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Russian perception of its network-centric warfare capabilities in Syria

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Abstract: This article examines Russian military and defence intellectuals' reflection on Russia's military involvement in Syria. The research is based on a mix of open-source Russian military writings, mainly analytical texts in prominent Russian military journals. The aim of the study is to analyse Russian narrative of its military campaign in Syria. The first part begins by providing Russia's internal discussions about probable military coalitions-building variants, risks, and operational-level decisions and objectives. The second part deals with Russian Armed Forces' network-centric warfare capabilities and limitations. The article concludes by showing that in Syria Russia introduced a modified network-centric warfare as its main feature of new method of operations is the combination of advanced intelligence-command assets and old-fashioned munitions.

Keywords: Russia; Syria; military thought; network-centric warfare; intelligence-command-strike system.

1 Introduction

The object of the research on Russian officers' and military experts' texts reflecting on experiences of Russian military campaigns in Syria and their analysis is to enable us to perceive and better understand the Russia's capabilities and limitations in fighting effectively in expeditionary military campaigns.

Russia nowadays attempts frequently to resolve its foreign policy issues by using military force beyond the borders of its own territory. The military campaign of 2008 in Georgia, later on the accomplished annexation of the Crimea in 2014 and the factual support in the conflict of Eastern Ukraine demonstrate the capability Russia's military might against its neighbours; however, the expeditionary military campaign in Syria that began on 30 September 2015 became not only a new test for Russia but also provided a possibility for the West to estimate the military capability of modern Russia. It is important that Russia's military elite emphasizes that Russia's armed forces are acquiring a unique combat experience in Syria. According to the Chief of Russia's General Staff, Gen. Valery Gerasimov, it is necessary to adequately master these military experiences, organise military conferences to discuss and seek new ideas and suggestions on how to fight effectively instead of just orienting or inclining towards the submission of formal reports (Gerasimov, 2016, p. 23) (Gerasimov, 2017, pp. 12-13). The General is confident that the conflict in Syria is a perfect situation for Russia to modernize its armed forces and weaponry based upon the lessons learned in military actions, thus firmly emphasizing the practical solution for problems through the prism of experience acquired in Syria. Meanwhile, Gen. (decd.) Makhmut Gareyev, former President of Russia's Military Academy of Sciences, is apt to more emphasize the potential of science and the importance of generating new, innovative scientific theoretical ideas and testing those ideas innovatively rather than testing them in combat operations in Syria *i.e.* to seek new *theories of victory* based on military experiences in Syria (Gareev, 2016, p. 14).

The insistence of the military elite indicates that Russia's armed forces are ready for military changes that can be initiated by lower-ranking officers (the *bottom-up* process) participating directly in combat actions in Syria. This study is based on the assumptions of the Military Change Theory that states that the military change can be performed in three ways: innovation (by creating technologies), emulation (by learning from experiences and ideas of other armies)

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and adaptation (by mastering its own military experiences) (Farrell & Terriff, 2002, p. 6). The experience acquired in Syria created opportunities for Russia to take corrective actions and to modernize its weaponry which will have a great impact on the development of armed forces and also in the preparation of future wars. This article does not aim to disclose or conclude how much and how successfully Russia's forces are capable of taking over and making practical use of their experiences in Syria because in that case it would be necessary to analyse the content of the renewed military doctrines, structural changes or the modifications of goals set for the army. The Military Change Theory in this study is used non-traditionally when the results of the military change are not sought in the institutionalized sources (a new doctrine, structure or aims) but attempts are made to analyse the process of the Russian military thought, *i.e*. the informal military doctrine. According to Harald Hoiback and Aaron P. Jackson, the most famous researchers on doctrines, the informal doctrine is insignificantly influenced by bureaucratic or hierarchical obstacles; therefore, it is marked by a broader discussion of opinions and ideas in military intellectual platforms (military journals, conferences or the Internet portals) (Jackson, 2013) (Hoiback, 2013). Following the conviction of John A. Nagl, the officers can easily establish themselves in these platforms through the ideas and lessons gained from combat operations when experts criticize the standpoints of the present doctrines and the official military position by submitting the latest reports (Nagl, 2002, pp. 1-11). It is due to these reasons that the texts of the informal military doctrine can probably express more qualitatively the internal reasoning process of Russia's security and military community when Russian officers and experts analyse the military campaign in Syria and submit their observations and proposals.

The aim of this article is to analyse Russia's narrative about its military campaign in Syria and reveal the potential of its armed forces to conduct network-centric warfare operations.

The research analyses Russian texts published in military-scientific journals and portals: *Вестник, Военная Мысль, Военно-Промышленный Курьер*, *Ориентир* and *Армейский Вестник*. The sources are chosen because they publish academic-analytical texts in which military practitioners and experts present their ideas and insights on Russia's military operations in Syria. Thus, the analysis covers both practical- and theoretical-nature of discussions. The article does not make use of Russia's informational portals that are rather inclined towards everyday information about Russia's military matters but not the analytical reflection on military experiences as we are not interested in the details of the military campaign. The research analyses texts published from September 2015 to December 2017. This time interval was chosen with the author being aware that the conflict in Syria was not over but going on while the study was conducted. It is based on the assumption that at the beginning of the military campaign, the operations carried out by Russia's military forces truly reflect the latest version of Russia's warfare because at the initial stage military operations are theoretically carried out according to the preplanned strategy but later on, the very dynamics and transformation of the conflict forced them to review military plans and modify the warfare (*e.g.* Russia has officially announced three times i.e. in March 2016, January 2017 and December 2017 that its forces will withdraw from Syria due to the positive military progress in military campaign.

The study consists of two parts. The first part analyses internal discussions of Russian militaries and experts on the perspectives of fighting in a coalition and in probable areas of risk, and operational objectives related to military intervention in Syria. At the same time the article provides answers on why Russia abandoned classical (Soviet) warfare methods and chose to carry out network-centric warfare operations with optimally compact capabilities. The second part analyses the practical potential of network-centric warfare of Russian Aerospace Forces (*Воздушно-Космические Сил*) and Navy Forces (*Военно-Морской Флот)* in Syria as well as military systems and armaments intended for that. The article concludes with a revelation that the network-centric warfare is a new Russian method of operations, which is based on the integrated intelligence-command-strike system resulted in effective, but only fragmentary usage of precision-guided munitions (PGMs). This capability shortfall signifies significant gaps in the potential of Russian network-centric warfare operations when hi-tech intelligence and command systems are used for intense and systemic targets bombing with unguided (low-tech) bombs and missiles during combat actions.

2 Initial Russian discussions on the prospects for military intervention in Syria

This section is going to address Russian considerations and thinking about perspectives to run military campaign in coalition with other states, areas of military risks and then proceed with their probable military operational-level decisions and objectives.

2.1 Military coalition-building variants

The strategy of Russia's combat actions in Syria shapes its vision of limited participation in the conflict since Moscow seeks to achieve major political objectives with limited use of military resources (Tsygankov, 2016, p. 13). This type of participation calls for the review of military coalition-building variants while thinking about Russia's possibilities to fight alongside with allies in Syria. Consideration is given to several coalition variants that cover the perspective of the alliance with the USA, the consolidation of capabilities of the states of the Collective Security Treaty Organization (CSTO (*Организация Договора о Коллективной Безопасности*)) or the involvement of regional states in a coalition with Russia.

The perspective of the coalition with the USA is marked by an unambiguous position – though it is not inconceivable, it is perfectly clear that this would lead to the greatest progress of Russia's prestige on the global arena. First of all, this alliance is hindered by different perception of objectives in Syria, because fighters of Islamic State (ISIL)[1] are from different categories: the USA supports the Syrian opposition in its fight against terrorism and the ruling regime, while Russia supports the army of President B. al-Assad in its fighting against terrorists and at the same time against the oppositional military forces in the country. Russian military elite tends to classify the oppositional forces as illegal military groups manipulated by an external player resulting in creating internal discord among local Syrians (Gerasimov, 2016, p. 20) (Gerasimov, 2017, pp. 9-13) (Satanovsky, 2015, p. 2). The Minister of Russian Defence Sergey Shoygu is convinced that the Syrian ruling regime must be protected and safeguarded because the military campaigns of the West in Iraq and Libya and the overthrow of Saddam Hussein and Muamar Gaddafi governments and their executions did not guarantee peace (Shoygu, 2016, p. 4). Different objectives to protect or overthrow of the Syrian President as well as the legitimacy of the use of military force in the land of another state created a fissure for the establishment of this coalition. Russia's military and security community constantly emphasizes the fact that Russia's military campaign has begun only after an official request from the Syrian President was received while USA and its allies started operations without any official sanction. Russia used the official request to emphasize that Russia, contrary to the West, respects the rights and sovereignty of other states. Efforts are made to convince national and international community that the main motive for employing military force in Syria was not due to threats to Russia's security but due to the official request for military assistance from the Syrian President.

