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Character of the War in Ukraine and its implications for the Czech Republic

Charakter války na Ukrajině a z ní vyplývající implikace pro Českou republiku

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Abstract: Current War in Ukraine represents conventional conflict of high intensity unparallel in contemporary European history. Using a qualitative method, authors present character of the war and identify its key specifics through multi-domain optics. A preliminary set of recommendations is derived from these results for the national defense capability of Czech Republic. Authors conclude that both State and the Armed Forces must increase their readiness for the large-scale conflict.

Abstrakt: Současná válka na Ukrajině představuje konvenční konflikt vysoké intenzity, jaký v moderní evropské historii neměl po dekady obdoby. Za pomoci kvalitativním analýzy autoři předkládají charakter této války a prostřednictvím perspektivy operačních domén identifikují její klíčová specifika. Na tomto základě pak předkládají předběžná doporučení pro oblast obranyschopnosti České republiky. Docházejí přitom k závěru, že se stát i ozbrojené síly musí připravovat na potenciální konflikt velkého rozsahu.

Key words: Ukraine; Conflict Analysis; Operating Environment; Defense.

Klíčová slova: Ukrajina; analýza konfliktu; operační prostředí; obrana.

INTRODUCTION

Almost two years since Russian columns have (officially) crossed the Ukrainian borders, military aggression against Ukraine continues. Since that, the war claimed lives, depleted resources and changed security environment of Europe more than many expected before 24th February 2022.

Conflict is omnipresent in media space and lessons learned from character of Ukrainian war provide invaluable inputs to doctrinal, operational and defense planning of non-involved military across-globe. Yet sometimes it's not easy to identify key aspects in fast-changing and evolving aspects of the warfare in Ukraine. Therefore, the aim of this article is to analyze what makes the Russian invasion characteristics and to provide an overview of the most significant elements in conflict to the date.

In first part, authors deal with the character of war – how it can be described and if some clean patterns could be identified in the conflict. Then in the next chapter, the characteristic factors shaping conflict in different domains are discussed. The article focuses on land, air and maritime domain. Space and information domain are combined together because cyber aspects of war are not included due to limited space. Of course, it is not possible to cover all nuances of such complex warfare here, but finding key aspects could be beneficial because it allows us to distinguish few factors which really represent current era of warfare. Finally, the implications for the defense capability of the Czech Republic are provided.

1 METHODOLOGY

Methods of a qualitative analysis were employed to assess the ongoing war in Ukraine and to identify preliminary lessons. The qualitative case focuses on conflict from multi-domain perspective¹ which allows to structure the research across recognized operational domain with specific emphasis on land, air, maritime and space aspects of this war.

Moreover, the character of Russo-Ukrainian War is analyzed and compared with the characteristics of different generations of war.² Additionally, the lessons are identified across the political and military spheres of responsibility. The political considerations address non-military elements of comprehensive defense model and are tied to factors like industrial capability, decision making process etc. Thus, the methodological approach provides meaningful content to the whole of government and the whole of society defense policy principles which are being observed in the contemporary defense policy

¹ thus, each of operational domains recognized by NATO has its part in the ongoing conflict and military operations. Effects created in certain domain influence dynamics in the others.

² Using term coined by Lind and then enhance by Hammes carrying the idea that conflicts can be divided into different “generations” depending on the means and tactics used in them. HAMMES, Thomas X. *The Sling and the Stone: On War in the 21st Century*. 2004. Beverly: Voyageur Press. ISBN: 0760320594.

formulation of NATO allies and partners. The military considerations deal with the strategic, operational, and tactical aspects. Open-source data for research has been collected in systemic way since the beginning of war in 2022. Additionally, outcome of several roundtable debates and panel discussions organized by or with the active participation of the Centre for Security and Military Strategic Studies of the University of Defense have been taken in consideration.

2 CHARACTER OF WAR

It's necessary to emphasize once again that despite all rhetoric the Ukrainian conflict is a traditional, conventional war. Russia's aggression is without doubt violation of international law³ and both countries issued mobilization of their citizens. According to quantitative academic method, the criteria for the label "war" have also been met a long time ago.⁴ Although the war could be dogmatically labelled as local conflict with the fighting by conventional units deliberately waged primarily only on the territory of Ukraine, its international impact, the number of various foreign actors involved⁵ and auxiliary effort outside common geographical theater⁶ make the importance of the conflict much more significant.

Moreover, it is war of large-scale and high intensity – both of which have been unseen on European theater since World War II. One of the most telling indicators of that is how resource-intensive the war evolved. Sustaining the tempo of AFU (Armed Forces of Ukraine) during the first six months of the war, the British army would have been able to fight only one week in such conflict.⁷ Of course, it's necessary to take in the account the doctrine and the composition of the forces of engaged militaries, but the amount of used ammunition could be useful indicator for all militaries how demanding peer-to-peer conflict in 21th century can be. Intensity is also reflected in the number of casualties. US general Milley said that Russians lost more than 100,000 combatants already

³ GALBA, Jaroslav, SPIŠÁK, Ján. Speciální vojenská operace v kontextu interpretace Ruska. Vojenské rozhledy. 2023, 32 (1), 050-068. ISSN 1210-3292 (print), 2336-2995 [online]. Available at: www.vojenskerozhledy.cz.

⁴ For instance, Upsalla university characterizes war as „A state-based conflict or dyad which reaches at least 1000 battle-related deaths in a specific calendar year”.

UPPSALA UNIVERSITY. UCDP Definitions. [online]. N. d. [cit. 24. 7.2023]. Available at: https://www.pcr.uu.se/research/ucdp/definitions/#tocjump_25414042883737875_53

⁵ Till 6th July 2023 Ukraine received total sum of about €165 billion of international aid. KIEL INSTITUTE FOR THE WORLD ECONOMY. Ukraine Support Tracker. In: ifw-kiel.de. [online]. N. d. [cit. 24.7. 2023] Available at: <https://www.ifw-kiel.de/topics/war-against-ukraine/ukraine-support-tracker/>

⁶ As cyber-attacks against non-governmental western satellite providers

⁷ ZABRODSKYI, Mykhaylo et al. Preliminary Lessons in Conventional Warfighting from Russia's Invasion of Ukraine: February–July 2022. RUSI Special Report. [online]. Nov 30, 2023, p. 55. Available at: <https://static.rusi.org/359-SR-Ukraine-Preliminary-Lessons-Feb-July-2022-web-final.pdf>

back in January 2023 with Ukrainians casualties reported of being similarly significant.⁸ The sources of NY Times from August estimated with over 500,000 killed or wounded soldiers since the beginning of the invasion.⁹ Without doubt, certain engagements showed that in this war formations of size of battalion or even larger could be destroyed unexpectedly quickly.¹⁰ The rising intensity of the conflict is also illustrated by the heavier and “less-restricted” armaments and methods used in the theater.

