reforms, especially with the move of Army Aviation units under the command of the VVS. The most recent shift brought Naval aviation under VVS command from April 2011 causing further tensions.[54] It is yet to be demonstrated that these combined commands can deliver the improved coherency and efficiency of operations that was so significantly lacking in the Chechen and Georgian conflicts. If they are to deliver the best results, then there will need to be greater significance attached to the way that the units train and operate together, as well as ensuing that their communication systems are compatible. Without these additional considerations, the shift in command structure will be unlikely to result in joined-up operations in the future.

Personnel

The recent reforms have sought to reduce the total military headcount to below one million by 2012. Although the largest reduction has been to the ground forces, the air force has also seen its strength reduced from 167,000 to 148,000.[55] This has also redressed the officer to NCO balance, reducing the total number of officers by 50,000 over three years.[56] Whilst empowering lower ranks will be important to create a more sustainable personnel cadre, the reduction of senior rates, especially the proposal to eliminate the warrant officer rank (WO), has posed one of the greatest risks to the VVS as it risks deleting invaluable technical knowledge and engineering maintenance. Most of the aircraft technicians, across the different fighter and bomber platforms, hold the rank of WO. There are severe doubts whether the plan to reduce the WO cadre by 100,000 and replace them with 'professional' sergeants can be funded, manned or trained to deliver the necessary expertise.[57]

One of the biggest shifts across the military has been the transition to a much higher number of professional 'contracted' personnel. Although this policy had been launched back in 2003, it had failed to be delivered. In the wake of the Georgian war there was greater emphasis placed on the urgency to professionalize the skill sets of the armed forces, especially in highly technical areas such as aircraft maintenance, and to reduce some of the social issues related with conscription. Up to one in four of those who reported for air force duty in the Georgia

war were from single parent families with one in 10 having used drugs. This of course reflects the wider social challenges in Russian society, but the necessity to maintain a significant proportion of conscripts is an issue that will continue to challenge the military as it tries to reform.[58] The ongoing shortage of funding meant that in 2010 a large number of contracted personnel had to be discharged. This regressive step was highly criticized for risking a further dilution of the level of skilled personnel, but although there has been a renewed call to raise the number of contract personnel to 450,000 by 2017,[59] whether the necessary funding can be brought to bear to fully implement it is still to be seen.

In recognition of the ongoing need to attract high quality recruits, President Medvedev has supported the increase in basic pay. While raising pay in line with performance may provide a valuable incentive package, this alone will not deliver long-term solutions if the inadequate conditions, especially the lack of family housing, are not also addressed.[60] This will require significant investment, but will be vital to securing the right calibre of recruits to help to deliver an effective and capable air force in the future.

Equipment

A 10-year weapon modernization plan was launched to address the shortfalls identified by the Georgian campaign and has recently been revised out to 2020. The plan prioritizes equipment in line with the strategic nuclear deterrent but also identified significant procurement for each of the arms of service. For the VVS the programme includes the procurement of 600 new fixed wing and 1000 new rotary wing assets, which should go some way to helping to reduce the aircraft attrition rate, if complemented by the necessary training and flying hours. The equipment plan also includes significant capability modernization to address some of the most marked shortfalls of the recent conflicts including night vision capabilities and air defence systems. The acquisitions also include a 18-fold increase in PGMs and a 4.5-fold increase in all weather and night capability upgrades. There is also planned to be a six-fold increase in UAVs, which will form 30 per cent of all VVS assets by 2020.[61] The purchase of UAVs is hoped to also reduce the costly pilot training burden and to minimize operational costs for the VVS.

The poor state of Russian equipment in the Georgian conflict led to the recognition that to remain competitive and capable, the military required some externally purchased equipment to supplement the organically developed capabilities. This has continued to be a controversial issue amongst both the political and military leadership. However, there can be little doubt that some advanced technologies could not be provided within the same budget or timescale using only domestic technology and production.

The VVS has already benefitted from new acquisitions due to reinvigorating ties (sometimes aggressively) with defence companies in the former Soviet-space as well as forging new international industrial partnerships to provide some of their latest equipment and upgrades. In 2009 Russia purchased 12 UAVs from Israel Aerospace Industries, demonstrating its

determination to modernize at the expense of sovereign technology. Russian forces gained first-hand experience of the capabilities of these platforms when they faced them in the hands of Georgian forces in 2008. The Israeli technology is much more advanced than that of Russian UAVs. To ensure full operational capability the Russian agreement has also included the necessary operator training for Russian pilots. The agreement was followed by a further joint venture to develop a longer-range UAV in the future. However, this programme has been put on hold over fears that Russia may seek to sell-on the technology and has forced Russia to reconsider costly indigenous development.[62]