The perspective of the coalition with the states of the CSTO is assessed with optimism for more than one reason. According to the analyst Mikhail Khodarenok, motives and hidden interests of the states belonging to this community are widely different while the assessment of the military potential raises still more doubts concerning its unofficial inclination towards the organizational culture of common demonstrative exercises, the culture that is more representative of the spirit of military-sports competitions than the readiness to conduct real combat operations. The expert does not shun speaking ironically about the military readiness of this organization by attributing it to the "*came, talked, dispersed*" format which is marked by all talk and no action (Hodarenok, 2015, p. 4). Still, the summing up stresses that execution of actual combat actions in a joint military operation is hardly feasible; however, these insights are valuable in estimating real capabilities of operating in a united military campaign from this security organization existing for more than a decade.

1 August 26, 2015 an agreement was reached between Russia and Syria on the deployment of Russian Air Force in Syria. Having regard to the Act of 8 October 1980 „USSR-Syrian Arab Republic Friendship and Cooperation Agreement" Syrian President B. al-Assad approached Russia with a formal request for military assistance on 30 September 2015. In: Шеповаленко М. Ю., 2016. *Сирийский Рубеж*, Москва: Центр Анализа Стратегий и Технологий. p. 206.

Without any slightest doubt Russia's military personnel and experts consider the unification of efforts of these four regional countries in Syria: Russia, Syria, Iraq and Iran as the most feasible coalition scenario. This coalition format is particularly beneficial for Russia because it would create conditions to operate from the territory of the neighbouring Syrian states and make use of the available infrastructure, particularly from Iran, meanwhile thinking about the employment of long-range (strategic) air assets from air bases stationed there (Sushentsov, 2015, p. 9) (Satanovsky, 2015, p. 11) (Ramm, 2015b, p. 8) (Sivkov, 2015b, p. 10). Besides, this composition of the coalition is favourable for maintaining the image of the legitimacy of Russia's military operation when combat attacks were organized in coordination with the Syrian army as well as the neighbouring states. It should be acknowledged that this coalition variant was factually implemented by establishing a joint coordination centre in Baghdad from where the initial monitoring of the military campaign, planning of combat actions and coordination was carried out by representatives of the four states (Gerasimov, 2016, pp. 4-5). As of 23 February 2016, at the Hmeimim military base in Syria, an Operations Command Post (OCP) was established which achieved the key objectives, coordination and the interaction with the Syrian army (Shepovalenko, 2016, p. 181). Although the military analyst Andrey Areshev is confident that Russia is not inclined to totally *slam the door* for the involvement of Western states in the coalition for fighting against ISIL terrorists in Syria and the Defence Minister S. Shoygu approval for the wider discussions itself demonstrate the inherent intention to expose the positions of the USA and the West to the world as well as in ignoring Russia's efforts to make an agreement (Shoygu, 2016) (Areshev, 2016, pp. 8-11).

2.2 Military risks in Syria

A potential knowledge of the adversary in the military domain becomes an important moment in seeking to develop effective warfare methods, adequately set operational objectives and choose the necessary military means. The novelty of Russia's military thinking is to include a broader spectrum of threats in analysing their assessment with the prediction of reactions or feelings of Russian people to the necessity of the military campaign in Syria. Moreover the loss of personnel in the war will change the attitudes of Russian people and develop an internal pressure to political-military command against participation in expeditionary military campaigns. Thus, Russia turns back to its own experience in the Soviet-Afghan war and considers the entangling of the state in the long and hardly solvable military conflict in Syria that might result in lot of casualties of Russian military personnel, the greatest threat. The potential of this risk forces the military elite and experts of modern Russia to seek more rational and safer military approach in Syria.

Sunni radicals are considered as the most ferocious fighters and fighting them in Syrian urban areas is a monumental task. The probable USA decision to support insurgents in Syria by supplying them with man-portable air-defence systems is also considered as a potential threat and yet Russia hopes that the USA will not undertake this line of action and Syria will not turn into another Afghanistan. The probability of the confrontation of Russian air force with the USA or Turkish aircrafts is also not discarded. According to Russia's estimation, this could have an impact not only on the execution of military tasks in the northern part of Syria but can also negatively influence interstate relations or even escalate into a hardly controllable growth of military tension in the region.

These discussions unequivocally bring to light a distrust in Turkey that finds itself at the receiving end of sceptical estimations due to its constant indirect influence on Russia's military conflicts ranging from the time of the war with Chechnya to its latest attempts to escalate the conflict through the local Tartars the situation in the Crimea (Pogorely, 2018, pp. 170-176) (Semenchenko, 2017, p. 4) (Karya, 2016, pp. 8-10) (Tsygankov, 2016, p. 17). All these military risks are generalized by Gen. V. Gerasimov who claims that the conflict in Syria is a case of modern *hybrid war*, and a cornerstone where irregular armed groups are fighting in the guerrilla style, having conventional armaments, orientated towards fighting in urban areas and resorting to using civilians as a shield from probable military strikes. At the same time, he emphasizes the dependency of these groups can't be guaranteed since their actions are coordinated by an interested external player. Although a specific external player is not named but it is possible to identify that he is referring the USA and Turkey. It is expected that Russia will have to fight against irregular armed groups that have modern military materiel and weaponry at their disposal and have moved their military actions to the populated areas. In spite of this, Russia is obligated to fight with least casualties (Gerasimov, 2017, p. 12). Another risk of the military campaign in Syria is related to the complexity of the victory of hybrid wars because military victory might create favourable conditions for the ethnic conflict between the Sunnis and Shiites. This perception of threats particularly correlates with the Russian policy

of fighting against terrorism in another country with limited resources. Thus, the most dangerous military scenario is being avoided, *i.e.* a direct confrontation of Russian military personnel with an ideologically stronger adversary in their own territory is avoided while seeking its total destruction. Nevertheless, the creation of favourable political conditions for the talks is rather emphasized while attacking ISIL fighters from a safe distance in the air but not the attempts to completely destroy them.

At this point an intrigue is naturally formed how Russia is going to implement its policy of fighting terrorism with limited involvement in another country and transferring the strategy or policy to the ground level or operational-military level.

2.3 Framing operational methods and objectives

In the discussions on the most optimal method for the employment of Russian forces in Syria, two methods are always considered. The first one is based on the classical, typical of the Soviet Union formulation grounded on the belief that victory can be achieved by massive military forces. Whereas the second one represents modern warfare tendencies where military strikes are executed from a safe distance by using modern military technologies. Khodarenok presents military calculations representing the stereotype of the Soviet warfare which is characterized by the principles of massive military units and fire. In his opinion, the group of land forces should comprise 10 combat divisions and 15-20 artillery regiments, simultaneously activating the air army as well as mandatory combat support and supply units. In total about 100,000 Russian military personnel should be activated in Syria (Hodarenok, 2015, p. 4). A similar calculation is provided by the military analyst Aleksandr Khramchikhin who urges Russia to stop thinking about saving, particularly in war. The expert is convinced that victories in modern warfare are still achieved on land; therefore, a combat group of land forces should be deployed in Syria. This group would play the essential military role. First, he proposes to send elite Russian military units: special force, airborne, marine and Chechen combat units. These units are distinguished by the expertise in their mobility, perfect readiness and loyalty. The strength of this combat group of land forces would be 5,000–10,000 troops including artillery support units that are necessary when fighting on land (Khramchikhin, 2017, p. 9). These nuances of the land element formation enable to better understand the most effective means of the Russian land army that might be realized in other military conflicts when operations on land will be unavoidable and have no other alternatives.

Still, Soviet warfare methods based on massive structures of land forces are not acceptable to modern Russia for several reasons. Firstly, the state is not determined to send young soldiers or conscripts to Syria because of probable losses that would have a negative impact on the support of society. The idea to send only professional military personnel is feasible but hardly implemented since in such a case about one third of present professionals in the armed forces of Russia would come into play. The effectiveness of professionals themselves in Syria is estimated rather controversially as they would rather go to make money than sacrifice themselves when conducting combat tasks is not completely rejected. Besides, it is feared that the deployment of many thousands of troops in Syria and warfare on land might bring Russia nearer to the Afghanistan war scenario.