“Pre-invasion” balance of power was so heavily skewed in favor of Russia that this probably heavily contributed to the initial estimation that Ukraine will fall in three days. Since then, however, Ukraine proved it could resist Russian forces not only with hit-and-run tactics and modified strongpoint defense,¹¹ but also take initiative and draw main offensive operations. Thus, the war could be described as one with both symmetric and asymmetric elements. Both actors employ non-conventional means and actions¹² across all domains, but the current aim of war indicates traditional warfare between similarly capable parties. Diversity of elements used Ukrainian conflict led to different conclusions to which kind of warfare we are looking at.¹³

Generally, it wouldn't be accurate to label war in Ukraine as that of “fifth generation” because it doesn't capture all the nuances of the conflict.¹⁴ Equally, focusing only on “traditional” characteristics of war wouldn't do it justice. It is more plausible to state that in Ukraine, elements from all generations of warfare can be seen. Attrition warfare on frontline, human “wave” tactics with distant artillery support,¹⁵ extensive field for-

⁸ U.S. DEPARTMENT OF DEFENSE. Transcript: Secretary of Defense Lloyd J. Austin III and General Mark A. Milley Press Conference Following Ukraine Defense Contact Group Meeting, Ramstein Air Base, Germany. In: defense.gov. [online]. Jan 20, 2023. [cit. 24.7. 2023] Available at: <https://www.defense.gov/News/Transcripts/Transcript/Article/3273771/secretary-of-defense-lloyd-j-austin-iii-and-general-mark-a-milley-press-confere/>

⁹ COOPER, Helene et al. Troop Deaths and Injuries in Ukraine War Near 500,000, U.S. Officials Say. In: nytimes.com. [online]. August 18, 2023. [cit. 24.7. 2023] Available at: <https://www.nytimes.com/2023/08/18/us/politics/ukraine-russia-war-casualties.html>

¹⁰ SPIŠÁK, Ján. Vojenské aspekty války na Ukrajině. Vojenské rozhledy. 2022, 31 (4), 103-118. ISSN 1210-3292 (print), 2336-2995 [online]. Available at: www.vojenskerozhledy.cz.

¹¹ As they used to good success. More for instance in: ANDERSON, Michael. How Ukraine's roving Teams of light infantry helped with the battle of Sumy: Lessons for the US Army. In: Modern War Institute. [online]. Jul 17, 2022. [cit. 24.7. 2023] Available at: <https://mwi.usma.edu/how-ukraines-roving-teams-of-light-infantry-helped-win-the-battle-of-sumy-lessons-for-the-us-army/>

¹² Like increasing digital resilience of civil population. FABIAN, Sandor, STRINGER, Kevin and Andrew LIFLYANDCHICK. Simple Sabotage 2.0: the Threat of Pro-Russian Civil Resistance in Ukraine. In: Irregular Warfare Center: Insights. Vol. 1, No. 6., April 2023. Available at: <https://irregularwarfarecenter.org/2023/05/simple-sabotage-2-0-the-threat-of-pro-russian-civil-resistance-in-ukraine/>

¹³ Coming from “new type of warfare” to „World war one with drones“

¹⁴ Hames himself writes about “5GW warfare” mainly in context of anthrax letters attacks in United States. Equally concept attributed to Russia called “New generation warfare” puts an emphasis on the use of non-conventional and non-kinetic means. In all cases, Ukrainian resistance and will to fight invading forces even in large scale combat has made all such efforts unsuccessful.

¹⁵ YANCHIK, Olivia. Human wave tactics are demoralizing the Russian army in Ukraine. In: Atlantic Council. [online]. April 8, 2023. [cit. 24.7. 2023] Available at: <https://www.atlanticcouncil.org/blogs/ukrainealert/human-wave-tactics-are-demoralizing-the-russian-army-in-ukraine/>

tifications¹⁶ and mass fire are still relevant as well as non-linear maneuvers, combined arms operations¹⁷ and strikes to enemy's rear. Private military companies secured an important position for themselves acting sometimes even without further cooperation with regular army,¹⁸ while the role of strategic communication, digital resilience and civil population involvement highly increased.

It is also important to mention, that not all those aspects exist in theater at the same time. Therefore, the Ukraine conflict could be characterized as one with high dynamic. Zabrodskyi et al. distinguished at least three different phases of war till July 2022.¹⁹ Since that, with the Kherson counteroffensive and positional battle of Bakhmut, at least few significant shifts have appeared in operational tempo and in the character of conflict.²⁰ The long-awaited Ukrainian offensive of 2023 (which is still in motion at the time of writing) marks another significant milestone bringing to usage of western heavy armament and struggle for highly fortified positions.

Because of that all, the inconsistency of lessons learned is one of necessary outcomes of the war. Take weapon of tank for an instance; claims have appeared at that start of the war that they are obsolete, based on how they were engaged on battlefield and due to their insufficient protection by other elements of combined arms warfare.²¹ In the spring 2023 the western powers had begun sending tanks to the Ukraine and many adored them as critical assets for mobile offensive.²² According to the Institute for Study of War, the western reluctance to provide tanks (among other systems) was one of reasons why Ukraine didn't have capabilities for major offensive in winter 2022.²³ Dynamism of war

¹⁶ Defensive position in Zaporizhzhia region could be about 120 km long and consist of trenches, dragon teeth, minefields etc.

For more read for instance: BETZ, David J. Russian fortifications present an old problem for Ukraine. In: engelsbergideas.com. [online]. July 20, 2023. [cit. 24.7. 2023] Available at: <https://engelsbergideas.com/essays/russian-fortifications-present-an-old-problem-for-ukraine/>

¹⁷ JONES, Seth G., MCCABE, Riley and Alexander PALMER. Ukrainian Innovation in a War of Attrition. CSIS Briefs. 2023. Available at: <https://www.csis.org/analysis/ukrainian-innovation-war-attrition>

¹⁸ Which escalated in the so called "Prigozin munity" and indicated what degree of initiative and independence these subjects could have. Still further analysis of the events of June 2023 has to be made to come with reliable conclusion.

¹⁹ ZABRODSKYI, Mykhaylo et al. Preliminary Lessons in Conventional Warfighting from Russia's Invasion of Ukraine: February–July 2022. RUSI Special Report. [online]. Nov 30, 2022. Available at: <https://static.rusi.org/359-SR-Ukraine-Preliminary-Lessons-Feb-July-2022-web-final.pdf>

²⁰ The phrases "conflict enters a new phase" or "stage" were omnipresent in media during the end of 2022 and beginning of 2023.

²¹ LEE, Rob. The Tank is not obsolete, and other observations about the future of combat. In: Warontherocks.com. [online]. September 6, 2022. [cit. 24.7. 2023] Available at: <https://warontherocks.com/2022/09/the-tank-is-not-obsolete-and-other-observations-about-the-future-of-combat/>

²² HENKIN, Yagil. The "Big Three" Revisited: Initial Lessons from 200 Days of War in Ukraine. Marine Corps University Press. 2022. [online]. N.d.[cit. 24.7. 2023] Available at: https://muse.jhu.edu/article/869955#info_wrap

²³ KAGAN, Frederick W. et al. Russian Offensive Campaign Assessment, January 29, 2023. In: understandingwar.org. [online]. January 29, 2023[cit. 24.7. 2023] Available at: Russian Offensive Campaign Assessment, January 29, 2023 | Institute for the Study of War (understandingwar.org)

is based on the current objects of actors, means to achieve them, and ways how are those means employed. Both sides are constantly learning and improving. For instance, the dynamics of war also brought more fundamental changes to the Russian military organization as the army seemed to abandon its battalion tactical group (BTG) concept²⁴ at the end of 2022 and has begun to return to divisional structure.²⁵

Finally, as was mentioned, the Russo-Ukrainian war is multi-domain. However, it is important to distinguish between synergic application of Multi-Domain Operations approach through joint usage of forces and means and the simple statement that the parties are competing in multiple domains. The whole concept of Multi-Domain Operations was coined by US army²⁶ and despite being evergreen in the last years, multi-domain is still highly complex and evolving issue which may vary across different branches and countries.²⁷ Therefore, it is not beneficial to dwell on it any further in this article and we will go with “working” NATO definition of MDO which describes it as “the orchestration of military activities, across all domains and environments, synchronized with non-military activities, to enable the Alliance to deliver converging effects at the speed of relevance”.²⁸ Russian military has promoted concepts of its own multi-domain integration, still it is claimed that for combat operations Russia relies on its ground-centric forces and approach.²⁹ It is difficult to evaluate capability of both armies in context of MDO from open sources. However, many analysts question Russian ability to perform such operations in this war, claiming bad coordination of forces as one of main reasons why the initial invasion has failed. This was seen particularly between land and air forces, with