UAVs have not been the only international air force collaboration. Other programmes have included the supply of French Sagem inertial navigation systems for both MiG and Sukhoi aircraft that are also available to the Russian export market.[63] There has also been a renewed focus on developing a fifth generation fighter to rival the US F-22 and the multinational F-35. The Sukhoi T-50 has been undergoing extensive trials and achieved its first supersonic flight in January 2011. However, although development of this aircraft appears to be progressing well, the procurement plan, which includes a cut to R&D of 10 per cent of planned spending, will make technology development a continued challenge in the future.[64] Closer ties with multiple defence industrial partners like India are therefore likely to be Russia's best option.[65]

Training

Significant steps have been taken in terms of the reform of military training and education, which have been created in line with the more effective US programme.[66] Despite some of the structural reforms, such as the creation of JSCs, removing branch authority over their personnel, the responsibility for training has remained branch specific. Overall military higher education has been significantly streamlined from 65 down to 16 institutions. These include individual military training and science centres for each of the branches, 11 military academies and two universities. However, intention to reduce the educational and training establishment of the VVS to a single centre, may risk the oversimplification of the different training requirements for a modern air force.[67]

One of the key issues has been the need to develop an effective thinking NCO, capable of problem solving at lower levels in the command chain. As part of the longer-term development of potential recruits the President announced the plan to establish eight "presidential cadet schools" which would increase pre-induction training and boost the attractiveness of military careers.[68] To address the significant shortfall in NCOs with adequate training, 5,000 junior officers were reassigned after graduating in 2009 – 2010, to serve as NCOs.[69] This example highlights the uncoordinated nature of some of the reforms, and the importance of getting the education and training organization and through-flow correct in order to deliver the right number of adequately trained personnel to the front line branches. The VVS still needs to devise a longer-term solution to engender an ethos of 'mission command' as ad hoc fixes do little to instil the required cultural change.

There is little evidence of substantial training reform to address the issues of limited aircrew competence that resulted from the truncated training pipeline. However, the increased availability of fuel supplies has enabled the average crew flying hours to be raised to between 80 and 100 hours a year.[70] It is likely that more attention to training will need to be paid if the VVS is to retain a required level of human capital, especially when operating new and advanced platforms in the future. In the complex modern battlespace, in local conflict or operating in support of more strategic missions, motivated and capable personnel will be required to optimize the effects that Russia seeks to achieve.

Budget

The defence budget allocation for the post 2008 transformation also reflected the turning point in the nature of reform and included a substantial increase on that of previous years to three per cent of GDP. It is estimated that Russia's 2011 military budget was the fifth largest in the world, and likely to soon surpass France and the UK if austerity plans continue to bite across Europe, in contrast to Russia's planned increase in military expenditure to four per cent of GDP by 2015.[71] However, the ambitious reforms have still been dependant on significant personnel reductions and far reaching structural reforms in order to free-up the requisite funds for enhanced training and new equipment capabilities.

Procurements appear set to rise significantly in line with the new $698.4 billion State Armaments Procurement Programme for 2011 – 2020. In recognition of the challenge of modernizing Russia's vast inventory, the plan notably increases overall spending from the earlier 2007 – 2015 plan. However, modernization is progressing at a painfully slow pace, as adequate funds are not being made available to meet the requirements. Increasing development costs and delays have continued to affect new platforms such as the SU-35 fighters and SU-54 bombers, which are straining the already tight budget and threaten to undermine the overall success of the planned reforms.

Ongoing Challenges

Although progress has been made, the reforms have faced daunting delays, modifications and countless setbacks. Even as early as August 2009 General Zelin, Commander in Chief of the VVS indirectly acknowledged the plethora of challenges that this modernization would create. While President Medvedev announced in March 2010 that the reorganization was complete, with the total number of personnel reduced below one million, this belied some of the most demanding reforms that were yet to be tackled, in terms of equipment modernization and ongoing education and training to increase combat effectiveness.[72] In terms of training, only 56 per cent of the planned command post training had been conducted during recent winter programme, reflecting the complications of organizational and personnel changes. There was a 13 per cent increase in flying hours, compared to the same period the previous year; however, the introduction of new platforms will require a much more significant increase in both time and money to ensure that training in the air and in terms of maintenance is conducted safely.

Noting the ongoing challenges of introducing more modern aircraft, Zelin questioned whether the VVS could actually accomplish their goal of transformation; "manned aviation will not by 2025 be in a position to accomplish the requisite quantity of missions in a local war". Zelin's comments about the inability of the future air force to conduct operations in a local conflict made him the first service commander to question the validity of the far-reaching reforms. These comments are likely to have been a reflection of inter-service rivalry, with the VVS commander wishing to influence a larger proportion of the defence budget. There is much unease over bypassing Russian defence industries in favour of foreign competitors, and the budget for defence is still orientated towards the strategic deterrent, acquiring naval platforms and developing intelligence gathering capability, raising the question as to whether the conventional capabilities of the VVS will indeed be sufficiently enhanced.[73]

It therefore remains highly uncertain that the necessary budgetary and indeed demographic resources will be able to be brought to bear to deliver an adequately trained, professional air force with a considerably modernized capability and high readiness within the next decade. Moreover, the ongoing reliance on the domestic defence industry will also require substantial investment in both human capital and financial resource if it is to play its part in delivering sovereign capabilities of a significant enough quality and volume.

