Edited by
Mykhailo Koval

THEORETICAL AND APPLIED ASPECTS OF THE RUSSIAN-UKRAINIAN WAR: HYBRID AGGRESSION AND NATIONAL RESILIENCE

Technology Center

2023

Reviewers:
Mykola Dieniezhkin, Doctor of Military Sciences, Professor, Central Research Institute of the Ukrainian Armed Forces;
Yurii Punda, Doctor of Military Sciences, Senior Researcher, National Defence University of Ukraine;
Pavlo Hrytsai, PhD, Senior Researcher, National Defence University of Ukraine;
Victor Pavlenko, Phd, Center for Security Studies of the National Institute for Strategic Studies.

T44   **Scientific editor:** Mykhailo Koval
Executive editor: Valerii Hordiichuk, Nina Andriianova
Authors: Mykhailo Koval, Andrii Ivashchenko, Vasyl Telelym, Tobias Sæther, Dmytro Fedianovych, Tetiana Uvarova, Valerii Hordiichuk, Nina Andriianova, Oleksandr Peredrii, Mykola Shpura, Volodymyr Ilchenko, Olha Demeshok, Oleksandr Ustymenko, Mykola Shaptalenko, Iryna Zahorka, Mykhailo Lobko, Pavlo Shchypanskyi, Andrii Koretskyi, Vasyl Shvaliuchynskyi, Serhii Pochynok, Volodymyr Prymirenko, Oleksandr Malkov, Oleksandr Yanenko, Olena Korshets, Volodymyr Horbenko, Stepan Yakymiak, Petro Snitsarenko, Yurii Sarychev, Vitalii Hrytsiuk, Dmytro Viter, Iryna Izhutova, Volodymyr Shubin, Oleksandr Voitko, Volodymyr Rakhimov, Olha Pashkova, Ihor Pidopryhora, Andrii Biliuha, Vitalii Bidnyi, Valeri Hrytsiuk, Rostyslav Pyliavets, Volodymyr Kydon, Maryna Semenkova, Oleksandr Kotliarenko, Liudmyla Prypolova, Radion Tymoshenko, Anatolii Pavlikovskyi

Theoretical and applied aspects of the Russian-Ukrainian war: hybrid aggression and national resilience: monograph / M. Koval and others. – Kharkiv: TECHNOLOGY CENTER PC, 2023. – p. 372

The monograph reports the results of a study on the search for countermeasures in a hybrid war, in particular, in the war waged by Russia against Ukraine: generalized strategies for conducting and countermeasures in a hybrid war; strategic aspects of the Russian-Ukrainian war are analyzed; a domain-to-domain analysis of the Russian-Ukrainian war's features on land, in the air, at sea, in information space (in particular, cyberspace) was carried out; informational, social, legal, and historical aspects of the Russian-Ukrainian hybrid war were investigated.
The monograph was prepared on the basis of materials from the research work "Improving the Theoretical Foundations of Countering Hybrid Warfare" (State registration number: 0122U200490) within the framework of the Ukraine-NATO Platform for Countering Hybrid Warfare, as part of the implementation of international scientific projects: "Military Aspects of Countering Hybrid Warfare: Experiences, Lessons, Best Practices" (NATO code – SAS-161) with the NATO Science and Technology Organization and "Total Defence" with the Norwegian Defence University College. The publication is intended for domestic and foreign specialists who research security and defence issues, in particular for specialists of the Ministry of Defence of Ukraine, the General Staff of the Ukrainian Armed Forces, professors, officers-listeners, cadets and students of scientific institutions and educational establishments in the system of the Ministry of Defence of Ukraine.
Figures 49, Tables 5, References 462 items.

Cite as: Koval, M. (Ed.) (2023). Theoretical and applied aspects of the Russian-Ukrainian war: hybrid aggression and national resilience. Kharkiv: TECHNOLOGY CENTER PC, 372. doi: http://doi.org/10.15587/978-617-8360-00-9

AUTHORS

MYKHAILO KOVAL[1]
Doctor of Military Sciences, Commandant of the University
ORCID ID: https://orcid.org/0000-0002-2130-2548

ANDRII IVASHCHENKO[1]
PhD, Associate Professor
ORCID ID: https://orcid.org/0000-0002-8131-5463

VASYL TELELYM[1]
Doctor of Military Sciences, Professor
ORCID ID: https://orcid.org/0000-0001-5926-7680

TOBIAS SÆTHER[2]
ORCID ID: https://orcid.org/0000-0001-7115-1752

DMYTRO FEDIANOVYCH[1]
PhD, Senior Researcher
ORCID ID: https://orcid.org/0000-0002-9896-8655

TETIANA UVAROVA[1]
PhD, Senior Researcher
ORCID ID: https://orcid.org/0000-0003-2388-4059

VALERII HORDIICHUK[1]
PhD, Senior Researcher
ORCID ID: https://orcid.org/0000-0003-3665-4201

NINA ANDRIIANOVA[1]
PhD
ORCID ID: https://orcid.org/0000-0002-7115-2445

OLEKSANDR PEREDRII[1]
PhD, Senior Researcher
ORCID ID: https://orcid.org/0000-0003-2877-4959

MYKOLA SHPURA[1]
PhD, Senior Researcher
ORCID ID: https://orcid.org/0000-0002-3350-6003

VOLODYMYR ILCHENKO[1]
ORCID ID: https://orcid.org/0009-0004-8902-6246

OLHA DEMESHOK[1]
PhD, Associate Professor
ORCID ID: https://orcid.org/0000-0002-6297-3241

OLEKSANDR USTYMENKO[1]
PhD, Senior Researcher
ORCID ID: https://orcid.org/0000-0002-0003-0790

MYKOLA SHAPTALENKO[1]
PhD, Associate Professor
ORCID ID: https://orcid.org/0000-0001-8343-694X

IRYNA ZAHORKA[1]
ORCID ID: https://orcid.org/0000-0002-0693-1434

MYKHAILO LOBKO[1]
PhD, Associate Professor
ORCID ID: https://orcid.org/0009-0003-5946-5013

PAVLO SHCHYPANSKYI[1]
PhD, Professor
ORCID ID: https://orcid.org/0000-0002-0854-733X

ANDRII KORETSKYI[1]
PhD, Senior Researcher
ORCID ID: https://orcid.org/0000-0002-6346-3083

VASYL SHVALIUCHYNSKYI[1]
PhD, Associate Professor
ORCID ID: https://orcid.org/0000-0002-2775-4422

SERHII POCHYNOK[1]
PhD
ORCID ID: https://orcid.org/0000-0002-1890-090X

VOLODYMYR PRYMIRENKO[1]
PhD
ORCID ID: https://orcid.org/0000-0002-2892-581X

OLEKSANDR MALKOV[1]
ORCID ID: https://orcid.org/0000-0002-4303-1726

OLEKSANDR YANENKO[1]
ORCID ID: https://orcid.org/0000-0002-8552-7543

OLENA KORSHETS[1]
PhD, Associate Professor
ORCID ID: https://orcid.org/0000-0002-7225-0848

VOLODYMYR HORBENKO[1]
PhD, Associate Professor
ORCID ID: https://orcid.org/0000-0002-7030-0995

STEPAN YAKYMIAK[1]
PhD, Associate Professor
ORCID ID: https://orcid.org/0000-0002-1530-271X

PETRO SNITSARENKO[1]
Doctor of Technical Science, Senior Researcher
ORCID ID: https://orcid.org/0000-0002-6525-7064

YURII SARYCHEV[1]
PhD, Senior Researcher
ORCID ID: https://orcid.org/0000-0003-1380-4959

VITALII HRYTSIUK[1]
PhD
ORCID ID: https://orcid.org/0000-0002-3146-1956

DMYTRO VITER[1]
Doctor of Philosophy Sciences, Senior Researcher
ORCID ID: https://orcid.org/0000-0002-7330-1280

IRYNA IZHUTOVA[1]
PhD
ORCID ID: https://orcid.org/0000-0002-2614-7014

VOLODYMYR SHUBIN[1]
ORCID ID: https://orcid.org/0009-0003-6903-0806

OLEKSANDR VOITKO[1]
PhD, Associate Professor
ORCID ID: https://orcid.org/0000-0002-4610-4476

VOLODYMYR RAKHIMOV[1]
ORCID ID: https://orcid.org/0000-0001-9868-986X

OLHA PASHKOVA[1]
PhD
ORCID ID: https://orcid.org/0000-0002-6525-4613

IHOR PIDOPRYHORA[1]
PhD
ORCID ID: https://orcid.org/0000-0002-7611-9134

ANDRII BILIUHA[1]
ORCID ID: https://orcid.org/0000-0002-0999-7447

VITALII BIDNYI[1]
PhD
ORCID ID: https://orcid.org/0000-0002-5837-5046

VALERII HRYTSIUK[1]
Doctor of Historical Sciences, Associate Professor
ORCID ID: https://orcid.org/0000-0001-9877-1900

ROSTYSLAV PYLIAVETS[1]
PhD, Associate Professor
ORCID ID: https://orcid.org/0000-0002-2641-053X

VOLODYMYR KYDON[1]
PhD
ORCID ID: https://orcid.org/0000-0002-3606-8061

MARYNA SEMENKOVA[1]
PhD
ORCID ID: https://orcid.org/0000-0002-4143-5671

OLEKSANDR KOTLIARENKO[1]
PhD
ORCID ID: https://orcid.org/0000-0001-8776-2515

LIUDMYLA PRYPOLOVA[1]
PhD, Senior Researcher
ORCID ID: https://orcid.org/0000-0002-8429-1866

RADION TYMOSHENKO[1]
Doctor of Military Sciences, Senior Researcher
ORCID ID: https://orcid.org/0000-0003-2433-8025

ANATOLII PAVLIKOVSKYI[1]
PhD, Associate Professor
ORCID ID: https://orcid.org/0000-0002-0637-368X

[1] National Defence University of Ukraine, Ukraine
[2] Norwegian Defence University College, Norway

ABSTRACT

The monograph reports the results of a study on the search for countermeasures in a hybrid war, in particular, in the war waged by Russia against Ukraine: generalized strategies for conducting and countermeasures in a hybrid war; strategic aspects of the Russian-Ukrainian war are analyzed; a subdomain analysis of the features of the Russian-Ukrainian war on land, in the air, at sea, in information space (in particular, cyberspace) was carried out; informational, social, legal, and historical aspects of the Russian-Ukrainian hybrid war were investigated.