²⁴ Still the problematics of BTG is much more complex. Being praised before invasion, the BTG was often marked as one of main reasons Russian attack failed, claiming they were not designed for large scaled attrition warfare. According to Dalsjö et al. the BTG may not be an innovative design, but rather a temporary solution due to lack of manpower. If proven true that could suggest Russians didn't invade Ukraine with with an inappropriate composition of forces but simply didn't have means to build capable one. DALSJÖ, Robert, JONSSON, Michael and Johan NORBERG. A Brutal Examination: Russian Military Capability in Light of the Ukraine War. In: *Survival*, 64:3, 7-28, DOI: 10.1080/00396338.2022.2078044. 2022. Available at: <https://www.tandfonline.com/doi/pdf/10.1080/00396338.2022.2078044>

²⁵ AP NEWS. Russian military announces plan to expand, create new units. In: *apnews.com*. [online]. December 21, 2022 [cit. 24.7. 2023] Available at: <https://apnews.com/article/putin-finland-sergei-shoigu-ee953abf7f9bf217ccdaa61ec1b35ddd>

²⁶ U.S. ARMY. FM 3-0 Operations. 2022. Washington, D.C.: Department of the Army. Available at: https://armypubs.army.mil/epubs/DR_pubs/DR_a/ARN36290-FM_3-0-000-WEB-2.pdf

²⁷ GREY, Heiner, HEREN, Henry. What is a Multi-Domain Operation? In: Joint Air & Space Power Conference 2019 Read Ahead. 2019. [online]. N.d. [cit. 24.7. 2023] Available at: <https://www.japcc.org/essays/what-is-a-multi-domain-operation/>

²⁸ NATO. Multi-Domain Operations: Enabling NATO to Out-pace and Out-think its Adversaries. In: *nato.int*. [online]. July 2022, 2023. [cit. 24.7. 2023] Available at <https://www.act.nato.int/articles/multi-domain-operations-out-pacing-and-out-thinking-nato-adversaries>

²⁹ BLACK, James et al. Multi-Domain Integration in Defence: Conceptual Approaches and Lessons from Russia, China, Iran and North Korea. 2022. Santa Monica: RAND. P. 14. Available at: https://www.rand.org/pubs/research_reports/RRA528-1.html

the latter unable to provide efficient support for grounded troops.³⁰ Still, the “multi-domain aspects” of conflict are closely followed by western analytics and even US Army has delayed the release of its new Field Manual to verify the outcomes in the Ukraine war.³¹

3 WAR IN DOMAINS

3.1 Land domain

The land domain prevails as the most important theater in the Ukraine conflict – due to both geographical features and means used to achieve desired goals of both actors. Although military innovations are thriving in this war, the ultimate need of “boots on grounds” is still valid with sides deploying ground forces to fight for key nodes and positions. Moreover, insufficient numbers of supporting infantry were stated as one the reasons responsible for Russians gargantuan losses of armored technique.³² According to Oryx, the Russians lost as far as 2146 tanks of all types from T-90M to variants of T-62 till the middle of July 2023.³³ That’s an enormous amount, one that is impossible to sufficiently replace in the proper time. Thus despite the extensive use of precise weapons and modern technology, the scale of Ukrainian war simply doesn’t allow both actors to rely on state-of-the-art arms. In contrary, militaries are forced to deploy older and older equipment as the attrition takes its toll on their arsenal. Obsolete equipment is, of course, much less suited for modern, connected battlefield. It brings lower combat value which in turn results in higher losses of attacker’s forces. Deployment of various arms also increases the logistical burden of sustaining combat readiness. Many Russians models share the same components which makes potential mixed battalions more operational,³⁴ on the other hand, Ukrainians had to maintain 33 different types of tanks just

³⁰ DALSJÖ, Robert, JONSSON, Michael and Johan NORBERG. A Brutal Examination: Russian Military Capability in Light of the Ukraine War. In: *Survival*, 64:3, 7-28, DOI: 10.1080/00396338.2022.2078044. 2022. Available at: <https://www.tandfonline.com/doi/pdf/10.1080/00396338.2022.2078044>

³¹ ROATEN, Meredith. Army Assessing Ukraine Before Finalizing New Doctrine. In: *nationaldefensemagazine.org*. [online]. June 2, 2022. [cit. 24.7. 2023] Available at: <https://www.nationaldefensemagazine.org/articles/2022/6/2/army-finalizing-multi-domain-operations-doctrine-in-ukraine>

³² KOFMAN, Michael, LEE, Rob. Not built for purpose: the Russian Military’s ill-fated force design. In: *warontherocks.com*. [online]. June 2, 2022. [cit. 24.7. 2023] Available at: <https://warontherocks.com/2022/06/not-built-for-purpose-the-russian-militarys-ill-fated-force-design/>

³³ MITZNER, Stijn end JANOVSKY, Jakub. Attack On Europe: Documenting Russian Equipment Losses During The Russian Invasion Of Ukraine. In: *oryxspioenkop.com*. [online]. June 2, 2022. [cit. 20.7. 2023] Available at: <https://www.oryxspioenkop.com/2022/02/attack-on-europe-documenting-equipment.html>

³⁴ AXE, David. Ukraine Is Collecting A Lot Of Russia’s Old T-62 Tanks. In: *forbes.com*. [online]. October 27, 2022. [cit. 24.7. 2022] Available at: <https://www.forbes.com/sites/davidaxe/2022/10/27/ukraine-is-collecting-a-lot-of-russias-old-t-62-tanks/?sh=7c84e77c30a5>

in October.³⁵ With western armor being delivered to Ukraine the maintenance requirements and crew training times will increase even more. Therefore, the ability to adapt and work with diversified means and in international environment seems like a critical capability for any military willing to succeed in modern large-scaled conflict.

Since the beginning of the war non-standard tactical vehicles (commonly known as technical) have appeared in Ukraine, even though those assets are usually associated with guerilla warfare and ill-equipped military. Nevertheless, technical had clearly found its place even in this conventional conflict by providing adaptability, mobility and availability.³⁶ This confirms the multi-layered character of conflict and shows how both actors tries try to improvise³⁷ against rising losses.

Still, the undisputed “god of war” on Ukraine is the artillery. Report from the Ukraine conflict in 2019 claimed that about 80 % of Ukrainian losses were caused by artillery³⁸ and although the similar data from current war are not available, these arms are omnipresent on battlefield. Russia is numerically superior in this field and its artillery is able to create desired effects on battlefield, but it doesn’t provide the kind of operational advantage that the Russian commanders hoped for – this was seen for instance in the battle of Bakhmut.

In war defined by immense quantity (losses, cheap UAS, missile strikes...) the prominence of weapons like HIMARS shows importance of precision and technological superiority over masses. Probably no other weapon gained such renown in this conflict, even when USA provided them in low numbers. It would be inaccurate to see HIMARS as only decisive capability in the conflict³⁹ because in near contact with enemy its classical artillery what brings success.⁴⁰ In the end, the combined arms maneuver of mechanized forces is still irreplaceable in gaining territory in Ukraine⁴¹ and every weapon has its utility.

Nevertheless, the precision firing makes very vulnerable asset from any component of enemy forces. Combined with the constant surveillance above battlefield, it is responsible for what Zabrodskyi et al. label as “no sanctuary” i.e. even targets in the rear could be acquired and destroyed. Because of that, both parties often utilize hit-and-run artillery

³⁵ KOSSOV, Igor. Can Ukraine maintain and optimally use its modern Western tanks? In: kyivindependent.com. [online]. February 27, 2023. [cit. 24.7. 2023] Available at: <https://kyivindependent.com/can-ukraine-make-optimal-use-of-western-tanks-and-attack-vehicles/>

³⁶ Due to civilian nature of vehicle, it is also obtainable through civilian donations, which is another significant aspect of the war.