The second problem with this method is logistics. The redeployment of tanks and fighting vehicles remains a major challenge because there is no railway line between Syria and Russia; therefore, the entire logistic operation is feasible only through air and sea ways. It is possible to redeploy only small numbers of military forces by air. The redeployment by sea from the nearest Russian seaport in Novorosijsk[2] is feasible but the loading of the infantry division would paralyse the activity of the port for at least a week.

The third problem is related to battalion commanders. It is not recommended to send a standard motorized battalion to fight against irregular armed groups operating in guerrilla-like mode; therefore, Russia would be forced to form non-standard combat battalion groups that would integrate broader military capabilities. Yet current commanders are not trained to command a combat battalion group of a non-standard structure. The statements that Syrian countryside dominated by the steppes is more favourable to manoeuvre warfare than the mountains in Afghanistan could be attributed to the attempts to mitigate the warfare on land variant. However, Khodarenok emphasizes about the lessons

2 Novorossiysk Sea Port is one of the largest ports in the Black Sea basin and the largest in Krasnodar region, Russian territory.

learnt by France from the complex war in Algerian steppes, the war that was not easy for France army (Hodarenok, 2015, p. 4).

Modern warfare ambitions in Russia represent the second format of military actions that is orientated towards the systemic control of units and fire in military operations and is getting even more established in military discourse. It is clearly perceived at the top military level that frontal 20th-century wars are being replaced by technological ones. Gen. V. Gerasimov stresses that the ongoing *hybrid war* in Syria calls for PGMs and Russia should demonstrate the effectiveness of its military capabilities not through amassing them but through the capability to operate using small military forces. In the General's opinion, the capability to fight from a safe distance is the attribute or a capability of a modern army and a guarantee of minimal friendly casualties (Gerasimov, 2016). Thus, thinking about the mobilisation of massive units orientated towards frontal warfare is rather perceived as a military incompetence. Still more important is the ambition to make use of the newest fire control systems and PGMs on the basis of which the concept of the network-centric warfare would be realized. This way the position is being formed that Russia should use this chance in Syria and test and develop network-centric warfare which could be initiated with long-range missile strikes against ISIL fighters' objects with the aim of seeking to guarantee the local air superiority over operational theatre of the military air force intended to support the assault operations of Syrian army on land. All this calls for an integrated system of the hi-tech intelligence, force control and conducting of attacks throughout the entire area of Syrian combat actions with the assumption that the Syrian army is capable of conducting offensive operations, massive structures of Russian land forces will not be integrated and only separate units will be assigned to assure the stabilization of the political situation. Although the aspiration to copy network-centric warfare models of Western military campaigns in Yugoslavia, Iraq or Libya is noticeable, but the analyst Oleg Kobyletskiy emphasizes that Russia can operate in different ways from the West because Russia's fight against ISIL is based upon concreteness, professionalism and merciless attitude, particularly stressing the last one which is perceived as Russia's exclusiveness and a weakness in the warfare of the West (Kobyletski, 2016, pp. 16-17).

Although Russian experts consider the political-strategic scenario of the military campaign in Libya followed by the West was totally unacceptable, while Western methods of fighting from the air far beyond their own borders can be learned and worth attempting to repeat them in Syria. While analysing operational objectives in Syria in more detail, a paradoxical situation arises when importance is given to combat operations in the air, sea and space domains yet the complete military victory is achieved in the land domain only, *i.e.* the recapturing of the control of urban areas from ISIL. The military expert Anatoly Tsyganok presents geographically orientated operational objectives. Firstly, joint combat actions of Russian and Syrian army must create a safe land-corridor towards the eastern borders of Turkey where ISIL fighters are trained. Second, it is mandatory to stabilize the front Damascus-Homs-Hama-Idlib-Aleppo front by eliminating ISIL fighters in these cities. Third, liberating the eastern areas of Syria, particularly the city of Palmyra as it is the most important communication point in the surrounding desert. Fourth, creating conditions for the assault of the Syrian army in the city, Raqqa, which is considered to be the caliphate (the capital) of ISIL (Tsygankov, 2016, p. 13). These objectives in Syria make it possible to state that Russia's thinking about the physical consolidation of the military victory on land has not abandoned in the contemporary war and is the necessary indication of the military campaign progress. In this case, Russia rather seeks to make use of Syrian military forces in the land domain while using its own military capabilities in the air, sea and space domains. Thus, Russia relatively avoids the deployment of not only massive Russian military assets and forces in Syria but also the intensive military operations in the land domain to avoid losses and casualities. Without any doubt, this is a risky variant of the achievement of Russia's operational objectives since it has to depend finally upon on poorly trained and organized Syrian army for the ultimate victory on land. Nevertheless, Russian combat actions modelling do not renounce an intensive and brutal fighting in the land domain which is unavoidable, yet can be compensated by massive manoeuvers of Syrian army.

Although internal discussions do not shun reasoning about the old-fashioned Soviet warfare, one can firmly state that Russia's military ambitions in Syria are orientated towards the format of modern network-centric warfare which is based on the integrated technological system of intelligence, unified forces command and fire control. The Syrian conflict simultaneously calls for a skilful application of traditional and non-traditional measures (both military and non-military). It is expected that the complicated scenario of the ending the military conflict in Syria can be implemented on the grounds by Russia with its own experience as well as with the experience from Chechnya. In this case, finding a leader equal to *Ramzan Kadyrov,* who should be loyal to the central government and capable of assuring security in Syrian regions after the destruction of ISIL thinking, is given to the dialogue among (Tsygankov, 2016, p. 13) (Sushentsov,

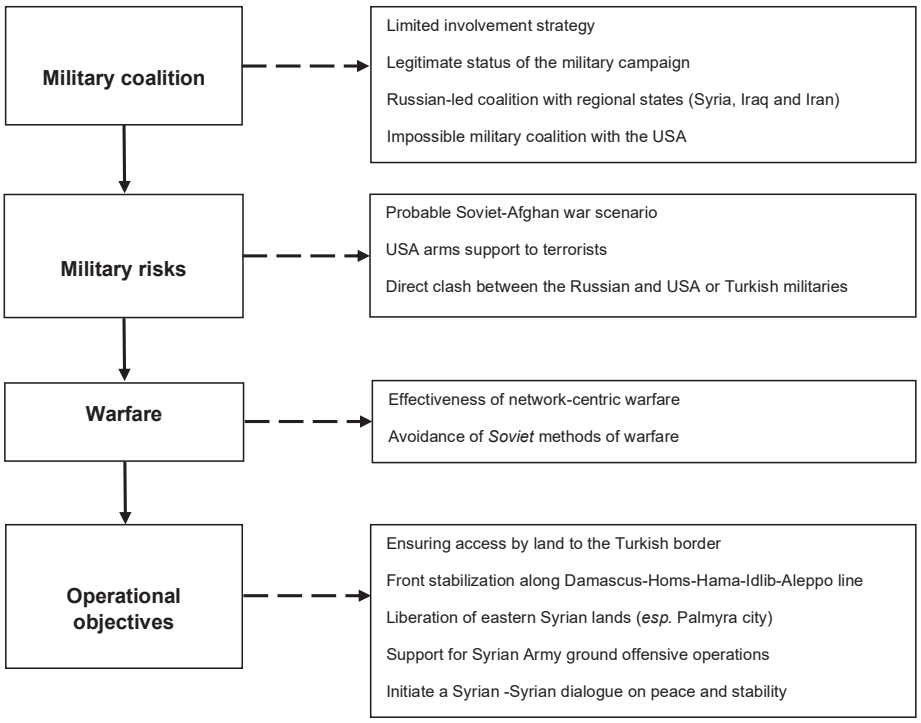

Figure 1: Initial insights of Russian military experts on the Russian military intervention in Syria (made by the author).

2015, p. 9). All this suggests that Russia not only intends to use its numerous troops to destroy a technologically weaker adversary, but is also actively considering the use of non-military measures necessary for a successful settlement of the internal conflict, *i.e.* to initiate a Syrian-Syrian dialogue on peace and stability.

To sum up, the key insights and predictions of Russian military intellectuals about the Russian military intervention in Syria are presented in Figure 1.

The most obvious observation is that Russia tends to maintain a strategy of limited involvement. As a result, Russia is considering forming a military coalition in which the military capabilities of other states would compensate the shortfall or gap existing due to the limited Russian forces participations in the military campaign. The prospect of limited involvement is also supported by a risk assessment on Russia's unwillingness to engage in a devastated and brutal war with ISIL fighters in the land domain and active consideration of handing over the land domain to the Syrian army. Meanwhile, technologically advanced Russian forces would cover air, naval, and space dimensions through network-centric warfare operations. In this way, Russia not only providing combat support for Syrian army's offensive operations on the land, but also avoiding its own military losses by fighting from a distance.