The monograph was prepared based on the materials of the research work "Improving the Theoretical Foundations of Countering Hybrid Warfare" (State registration number: 0122U200490) within the framework of the Ukraine-NATO Platform for Countering Hybrid Warfare, as part of the implementation of international scientific projects: "Military Aspects of Countering Hybrid Warfare: Experiences, Lessons, Best Practices" (NATO code — SAS-161) with the NATO Science and Technology Organization and "Total Defence" with the Norwegian Defence University College, Norway.

CONTENTS

CONTENTS

CONTENTS

LIST OF TABLES

LIST OF FIGURES

CIRCLE OF READERS AND SCOPE OF APPLICATION

The publication is intended for domestic and foreign specialists who research security and defence issues, in particular for specialists of the Ministry of Defence of Ukraine, the General Staff of the Ukrainian Armed Forces, scientific and scientific-pedagogical workers, students, cadets and students of scientific institutions and educational establishments in the system of the Ministry of Defence of Ukraine.

ACKNOWLEDGEMENTS

CONFLICT OF INTEREST

The authors declare that they have no conflict of interest in relation to this research, whether financial, personal, authorship or otherwise, that could affect the research and its results presented in this paper.

ABBREVIATIONS

A	Army
AA	Army Aviation
ABF	Airborne Forces
ACS	Automated Control System
AF	Armed Forces
AF RF	Armed Forces of the Russian Federation
AFC	Army Futures Command
AFV	Armored Fighting Vehicle
APC	Armored Personnel Carrier
AR	Autonomous Republic
ASMS	Anti-Ship Missile System
AT	Airborne Troops
ATMS	Anti-Tank Missile System
ATO	Anti-Terrorist Operation
C2	Command and Control
C4ISR	Army Command, Control, Communications, Computers, Intelligence, Surveillance and Reconnaissance
C5ISR	Army Command, Control, Communications, Computers, Cyber, Intelligence, Surveillance and Reconnaissance
CCDC	Combat Capabilities Development Command
CFT	Cross-Functional Team
CMU	Cabinet of Ministers of Ukraine
CP	Command Post
DFZ	Deep Fire Zone
"DPR"	"Donetsk People's Republic"
EBRD	European Bank for Reconstruction and Development
EFSD	European Fund for Sustainable Development
EJ	Electronic Jamming
ES	Escort Ship
EU	European Union
EW	Electronic Warfare
FF	Frigate
FSB	Federal Security Service of the Russian Federation
GDP	Gross Domestic Product
GF	Ground Forces

GMC	Guided Missile Corvette
GMW	Guided Missile Weapons
GS	General Staff
ICRC	International Committee of the Red Cross
IDCC	International Donor Coordination Center
IED	Improvised Explosive Devices
IFU	International Fund for Ukraine
JADC2	Joint All-Domain Command and Control
JF	Joint Forces
LAS	Large Amphibious Ship
LC	Landing Craft
LCM	Landing Craft Mechanized
LS	Large Submarine
"LPR"	"Lugansk People's Republic"
LRPF	Long-Range Precision Fires
MAA	Means of Air Attack
MB	Missile Boat
MC	Missile Cruiser
MCs	Mythological Complexes
MD	Military District
MDB	Multi-Domain Battlegroups
MDC2	Multi-Domain Command and Control
MDI	Multi-Domain Integration
MDO	Multi-Domain Operations
MFA	Macro-Financial Assistance
MLRS	Multiple-Launch Rocket System
MPADS	Man-Portable Air-Defense Systems
MtM	Material and Technical Means
MWR	Morale, Welfare, and Recreation
NATO	North Atlantic Treaty Organization
Navy	Naval Forces
NBU	National Bank of Ukraine
NSDC	National Security and Defence Council of Ukraine
OCA	Offensive Counter-Air
OGT	Operational Grouping of Troops
ORDLO	Certain areas of the Donetsk and Luhansk regions of Ukraine
OTGT	Operational-Tactical Groupings of Troops (Forces)
OTMS	Operational-Tactical Missile System
PLAC	People's Liberation Army of China

PRC	People's Republic of China
PS	Patrol Ship
RF	Russian Federation (Russia)
RF&A	Rocket Forces and Artillery
ROF	Russian Occupation Forces
SAMS	Surface-to-Air Missiles
SAS	Small Anti-Submarine Ship
SBGSU	State Border Guard Service of Ukraine
SCMD	Separate Coastal Missile Division
SLB	Separate Logistics Brigade
SLBn	Separate Logistics Battalion
SO	Special Operation
SOF	Special Operations Forces
SPAV	Self-Propelled Artillery Vehicle
SIG	Subversive Intelligence Group
SSU	Security Service of Ukraine
STO NATO	NATO Science & Technology Organization
TA	Tank Army
TDF	Territorial Defence Forces
TG	Tactical Group
TO	Theatre of Operations
TOT	Temporarily Occupied Territory
UAS	Unmanned Aerial System
UACS TL	Unified Automated Troop Control System
USA	United States of America
VFTC	Voluntary Formation of the Territorial Community
WME	Weapons and Military Equipment

PREFACE

After February 24, 2022, the world changed forever — the world order was broken. Russia once again disregarded international norms and principles of law. Today, no state can feel protected and has no guarantees of national security. Ukraine chooses the right to peaceful existence, freedom and democratic values. It can be argued that the future of civilized society depends on whether Ukraine survives this war.

Russian aggression contains all the signs of hybridity: along with the massive use of kinetic weapons, political, economic, informational, and other means and methods of achieving the goal of aggression are widely used.

The hybrid Russian-Ukrainian war is a war of a new type, which is characterized by an increase in the number of operational environments and areas of combat operations. In addition to the traditional operational domains of physical space — land, sea, air, space, the war continues in the operational domains of virtual space — cybernetic and cognitive. Under these conditions, it becomes necessary and extremely important to find ways to resist such hybrid aggression, anticipate security challenges, be ready for threats and defend against them, adapt to the action of destructive influence and recover from it.

To find these ways and increase national stability, the authors of the monograph analyze the strategic aspects of the Russian-Ukrainian war; generalize and analyze war experience in various operational environments; study the informational, social, historical, and legal components of the Russian-Ukrainian hybrid war.

In order to determine the ways of increasing stability, the work focuses on the following issues: analysis of the essence of modern war; concepts and strategies of countermeasures against an enemy with superior resources; organizations of national resistance; the importance of military and financial aid; scenarios and features of the use of troops (forces) in various operational environments (domains); comprehensive use of military and non-military forces and means to counter Russian hybrid aggression; features of the development of the national system of sustainability in Ukraine and the leading countries of the world; analysis of individual problems of the post-war development of Ukraine; devising recommendations for countering hybrid threats.

Thus, the monograph can provide answers to a number of questions on determining ways to counter the large-scale aggression of the Russian Federation and will be useful in assessing the future security environment. The practical significance of the reported research results is

enhanced by the fact that most of the authors of the monograph took a direct part in the repulsion of Russian aggression, and some of them continue to defend the independence, territorial integrity, and state sovereignty of Ukraine with weapons in their hands; this experience, which is reflected in the current monograph, is undoubtedly invaluable both for Ukraine and the international community.

Commandant of the National Defence University of Ukraine
Doctor of Military Sciences

Colonel General   Mykhailo KOVAL

CHAPTER 1

STRATEGIC ASPECTS OF THE RUSSIAN-UKRAINIAN WAR. HYBRID AGGRESSION AND NATIONAL RESILIENCE

1.1 HYBRID WARFARE: STRATEGIES AND COUNTERMEASURES

Mykhailo Koval, Andrii Ivashchenko, Vasyl Telelym

ABSTRACT

In modern military science, there are processes of theoretical understanding of the realities of the late 20th and early 21st centuries in the political, economic, military, virtual, and cognitive sectors, which today have become the theaters of military and non-military actions. In different domains of these sectors, during hybrid operations, the main players fight among themselves for their interests. Such players primarily include the USA, China, and Russia. Regional players also play their role: India, Saudi Arabia, Pakistan, Egypt, Turkey. After leaving the EU, Great Britain is increasingly active in resuming its role in the struggle to preserve the liberal model of the world order.

The search for the essence of war and peace acquires theoretical and practical significance. Russia's full-scale and unprovoked invasion of Ukraine and the further development of the conflict dramatically changed the perception of the latest war.

The question of the nature of the Russian-Ukrainian war and its essence is currently open. Assumptions that the modern war should reduce the role of conventional weapons, and tank battles remained in the past, turned out to be premature. Also, the widespread idea that the latest conflicts are conducted in "radically different ways" and are less and less connected with lethal or kinetic force has also not come true. Conventional warfare *is not dead*, lethal weapons are in fact decisive for the current phase of warfare. This fact makes some researchers just as quick to dismiss the role of non-kinetic methods in modern warfare, including cyber and information attacks and narrative control.