³⁷ AFU released a footprint with rocket launcher from Russian KA-52 mounted on its technician

³⁸ BIELIESKOV, Mykola. The Russian and Ukrainian Spring 2021 War Scare. In: csis.org. [online]. September 21, 2021. [cit. 24.7. 2023] Available at: <https://www.csis.org/analysis/russian-and-ukrainian-spring-2021-war-scare>

³⁹ its similar situation when the focus was on anti-tank missiles like Javelin.

⁴⁰ KNUTSON, Barry, NEWBOLD, Gregory. The Ukraine war has taught us this: A combined-arms team is essential. In: thehill.com. [online]. May 10, 2022. [cit. 24.7. 2023] Available at: <https://thehill.com/opinion/national-security/3669824-the-ukraine-war-has-taught-us-this-a-combined-arms-team-is-essential/>

⁴¹ Univerzita obrany komentuje. Zdeněk Petráš (CBVSS) k otázce budoucího vývoje. [online]. January 9, 2023. [cit. 4.9. 2023] Twitter post. Available at: <https://twitter.com/UNOBkomentuje/status/1612455969962737664?lang=cs>

tactics, and the critical aim is to neutralize counter-battery radars of the opponent.⁴² Consequently, the capability to perform disperse operations is crucial to avoid unbearable attrition. For example – by using advanced Strom Shadow missiles, Ukrainians were able to destroy Russian ammunition supply point with over 2,500 tons of ammo.⁴³

The imperative to disperse increases geographical distance between troops and in turn raises demands for coordination and communication.⁴⁴ The main factor contributing to have or don't have option for precise strike is electronic warfare. Because of that managing signature of all involved elements on all echelons seems to be crucial on Ukrainian theater – together with the deception and deployment of false targets.⁴⁵ There are already examples of heavy losses inflicted by negligence with cell phones manipulations.⁴⁶

3.2 Air domain

Initial air and missile strikes on Ukraine's key positions at the dawn of invasion are evergreen topic among conflicts analytics. Survival of Ukrainians mobile SAM devices⁴⁷ and inability of Russian Aerospace Forces to achieve air superiority over Ukraine's sky is to date a subject of many explanations. Whether it is due to poorly chosen operational plan and bad target acquisition,⁴⁸ lack of quality and experience between personnel,⁴⁹

⁴² MINISTRY OF DEFENCE. Latest Defence Intelligence update on the situation in Ukraine - 31 March 2023. Twitter post. [online]. March 31, 2023. [cit. 24.7. 2023] Available at: <https://twitter.com/DefenceHQ/status/1641687536564142081>

⁴³ BARNES, Joe. Twitter post. [online]. July 16, 2023. [cit. 24.7. 2023] Available at: https://twitter.com/Barnes_Joe/status/1680494813349642240

⁴⁴ ZABRODSKYI, Mykhaylo et al. Preliminary Lessons in Conventional Warfighting from Russia's Invasion of Ukraine: February–July 2022. RUSI Special Report. [online]. Nov 30, 2022. p. 53-61. Available at: <https://static.rusi.org/359-SR-Ukraine-Preliminary-Lessons-Feb-July-2022-web-final.pdf>

⁴⁵ WATLING, Jack and REYNOLDS, Nick. Meatgrinder: Russian Tactics in the Second Year of Its Invasion of Ukraine. RUSI Special Report. [online]. May 19, 2023. p. 18-19. Available at: <https://static.rusi.org/403-SR-Russian-Tactics-web-final.pdf>

⁴⁶ Like new Year Eve strike on Makiivka barracks where died at least 63 Russian soldiers VERNON, Will and MAISHMAN, Elsa. Makiivka: Russia blames missile attack on soldiers' mobile phone use. In: [bbc.com](https://www.bbc.com/news/world-europe-64159045). [online]. January 4, 2023. [cit. 24.7. 2023] Available at: <https://www.bbc.com/news/world-europe-64159045>

⁴⁷ Zabrodskyi et al. claim that while 75 % of Ukrainian air defense stationary sites were engaged in first 48 hours of invasion, the same could be said only for 10 % mobile ones. ZABRODSKYI, Mykhaylo et al. Preliminary Lessons in Conventional Warfighting from Russia's Invasion of Ukraine: February–July 2022. RUSI Special Report. [online]. Nov 30, 2022. p. 24. Available at: <https://static.rusi.org/359-SR-Ukraine-Preliminary-Lessons-Feb-July-2022-web-final.pdf>

⁴⁸ GOULD-DAVIES, Nigel. Putin's Strategic Failure. In: *Global Politics and Strategy*, vol. 64, 2022 – Issue 2, p. 7-16. Available at: Full article: [Putin's Strategic Failure \(tandfonline.com\)](https://www.tandfonline.com)

⁴⁹ LUZIN, Pavel. Russian Air Power: Vanished or Overstated to Begin With? In: *Eurasia Daily Monitor Volume: 19 Issue: 156*. [online]. October 20, 2022. [cit. 24.7. 2023] Available at: [Russian Air Power: Vanished or Overstated to Begin With? - Jamestown](https://www.eurasiamonitor.com)

depletion of Russian precise-guided munition, decision to not deploy aircraft due to fear of being shot down by enemy or own anti-air defense⁵⁰ or any combination of those reasons, its without doubt that – despite quantitative differences – no party was able to effectively suppress enemy air defense and create a freedom of maneuver in air domain beyond the frontline. Stefanovic et al. even liken the air warfare in Ukraine to World War First and write about “aerial no-man’s-land.”⁵¹

In Ukraine, the air assets don’t have capabilities to perform successful SEAD/DEAD missions to neutralize mobile SAM assets of the opponent.⁵² In combination with Ukrainian decision to apply some tenets from American Agile Combat Employment⁵³ this led to current status quo. Because of that, both parties sustained losses and began to operate their aircraft from relatively safe distance with Russians relying on extensive use of guided missiles and stand-off rocket attacks. Thus so far the Russian Aerospace Forces haven’t yet been able to provide sufficient close-air-support for Ground forces and the same could be said for helicopter hunter-killer missions. These were targeted by western Javelins and Starstreaks which forced Russians gunships to indirect rocket fire with unguided munition using grid square targeting.⁵⁴

Moreover, contrary to western tradition, Ukrainians were able to conduct two major offensives⁵⁵ without air superiority provided by enhanced aircraft. Instead, they used its anti-air assets to limit Russian Aerospace Forces operational space, employed deception and relied on ground forces.⁵⁶

This may suggest that the wars are turning back to the ground-centric approach with the emphasis on protection of forces and denial. This was often cited as one of the reasons why Ukraine doesn’t need to receive F-16s fighters. Bremer and Grieco see Ukrainian successes based not in Russian shortcomings but rather in general shift from

⁵⁰ WISWESSER, Sean M. Potemkin on the Dnieper: The Failure of Russian Airpower in the Ukraine war. In: *Small Wars & Insurgencies*. 2023. Available at: <https://www.tandfonline.com/doi/full/10.1080/09592318.2023.2187201?scroll=top&needAccess=true&role=tab&aria-labelledby=full-article>

⁵¹ STEFANOVIC, Michael et al. The Somme in the sky: Lessons from the Russo-Ukrainian Air War. In: *warontherocks.com*. [online]. February 9, 2023. [cit. 24.7. 2023] Available at: *The Somme in the Sky: Lessons from the Russo-Ukrainian Air War - War on the Rocks*

⁵² Bronk adds to this with warning that even western Air Forces with US Air Forces as exemption didn’t build this capability enough. BRONK, Justin. Getting Serious About SEAD: European Air Forces Must Learn from the Failure of the Russian Air Force over Ukraine. In: *RUSI*. [online]. April 6, 2022. [cit. 24.7. 2023] Available at: *Getting Serious About SEAD: European Air Forces Must Learn from the Failure of the Russian Air Force over Ukraine | Royal United Services Institute (rusi.org)*