In addition, the fascination concerning the possibilities of the network-centric warfare in Russia's military operations in Syria keeps increasing due to the potential of Russian new military technologies and weaponry. Nevertheless, Russia is forced in part to develop and integrate them independently, *i.e.* Russia cannot freely use the already tested advanced military technologies and weaponry on the West.

3 Potential of network-centric warfare of Russian armed forces in Syria

Russia officially calls the military campaign in Syria as a military aerospace operation. While the network-centric warfare potential of Russia is analysed in classical military domains (air and sea) as well as in their interaction with space and land domains. Thus, attempts are made to comprehensively expose the strong and weak sides of the new method of operations employed by Russia.

The concept of network-centric warfare in this analysis is based on the theoretical model developed by Col. (decd.), Professor of the Russian Military Academy of Sciences, Valery Kiselev. The model is based on the operation of the integral intelligence-command-strike system in the theatre of operations (Kiselev, 2017, pp. 37-39; 42-44). This system should assure a timely control of a missile-aviation-artillery attack from a distance. Thus, the professor identifies PGMs that can attack enemy targets from a safe distance as the most important means of network-centric warfare. The potential of the realization of PGMs is inseparable from the employment of progressive technologies in military space and information domains which guarantee all-level intelligence, spreading of information, security of friendly systems and create conditions to attack targets with PGMs.

3.1 Military air operations

The greatest attention in the joint forces combat group is given to the air force. First, Russia is not prone to enjoying a covert operation of redeploying its aviation group in the Syrian Hmeimim military base prior to the beginning of combat actions. Within a month, by maintaining an absolute communication silence, a mixed personnel group of Russian military air force was deployed in Syria. Maintaining of the covertness and secrecy of the operation was a complicated task because of the capabilities USA space intelligence, NATO air intelligence and flights of unmanned aerial vehicles (UAVs) that actively operated in that region as well as stationed air intelligence systems of Israel and Turkey. But two days prior to the beginning of the military campaign, Israel managed to identify the deployment of the Russian military aircrafts, this fact is not considered as a shortcoming of the operation. On the contrary, it is stressed that the covert operation equals the Soviet Union's missile deployment operation to Cuba considering current progressive and complicated intelligence technologies of the West. Thus, at the beginning of the military campaign, a mixed military aviation group consisting of fighter-bombers Su-24SM and Su-34, attack aircraft Su-25SM, heavy multirole fighters Su-30SM, attack helicopters Mi-24, transport helicopter Mi-8 and UAVs was redeployed (Ramm, 2015a, p. 1) (Khramchikhin, 2017, p. 9) (Ramm & Lavrov, 2015, p. 4) (Semenchenko, 2017, p. 1).

The practical capability of the military aviation group in Syria is assessed more frequently by Russian experts through the prism of three factors: combat equipment (weaponry), reaction time and number of generated strike sorties (Sivkov, 2015a, p. 4). Although these figures enable experts to follow the increase in capability by comparing individual periods of time in this military campaign, the more important aspect is the determination to identify the new capabilities of the network-centric warfare of Russian military air force but not to portray the dynamic change of its military capability. This way, the most important factors that are discussed in Russian discussions rooms on military experiences in Syria are the capabilities of the military air force to operate in the centralized intelligence-command-strike system alongside other military forces and the effective employment of PGMs.

Exceptional interest, by Russian experts, is given to the latest attack aviation's weaponry and systems based on which PGMs were used in Syria. Experts point out a successful employment of the fighter-bomber Su-24 with a newly integrated navigational and attack system SVP-24 (*Специализированная Вычислительная Подсистема*), which assures the accuracy of general purpose aviation bombs FAB-250, FAB-500 and BETAB-500 (F*АБ-250/500, БетАБ-500*) within 15–30 metres while attacking targets on land from the height of 5 kilometres. Without this system the usual error margin of bombs would be around 150–400 metres; therefore, the new accuracy provided possibilities to destroy multiple target set per sortie. Attack aircraft Su-25 operated was equipped with navigational and attack complexes SOLT-25 (*Оптическая Lазерно-Телевизионная Система*), which enabled guided missiles Kh-29 and Kh-25 (*Х-29/25*) to attack targets on land very accurately. The accuracy of these missiles made it possible to use them effectively in densely populated areas without causing any civilian casualties while destroying insurgent objects. Guided aviation bombs KAB-250 and KAB-500 (*КАБ-250/500*) (in rare cases, the largest KAB-1500 is used) that were dropped by fighter-bombers Su-34 was another PGMs in Syria campaign. The global navigation satellite system GLONASS (*Глобальная Навигационная Спутниковая Система*) and the integrated semi-active laser-homing system guarantee the accuracy of these bombs to within a few metres. Russian experts point out that their effectiveness was proved by attacking targets in densely populated areas without any loss of civilian casualties. Also the fighter-bomber Su-34 became an exceptional network-centric warfare platform due to the advanced TKS-2M (*ТКС-2М*) communication and control system on board, which empowered the intercommunication in fighter-bomber and transferring of coordinates without the interference of command on land during combat strike sorties. Thus, all air-borne fighters equipped with this system can gather

the latest information about the target and attack it if a fighter has spotted the enemy target without any information provided to them (Falichev, 2015a, p. 4) (Falichev, 2015b, p. 11) (Military Industry Currier [ВПК], 2015, p. 4) (Sivkov, 2016, p. 4) (Kobyletski, 2015, p. 35) (Bogatchev, 2015) (Tsygankov, 2016, p. 11) (Ramm, 2015a, p. 1) (Ramm, 2015b, p. 8) (Ramm & Lavrov, 2015, p. 4). This system demonstrates not only the potential of the centralized network-centric warfare but, quite on the contrary, the flexibility of the decentralized coordination during ongoing strike sorties.

Talking about the network-centric warfare in air operations, the integration of the assault aircraft into a unified intelligence-command-strike system is an important achievement. Russian experts emphasize that in this space systems, radio-electronic warfare capabilities and air intelligence can effectively operate in a coordinated way by using UAVs and land combat elements (Tihanychev, 2016, pp. 16-20) (Andrejev, et al., 2017, pp. 78-82) (Semenchenko, 2017, p. 5). Assault aircraft guaranteed the attack-strikes when targets were detected by using orbit and communication take-over systems, UAVs and military forces operating on land. According Gen. (ret.) Pyotr Deynekin, this indicates that Russia can conduct adaptive military operations that do not call for early thorough preparation and planning (Deinekin, 2016, p. 78). The OCP established in the Hmeimim air base had the capabilities to receive timely intelligence information from the space, radio-electronic warfare systems and UAVs prior to attacking the chosen targets, to perform coordination with the Syrian army and to record the happenings during the attack and results of the fire strikes via UAVs. These capabilities demonstrated to carry out intelligence in a systemic way without troops in the theatre of operations and data are collected in real time and assessed in a centralized way while objects are attacked only after the authorisation of the Syrian operational group from the OCP. The intelligence input of UAVs is particularly successful since it helps to identify targets, keep an eye and track them, analyse and transmit via the latest cameras a timely image to the OCP and present battle damage assessment. A total of 70 UAVs is in operation; they are constantly used in target identification, particularly in those areas when the information about them is supplied by the Syrian army (Gerasimov, 2016, p. 5) (Radskoi, 2016, p. 5) (Falichev, 2015b, p. 11) (Falichev, 2015a, p. 4). This way Russia compensates the distrust of the Syrian army that remains the essential combat element in the land domain, the element that should be constantly controlled.

Radio-electronic warfare tools which were at Russia's disposal both in the air, on land and at sea became an additional factor of Russian combat power in the aerospace. It is great wonder that the deployment of such a wide range of means became an inseparable part of the united intelligence-command-strike system. The 'Khibin' system (*Хибин*) in which fighter-bombers Su-34 and military naval ships were equipped with received a positive evaluation. This system is not only capable of networking varied military capabilities into one informational system but, what is more important, provides additional security by being able to carry out radio-electronic intelligence and jam early warning enemy radars by assuring protection from anti-aircraft, aviation-related and missile attacks. Another important platform of the radio-electronic warfare in the air was the reconnaissance plane IL-20M1, which controlled the radio communication data of the Islamists and searched for probable targets using modern infra-red ray systems and radars. Still, the greatest achievement of this aircraft is its technological capability to directly transfer an image, via the satellite communication channel, from Syria to the National Defence Management Centre in Russia (*Национальный центр управления обороной Российской* Федерации), so that it can conduct direct operational command and control from Moscow. Besides, land-surface radio-electronic warfare complexes 'Krasukha-4' (*Красуха-4*) that were intended to jam radio-electronic capabilities of the opponents, detect attack aircraft and UAVs were also deployed in Syria (Urypin & Tanenya, 2016, pp. 20-21) (Tsygankov, 2016, pp. 18-19) (Ramm, 2015a, p. 1).