The Nature of New Reform – New Capabilities in the Image of the US

Despite the substantial reductions in the Russian armed forces, with over one million active personnel in 2011, their military is still the fifth largest in the world (exceeded only by the US, China, North Korea and India). Although overall defence spending has decreased, it remains one of the highest in the world. Russia has continued to focus its priority on its strategic nuclear capabilities, however, the changing nature of the threats in its regional and local sphere have necessitated a re-evaluation of its conventional capabilities. Although the most recent military reforms have gone further than earlier ones, there is still much debate over the short-term and longer-range effects of Russia's military modernization. The latest reforms have been markedly different from those which have gone before; they are far more wide ranging and are more closely aligned to the US military model in terms of their formations and training. This demonstrates a significant shift from the continuation of a more traditional Soviet-style leadership throughout the earlier reforms, and if effectively institutionalized, bodes well for the utility of the armed forces in combating more modern threats in the future.

One key area of debate is the nature of Russia's intended outcome. Is Russia seeking to recreate the superpower capabilities of the Soviet-era, reconstituting armed forces that can deliver global reach in order to dissuade international interests in the traditionally Russian global space, or is its interest to adopt a military that reflects the US capabilities of a smaller, highly skilled and more professional homeland security and counter terrorism role?
The intentions of Russian leadership appear somewhat inconsistent. Although the recent reforms appear to focus on more modern missions, the increase in Russian long-range strategic

flying over the Atlantic, Pacific and Arctic oceans appears to be more in line with the posturing of a would-be superpower than a state concentrated on internal security issues.[74] Moreover, when the Commander in Chief of the VVS outlined his plans to enhance Russian airpower, he indicated that the new extensive reforms were necessary to counter the "threat" posed by the US as well as future local conflicts within Russian boarder regions.[75]

While there is still evidence that the reforms are in part driven by Russia's perception that the US and the expansion of NATO represent potential threats, there is also the possibility that a stronger Russia will feel less strategically vulnerable. There has been some opening to a greater dialogue on collaborative working regarding missile defence and an open engagement policy which seeks to try to enhance cooperation across arms reduction and a plethora of wider global issues which serve US and Russian mutual interests. Regardless of Russian intentions, in the face of significant challenges in terms of budget, demographics and technological development Russia is unlikely to be able to recreate its military in a superpower image, capable of delivering strategic effects on multiple continents.

Conclusion

Russia has undertaken a number of disjointed reforms of its armed forces since the dissolution of the USSR. Through detailed analysis of the recent conflicts in Chechnya and Georgia, we have considered how Russian air power developed through the lessons learned from these campaigns by evaluating the nature of Russian military reform. Despite some improvements in the late 1990s and early 2000s budget limitations and resistance to wide ranging organizational reform continued to inhibit the application of Russian air power. While the single organizational structure of the VVS did enhance command and control at the operational level during the Georgian war, this experience demonstrated severe shortcomings in tactics, training and equipment.

Although Russian military reforms had taken place before 2008, the nature of the reforms introduced in the wake of the Georgia war marked a turning point in Russian military organization and command. They have been wider reaching and coordinated in their approach, addressing significant organizational restructuring across the whole of the armed forces. The strength of both political and military will to modernize the armed forces has been a potent mix and has been instrumental in driving forward change. Replicating more modern military models, the air force has finally broken away from traditional complex structures and embraced joint concepts and more integrated unit and command structures. This more efficient framework has the potential to deliver the greater capability and professionalism that was espoused at the outset of the reforms. However, effective transformation will not be possible without the necessary significant investment and attention to developing and retaining the necessary human capital as well as equipment modernization.

There remain key challenges going forward. Aircraft modernization is happening but only slowly. Although some success has been achieved by partnering with international companies,

there is still resistance to full industrial cooperation on both sides; this will need to be addressed if Russia is to maximize the opportunities of industrial burden sharing. The issues of conscription and the declining social health of young military age Russians also pose a challenge to military modernization, education and professionalism. The VVS still has much to learn from its recent experiences and its future will depend on more than just technological upgrades. Overcoming some of the personnel issues to retain their best pilots and technicians, and investing in the right education and training to continue to develop modern procedures and effective command will be the key to delivering and sustaining a truly modern and capable Russian air force in the future.

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