⁵³ PAPPALARDO, David. ir superiority in Ukraine: Be sensitive to Diagoras’s problem. In: *atlanticcouncil.org*. [online]. August 30, 2022. [cit. 24.7. 2023] Available at: *Air superiority in Ukraine: Be sensitive to Diagoras’s problem - Atlantic Council*

⁵⁴ BRONK, Justin. Getting Serious About SEAD: European Air Forces Must Learn from the Failure of the Russian Air Force over Ukraine. In: *RUSI*. [online]. April 6, 2022. [cit. 24.7. 2023] Available at: *Getting Serious About SEAD: European Air Forces Must Learn from the Failure of the Russian Air Force over Ukraine | Royal United Services Institute (rusi.org)*

⁵⁵ Charkov and Krehson

⁵⁶ BREMER, Maximilian and GRIECO, Kelly. Success denied: Finding ground truth in the air war over Ukraine. In: *Defensenews.com*. [online]. September 21, 2022. [cit. 24.7. 2023] Available at: *Success denied: Finding ground truth in the air war over Ukraine (defensenews.com)*

attack to defense.⁵⁷ Still it would be wrong to consider air domain in Ukraine war as secondary. Although the domain isn't as dynamic and decisive as in earlier conflicts with western engagement, that doesn't mean it's not vital. On the contrary – losing the capability to deny enemy air presence in its own airspace could cost any side a victory. Still, the Ukrainians believe that air assets are still invaluable in offensive operations. Chief of the Ukrainian Air Force Oleshchuk⁵⁸ said that “concepts of Air Power, Air-Land Battle, and Multi-Domain Operations are actual as never before” and that “this war already has the name ‘the artillery war’, but this is a consequence rather than a conscious choice.”

Another significant characteristic of Ukraine war is proliferation of unmanned aerial systems (UAS). The last spring estimate talked about 6,000 pieces on Ukrainian side.⁵⁹ While current number of drones deployed in theater is impossible to determine, we could still identify three key aspects of their usage in this war: proliferation on all levels and echelons, democratization of technology and increasing importance of them in the waging of war. Firstly, the Russo-Ukrainian War shows rapid proliferation of UAS across militaries of both actors. Even small units like militia components often have their own air surveillance capability which could lead to tactical advantage in local combat. While the overall idea is covered by the project “Army of Drones” on Ukrainian side, its tactical execution often relies on small strike companies, which receives Starlink stations and drones. Secondly, next to the military UAS like Orlan-10 or Bayraktar Bt-2, growing numbers of commercial drones and quadcopters are deployed in combat. While at least some of those cheap models can fulfil some tasks, they are vulnerable to electronic warfare and usually have very low survivability in contested environment. Ukrainians are therefore afraid that current Russian progress in jamming countermeasures will mitigate operational awareness provided by those drones.⁶⁰ Still the civil models from foreign manufactures are constantly used by both sides. However, it remains uncertain whether Russia integrated them to its military intentionally before the invasion or has begun to use them after it to cover its losses⁶¹ in same way how they acquired Iranians UAS. Either way, both actors undoubtedly believe that is better for their operations to have *any* drones than to not have them at all. That's because (thirdly), almost every military action in Ukraine requires participation of UAS. They are used for ISR, electronic warfare, isolation

⁵⁷ Success denied: Finding ground truth in the air war over Ukraine (defensenews.com)

⁵⁸ OLESHCHUK, Mykola and SHAMKO, Viacheslav. Air Power in the Russian-Ukrainian War: Myths and Lessons Learned. View from the Command Post. IN: The Journal of JAPCC, edition 35. [online]. 2023. [cit. 24.7. 2023] Available at: <https://www.japcc.org/articles/air-power-in-the-russian-ukrainian-war-myths-and-lessons-learned/>

⁵⁹ BURGESS, Matt. Small Drones Are Giving Ukraine an Unprecedented Edge. In: wired.com. [online]. May 6, 2022. [cit. 24.7. 2023] Available at: Small Drones Are Giving Ukraine an Unprecedented Edge | WIRED

⁶⁰ SABBAGH, Dan, MAZHULIN, Artem. ‘They’re starting to die’: fears Ukraine’s drone supremacy may soon be over. In: theguardian.com [online]. April 10, 2023. [cit. 24.7. 2023] Available at: <https://www.theguardian.com/world/2023/apr/10/in-war-there-are-no-emotions-ukraine-drone-squads-bakhmut>

⁶¹ BEDNETT, Samuel, EDMONDS, Jeffrey. Russian Military Autonomy in Ukraine: Four Months In. CNA Occasional Paper. [online]. 2022 [cit. 24.7. 2023] Available at: <https://www.cna.org/reports/2022/07/Russian-Military-Autonomy-in-Ukraine-Four-Months-In.pdf>

of war zones, to point-attacks against various targets or to broadly serve as force multipliers. UAS were also crucial for coordination Wagner-group tactics and also provide necessary information to territorial defense. From news and reports it seems that UAS are key to everything in Ukraine, but the aforementioned vulnerability raises questions how effective low-tier commercial drones would be against prepared and layered defense in future conflicts.

In the utility space between UAS and missiles could be placed loitering munition. Another important mark of the Ukraine war. As with any another weapons, the use of loitering munition in Ukraine is not revolutionary *per se*, but rather because of numbers of it used in the conflict. The length of the article doesn't allow to discuss issue properly, but it is without doubt that loitering munition is used *at masse* since the very beginning of the conflict.⁶² Above tactical level, the Russians have started to use cheap, long ranged loitering munition called "Geraň 2"⁶³ as an asset in their bombardment campaign as substituent for depleting storages of missiles. Firstly, the Russian loitering munition had been used against valuable point targets of the enemy, but then coordinated attacks against critical infrastructure began from October.⁶⁴ Thus it could be said that Russian military sees the loitering munition as asset able to provide it strategic advantage in situation when conventional offensive reached its culmination point. While the strikes achieved to decommission about 40% of Ukrainian energetic infrastructure in November 2022, they didn't have impact of dynamics of grounded warfare so far.

Either way, the democratization of air space and increasing number of inexpensive air weapons has led to increased demand for number of anti-air assets with cheap effectors to do defense against UAS and loitering munition more cost effective and widespread. Thus, among other military aid the mobile rapid-fire assets were sent and used with significant effect at Ukraine despite being considered as morale obsolete before the current conflict had even started.⁶⁵

⁶² USA decided to provide first delivery of switchblade loitering munition to Ukraine in March 2022

MCLEARY, Paul, WARD, Alexander. U.S. sending Switchblade drones to Ukraine in \$800 million package. In: politico.com [online]. March 16, 2022. [cit. 24.7. 2023] Available at: <https://www.politico.com/news/2022/03/16/us-sends-switchblade-drones-to-ukraine-00017836>

⁶³ Identified by experts as Iranian Shahed-136

⁶⁴ KAGAN, Frederick W. et al. Russian Offensive Campaign Assessment, January 29, 2023. In: understandingwar.org. [online]. January 29, 2023 [cit. 24.7. 2023] Available at: Russian Offensive Campaign Assessment, January 29, 2023 | Institute for the Study of War (understandingwar.org)

⁶⁵ Success rate claimed by Ukraine against Shahed 136 varied from 50-85 %. Probably because of that Russians started to use them simultaneously with cruised missiles and know with decoys.