Another effective Russian weapon used from the air in the Syrian military campaign is the first-time employment of long-range (strategic) aviation in combat actions that attacked targets on land by using cruise missiles that are attributed to the category of PGMs. Russian officers and experts underline a particularly successful employment of strategic bombers Tu-160, Tu-95MS and Tu-22M3, a statement proved by bomb and missile strikes carried out by them in Syria. The employment of bombers Tu-160 and Tu-95MS, armed with the latest cruise missiles Kh-555 and smaller ones Kh-101 (*X-555/101*) which are of combat debut, should be pointed out as the essential moment in the realization of the network-centric warfare. It is stated that this debut was particularly effective because missiles launched from the distance of 2,500–5,000 kilometres operated with the margin of 10-metre error. This strategic aviation was launched from the territory of Russia (from military bases situated in the region of the Caspian Sea in the districts of Saratov and Mozdok). Nevertheless, the greatest challenge was not the aviation routes over Iraq or Iran but the trajectories of the cruise missiles over the territories of these neutral states due to complex radio-electronic conditions. It is pointed out that these cruise missiles became one of the most effective weapons for destroying terrorist nests situated in Syria

from a distance that adapted to the tactics of Russia's attack aircrafts. Terrorists, having received information about the sorties of fighters from Russian bases in Syria, would abandon their areas of fighting and hide in urban areas; therefore, fighters would be recalled from combat missions (Ramm, 2015c, p. 4) (Tsygankov, 2016, p. 12). Meanwhile, terrorists had no possibility of getting warned about the incoming strikes of long-range (strategic) aviation. The decisions and actions taken demonstrate the flexibility and adaptation of Russian officers in seeking new military means against the changed tactics of terrorists on land. In the meanwhile, bombers Tu-22M3 were armed with modified general-purpose aviation bombs OFAB-250 and OFAB-270 (*OFAБ-250/270*) the accuracy of which was enhanced by the above-mentioned navigational and attack system SVP-22. Nevertheless, Russian experts do not consider these modified bombs as PGMs since they were used for attacking area targets, *i.e.* accuracy is compensated by the number of bombs. Although this type of bombardment sounds old-fashioned, yet progress in attacking targets with modified aviation bombs was achieved while, as early as 2008, in Georgia, bombers Tu-22 failed to paralyse Kopitnari airport whereas in Syria, while attacking oil-processing facilities, these bombers were much more effective. Besides, Tu-22M3 demonstrated other exceptional attributes of the network-centric warfare of Russian air force when the rendezvous of long-range aviation with fighters Su-30MS and Su-27 from the Hmeimim base in Syria was carried out. The fighters were armed with air-to-air missiles and had to provide security and ensure escort to the target area or release point of the bombers while they were attacking objects in the northern part of Syria (Novikov, et al., 2016, p. 15) (Ichenko, 2025) (Seleznev, 2016, p. 2) (Ramm, 2015c) (Tsygankov, 2016, p. 12) (Ramm & Lavrov, 2015) (Sivkov, 2015b, p. 4) (Semenchenko, 2017, pp. 4-5).

Another distinct moment of the network-centric warfare in the strategic aviation exercises is Russian refuelling during the air operations when IL-78 tankers refuelled the air strategic bombers Tu-160 both in day and at night. Operations of this nature call for a particularly accurate coordination in the air in order to perform timely refuelling. These Russian capabilities enabled Russia to activate strategic aviation from the Olenya air base near Murmansk (in the northern region of Russia), send it on a successful 13,000-kilometre sortie around Europe from the Gibraltar to Syria and attack targets situated there. This practical aspect is particularly important for Russia because it is next to impossible for Russia to obtain permissions to cross the air space of Europe or Turkey and carry out coordinated attack activities. All this reveals the networking capabilities, combat readiness and professionalism of Russian long-range (strategic) aviation that enables Russia to plan and carry out strategic redeployments as well as demonstrate its military power at any point in the world (Seleznev, 2016, p. 2) (Ramm & Lavrov, 2015, p. 4).

Despite all the enumerated military achievements of Russia in conducting modern military air operations in Syria, it is worth paying attention to the shortcomings, identified by their own military personnel and experts. Primarily, Russians themselves have doubts about their attack aviation capabilities; when 50 attack aircraft conduct approximately 20–60 strike sorties in 24 hours, it is nearly impossible to achieve a fast victory because systemic bombardment of Islamist objects with an adequate intensity, making attack operations on land effective, is not guaranteed. According to the estimates, it will take about 5 years to achieve victory with these capabilities. In order to avoid this, it is necessary to have in Syria approximately 140–200 attack aircrafts that would enable to generate about 200 strike sorties within 24 hours (Hodarenok, 2015, p. 5) (Sivkov, 2015a) (Sivkov, 2015b, p. 10) (Khramchikhin, 2017, p. 9). Once more, the decision is not simple because Syrian air bases have no possibility to accommodate and adequately service these aircrafts in case the decision is made to use them. It is possible that Russia's decision to send an aircraft to a combat mission is related to the ambition to increase the number of strike sorties within 24 hours (Sivkov, 2015c, p. 8) (Falichev, 2015a, p. 11) (Semenchenko, 2017, p. 4). Although one aircraft tactics is presented as Russia's military adaptation in Syria, yet an ambiguous impression is formed when it is not clear whether it is a new tactical possibility or rather a necessity while searching for the most effective decision to increase the intensity of the bombardment simultaneously undertaking additional risk since bombers operate independently without any protection in the air.

The second shortcoming is associated with Russia's capability to widely use the latest PGMs. Still, the lion's share in the air (about 70–80% of all strike sorties) was performed by fighter-bombers Su-24 and attack aircraft Su-25, that intensively dropped general purpose aviation bombs FAB-250/500, the main arsenal of Russia, and only in rare cases, at the beginning of the campaign, bombers were armed with guided bombs KAB-250/500. Meanwhile, strategic aviation most intensively used bombers Tu-22 that intensively dropped aviation bombs OFAB-250/270. This moment raises doubts as to Russia's capability to fight with PGMs for a longer time. Though an intensive employment of unguided bombs is based on the fact that Russian air force in Syria follows the principle *what targets, such bombs* or this conflict is simply not the right occasion where Russia could disclose its entire military potential (Deinekin, 2015). But then questions arise about accuracy of air attacks when the generals emphasized that their forces in Syria do not attack hospitals, mosques

and schools even in case they are used by ISIL fighters for hiding.[3] Nevertheless, it is a hardly conceivable thing to maintain precision in attacking targets in urban areas from not lower than 5-kilometre height when Russians emphasize the saving of PGMs that are compensated by unguided (even though modified) bombs. Thus, a dual impression is created when exceptional accuracy with the latest cruise missiles is demonstrated yet fighting is most frequently based on general purpose bombs and exceptional accuracy rhetoric is still engaged in internal reflections.

The third aspect calling for improvement is related to cruise missiles which have not yet been developed to such a technological level that would enable Russian military forces to use them effectively in poor weather conditions. This shortcoming had a direct impact on Russia's military campaign since the least favourable weather season in Syria would be in February-April months during which it was necessary to maintain and execute a systemic destruction of Islamist objects from the air with a limited employment of cruise missiles. Although the technological weaponry progress creates conditions for Russia to expect the military capability of *one bomb – one target*, yet in Syria, the achievement *one strike sortie – one target* is rather observable and resistance to weather changes remains a sensitive issue (Semenchenko, 2017, p. 5) (Falichev, 2015b, p. 11). Once more, this achievement is not completely carried out because of the problems encountered while attacking moving enemy targets. Although the Chief of the General Staff Operational Control Division of Russia Col. Gen. Andrei Kartapolov states (Kobyletski, 2015, p. 36) that the technological intelligence from the space and air assuring constant observation of the target and generating conditions to attack it later when it is immobile compensates for this drawback, one is safe to believe that Russia's military forces still have room for perfection.