Cybernetic means cannot hold territory but this does not mean that cyber security and information and psychological operations have lost their importance. Attempts to abandon the concept of hybrid conflicts are also hasty.

The aggressor country continues to use hybrid techniques one way or another. The Russian military denies attacks on civilian objects, the destruction of hospitals, atrocities against the civilian population, disguises the goals of its war, and tries to shift responsibility for the world food crisis to Ukraine.

Non-lethal means of modern warfare, as well as the use of the latest high-precision weapons, contrary to previous assumptions, do not constitute an alternative to traditional weapons. Rather, they are all used together. This is one of the important preliminary lessons of the Russian-Ukrainian war.

The goal of the Russian war strategy remains the preservation of control over the temporarily occupied territory of the Autonomous Republic of Crimea and access to the administrative border of the Donetsk region. Plans to advance deep into the territory of Ukraine in the direction of Kryvyi Rih and Zaporizhzhia are being considered. A return to the plan to seize Kyiv and re-deploy hostilities from the territory of the Republic of Belarus is not excluded from the agenda.

At the same time, the aggressor country uses the methods of hybrid warfare, namely:

– hiding the goals of aggression;

– destruction of energy infrastructure facilities of Ukraine,

– denial of strikes on civilian objects, destruction of hospitals, residential buildings, terror against the civilian population;

– transfer of responsibility for the global food crisis to Ukraine.

It is predicted that hybrid warfare will continue beyond 2023. It is possible to talk only about a new stage of the confrontation, of course with other initial data and perspectives, but again – a long conflict, loss of life, consumption of resources, and an uncertain end result [1].

The prospects of a military campaign to liberate the occupied territories of Ukraine and further ensure the military security of Ukraine are considered taking into account such a complex and ambiguous combination of factors of Russian aggression in many areas. Only their full and comprehensive consideration, the achievement of synergistic effects at the intersection of domains, will make it possible to create the prerequisites for Ukraine's task of defeating the armed forces of the aggressor country and ending the destructive war in Europe.

KEYWORDS

Hybrid warfare, strategies, counteraction, modern warfare, the Russian-Ukrainian war, lethal weapons, cyber attacks, information attacks, hybrid conflicts, aggressor, energy infrastructure, military security, synergistic effects.

1.1.1 HYBRID STRATEGY OF THE UNITED STATES OF AMERICA

Despite the fact that the strategies of hybrid warfare developed in different countries have different views on its phases and stages, they also have many common elements. Thus, the war phase of hybrid warfare is a mandatory component of all new generation war strategies.

In US defence planning documents, the term "hybrid" is used in combination with the terms "threat", "adversary", and "war" when describing the complex nature of the modern military and political situation.

The transformation of information into weapons is the most distinctive feature of Russian operations of the last decade against Ukraine and the division and destabilization of Western countries. The Russian approach to information warfare combines psychological and cyber operations, which are key components of what Russian analysts call "new generation warfare" or "non-linear warfare".

At the same time, the Chinese strategy implies the use of new technological capabilities, the development of information and communication technologies to reduce the risks of aggression against another state. China's strategy of "unrestricted war" involves attacking the enemy's weak points, exploiting contradictions in the national security system, government, and society.

In the strategies of the United States, Russia, and China, hybrid war has not yet been definitively defined as a separate independent type of confrontation. At the same time, the tendency to use hybrid methods in modern military conflicts persists. It is believed that these methods will be used in the long term, therefore, it is necessary to develop separate hybrid warfare strategies that enable the mobilization of the necessary resources on a national scale, taking into account the integrated multidisciplinary nature of hybrid influence.

The new generation of wars will most likely include the following forms: fighting separatism, fighting in gray areas, asymmetric and high-tech warfare.

The three leading states in the military aspects – the USA, Russia, and China, which have strategic plans to obtain or maintain the status of world centers of power and powerful armed formations, have developed their own hybrid war strategies. The Middle East, Eastern Europe, and Indo-Pacific regions are called the theaters of the future war. Hybrid strategies and means of war are rapidly spreading, making it possible to achieve political goals, undermining the territorial integrity and political independence of states that are under international protection. Fundamentally new technologies are used, different from those used in the wars of previous generations: artificial intelligence, robotics and autonomous technical means, space technologies, biotechnology and improvement of human qualities, quantum technologies, hypersonic weapons, nanotechnology, and unmanned aerial systems [2].

None of the new-generation hybrid warfare strategies can be considered as a formal military-political act. Such strategies are the basis for choosing (or developing a new) system of defence management and planning.

Different definitions and characteristics of hybrid warfare are used in modern strategies. Alternative terms are used: "non-linear war", "unconventional war", conflict "in the gray zone", "war with the use of irregular armed formations", *proxy* war. All terms are intended to reflect the complex integrated forms of war of the new generation, the involvement of a large number of military and non-military subjects, blurred traditional concepts of war and peace, differences between types of armed conflicts. Unlike previous generations and contrary to the classical theory of war and peace, the space between them is considered as a new dimension in which not only military but also political, diplomatic, economic, informational wars are conducted, strategic deterrence measures, etc. are conducted. Traditionally, international law and national legislation consider the classic signs of a state of war and peace and are not adapted to the new terminology.

Hybrid wars of the new generation are planned and conducted by state and non-state (private) armed forces. These combat operations remain below the accepted level of detection and response, which is facilitated by flexible adaptive intelligence and planning systems, the use of large volumes (*Big Data*) and high-speed information exchange channels [3].

The strategic advantage of a hybrid war is that the participation of the aggressor state is difficult to prove. A state waging a hybrid war exerts its influence through non-state actors – militants, local population groups, organizations, the connection with which is formally completely denied. These actors can do things that the state itself cannot do because any state is obliged to adhere

to the Geneva Convention and the Hague Convention on the Laws of War, agreements with other countries. In addition, the aggressor country remains publicly uninvolved in the resolved conflict. The aggressor's denial of participation in the attack delays an adequate response to the aggressor, which would otherwise have a decisive, particularly forceful, international response [4].

Wars of the new generation are aimed at achieving political goals with limited use of military force. To achieve political goals, the integration of conventional armed forces and irregular forces (mercenaries, guerrillas, insurgents, and terrorists), which can include both state and non-state actors, is used. Conventional and irregular forces are used at all stages of the development of the conflict. Non-state actors are not limited by international obligations and have a greater degree of adaptation to the use of new tactical techniques.

The US national military strategy emphasizes the beginning of a qualitatively new stage in the evolution of wars and considers the following forms of modern warfare: the integration of internal and interstate conflicts, the combination of conventional armed forces and irregular forces to create uncertainty, seize the initiative and weaken the adversary; combining the traditional military strategy with the tactics of non-state armed formations, asymmetric approaches. Asymmetric warfare is used to determine the strategy and tactics of other countries that seek to achieve their political goals, despite the priority of the United States in military capabilities. The application of SWOT analysis methods to take into account the strengths and weaknesses of opposing parties remains an integral part of the strategy. Asymmetry, the use of reflexive management and information technologies make it possible to influence the politics and population of other countries without using conventional military methods. This greatly expands the strategy of conducting modern war and includes cultural, social, legal, psychological, and moral aspects where military force is less suitable for solving the tasks.

Conducted studies [5] estimate the probability of the US involvement in an interstate conflict as low, but growing. Defence planning in the US is aimed at developing capabilities to inflict maximum damage on the enemy. In the planning process, it is taken into account that non-governmental extremist organizations, thanks to the integration of readily available technologies and extremist ideology, pose a direct threat to international security and the achievement of US political goals. When state and non-state forces are integrated, a new combined (hybrid) area of conflict emerges, in which these actors combine techniques, capabilities, and resources to achieve political goals. Such a hybrid conflict may involve armed forces that hide their identity, as Russia did in Crimea, or involve the rudimentary capabilities of violent extremist organizations to form regular armed forces, as demonstrated by the ISIS terrorist organization in Iraq and Syria. Under such conditions, a hybrid war corresponds to a certain range of linear dependence of the probability of the occurrence of a conflict P and its consequences I (**Fig. 1.1.1**).

The basis of the hybrid warfare strategy is **the use of non-military means**. A state that launches a hybrid war achieves the goal of destabilizing another state internally by prioritizing *non-military means* such as information attacks and influence operations combined with economic pressure, support for local opposition groups, disinformation, and criminal activity. Covert placement

of troops in uniform without insignia ("little green men") or servicemen who are not part of the regular army is also used. The main emphasis in hybrid warfare is on information capabilities and intermediaries from among non-state actors.