RUBIN, Uzi. Russia's Iranian-Made UAVs: A Technical Profile. In: rusi.org [online]. January 13, 2023. [cit. 24.7. 2023] Available at: <https://rusi.org/explore-our-research/publications/commentary/russias-iranian-made-uavs-technical-profile>

3.3 Maritime domain

On the eve of invasion, the Ukrainian navy was the most poorly armed branch of the AFA.⁶⁶ Still in the 2022 Russian Black fleet was unable to achieve sufficient operational victory despite the other party's lack of capabilities for direct maritime confrontation.⁶⁷ However, with the combination of mines, missiles and land-based artillery the Ukrainians established denial sea zone in the area west of Crimea. According to Yakymiak⁶⁸ no Russia warship has come within 80 kilometers of the coast after the Essen frigate was hit on 2nd April last year. It's worth to mention here two most visible Ukrainian victories in naval domain as well: sinking the cruiser Moskva (14th April 2022) and raid on Sevastopol naval base (29th October 2022). While the first happened mainly due to insufficient coordination between different elements of Russian military,⁶⁹ the second reached widespread attention because of the engagement of maritime unmanned systems which damaged number of warships protected by defensive system of the base. Moreover, the Ukrainians repeated the pattern in March 2023⁷⁰. Still some analytics remain calm, calling the raid "tactically innovative but not revolutionary" because the way those means were engaged was relatively standard.⁷¹ However those actions underline the relevancy of asymmetrical warfare in naval domain.

Overall, it could be added that despite the technological progress traditional means like mines are still relevant in modern naval warfare and non-dedicated artillery pieces could be used against naval targets as well.⁷² Ukrainian defensive strategy during the last year significantly reduced area for combat maneuver on the sea a thus limited operational freedom of Black fleet. Although the maritime domain could be considered as

⁶⁶ ZABRODSKYI, Mykhaylo et al. Preliminary Lessons in Conventional Warfighting from Russia's Invasion of Ukraine: February–July 2022. RUSI Special Report. [online]. November 30, 2022. p. 21. [cit. 24.7. 2023] Available at: <https://static.rusi.org/359-SR-Ukraine-Preliminary-Lessons-Feb-July-2022-web-final.pdf>

⁶⁷ GERMOND, Basil. Ukraine: Russia's inability to dominate the sea has changed the course of the war. In: navylookout.com. [online]. February 24, 2023. [cit. 24.7. 2023] Available at: <https://www.navylookout.com/ukraine-russias-inability-to-dominate-the-sea-has-changed-the-course-of-the-war/>

⁶⁸ YAKYMIK, Stepan. Hybrid and War Actions of the Russian Federation at Sea: Lessons learned, cooperative countering and prospectives. [online]. 2023. [cit. 24.7. 2023] P. 75, Available at: 420754 (srce.hr)

⁶⁹ AKAR, Furhan. Analysis of the Sunken Russian Cruiser Moskva and Implications for Russia and the World Navies. In: Horizon Insights, Vol. 5, issue 2. [online]. 2022. [cit. 24.7. 2023] Available at: <https://behorizon.org/wp-content/uploads/2022/11/Horizon-Insights-Journal-Volume-5-Issue-2.pdf#page=5>

⁷⁰ Although apparently without success MINISTRY OF DEFENCE. Latest Defence Intelligence update on the situation in Ukraine - 27 March 2023. Twitter post. [online]. March 27, 2023. [cit. 24.7. 2023] Available at: <https://twitter.com/DefenceHQ/status/1640230743627497474>

⁷¹ PALATANO, Alessio. Ukraine's drone raid on Russian naval base was tactically innovative but not revolutionary. In: aspistrategist.org.au. [online]. November 10, 2022. [cit. 24.7. 2022] Available at: Ukraine's drone raid on Russian naval base was tactically innovative but not revolutionary | The Strategist (aspistrategist.org.au)

⁷² <https://www.heritage.org/asia/report/applying-lessons-the-naval-war-ukraine-potential-war-china>

less important from operational perspective in this conflict, the outcomes of naval are directly connected to other domains; Ukrainian denial made potential large-scaled amphibious operation in western Ukraine highly implausible despite the fact that Russians have capabilities for such task.⁷³ In return, they performed only minor operations on tactical scale to date.⁷⁴ That also reduced the number of attack vectors for critical infrastructure-bombing campaign because Russian warships couldn't engage inland targets from closer range. On the other hand, the Russian naval presence still ties Ukrainian ground forces as a reserve against potential maneuver in southern axes and limits their deployment somewhere else at the theater.

The battle for Black Sea has also consequences in broader geopolitical scale. Not only is the regional maritime security vital interest for at least three NATO countries, but also are "grain corridors" critical to keep global food market stable. Both of those issues are beyond the aim of the article but further illustrate the importance of maritime domain of the conflict. It is not without risk to predict future development, but certain American senior officers expect naval activities to further decrease due to mentioned characteristics of maritime war.⁷⁵ Nevertheless both parties have already showed that they can change operation tempo and if the militaries turn their focus nearer to Crimea, naval aspect of conflict could rise in dynamics again.

3.4 Space and information domain

Although it wasn't declared as operational domain by NATO until 2019,⁷⁶ space domain is considered critical to combat operations success at least since Desert Storm⁷⁷ and this claim is proved in Ukraine war as well. Despite Ukraine not having any space assets

⁷³ Wasielewski just before invasion stated that Russia has capability to transport two BTGs. WASIELEWSKI, Philip. The Feasibility of Russian Amphibious Operations against Ukraine. In: Marine Corps Gazette. [online]. January 2022. [cit. 24.7. 2023] Available at: <https://mca-marines.org/wp-content/uploads/The-Feasibility-of-Russian-Amphibious-Operations-against-Ukraine.pdf>

⁷⁴ MILLS, Walker, HECK, Timothy. What can we learn about amphibious warfare from a conflict that has had very little of it? A lot. In: Modern War Institute. [online]. April 22, 2022. [cit. 24.7. 2023] Available at: <https://mwi.usma.edu/what-can-we-learn-about-amphibious-warfare-from-a-conflict-that-has-had-very-little-of-it-a-lot/>

⁷⁵ KATZ, Justin. Naval warfare poised to play smaller role in year 2 of Ukraine war. In: breakingdefense.com. [online]. February 24, 2023. [cit. 24.7. 2023] Available at: <https://breakingdefense.com/2023/02/naval-warfare-poised-to-play-smaller-role-in-year-2-of-ukraine-war/>

⁷⁶ CARAI, Gianluca. The 'Land Approach' to the Space Domain: Developing Space Expertise in Land Forces. In: The Journal of the JAPCC, edition 32. 2021. Available at: <https://www.japcc.org/articles/the-land-approach-to-the-space-domain/>

⁷⁷ VERGUN, David. Space Domain Critical to Combat Operations Since Desert Storm. In: defense.gov. [online]. March 19, 2021. [cit. 24.7. 2023] Available at: <https://www.defense.gov/News/News-Stories/Article/Article/2543941/space-domain-critical-to-combat-operations-since-desert-storm/>

on its own, Burbach labels conflict as the “first two-sided space war.”⁷⁸ That’s because western support (both governmental and commercial) allows Ukraine to use foreign capabilities for its own operational purposes. It is risky to evaluate to which extend the sophisticated technology and information are provided from open-source perspective, but the consensus among analytics is that this information is highly crucial for Ukrainian ability to resist the invasion.⁷⁹ The “space war” in Ukraine conflict is not directly kinetic but due to enhancement of communications, ISR, positioning and navigation it allows to grant relative advantage to one of the actors on the theater. Beyond that, space assets provide important tool for revealing war crimes or assessing destruction of civil infrastructure.⁸⁰ The Ukrainian war from space perspective is characterized by strong private participation with Ukraine receiving over 25,000 Starlink terminals since the beginning of the war. The service itself has become active in the country only few days after invasion, providing resilient and secure communication tool with no delay.⁸¹

What is probably more critical is the way how Ukrainian side uses intel and communication channels provided. That’s when necessity from asymmetry is turned into advantage because Ukrainians rely on innovative domestic assets to match Russian material superiority. One of key aspects is system GIS ARTA, which integrates provided data and converts them to precise artillery coordinates in real time. That dramatically increases Ukrainian OODA loop and gives tactical advantage against slower Russian kill-chain.⁸²

Regardless, the observers and media should not see Ukrainian military as completely transformed from post-soviet army to modern futuristic force. It still lacks critical capabilities; many arms are identical with the Russian ones and reported lack of government support hinders the application of volunteering innovations.⁸³ On the other hand, at least in space domain the Russian capabilities are definitely lacking. Despite having 102 military satellites, only two of them are optical intelligence spacecraft (Persona No. 2

⁷⁸ BURBACH, David T. Early lessons from the Russia-Ukraine war as a space conflict. In: Atlanticcouncil.org. [online]. August 30, 2022. [cit. 24.7. 2023] Available at: Early lessons from the Russia-Ukraine war as a space conflict - Atlantic Council

⁷⁹ SCHMITT, Benjamin. The Sky’s Not the Limit: Space Aid to Ukraine. In: cepa.org. [online]. May 19, 2022. [cit. 24.7. 2023] Available at: <https://cepa.org/article/the-skys-not-the-limit-space-aid-to-ukraine/>

⁸⁰ Ibid.