The fourth point is related to forced flying of Russia's strategic aviation around the territories of Europe and other states and this prevents a rapid and effective employment of this strategic weapon in expeditionary operations. A detailed advance planning concerning the necessary refuelling and large distances do not allow to arm strategic bombers to the maximum, *i.e.* the priority of fuel in comparison to the number of bombs on board the bomber.

Still, one of the weakest points in Russia's Aerospace Forces in Syria is the capability to attack objects with UAVs (Ramm & Lavrov, 2015, p. 4). Although the stress is placed on the effectiveness of their ability to detect, home in on the target, identify and record attack results while in immediate operation with space orbit intelligence systems and thus assure the control of combat actions, yet the unavoidable factor of the combat power is considered the armaments of these vehicles. In operations, this shortcoming is in part compensated by attack helicopters which bring about the importance and urgent development of this capability. Yet, it is believed that in the future, production-designing processes of these attack UAVs will be improved and completed in Russia and it will be possible to move to another quality-related level of fighting having at the disposal one more PGMs' platform while fighting from a safe distance.

Russia's internal discussions lack more detailed information about Russian orbital systems in the space though this fact cannot be considered as one more shortcoming of Russia's Aerospace Forces. Official statements read that the Syrian military campaign is constantly supported by 10 space apparatuses that might still be enhanced by satellites from the operational reserve (Shepovalenko, 2016, p. 111). These orbital systems assure a constant monitoring of the theatre of operations, detection of enemy objects, communication among forces and the accuracy and control of PGMs; however, there is no information available about real trials to conduct combat attacks from space platforms. Thus, Russia's military space capabilities are rather intended to make possible the employment of PGMs from both air and naval platforms. Meanwhile, a qualitative jump in terms of space capabilities is observed when compared with the situation in the war with Georgia in 2008 when Russian military aircraft could be armed with PGMs; however, during the entire war, it was possible to use this weapon only twice for three hours at a time; therefore, unguided bombs were employed on a massive scale (Tsygankov, 2016, p. 11). Nevertheless, this fact is considered the past of Russia's military capabilities because modern military forces of Russia make immediate use orbital satellite communication and GLONASS systems in its combat actions in Syria that operate in the same informational network as military naval and air forces. In essence, Russia's military forces have at their disposal technologies that enable them to conduct a joint military operation.

3 Specifically here Gen. Валерий Герасимов and Ltn.Gen. Сергей Рудской, 2016. N.n. *Военно-Промышленный Курьер*, 17 (632), 2016, p. 5.

3.2 Military naval operations

Russian military personnel and experts, while analysing the effectiveness of Russia's military naval force in Syria orientate themselves towards individual operations of military naval flotillas in the Caspian and the Mediterranean Seas. An exceptional attention is given to the employment of the aircraft carrier 'Admiral Kuznetcov' (*Адмирал Кузнецов*) at a later stage of the campaign.

In the aquatory of the Caspian Sea, new capabilities were demonstrated by 4 missile ships 'Dagestan', 'Grad Sviyazhsk', 'Uglich' and 'Velikij Ustyug' (*Дагестан, Град Свияжск, Углич, Великий Устюг*) from which 26 high-precision cruise missiles 'Kalibr-NK' (*Калибр-НК)* were launched on 7 October 2015. It was the first combat christening for these missiles and the successful results were immediately reported to the President of Russia by the Russian Defence Minister S. Shoygu (Samosvat & Kurtsev, 2016) (Itchenko, 2015) (Kiselev, 2017, p. 43) (Kobyletski, 2015, p. 36). After a month, on 20 November, additional 18 missiles of the same type were launched from the Caspian Sea. They attacked Islamist objects in the northern Syrian provinces of Aleppo, Idlib and Raqqa (Fig. 2) and demonstrated practical capabilities of the Russian military naval force attacks in network-centric warfare operations. In Syria, under combat conditions, high-precision cruise missiles were for the first time launched from ships to Islamist objects more than 1,500 kilometres away. Although official technical tactical specifications of 'Kalibr'-type missiles is a secret one, Russian experts are sure that missile modifications (*e.g.* 3M-14) can attack targets even from the distance of 2,600 kilometres (Klimov, 2015, pp. 2-3). It has been counted that the first 26 missiles destroyed 11 targets while the later launched another group of 18 missiles eliminated 7 targets. This means that 2–3 missiles are necessary to destroy one target including the probability of 10–16% that not all the missiles reached their targets. It is important that these missiles were used to attack only targets of critical significance, the targets that, according to Col. Gen. A. Kartapolov, had to be destroyed immediately (Kobyletski, 2016, p. 36). The guarantee of missile accuracy became the united intelligence-command-strike system within which varied military forces of Russia operated in a coordinated way. Space and air intelligence were used for target detection while the trajectories of missiles over the territories of Iran and Iraq were controlled via the GLONASS system.

There is not any information supplied on how many targets were planned to destroy in one or another case that would enable to objectively assess their genuine accuracy; however, Russian military personnel and experts consider high-precision cruise missiles launched from the Caspian Sea flotilla was a great and important achievement since the capabilities of precision-guided munitions were demonstrated. Russian experts place the demonstrated accuracy over long distances on the same footing as strategic non-nuclear strikes. Still, no more military operations until the Caspian Sea flotilla in 2018 since Russians stick to the position that much-costing cruise missiles are intended for the destruction of only particularly important objects.

While estimating military operations of the Mediterranean Sea flotilla, Russian experts present the information that this flotilla was enhanced by ships from the North, Black and Baltic Sea flotillas. A total of more than 15 ships including submarines were engaged in the Mediterranean Sea. In analysing network-centric warfare aspects, a particular attention should be paid to the protective guided missile cruiser 'Maskva' (*Москва)*, the intelligence ship 'Vasilyj Tatishchev' (*Василий Татищев*) and certainly the submarine 'Rostov-na-Donu' (*Ростов-на-Дону*).

The ship 'Maskva' was one of the first sent to the shores of Syria with the aim of protecting Russian military forces in the air and on land from probable missile or air attacks. The ship was armed with long-range surface-to-air missile systems S-300F (*C-300*F*)* that assured protection of the aviation group in Syria during strike sorties. The missile capabilities of the ship were integrated into the already functioning on land air defence system consisting of missile systems S-300, S-200, S-125, 'Pancir-S1'and 'Buk-M2' (*C-300, C-200, C-125, Панцирь-С1, Бук-М2*) stationed in Tartus and Hmeimim military bases (Madzumdar, 2015, p. 4) (Ramm, 2016, p. 5) (Sokolov, 2016, pp. 6-7) (Damantsev, 2015) (Semenchenko, 2017, p. 4) (Tsygankov, 2016, p. 18). Thus, air defence radars and missile complexes, while being in different military domains were integrated into a single intelligence-command-strike system that assured the coverage of the air space within short, medium and long range. The combination of these capabilities enabled Russia to develop strategic superiority over the USA that allegedly lost a real possibility to attack the Damascus province and Syrian military forces stationed there. Nevertheless, after the incident in the air with Turkey, when the fighter F-16C of its military forces attacked and shot down the Russian fighter Su-24M in the northern part of Syria, a decision was taken to deploy in Syria the latest long-range air defence systems S-400 'Triumph' (*C-400 Триумф*) to guarantee the security