○ **Fig. 1.1.1** A new generation of warfare strategy from U.S. perspectives
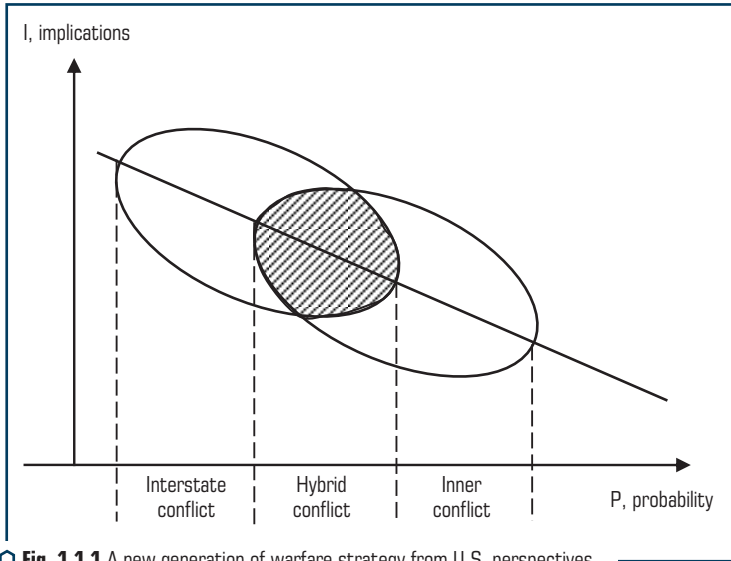
It is the term "hybrid" in combination with the terms "threat", "resistance", and "war" that is used in other US defence planning documents when describing the complex nature of the modern military and political situation and the need to adapt the structure and functions of the armed forces to new challenges.

1.1.2 RUSSIA'S HYBRID STRATEGY 2013-2014

Despite the fact that the term "hybrid war" was introduced in the West, today military experts use it to define all the variety of forms and methods used by Russia in the conflict with Ukraine. Russian measures include the traditional mix of conventional and irregular combat operations, the organization of political protests, economic pressure, cyber operations, and intensive disinformation campaigns.

In addition, there is another important component in the Russian set of tools for conducting modern hybrid war – "legal war". This component is of great importance and quite dangerous, but remains insufficiently studied. Considering the central role assigned to the "legal war" in the

Russian hybrid strategy, a deeper understanding of this form of hybrid war and the development of a strategy to counter this threat to European security and the entire world order are necessary.

The development and practical application of the concept of hybrid war by Russia is associated with the Chief of the General Staff of the Armed Forces of the Russian Federation (GS AF RF), Army General Gerasimov[1], who expressed a view of hybrid war as an asymmetric response to the spread of liberal democracy in the globalized world, although in Russian official documents and scientific articles they do not use the term "hybrid war" but "non-linear" war, or "new generation war" [6].

In January 2013, General Gerasimov gave a speech on future wars at a meeting of the Academy of Military Sciences. Then he mainly relied on the example of mass protests, uprisings, and internal conflicts with external participation in the Middle East in 2010–2012, known as the "Arab Spring". Before the start of the special army operation of the Russian Armed Forces for the annexation of Crimea, the war in Donbas and other dramatic events of the "Russian Spring", the report was printed [7] and became known as the *Gerasimov doctrine of hybrid war*.

The report does not use the term "hybrid war", it refers to "asymmetric actions", the use of both military and non-military information methods to destabilize the enemy. Gerasimov claims that "frontal clashes of large groups of troops (forces) at the strategic and operational level are gradually becoming a thing of the past", and are being replaced by non-contact, long-range, high-precision strikes together with the actions of special forces in combination with the forces of the "internal opposition". This strategy was implemented in Crimea, Donbas, and Syria. However, it was not completely "non-contact" and without losses, and most importantly, the Russian Federation was bogged down in endless and increasingly expensive military conflicts in Ukraine and Syria.

Gerasimov's doctrine can be considered as a rethinking in the realities of the 21st century of the well-known concept of non-traditional military actions, which in modern Russian military terminology have received the name "non-linear". Within these concepts, the main goal of non-linear military operations is to achieve the desired strategic and geopolitical results using a wide range of non-military methods and means: overt and covert diplomacy, economic pressure, gaining the sympathy of the local population, etc. The doctrine envisages a ratio of non-military and military actions as 4:1 (**Fig. 1.1.2**). Combat actions include strategic deterrence measures, strategic deployment, direct military operations, and peacekeeping operations.

Methods of non-military actions include formation of coalitions and alliances, political and diplomatic pressure, economic sanctions, economic blockade, severance of diplomatic relations, formation of political opposition, action of opposition forces, transfer of the economy of the opposing country to military rails, search for ways to settle the conflict, change of the political leadership of the opposing country country, carrying out a set of measures to reduce tensions in relations after the change of political leadership.

In addition, the doctrine assumes "the conduct of information warfare", without specifying whether these measures are military or non-military.

---

[1] *Since January 2023, he has been the commander of the so-called "special military operation" on the territory of Ukraine.*
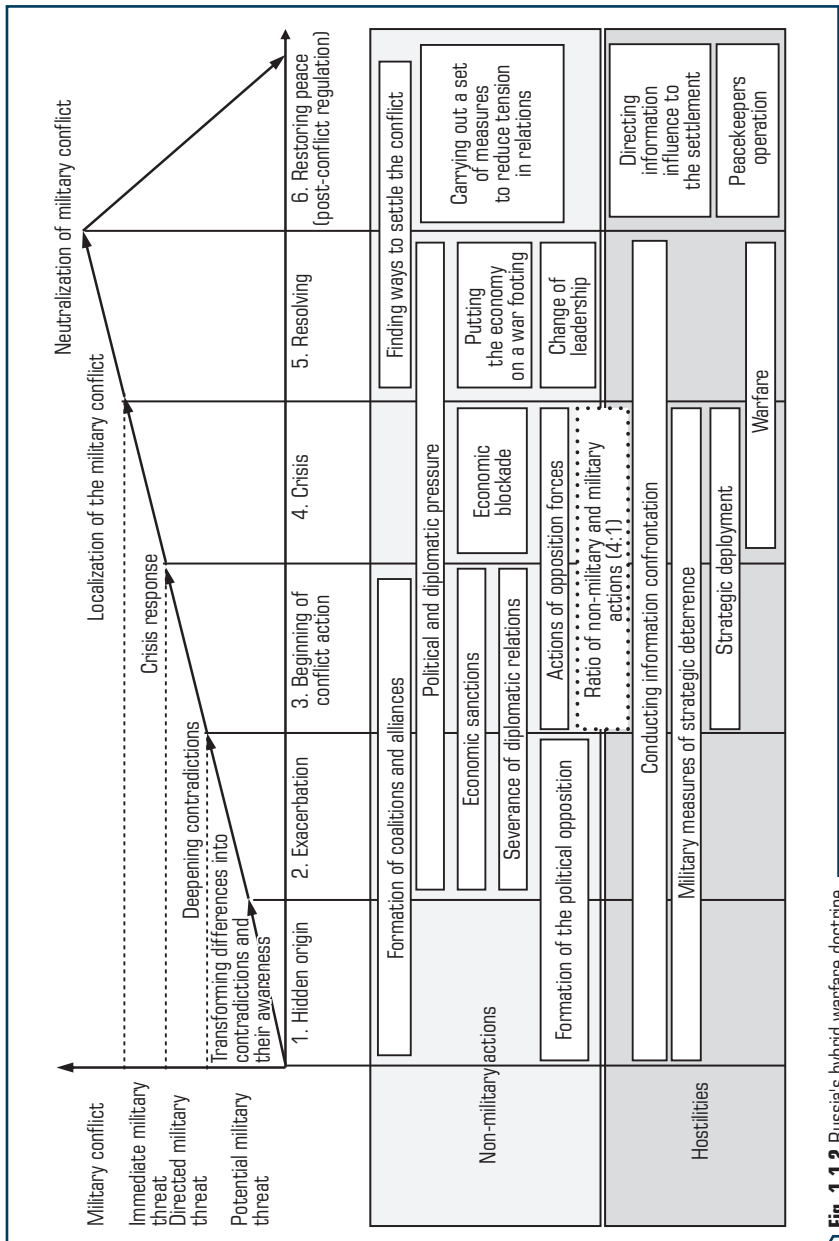
Fig. 1.1.2 Russia's hybrid warfare doctrine

Gerasimov combined Soviet tactics with the strategic idea of total war and laid out a new theory of modern warfare – it is more like a "hacking" of the enemy's society than a direct attack. He wrote: "The very rules of war have changed. The role of non-military means of achieving political and strategic goals has increased, and in many cases it significantly exceeds even the power of weapons in terms of effectiveness. All this is complemented by covert military measures".

Gerasimov's doctrine is an explanation of Russia's modern strategy in Ukraine, a vision of total war, in which politics and military confrontation are in the same range of activity from both a philosophical and a practical point of view. This approach applies across all domains involving various actors and tools, such as hackers, mass media, businessmen, leakers, and of course fake news, in addition to conventional and asymmetric warfare. Thanks to the Internet and social media, operations are now possible that Soviet psychological warfare specialists could only dream of. It is possible to turn the internal affairs of entire countries upside down with just information.

Gerasimov's doctrine created the basis for these new tools. According to it, non-military tactics are not auxiliary means after the use of force but an expedient way of victory. They are, in fact, a real war. Chaos is the Kremlin's strategy. Gerasimov writes that the goal is to achieve an atmosphere of constant unrest and conflicts in the enemy country.

1.1.3 RUSSIA'S HYBRID STRATEGY 2019-2022

After six years of implementing the provisions of the 2014 doctrine, three hybrid conflicts, before the start of a new cycle of defence planning in the Russian Federation, on March 2, 2019, Gerasimov at the regular meeting of the Academy of Military Sciences in Moscow delivered a report [8], which can be recognized as significantly modified under the conditions of increasingly intense global confrontation with the West, the new doctrine of Gerasimov.

The tone of the presentation has changed: the terminology of the height of the Cold War has returned to official documents. Now the USA and its allies are called "aggressors" who are ready to treacherously attack at any moment, using the technologies of color revolutions and soft power, as well as "alleged adversaries".