⁸¹ According to the Ukrainian minister Fedorov about 150,000 people used Starlink daily at the spring of 2022; AYAN, Arda, LADD, Brian. The Impact of Commercial Space in Times of Conflict: From a Fortuitous Boost to a Potential Solution. In: The Journal of the JAPCC, edition 35. [online]. 2023. Available at: <https://www.japcc.org/articles/the-impact-of-commercial-space-in-times-of-conflict/>

⁸² KOBZAN, Sergiy Markovych. GIS for the Armed Forces of Ukraine. Two Components of Victory. [online]. 2022. [cit. 24.7. 2023]. Available at: https://www.researchgate.net/publication/362423300_GIS_FOR_THE_ARMED_FORCES_OF_UKRAINE_TWO_COMPONENTS_OF_VICTORY

⁸³ JONES, Seth G., MCCABE, Riley and Alexander PALMER. Ukrainian Innovation in a War of Attrition. CSIS Briefs. 2023. Available at: <https://www.csis.org/analysis/ukrainian-innovation-war-attrition>

and No. 3).⁸⁴ Because of that, Zabrodskyi et al.⁸⁵ consider insufficient battle damage assessment as critical weakness in Russian strike campaign, claiming that Russian Aerospace Forces probably overestimated its own satellites and their low numbers at the orbit. Apparently, Russians began to buy private satellite pictures on world market in April 2022⁸⁶ to improve their situational awareness. From that we can see that this is the issue Moscow started the war with, not something that appeared due to counter-operations of enemy. According to Bremer and Grieco⁸⁷ the insufficient resolution of Russian satellites helped Ukrainian army during two grand counter-offensives last year. Due to air-denial mentioned above, Russians couldn't rely on their air ISR and because their satellites were unable to provide intel in real time, the Ukrainian forces could perform maneuver with the use of deception.

That is surprising, considering fact that attempt to gain information dominance is part of Russian's Armed Forces military doctrine⁸⁸ and that Russian Aerospace Forces showed capability to use imagery and electronic warfare reconnaissance satellite for its sorties in Syria. However, Shoigu stated at the end of 2022 that "over 500 US and NATO space vehicles, including over 70 military and the rest being of dual purpose, are working in the interests of the Ukrainian Armed Forces."⁸⁹ Thus, Russian military probably reflects the balance of power in space domain and considers western support as a threat to their military efforts. Future dynamics in this regard can set critical precedent for the security of space domain not only for state actors not directly participating in armed conflict, but also for private ones. Russian foreign ministry warned in October 2022 that commercial satellites "may become a legitimate target for retaliation."⁹⁰ Although attacks against space infrastructure already happened till date it wasn't done by kinetic means which Russians claims to possess.

⁸⁴ LUZIN, Pavel. Russia's Space Satellite Problems and the War in Ukraine. In: Jamestown.org. [online]. May 24, 2022. [cit. 24.7. 2023] Available at: <https://jamestown.org/program/russias-space-satellite-problems-and-the-war-in-ukraine/>

⁸⁵ ZABRODSKYI, Mykhaylo et al. Preliminary Lessons in Conventional Warfighting from Russia's Invasion of Ukraine: February–July 2022. RUSI Special Report. [online]. November 30, 2022. p. 25. [cit. 24.7. 2023] Available at: <https://static.rusi.org/359-SR-Ukraine-Preliminary-Lessons-Feb-July-2022-web-final.pdf>

⁸⁶ Ibid.

⁸⁷ BREMER, Maximilian and GRIECO, Kelly. Success denied: Finding ground truth in the air war over Ukraine. In: Defensenews.com. [online]. September 21, 2022. [cit. 24.7. 2023] Available at: Success denied: Finding ground truth in the air war over Ukraine (defensenews.com)

⁸⁸ SUESS, Juliana. Space and the Future of War According to Russia. In: rusi.org. [online]. November 21, 2021. [cit. 24.7. 2023] <https://rusi.org/explore-our-research/publications/commentary/space-and-future-war-according-russia>

⁸⁹ PRESIDENT OF RUSSIA. Meeting of Defence Ministry Board. In: kremlin.ru. [online]. December 21, 2022. [cit. 24.7. 2023] Available at: <http://www.en.kremlin.ru/events/president/transcripts/70159>

⁹⁰ BINGEN, Kari A., JOHNSON, Kaitlyn and Zhanna Malekos SMITH. Russia Threatens to Target Commercial Satellites. In: csis.org. [online]. November 10, 2022. [cit. 24.7. 2023] <https://www.csis.org/analysis/russia-threatens-target-commercial-satellites>

4 IMPLICATIONS FOR THE CZECH REPUBLIC DEFENSE PROVISION

Identifying lessons at the contemporary stage of research of the war in Ukraine is a risky but necessary endeavor, because current dynamics calls for swift adaptation of our security and defense strategy, reinforcement of security and defense system, rapid enhancement of our armed forces capabilities and capacities. This effort is undoubtedly work in progress since the annexation of Crimea in 2014, but it took on urgency after Russia's invasion of Ukraine in February 2022.

The outlined observations and recommendations in this article are comprehensive and identified across political and military lines. Nevertheless, they are preliminary and should not be understood as exhaustive.

The point of departure for the identification of future policy recommendations is that after more than three decades of convenient security environment the Czech Republic must invest significant amount of resources to prepare the entire state for potential high intensity and prolonged conflict with technologically advanced enemy.⁹¹ Credible deterrence and defense of the Czech Republic in evolving strategic context requires also meaningful political investment since the societal mindset has been heavily influenced by the enormous peace dividends being taken after the end of the Cold War.⁹²

4.1 Political considerations

- The complexity and intensity of war in Ukraine has demonstrated the scope of challenges for strategic defense management. The instrument must ensure strong political and military leadership, resolve, resilience, preparedness, and effective coordination reflecting the higher level of defense complexity embracing both military and non-military elements of national power. It is of the utmost importance to expand defense concept based on its traditional military element to the whole of government and whole of society approach to defense. Outsourcing of national defense via relatively small professional armed forces is not an option in contemporary strategic landscape. On contrary, every inhabitant and private businesses should also contribute to country's defense and must be adequately prepared for this demanding role. This is reality in Ukrainian context where resilience of industry and support and active participation of population on war effort remain key elements which help to mitigate Russian offensive.
- One important line of effort rests with the necessity to speed up the critical process of legal framework adaptation to allow timely decision making and effective

⁹¹ MZVČR. April 19, 2022. Security Strategy of the Czech Republic 2023. In: mzv.cz. [online]. Nedat. [cit. 4.9. 2023] Available at: Security Policy | Ministry of Foreign Affairs of the Czech Republic (mzv.cz)

⁹² COHEN, Patricia, ALDERMAN, Liz. The 'Peace Dividend' Is Over in Europe. Now Come the Hard Tradeoffs. In: Nytimes.com. [online]. May 3, 2023. [cit. 4.9. 2023] Available at:

reaction in case of conflict eruption. Rational cooperation with the private industry and research institutions including academia is of the utmost importance to ensure security of supply, life-cycle support and faster innovation. The most significant criteria for decision making when it comes to legal framework adaptation become effectiveness, security, preparedness, resilience, decision making autonomy. Criteria as efficiency and affordability should play secondary role for future defense policy formulation and its implementation. However, wasting of scarce resources must be avoided.