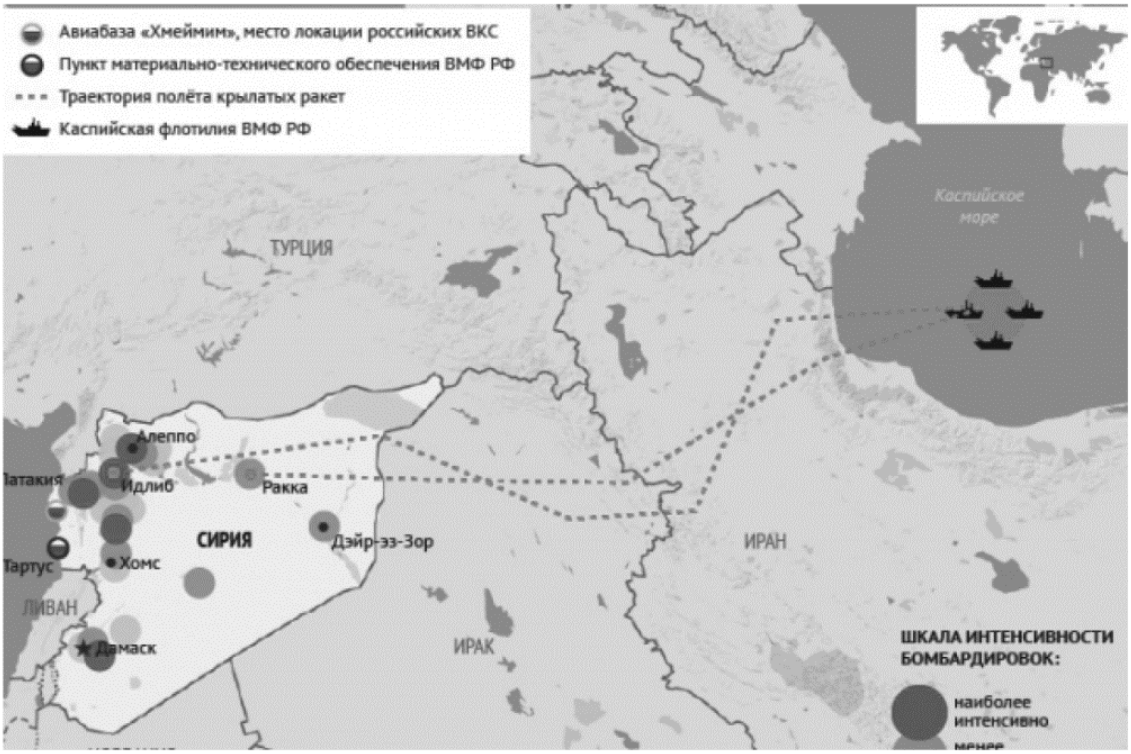

Figure 2: Trajectories of cruise missiles 'Kalibr-NK' while attacking objects in Syria from ships in the Caspian Sea (Tsygankov, 2016, p. 213).

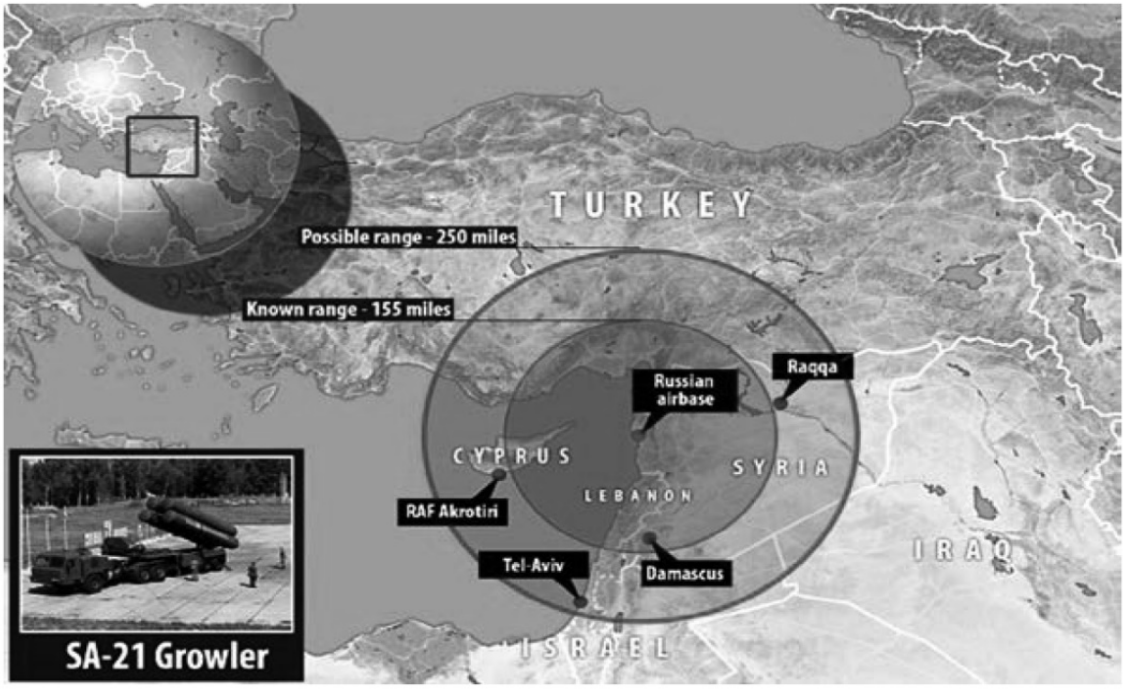

Figure 3: The effective coverage distance of long-range air-defence system S-400 '*Triumph*' (NATO reporting name: SA-21 '*Growler*') from Hmeimim military base in Syria (Tsygankov, 2016, p. 219).

of Russian air force even in the remotest parts of Syria; simultaneously Russia developed the capability enabling it to declare at any time the entire Syrian air space a no-fly zone (Fig. 3).

17 November (or 8 December, because sources supply these two dates) is considered one more historical day of the Russian Navy when the submarine 'Rostov-na-Donu' performed the first fire strikes with the high-precision cruise missiles 'Kalibr-PL' (*Калибр-ПЛ*) from the Mediterranean Sea against objects on the Syrian territory. Although experts do not supply more detailed information about the number of the attacked targets, it is known from the available information that 4 missiles were used to attack Islamist objects in Raqqa province. Still, the possible 17 November scenario makes it possible to discern a correlation with the operation begun on 16 November when long-range (strategic) aviation aircraft attacked targets in the surroundings of Raqqa, Idlib, Aleppo and Deir-ez-Zor cities (Tsygankov, 2016, p. 14) (Sokolov, 2016, p. 7) (Shepovalenko, 2016, p. 113). In such a case, Russia not only demonstrates completely new capabilities of PGMs of its submarines but also a potential to operate from varied military platforms from strategic distances all at a time.

In order to guarantee the dominance of Russian forces in the air domain, at the very beginning of the campaign, the radio-electronic intelligence ship 'Vasilyj Tatishchev' was sent to the shores of Syria. This ship assured a reliable protection of Russian aviation in the air and safety of other flotilla ships as well as the protection of the Syrian army on land. This protection was orientated towards the monitoring of the military aviation of other states, particularly of the USA, operating in Syria and timely warning. Experts emphasize that the ship is equipped with modern communication and radio-electronic intelligence systems 'Profil-M' and 'Prokhlada' (*Профиль-М, Прохлада*) that are capable of detecting and overtaking radio communication used by the opponent as well as identify the spread of coordinates. The radio-technological intelligence complex 'Oktava' (*Октава*), installed in the ship are designed to detect and analyse waves emitted by both sea- and surface-based radar equipment was also effectively used (Damantsev, 2015). These capabilities enabled Russia to some extent control hardly predictable actions of USA's military response from the air because the employment of this system made it possible to inform in advance the friendly forces about actions planned by the USA in the air. On the grounds of these technological capabilities, Russian experts distinguish this ship as an irreplaceable attribute of the Russian network-centric warfare which has to contribute to the dominance in the military informational domain that is mandatory in seeking to fight in a single intelligence-command-strike system.

Although Russian experts are rather inclined to stress the capabilities of modern Navy to operate in the automatized informational network with other forces as well as support them by the radio-electronic means of fighting and accurately striking with cruise missiles, the employment of the Russian aircraft carrier 'Admiral Kuznecov' experienced controversial attention and assessments. It is worth mentioning that the employment of this aircraft carrier in Syria cannot be considered as spontaneous since this possibility was being considered from the very beginning of the military campaign when Russia clearly realized that the capability of 50–100 attack aircraft deployed in Syria is not sufficient for the achievement of military victory (Sivkov, 2015c, pp. 8-9) (Sivkov, 2016, p. 4). Nevertheless, the decision was made to use the capabilities of the aircraft carrier in this military campaign though this step can be considered as a rather extreme strategic military means of Russia after the long-range aviation and missile attacks from ships were used. The aircraft carrier fulfilled the assigned to it missions only in part. First, it proved the ability to be employed in strategic distances when it successfully navigated to the Mediterranean Sea from the Barents Sea where the repairs of the ship had been carried out since May 2014. This redeployment demonstrates the capability not only of the aircraft carrier but also those of the ships escorting it. However, the composition of the escorting ships is not analysed in Russia's military mass media due to security requirements. In total, the aircraft carrier holds 14 multirole fighters Su-33 and 12 fighters Mig-29 that are designed to conduct combat missions from the deck of the ship. It is considered that the aircraft carrier can operate self-sufficiently for 7-9 days and nights. During that time, fighters can systemically and intensively carry out combat missions to the maximum, *i.e.* make 35-40 strike sorties within 24 hours. After this time, the ship must return to the seaport and replenish it with new supplies (Sivkov, 2016, p. 4). It is stated that the contribution of the aircraft carrier to the military campaign in Syria from November 2016 to January 2017 was significant because all in all 420 strike sorties were conducted during which more than 1,250 objects in Raqqa and Idlib provinces were attacked (Mihailov, 2017, p. 4) (Ivanov, 2017, p. 4). These provinces are the farthest to the north from the main Russian aviation base Hmeimim. This fact began to cause concerns to Russian air force that sought to maintain an intensive bombardment in these localities; however, a long distance to the objects had an impact on the frequency of strike sorties and armament of the aircraft due to a greater demand for fuel.