Moscow came up with a new treacherous strategy for the Pentagon and called it, according to Gerasimov, a "Trojan horse". According to it, the West's plan is as follows: "Using the protest potential of the 5th column, the USA will destabilize the situation in the Russian Federation, and at the same time strike the most important objects with high-precision weapons". It is clear that now civil protests and in general any dissatisfaction can be qualified as treason and conspiracy with the aggressor. However, according to Gerasimov, the Armed Forces of the Russian Federation are ready to oppose any hostile strategy, in particular to block the road to the "Trojan horse", and the General Staff of the Armed Forces of the Russian Federation has been "developing conceptual approaches to neutralize aggressive actions" in recent years. The basis of the "Russian response" is the "strategy of active defence", that is, "a set of preventive measures to neutralize threats to the security of the state".

Formally, the Military Doctrine of the Russian Federation is purely defensive in nature. However, within the framework of a similar concept of active defence, the Soviet General Staff 40 years ago was preparing a massive breakthrough of tens of thousands of armored vehicles to the English Channel. The operation was planned to last three days, with the use of tactical nuclear weapons, to warn a potential aggressor and have time to win in Europe before reinforcements arrived from the territory of the United States.

Today, as 50 years ago, both nuclear and non-nuclear deterrence forces are being deployed simultaneously. Gerasimov, together with Putin, lists new weapons: "Avangard", "Sarmat", "Peresvet", "Dagger", "Poseidon", "Petrel", and "Zirkon". Long before the formal termination of the Treaty on the Elimination of Intermediate- and Short-Range Missiles (INF) in July 2019, in accordance with Putin's decree "on the basis of the need to take urgent measures in connection with the violation by the United States of its obligations under the INF Treaty", the accelerated development began of "ground complexes of medium and short-range hypersonic missiles". There will be no arms race because of this, Gerasimov claims, following Putin, because new weapons "will be created within the planned defence budget", which cannot be reduced at such a time.

The planning of the operation to occupy Ukraine begins and the relatively moderate Russian doctrine of 2013 with its emphasis on hybrid actions is no longer suitable. Of course, all kinds of "asymmetric, political, economic, informational, and other non-military measures" remain in the arsenal but the main content of the military strategy is "issues of preparation for war and its conduct by the Russian Armed Forces". In addition, it is about a full-scale, not a local war, Gerasimov claims, because the alleged opponents are also preparing for a full-scale war.

All non-military measures, of course, affect the course of the war, but they only create and ensure the conditions for the effective use of military force. The General Staff of the Armed Forces of the Russian Federation is ready to coordinate "in the interest of achieving a common goal" hybrid actions "in other areas", but will not directly manage them, Gerasimov claims.

The main strike force in Syria was the Aerospace Forces, as well as special forces, private military companies, and local militias. Key logistical tasks were solved by the fleet but groups based on regular rotation were always commanded by senior army generals who all became heroes of the Russian Federation, received new ranks and assignments, and spread their influence limitlessly. The Main Political Department of the Armed Forces of the Russian Federation was revived.

The head of the General Staff of the Armed Forces of the Russian Federation also stated that "the complexity of modern weapons is such that it is unlikely to be possible to establish its production in a short time with the start of hostilities. We have to do everything we can to ensure a technical, technological, and organizational advantage over any potential adversary". That is, the Armed Forces of the Russian Federation must surpass the combined forces of the rest of humanity. This is exactly the goal that the Soviet General Staff sought and achieved by the end of the eighties, for example, by the total number of tanks or nuclear warheads. However, the USSR could not withstand the economic and social overstrain and collapsed ingloriously in 1991. Today, the Russian Armed Forces have more tanks than all NATO countries combined.

The new "Gerasimov doctrine" has been substantially adjusted in the direction of strengthening compared to the doctrine of 2013, and the General Staff of the Armed Forces of the Russian Federation, as during the Cold War, invents or significantly exaggerates external threats to justify the unrestrained militarization of Russia. The final result of the new attempt to achieve superiority "over any potential opponent" can be expected as in 1991.

Therefore, the basis of the Russian hybrid strategy is "the wide use of political, economic, informational, humanitarian, and other non-military means, which will be used jointly, taking into account the level of population protests... and will be reinforced by military means of a hidden nature" [6].

Russia's invasion of Georgia in 2008, the annexation of Abkhazia and South Ossetia, the seizure and temporary occupation of Crimea in 2014, and the temporary occupation of territories in the Donetsk and Luhansk regions are illustrative examples of Russian hybrid warfare. A hybrid war does not necessarily end with the annexation of territory. Disinformation campaign, incitement of anti-government demonstrations, cyber attacks, one of which disabled Estonia's computer infrastructure in 2007, attempted coups in Macedonia in 2016 and Montenegro in 2017, support for right-wing political parties in France and Germany, and interference in the US elections in 2016 and 2020 are suitable for the Russian hybrid war strategy [9]. Hybrid warfare is not a simple set of isolated cases or a set of technical techniques, it is a general strategy aimed at destabilizing the existing constitutional order.

The preparation of hybrid operations of the Russian Federation is carried out at the national level, which makes it possible to combine diplomatic, informational, economic, financial, and international legal instruments. The attention of Russian specialists in defence planning is directed to the development of scenarios in which relatively stable states are suddenly involved in an armed conflict, state institutions are rapidly destroyed, and society plunges into chaos. Information influence is considered the most important component of hybrid warfare. Hybrid aggression creates the possibility of bringing to power a loyal political leadership without direct force influence and capturing territory, only thanks to manipulative means.

The transformation of information into weapons is the most distinctive feature of the current decade's Russian campaigns against Ukraine and the division and destabilization of Western countries. The Russian approach to the information component of hybrid warfare is based on a combination of psychological operations and operations in cyberspace, which are key components of what Russian analysts call "new generation warfare" or "non-linear warfare". Russian information warfare seeks to blur the lines between truth and lies and create an alternative reality. In this war, the Russian Federation uses vulnerabilities in the social life of the countries chosen as the object of an information attack, tries to weaken state institutions and undermine the recognized legitimacy of governments. The new generation of wars uses non-kinetic methods that provoke public discontent and create an atmosphere of collapse, as a result of which little or no military force is needed. In this strategy, the armed forces play a supporting role. Special forces can conduct reconnaissance, sabotage, and espionage operations, while near the borders of the targeted state, large-scale military exercises can be conducted for the purpose of intimidation and pressure. The use of armed

forces must remain below the threshold that would trigger an armed response with the use of conventional forces. It is possible to generalize the Russian strategy of hybrid war as the dominance of the information component, the reduction to the minimum level of the use of armed forces.

The Russian strategy began to be worked out in the Soviet period. The use of technologies of reflexive management, transmission and processing of information made it possible to increase the effectiveness of these methods.

The concept of "reflexive management" (perception management) is a key point of Russian strategy. According to it, when using specially prepared information, the adversary is inclined to make decisions that were advantageous in advance to those who are the original source of this information [10]. Reflexive management techniques include blackmail, disguise, deception, and disinformation, and are capable of influencing the adversary's decision-making cycle in the desired direction.

The destructive power of war (global, military-political, and military *consequences* I) was used as an adjustable (initial) value, which has ten basic discrete levels, each of which corresponds to a certain *probability* P of occurrence and the corresponding military-political scenario (**Fig. 1.1.3**).

At the level of non-violent confrontation, three scenarios are realized, of which the extreme one, the largest in terms of consequences, is called a hybrid war. At this level there is a point of bifurcation (non-return), in which the object of war becomes unstable to external influence and uncertainty arises: either a state of chaos and further destruction, or a transition to a new, more differentiated and effective management system. When the bifurcation point is reached, the parties to the conflict decide on a peaceful settlement, or proceed to further increase the intensity of hostilities, including a global conflict. This determines the meaning of hybrid war as a new type of interstate confrontation. At the same time, hybrid war is considered as a phenomenon that includes various forms and methods of influencing the enemy and cannot be localized only at one of the levels of confrontation [11].

The Russian view of the strategy of waging wars of the new generation, compared to the American one, has the following differences:

– the beginning of the conflict is determined from the moment when the differences in the interests of the two states are revealed, this is a much lower level of intensity than that used in Western definitions;

– the linear concept of increasing the intensity of the hybrid war is replaced by a sequence of a parabolic nature: military and non-military operations reach a critical turning point, and then their intensity may decrease when strategic goals are achieved.

Thus, the considered strategies of hybrid war have common disadvantages: lack of a basic element; unclear conceptual framework; inability to cover communications within a holistic phenomenon; uncertainty of the final strategic location.

So, according to the official views adopted in the USA and Russia, the goal of hybrid aggression is to establish external management and total control over the sphere of state administration, which is achieved by creating the necessary and sufficient conditions for subduing the object (state-target of aggression, social group, civil society). In addition, the task of establishing full and

total control over sovereignty and territory, other important but not vital attributes, is not envisaged, except for ensuring the surrender of the armed forces. Decisive in achieving the goal of hybrid war are strategic communications, the main means of which is information, and the supporting element is a complex of force actions.