- The war in Ukraine might be labeled as a local conflict with global implications. It provides numerous evidence how fragile our globalized economy and long supply chains are and how any sort of dependencies on troubling and unreliable partners limits our decision-making autonomy. Comprehensive strategy embracing orchestration of all elements of national power and clearly defined strategic interests and priorities of state might be the correct response to this challenge.
- Conflict also brought a paradigmatic shift in defense provision of the Czech Republic and its Allies. Defense has become priority on political agenda. War in Europe has influenced discourse of public debate and stands of our inhabitants. The opinion surveys in the Czech Republic prove that majority of population supports the NATO membership.⁹³ The armed forces belong among the most trusted public institutions in the Czech Republic. Moreover, about half of the population supports increases in defense spending and investments in defense modernization. While the trend is improving, the relatively low willingness of young population to actively contribute to country defense is worrying. Effective defense policy response may require the enhancement of capabilities and proper orchestration of strategic communication instrument to successfully mitigate both state and non-state actors' propaganda and impact of adversaries' influence operations and disinformation campaign.⁹⁴
- The war has also underlined necessity for strong and cohesive collective response. Russia's direct military invasion of Ukraine caused strategic shock for many political leaders in Europe and put the Euro-Atlantic security and prosperity at stake. Further erosion of defense capabilities and capacities of the European pillar within NATO would constitute unacceptable level of risks. In this regard, the Czech Republic must pool its fair burden on collective defense and fulfil its international commitments towards its allies and partners.⁹⁵

⁹³ ČTK. S členstvím v NATO souhlasí nejvíc Čechů od roku 1994. In: novinky.cz. [online]. April 19, 2022. [cit. 4.9. 2023] Available at: <https://www.novinky.cz/clanek/domaci-s-clenstvim-v-nato-souhlasi-nejvic-cechu-od-roku-1994-40394259>

⁹⁴ PROCHÁZKA, Josef. Válka na Ukrajině a kolektivní obrana ČR. [příspěvek]. Česká sociologická společnost, 2023, 11 s. ISSN 2788-1679.

⁹⁵ PROCHÁZKA, Josef, GALBA, Jaroslav, SPIŠÁK, Ján, POTOČNÁK, Adam. Panelová diskuze „Reflexe války na Ukrajině a její další vývoj“. Brno, Česká republika. 22.2.2023. Workshop.

4.2 Military considerations

- Escalation of war at the eastern flank of NATO would require use of forces beyond the capabilities of professional Armed forces in peace time establishment structure. It is recognized that there is no warning time as well as no time for preparation. It means that Czech Republic must be prepared to mobilize resources like people and material and prepare reserves well before such crisis may arise. The character of Russo-Ukrainian War demonstrates enormous demand on ammunition and industrial capacities to deliver it in time of relevance. However, the supplies of military material in the West are very limited and the demands of high-intensity conflict thus exceed the productive capacity of today's industry. According to third-party sources, in autumn of 2022 the Russians fired about 20,000 artillery rounds per day while Ukraine managed about 7,000.⁹⁶ Also, the United States had delivered over 8,000 javelin anti-tank systems to the Ukraine till the September 2022 which is more than their industry managed to produce in seven years.⁹⁷ Therefore in the case of large-scale armed conflict, the industry must be able to switch to war production and provide sufficient support towards Armed Forces effort while existing stocks are being drawn down. This requires building new industrial capabilities that have been lost in the past.
- Together with that, it's necessary to rebuild capabilities designed to territorial defense of the Czech Republic. These include strengthening of civil and anti-air defense, resilience of critical infrastructure and ensuring the capacities of the health system. Russian bombardment campaign against Ukrainian rear demonstrated how critical flexible and affordable air defense is for resilience of whole system. Essential is also readiness and availability of reserves which are developed exclusively on voluntary basis.
- Czech Republic must be able to provide Host Nation Support and secure facilities for allied operating troops. Moreover, in the case of conflict according to article 5 of North Atlantic Treaty, part of army will be deployed abroad in international environment because joint effort would be necessary for modern large-scale war on eastern flank of the Alliance. Interoperability thus remains as key desired goal in Armed Forces development.
- As mentioned above, the future conflict may be the one where Armed forces must use weapon assets from different generations or from different providers and therefore its necessary to build integration system tying all those capabilities under joint effort. This implies a requirement for the rapid completion of the ongoing

⁹⁶ KUBE, Courtney. Russia and Ukraine are firing 24,000 or more artillery rounds a day. In: nbcnews.com. [online]. November 11, 2022. [cit. 24.7. 2023] Available at: <https://www.nbcnews.com/politics/national-security/russia-ukraine-war-ammo-rcna56210>

⁹⁷ CANSIAN, Mark. Is the United States Running out of Weapons to Send to Ukraine? In: csis.org. [online]. September 11, 2022. [cit. 4. 9. 2023] Available at: <https://www.csis.org/analysis/united-states-running-out-weapons-send-ukraine>

modernization of Czech Armed forces and acceleration of the research cycle in Czech Republic.

- The war in Ukraine confirmed increasing importance of space, cyber and cognitive domain as well as crucial competition on electromagnetic spectrum. Access to information and data processing from all domains are key to improving command and control chain in operations and thus should be priority for farther development of Armed Forces.⁹⁸ AI is vital in this field. To mitigate same capability on enemy's side, the army needs to put emphasize on means of deception in various domains, dispersion of unit components, high mobility and protection of forces. This is of ultimate importance mainly in contested environment, where "tail" may be as vulnerable as "tooth"
- Finally, the vast number of UAS has been deployed and engaged in Ukraine⁹⁹ which indicates the limits of Czech Armed Forces in this field. To maintain capability to operate in air domain with assets smaller than manned aircraft for longer time, the army needs multiples more drones than it currently possesses. Moreover, this UAS should be distributed to the lowest possible echelons.

CONCLUSION

Based on research results, the main finding is the presence of various aspects of all recognized war generations and their characteristics in this particular conflict. In addition, the research confirms with some level of certainty that there are several new elements demonstrating an evolving character of warfare.

Authors could conclude that the War in Ukraine is a large-scale, multidomain and conventional conflict with both symmetric and asymmetric elements and with wide diversity of means and evolving tactics from both sides. It embraces decades-old weapons and troops fighting in trenches as well as space satellites and cyber assets. Sophisticated and expensive weapon systems of 21st century are employed alongside with commercial or dual use assets. Real time and accurate information have become absolutely crucial determinant for gaining the advantage over the adversary. While at the same time, the Russian invasion is without doubt attrition war and thus requires societal resilience, high morale, sustainable manufacturing capacities and expenditure of an extreme amount of national resources.

Finally, various lessons were identified for both the Czech Republic and its Armed Forces. The authors mainly emphasized need to accept crucial political and military commitment taking into account the possibility that Czech Republic may become involved in such large-scale conflict. Therefore, it requires investment into sufficient legislative,

⁹⁸ CRHONEK, Pavel et al. Operating Environment. [online]. 2022. Brno: UN. Available at: https://lib.unob.cz/UNOB_EN/CSMSS/Publications/Operating%20Environment_2021-2022.pdf

⁹⁹ And their limited survivability

organizational, and resilient environment to build up all the main areas of military capabilities with the aim to prevail in intense modern war as a competent ally.

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