Although the activation of the aircraft carrier helped to meet challenges of the intensive bombardment, the suffered losses became more distinct moments in the ship's campaign, the losses that were suffered not in combat missions but were caused by the unprofessionalism of pilots or by the failure of the brake system of the aircraft carrier. First, the fighter Mig-29 fell into the sea while landing and later, the aircraft Su-33 was lost in a similar way (Mihailov, 2017, p. 4) (Ivanov, 2017, p. 4). These losses received immediate reaction and the aircraft were directed to the Hmeimim military base from which they continued combat missions. However, this mode of aircraft employment transforms the expeditionary capabilities of the aircraft carrier to more logistic ones that should not be rejoiced at in modern military operations because in other places, differently from Syria, there might be no possibility for the planes from the ship to land in Russian-managed military bases. The second shortcoming is the status of the equipment available on the fighters themselves that prevents them from employing precision-guided munitions and operating in the networking regime, *i.e.* the fighters of the aircraft carrier have no modernist navigational and attack systems. The aircraft carrier still maintains typical for a carrier self-sufficiency regime where deeper integration into network-centric warfare with other forces in the theatre of operations is extremely limited. Third, it is still believed that the aircraft carrier was not functioning at full strength in terms of fighters and used only 10 Su-33 and 4 Mig-29. Fourth was the shortage and poor preparation of pilots capable of taking off from the ramp deck of the ship. However, despite all the enumerated shortcomings, Russia obtained a practical chance to make sure of the importance of the aircraft carrier in modern military operations and the necessity to repair this aircraft carrier. Also, it ensured that training of pilots at their training centres is adequate and the modernization of training sites' infrastructure.

However, the most important shortcoming of the Russian naval force proved to be actual limited resources of precision-guided cruise missiles 'Kalibr' that prevented Russia from employing this strategic PGMs. It is stated that the *kalibrization* process of the naval force is still at the initial stage since its progress is negatively influenced by economic sanctions. Another, non-parade side of 'Kalibr' missiles is their limited capability to function in poor weather conditions and attack moving targets. The rearmament of the ships themselves is considered as an important operational shortcoming because missile ships are armed with 8 missiles whereas submarines have only 4 missiles that can be launched simultaneously. Ships must return to the seaport and rearm a new in it; therefore, a repeated attack of missiles is possible after approximately 2-3 days and nights keeping in mind the potential of the Caspian Sea fleet and the infrastructure present there. It is obvious that Russia, with the available Caspian Sea flotilla and the joint group of the North-Baltic-Black Sea flotillas, was not capable of conducting systemic attacking of ISIL objects with cruise missiles from the seas; therefore, their employment is rather associated with a demonstrative action intended for the West and particularly for the USA when the launched cruise missiles 'Kalibr' (about 50 units) symbolize modern military potential of Russia to fight by employing a strategic non-nuclear weapon from the distance operation with exceptional accuracy were practically demonstrated in Syria.

Rounding up combat actions of Russian air and naval forces in Syria one can state that Russia tests in Syria the capabilities of network-centric warfare by conducting a joint air-space-navy operation where the integral intelligence-command-strike system and the employment from a safe strategic or operational distance of PGMs (see Table 1) become the cornerstone moment. Although modern military platforms in space, air and information areas guarantee a qualitative intelligence and command, attack segment remain the weakest link in this system. The capability of the attack that is marked by both technological (functioning of weaponry in poor weather conditions or destruction of non-moving targets) and quantitative shortcomings (has no capability of attack UAVs and possesses limited resources of PGMs) has not yet been fully developed. These shortcomings limit Russia's capabilities to systemically attack enemy targets with PGMs; therefore, their employment is based on strict classification of targets and only critical enemy targets are attacked. It is also not clear how long and how intensively Russia could fight from a distance using PGMs since in the military campaign in Syria, unguided bombs and missiles are widely used. Thus, a specific format of network-centric warfare gets rather established in Syria when Russia has at its disposal an integrated intelligence-command-strike system yet systematically attacks targets with a non-guided weaponry, thus purposely avoiding the use of PGMs resources.

Table 1: Russian advanced intelligence-command-strike system activated in the Syrian military campaign (made by the author).

	Intelligence	*Command and Control*	*Strike segment*			
			PGMs	*Platform*	*Weaponry*	*Effective range*
Strategic (military) level	Space domain (orbital systems) + Air domain (aeroplanes and UAV) + Radio-electronic domain (ships, aeroplanes and radars)	National Defence Management Centre in Russia (Moscow)	Cruise missiles	Missile ships	*Kalibr-NK*	300–2,500 km
				Submarines	*Kalibr-PL*	300–2,600 km
				Strategic bombers	*Kh-101*	5,000 km
					Kh-555	2,500 km
Operational level	Space domain (orbital systems) + Air domain (aeroplanes and UAV) + Radio-electronic domain (ships, aeroplanes and radars)	Operations Control Post in Syria (Hmeimim Air Base)	Guided missiles and bombs	Fighter-bombers and Attack-aircrafts	*Kh-29* *Kh-25*	8–30 km
					KAB-1500 *KAB-500* *KAB-250*	Dropping altitude up to 8 km

4 Conclusions

The performed analysis of Russian military thought in this article revealed that Russia acquired significant military experience in planning and conducting an expeditionary military campaign in Syria a particularly that tests (at the same time demonstrates) the capabilities of network-centric warfare. In Russian experts' opinion, one of the greatest military achievements is the capability of Russian military forces to operate in the integral intelligence-command-strike system when military missions are simultaneously carried out by aerospace, navy and land forces assets. This system assures a centralized control of combat missions in Syria from the established OCP. In case of necessity, direct command of operations is undertaken and carried out by the National Defence Command Centre in Moscow. These capabilities are the result of hi-tech systems in space, air, sea and land domains when orbit systems, military aircrafts, ships and surface (over-ground) radars carry out systemic real time information collection and its transfer to command centres. All this enables Russian military forces to carry out adaptive combat operations in Syria. Meanwhile, a command chain performs the assessment of the received information, identification of targets, coordination of actions and initiates fire strikes against enemy targets.

The essential progress of Russia in network-centric warfare became PGMs when targets in Syria were attacked with high-precision cruise missiles and guided aviation bombs. These PGMs are grounded on the accuracy guaranteed by space satellites and capabilities to control the trajectories of missiles and bombs via modern navigational-attack systems. It is obvious that Russia's military forces have at their disposal a completely functioning centralized intelligence-command-strike system which makes it possible to effectively use PGMs beyond the borders of its own territory and wage war from a safe distance in carrying out adaptive combat missions. This way Russia demonstrates its modern strategic military power to deliver military strikes with cruise missiles from ships and aircrafts against objects situated thousands of kilometres away.

Nevertheless, military experiences in Syria exposed weak sides of Russian network-centric warfare which are related to the attack link in the common system. Although the resistance of PGMs to poor weather conditions is not clear and possessing no attack UAVs in its arsenal, but the greatest challenge is the attempts to predict how long and how intensively Russia would be able to conduct network-centric warfare operations with PGMs strikes. Nevertheless, in Syrian military campaign, this weapon was used fragmentally because of economy that might have emerged due to insufficient resources or shortage of critical targets; therefore, the intensive and systemic destruction of targets in

Syria was conducted with unguided bombs and missiles. This action conditionally modified the theoretical format of the network-centric warfare when Russia mainly conducted combat missions in the centralized intelligence-command-strike system without PGMs. Thus, Russia applies a combination of old weaponry and modern military intelligence-command technologies that enable its forces to see more, communicate faster but not able to ensure systematic and intense attacking with PGMs.

Although Russia demonstrates the potential of its military forces to conduct network-centric operations with joint Aerospace and Navy Forces that until now only the USA or NATO could boast, Russia maintains the internal perception that the military campaign in Syria is a low-intensity local conflict against the technologically backward enemy that lacks even the necessary air defence systems. Therefore, the application of military experiences acquired in this conflict to a conflict against a technologically progressive opponent in a high-intensity war is limited. Russia urges, in a rather peculiar way, not to rest on one's laurels in successfully fighting against ISIL fighters and demonstrating its military news to the world but to make progress in developing and improving warfare theory and perfecting its practice.

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