I, implications

10

9

8

7

6

5

4

3

2

1

Bifurcation point

Hybrid warfare

War with the use of
nuclear weapons

Conventional
war

Non-violent
confrontation

P, probability

Designation of scale I (military-political scenarios):
1 – stable conditions of the state administration system;
2 – political crisis with increased intensity of demonstration of military force;
3 – hybrid war;
4 – limited (local) conventional war;
5 – large-scale conventional war without damage to large urban agglomerations, chemical industries, nuclear power plants;
6 – a conventional war with the destruction of large urban agglomerations, chemical industries, nuclear power plants, which can be equated to the use of weapons of mass effect;
7 – nuclear conflict (a crisis situation in which one or more countries that have nuclear weapons (NW) are involved and one of them begins to use it as a tool of military and political pressure without direct use;
8 – demonstration use of NW in a desert area without damage to people, military and economic objects,
9 – war with limited use of nuclear weapons;
10 – massive use of nuclear weapons

○ **Fig. 1.1.3** The escalation curve of hybrid warfare
Note: based on the theory "Ladder of War", Herman Kahn, 1965

After the hybrid operation in Crimea, China's military theorists also began researching methods and improving the strategy of conducting hybrid warfare. The high cost and high level of risks in modern high-tech warfare required the Chinese military to find such forms of participation in conflicts that would allow controlling the military intensity and achieving political goals with limited use of force.

1.1.4 CHINA'S STRATEGY

China's military theorists publicly announced a new type of modern military conflict before their American counterparts, calling it "unlimited war". Chinese colonels Qiao Liang and Wang Xiangsui formulated the concept of unlimited war and identified its distinguishing features [12], ahead of the American F. Hoffman. The work of Chinese experts was first published in 1999. The specific provisions of the Chinese strategy largely coincide with the strategies of the United States and Russia, which indicates that PLAC not only recorded the changes in a timely manner but also promptly began to adjust the material (directly weapons) and informational (doctrinal documents) components.

China's modern military strategy is not limited to improving the ideas of the famous ancient Chinese general Sun Tzu. China's new military strategy of "unlimited war" includes the integrated use of a wide arsenal of military and non-military tools. Its essence is the application of new technological capabilities to achieve the political goals of aggression against another territory or state and includes the following tools:

— asymmetric strikes, which are carried out on vulnerable enemy targets under the conditions of direct military clashes;

— involvement of the local population, ensuring its loyalty in order to expand controlled territories;

— multiplicity and vagueness of the used means and methods;

— shift of emphasis in methods of confrontation towards the use of economic, political, informational, and other non-military measures;

— formation of dynamic alliances (formal and informal) between state and non-state entities;

— using information as a weapon: the effect of disinformation is comparable to a projectile as it is able to demoralize and impose a destructive model of behavior;

— cognitive impact on the population;

— hacker attacks;

— creation of problems in the financial system;

— the use of terrorism, influence through social networks, organization of disorder and armed resistance to the authorities in large cities.

The PRC has developed and applies a holistic approach to cyber warfare, which is consistent with two main strategic principles:

— the doctrine of people's war (mobilization involves broad sections of the population, the ideological factor has priority);

— civil-military cooperation: due to the involvement of the civilian population, security and private military companies, flexibility and greater effectiveness of combat operations are achieved).

Putting these principles into practice, the Chinese government initiated the creation of cyber-warrior brigades, which are staffed by civilians.

The growing role of artificial intelligence and biotechnology in the innovative transformations taking place in the Chinese military will ultimately lead to the integration of the soldier-operator and

the machine and will bring the conduct of military operations to a new level. China's approach to war will increasingly focus on artificial intelligence, and the focus of hostilities will shift from systemic confrontation to algorithmic confrontation.

An integral element of China's military strategy is the economic domain. In this domain, issues of economic pressure that go beyond the economic situation, financial support of radical movements in regions of interest to the Chinese government, such as Indo-Pakistan, are considered. The construction of roads, bridges, and tunnels within the framework of the "One Belt, One Road" initiative on the territory of other states are considered as elements of hybrid operations. The countries involved in such cooperation will become dependent on China and in the future may become "hot spots" for China to conduct hybrid operations. It is assumed that in the future competition in the economic domain may become more significant than in the military domain.

China's achievements in the development of cognitive technologies became the basis for the inclusion of the cognitive domain in the country's military strategy. The purpose of the operation in the cognitive domain is to gain an opportunity to control the enemy and the level of its resistance capabilities by penetrating the enemy's state structures and decision-making centers, creating chaos, supporting and strengthening anti-government sentiments. Actions in the cognitive domain include the accelerated spread of rumors, fabricated narratives, directing citizens to search for the guilty and identify them (preordained by the organizer of a profitable operation for him), creating and maintaining an atmosphere of fear. According to the "Principles of Organization of Political Work in the PLAC" approved by China's Central Military Commission in 2003, the coordinated use of actions in the cognitive domain is one of the main elements of China's modern military strategy.

Thus, an important role in the confrontation with Japan is played by the "powerful cognitive domain", it is precisely on this that the bet is made to turn the confrontation in favor of China, instilling fear and uncertainty in the enemy in the event of a conflict. Regarding India, actions and operations in the cognitive domain are also applied. It is expected that in the event of an escalation of the situation, the main operational center for the management of actions in the cognitive domain will become the 311 military base of PLAC near the city of Fuzhou.

The Chinese strategy of "unlimited war" underwent a practical test in the support of the unrecognized state of Wa in the northeast of Myanmar and its illegal armed formations. Support includes financial and material support of the separatist forces, training of the soldiers of the United Wa Army (30,000 soldiers, five divisions), equipping the separatist forces, supplying heavy weapons, conducting an informational aggression against the central government, and introducing Chinese as an official language.

The active development of hybrid warfare strategies by individual states requires the search for new approaches to the assessment and prompt response to changes in the military-strategic situation, which are associated with both traditional and hybrid threats to international and national security. At the strategic level, innovations in the forms and methods of waging modern war are associated with a change in the spectrum of threats and actors in the conflict, which form the quality that makes war hybrid.

In the strategies of the USA, Russia, and China, hybrid aggression has not yet been definitively defined as a separate, independent type of confrontation. At the same time, the tendency to use hybrid methods in modern military conflicts persists. It is believed that these methods will be used in the long term, so it is necessary to develop separate strategies for conducting hybrid warfare that allow the mobilization of the necessary resources on a national scale, taking into account the integrated multidisciplinary nature of hybrid influence. At the current stage, the content of new-generation hybrid warfare strategies boils down to the combination of already known means, techniques, and methods of military and non-military confrontation.

At the same time, in the military terminology of the US armed forces and in the armies of NATO member states, the concept of "hybrid war" is not used. The military applies the concepts and doctrines of "multi-domain operation". The two main strategies used in the military are the *destruction* strategy and the *erosion* strategy.

The strategy of *destruction* implies depriving the enemy of the ability to resist through the physical destruction of its military capabilities.

The strategy of erosion implies convincing the enemy that accepting our conditions will be less painful for them than continuing aggression or resistance. In this strategy, military force is used to "erode" the political will of the military-political leadership or society.

In the US armed forces, two main forms of warfare are adopted — traditional and irregular.

Traditional military action, as a form of military action, is characterized by a violent struggle for dominance between nation states or coalitions. The strategic goal of traditional military actions is to force the enemy state to fulfill military-political requirements and prevent the enemy from being forced to fulfill military-political conditions. This form has the designation "traditional" because it is the predominant form of military action in the West, since the Peace of Westphalia (1648), which established a monopoly on the legitimate use of armed force only by nation states.

Unconventional military operations are a form of military operations characterized as a violent struggle between state and non-state actors for legitimacy and influence over certain segments of the population. This form of military operations is defined as "irregular" and emphasizes their "non-Westphalian" context. The essence of the strategy of irregular military operations is the struggle to establish control (influence) over a certain population group.

CONCLUSIONS

One of the features of hybrid wars is their long-term nature, which requires a preventive and long-term policy of countermeasures organized at the state level. Other distinctive features of a hybrid war are its lack of formal declaration and difficult to predict long-term consequences. Since the societies of both the aggressor countries and the victim countries of aggression are extremely destabilized and disorganized in all spheres of life. In addition, there is such a feature as the growth of nonlinearity, which means a high probability of the occurrence of conditions capable

of significantly intensifying the consequences of small events that will radically affect the course of the entire conflict.

Therefore, the task for Ukraine is not only to adapt its military policy to the long era of hybrid wars but also to introduce military-political mechanisms that would not allow a hybrid war to develop into a large-scale one.

The successful adaptation of the national defence system to the challenges and threats generated by wars of a hybrid nature depends on the ability to form the theoretical foundations of a new type of war, to determine on their basis the strategy and scenarios of countermeasures, the priorities of the development of the armed forces, economy, information, and legal sectors.

The effectiveness of countering hybrid warfare depends on the reality of the projected scenarios. When conducting defence planning and defining scenarios for countering hybrid war, modern methods are needed, which use a much larger number of parameters of the military and political situation, external and internal factors, and the integration of military and non-military tools based on new management principles. It is also necessary to develop non-standard forms of confrontation, including asymmetric actions, changes in the defence planning system, and the use of specific tools during modern military conflicts.

In order to take into account all the features, it is advisable to supplement the scenarios of combating hybrid wars with a multi-domain operation of an interspecies grouping of troops, which is conducted simultaneously in physical, virtual, and cognitive operational environments. Such an operation is considered as a variant of the strategy of countering the prevailing enemy.

1.2 HYBRID WAR? A CRITICAL APPRAISAL AFTER RUSSIA'S FULL-SCALE INVASION OF UKRAINE

Tobias Sæther

ABSTRACT

The concept of hybrid war has been used widely in Western policy and academic circles since the early 2000s, but it gained new popularity in 2014 as a vivid, if oversimplified, way of conceptualizing Russia's annexation of Crimea and the subsequent invasion of Donbas. This chapter reassesses the hybrid war concept in the light of Russia's full-scale invasion from February 2022 to the present and concludes that Russia from the beginning of the conflict has viewed hybrid and other unconventional means as subordinate components in a conventional warfighting strategy. Russia still lacks the strategic culture, the will — or both — that is necessary to wage a coherent, synchronized hybrid war given a strict definition of the term.

In the early 2000s, the concept of hybrid war was popularized in Western security policy establishments and to a somewhat lesser extent in the academy [13–15]. The concept gained further momentum as the Russian Chief of the General Staff Valery Gerasimov and other figures in Russian military circles started to use similar terminology, although it has remained under-communicated that their application was primarily an attempt to characterize Western policy as they perceived it [16–19]. The term "hybrid war" was popularized further in 2014 with the outbreak of the Russian-Ukrainian War because it seemed to fit, at least superficially, Russia's approach that year to its annexation of Crimea and the ensuing invasion of Donbas [20, 21][2]. This chapter reassesses the hybrid war concept in light of Russia's full-scale invasion of Ukraine from 2022 to the present[3].

First, I discuss hybrid features of Russia's military operations in Crimea and Donbas. Then I assess benefits and pitfalls of using the hybrid framework to analyse the Russian-Ukrainian War prior to Russia's full-scale invasion in 2022. In the third section, I examine similarities and differences

---

[2] The non-military component has been described in different ways, including as "subversive instruments" in the economic, political, and informational realms. Competing concepts include "full-spectrum conflict", "non-linear" warfare, "grey zone strategies", "active measures", "asymmetrical", "ambiguous", "unconventional", "fourth generation conflict" and "new generation warfare"

[3] I wish to express my gratitude to colleague Amund Osflaten for excellent comments on an early chapter draft, including on aspects relating to the Russian way of war

between Russia's military operations in Crimea and Donbas until 2022 and the full-scale invasion. The final section concludes that Russian operations in Ukraine fall short of a strict definition of hybrid war, and that most definitions of the term are so broad as to explain very little. While the concept has merit in certain limited contexts, the hybrid and unconventional methods used by Russia in Ukraine are subordinate components of a strategy that ultimately rests upon the use of conventional means.

1.2.1 RUSSIA AND HYBRID WAR: EUROMAIDAN, CRIMEA AND DONBAS[4]

The report "Understanding Hybrid Warfare" by the Multinational Capability Development Campaign's (MDCD's) project on countering hybrid warfare is a characteristic example of the Western reading of Russian warfare in Ukraine using a hybrid war lens. According to this project, Russia's early operations in Crimea and Donbas employed a synchronization of economic, military and informational means. First, Russia used "synchronized attack packages" to "encourage" President Yanukovych to abandon the EU-Ukraine Association Agreements [23]. Then, after the change of government in Kyiv, Russia synchronized these economic means with informational and military means to reach its political objectives in a rapidly changing context. While the military means gained prominence with the annexation of Crimea, the non-military means continued to play an important role according to the line of thinking exhibited by the MCDC project. Prior to the Minsk negotiations, for example, the project points to the combined coercive use of gas and loan offerings with military escalation to create pressure [23]. Thus, Russian behaviour was characterized by a broad synchronization of military and non-military means.

Academic studies using the hybrid lens typically employ a narrower understanding of hybrid war. Tor Bukkvoll underlines that while the exact threats emanating from Russia may differ, the element of continuity is the launch of several military and non-military threats at the same time [24]. In their 2015 article "Russian Full-Spectrum Conflict" Oscar Jonsson and Robert Seely highlight the coordination of different military and non-military means as the novel characteristic of Russian warfare as applied in Ukraine. Their article argues that diplomacy and subversion were Russia's preferred means to reach political goals, but that conventional force generally was "a small but critical element of the overall scheme of manoeuvre" [25].

A commonality within most hybrid war studies is (1) a strong emphasis on the synchronized use of military and non-military means and (2) the high importance assigned to non-military means relative to military means. One of those non-military means often assigned a particularly important role is information operations. Bukkvoll [24] argues that non-military aspects such as "propaganda by state-controlled Russian television" increased the effect of Russian operations with special forces both in Crimea and Donbas. Bret Perry characterizes special forces operations and information operations as "force multipliers" in Russia's hybrid war in Ukraine. In a foreign policy with imperialist

---

[4] In this and the next section, I touch upon some aspects explored previously in [22]

undertones masquerading as a "humanitarian" foreign policy, Russia supported Russian schools, pro-Russian cultural centres, NGOs and media networks in Ukraine to increase the share of the Ukrainian population that spoke Russian and identified with Russian culture and worldviews [26]. Using such means in a "population vulnerable to Russian propaganda", he argues in the same article, "Russia was able to create an information space supporting its military operations in Ukraine." Shekhovtsov underscores how, from the beginning of Euromaidan, Russian and pro-Russian outlets termed Ukrainian actors "neo-fascists" to influence the image of the Maidan movement in Ukraine and beyond [27]. Excerpts from *RIA Novosti Ukraine*, the Ukraine-adjusted version of the Russian state-owned news channel illustrates the mixture of disinformation and twisting of facts. Euromaidan was characterized as being dominated by extreme and "nazi" elements – grossly exaggerating the role they played [28]. The inner workings of Ukrainian governments following the Ukrainian revolution were said to be dominated by "right-wing radicals" and were dubbed "fascist" [27, 29, 30]. At the same time, Russia had supported far-right and other radical organizations such as Russian National Unity, Aleksandr Dugin's International Eurasian Movement and Eduard Limonov's National Bolshevik Party in Ukraine since the 1990s [27]. Also, Russia's "information war" might have been undermined by the weak electoral results of Ukraine's far right [27]. However, while Russia's efforts to shape how Ukrainians thought were all-encompassing and systematic, intensity and brutalization do not automatically lead to effectiveness.

After 2014, Ukrainians increasingly mistrusted the Russian state [31]. The Ukrainian decision-making apparatus treated Russian threats in the information domain as a high priority, and as the nature of Russian threats in the information and media domains changed, Ukrainian decision-makers monitored the situation and tried to adapt. Taras Kuzio has underlined the decline in trust in Russian television among the Ukrainian population following Russia's military operations, and a growing awareness among Ukrainians of the threat to national security posed by Russia [32]. From the 2000s onwards the use of pro-Russian organizations as vehicles to spread Russian language, culture, and worldviews in countries of the former USSR – particularly Ukraine – increased. Notably, in 2005 the Donetsk Republic political movement was founded to campaign for separatism in Donbas [27]. In its long-standing efforts to mould Ukrainian identity, Russia played particularly strongly upon primarily Russian-speaking population segments in Ukraine. In such Ukrainian contexts, pro-Russian media and cultural actors could merely reinforce already widespread perceptions and fears. Elsewhere, it probably had reverse effects. McIntosh argues that while state-controlled Russian media outlets might influence the Ukrainian population, the disorientation they caused might have been just as important [33]. While the very best outcome of influence operations was to influence thinking, a second-best outcome was to spread confusion.

If "hybrid war" has merit as a concept, it lies in the ability to capture the importance of information operations in military conflict [17][5]. But, as noted by Michael Kofman in 2020 [18],

---

[5] *Unsurprisingly, this is also one of the aspects highlighted in one of the oft-cited Russian articles on the topic. But information operations are not the only aspect that is emphasized in the article; others include high-precision weapons and technology in general*

this aspect was gradually blown out of proportion to its true weight in Russian military thinking. Although Russian military thinking has indeed assigned increasing importance to "New Political Warfare" – with more emphasis on irregular and non-military means – the key point for Kofman is that Russia's overriding aim is still to ensure its conventional and nuclear capabilities [18]. As noted by Amund Osflaten:

...Russian strategic culture emphasizes conventional force. Additionally, the initial period of the war is central, where preparations, secrecy and deception are designed to enable an unhindered deployment of a conventional force. These enabling factors may be misinterpreted as expressions of a new Russian way of warfare. However, on the contrary, the complete period after the Cold War shows a continuing inclination to the use of conventional force [34].

1.2.2 HYBRID WAR FOR BETTER AND FOR WORSE

One risk when applying the hybrid war concept is of conflating the dynamically changing means available to military powers as a result of innovation and technological developments with change in the nature of warfare itself. Mark Galeotti suggests that Russian "tactics were given a particular novelty simply by the characteristics of the contemporary world". Rather than representing anything qualitatively novel, hybrid or "non-linear" warfare was a testimony to Russia's ability to adapt to a modern context of "interconnected economies, expensive militaries and the 24/7 news cycle" [19]. Methods seen as hybrid or non-linear were not the result of pure invention but of Russia's ability to invest in and utilize new military, intelligence and information opportunities made possible by technology [19].

It is apt to raise two strains of criticism. First, the local context of Crimea contributed to a strategic context that was relatively favourable to Russia. In this picture, we should include the peninsula's large pro-Russian population segments, locally conscripted recruits in the units of the Armed Forces of Ukraine on the peninsula and, above all, Russian military bases – including the headquarters of the Russian Black Fleet at Sevastopol. As Renz has summed up:

Russian strategy in Crimea was successful, because its approach was tailored to the circumstances and political objectives to be achieved in this particular case. A very favourable context for achieving the operation's objectives meant that the use of conspicuous military force was simply not required [35][6].

---

[6] *A divergent analysis of this should be mentioned: Osflaten has argued that "the Russian invasion of Crimea was conducted as a conventional invasion ... conducted by conventional forces operating overtly" [34]*

In other words, in Crimea Russia used an effective strategy in a context that was already favourable to it. With a view to Russia's less decisive performance in Donbas later the same year, Galeotti notes that "non-linear tactics" had functioned in Crimea because the local conditions there were favourable, and the aim was attainable. In Donbas, the conditions were also relatively favourable, but the aim did not correspond to the means at hand [19]. Russia overreached.

Second, the annexation of Crimea happened during the Ukrainian Revolution – the shift away from a pro-Russian administration under Viktor Yanukovych and to a transitional administration with support in the Maidan movement that had been driving events forward during Ukraine's Euromaidan protests. This led to rotations and defections within Ukraine's military leadership – including in the intelligence services at the time of annexation – thus hindering the flow of intelligence both within the country's military structure and between the military and political levels at a critical point in time [36, 37]. The turnover in political leadership positions, meanwhile, hampered political decision-making. The revolutionary social context also made it hard for both the leadership and the population at large to adjust to a threat appearing from the outside. This often-overlooked set of considerations illuminates the inadequate Ukrainian response to events in Crimea and the relative ease with which Russia annexed the peninsula.

These two factors explain much of the difference in Ukrainian response and Russia's degree of success in Crimea and Donbas, and – together – they suggest that that the outcome of Russia's operation to annex Crimea was due significantly to factors inherent to Ukraine rather than any particularly novel Russian way of utilizing military and non-military means. When studying the application of armed forces, the political and strategic contexts in which an operation is conducted are as important as the characteristics of the operation itself. Thus, whether we apply the term hybrid or not, if we draw too heavily on Russia's operation to annex Crimea in our analysis of what Russia can achieve through combined military and non-military means, or indeed in our analysis of modern warfare, we risk getting it very wrong. This is an important lesson, as it is likely that Russia's operation to annex Crimea made the concept of hybrid warfare more fashionable.

1.2.3 BREAK AND CONTINUITY IN THE RUSSIAN USE OF MILITARY POWER IN UKRAINE: 2014-2023

There are numerous differences between the 2014-2015 period and the period since 2022. First is the scale of operations. At the height of Russian troop presence in Ukraine in 2014–2015, somewhere between 10,000 and 13,000 Russian regular troops were involved in military operations in Eastern Ukraine. Another 26,000–50,000 troops were stationed in Crimea and 29,000–42,000 supported operations at the Russian-Ukrainian border [38]. While these estimates are substantial (though the lower ends of the ranges are more credible), the 2022 invading force was much larger, with additional troops supporting operations from within Russia and Crimea. What is more, the post-invasion troop numbers have grown enormously over time.

Second, the operating area is much larger and the front line much longer. In 2022, the front line was 1,600 km in the beginning, then gradually diminished to 1,200 km as Ukrainian ground forces pressured Russian troops to withdraw from around Kyiv and then expelled Russian forces from around the cities of Kharkiv and Kherson [39]. Between 2014 and 2022, by contrast, the front line was roughly 400 km long [40]. In short, the war expanded greatly in scale from 2022 onwards.

Third, the intensity is greater. Until 2022, the war in Donbas caused tremendous suffering, death and casualties, and its repercussions for Ukraine and the international relations of Europe were significant. Nevertheless, as argued by Käihkö [41], "By the end of that year [2014]" or the beginning of 2015 the military conflict had become "a limited war where both Ukraine and Russia used limited means to reach similarly limited aims". The full-scale invasion of 2022 is, in contrast, based on far more ambitious Russian aims. Russia has poured in most of its available ground troops – however insufficient these may be given Ukrainian resistance and the ambitious aims the Russian leadership has set for itself – and systematically mobilized its society, economy and defence sector for a long war.

Significant similarities do exist between the earlier military operations in Crimea and Donbas in 2014–2015 and the full-scale invasion since 2022. In Crimea and Donbas, Russia concealed the ways in which it operated even if these where not necessarily defining characteristics for its operations. In Crimea, Russian special forces operating without insignia but in Russian uniforms were quickly termed "little green men"; in Donbas, mercenaries appeared and were followed by Russian soldiers operating as volunteers and soldiers on "holiday". Russia denied involvement in both cases. No declaration of war was made, and the operations relied on speed, narrative controlling the narrative and confusion over the aggressor's intentions. Later the regular Russian army was brought in.

Such gambits over time have characterized the Russian and previously the Soviet way of war [34, 42], so it is unsurprising that they would be reemployed in Russia's full-scale invasion of Ukraine in 2022. First, Russia deployed large military formations at the Russian-Ukrainian border while arranging summits in a parody of real negotiations. Russia then attacked suddenly – using the element of surprise to try to overwhelm Ukraine militarily, politically and psychologically. Complementing this overt military operation were the covert methods Russia devised to try to transition from physical control of Ukrainian territory to permanent political and populational control. Special forces where designated with an important role in occupation administrations, a fine-meshed pro-Russian network in Ukraine organized by Russian intelligence organizations as well as Chechen units supporting FSB for counterintelligence purposes on occupied territory. The Wagner Group's initial role was likely limited to the utilization of its networks in Africa to support Russian information campaigns intended to spread the impression that Russia enjoyed wide-ranging support for its war [43–45]. Second, as in 2014 Russia tried to maintain control of the narrative, and actively used internet and social media channels to spread disinformation within Russia, towards Ukraine, and beyond. In sharp contrast to 2014, Russia's ability to shape perceptions of the war were

undermined by UK and US sharing of intelligence warnings. The fact that deception largely failed in 2022 gave the Ukrainian side as well as Europe and the US time to think about responses and undercut Russia's ability to maintain control over the narrative in the West. Crucially, Russia's ability to influence public opinion in Ukraine through narrative was largely lost after 2014. Disinformation, in contrast, might still be a useful tool, and there was an increase in Russian disinformation campaigns in Ukraine from the moment the full-scale invasion was launched in February 2022 and continuing in the months that followed. This is not surprising, as it is in line with both Russian capacities [46] and patterns of behaviour over time, including in Ukraine in 2013–2014 [47]. This was also the worry in governmental circles in Ukraine in 2014–2015 and has remained a concern in the years thereafter. In a similar fashion, Russia launched a variety of cyberattacks in Ukraine starting in February 2022 against webpages and systems of Ukrainian state organizations, private businesses and power grids with a varying degree of success [46, 48]. But cyber warfare has arguably not been as pronounced a feature of the war as many observers had thought beforehand that it would be [49], and Ukraine has organized a variety of attacks on Russian websites and digital infrastructure, thus likely binding up capacity on the Russian side [50, 51]. The support for Russia's invasion and the chaos that Russia tried to create in support of its operations fell short not only of likely Russian expectations, but also of the expectations one would have if adhering to a hybrid war framework.

1.2.4 RUSSIAN WARFARE AGAINST UKRAINE: HYBRID OR CONVENTIONAL?

The hybrid war concept has illuminated the importance of non-military means in our contemporary globalized and interconnected world. At the same time, the pitfalls of using it analytically are great. As commonly understood, the term "hybrid" is so broadly applicable that confirmation bias tends to sneak in — that is, "the seeking or interpreting of evidence in ways that are partial to existing beliefs, expectations or a hypothesis at hand", in the words of Raymond S. Nickerson [52]. Long lists of characteristics of a certain type of warfare are not helpful. Rather than reproducing the phenomenon it is supposed to illuminate in its full magnitude, conceptualization is only useful when it cuts through to the core of a phenomenon by drawing upon a small but dimensional set of characteristics.

Yet interestingly, as alluded to in the introduction, the original hybrid concept as developed by some early theorists was limited to the synchronization of regular and irregular military force at all levels. For Frank Hoffman [15], the simultaneous launching of multiple actions in non-military and military domains is not enough to qualify. To begin with, he defines the concept as exclusive to the military domain. Second, the key aspect is synchronization within the military domain *at all levels*, tactical, operational, and strategic. Against this backdrop, the combination of Russian-led and Russian-assisted militants in Donbas in 2014 and the later use of Russian conventional forces is a good example. But also here, the combination of regular and irregular means became a dominant

feature only when it became clear that Russia would not reach its aims solely through irregular means. As Muradov notes, "[the] Ukrainian army was very close to victory over the separatist forces by first half of August 2014" [53]. In that context, Russia sent in regular forces to reinforce the irregulars and succeeded in capturing Ilovaisk and regaining initiative. In this same Battle of Ilovaisk, the Kremlin "combined its regular and irregular forces to create a synergy" [53]. As a rebel commander interviewed by Anna Matveeva noted:

The counter-offensive was kept a deep secret, we knew nothing. It came suddenly. One minute, Blagodatnoye and Novoazovsk were taken, and the next, the units were already approaching Mariupol. We never saw the Russian forces and did not have any joint operations with them but could see that something was going on. The artillery shelled precisely on target and then we attacked, but we did not realize that this was a part of a plan. Orders were given from time to time to attack here and there, but who was giving them and why was not clear. Everybody was surprised, wondering who could have organized this, because rebel detachments were disconnected and a lot of them did not know each other [54].

Combining is not the same as synchronization, but this suggests that rebel and conventional forces might have operated parallel to each other but also with some degree synchronization. While the counter-offensive as described was certainly hybrid in aspect, the commander's surprise suggests that such means had not been applied on a large scale before August 2014. After August 2014, the presence of Russian conventional units were the decisive factor on the Russian side. Periodically, the use of special forces in flexible roles and in both combat and non-combat settings has also been put into a hybrid context. Bukkvoll, for example, notes the use of special forces "to influence local political events in non-combat situations" in Donbas in 2014 [24]. But special forces arguably fall clearly within the domain of conventional use of force, and thus outside the presumed characteristics of a "hybrid" operation.

When assessing the Russian overall war plan for 2022, Zabrodskyi et. al. [44] conclude that the "Russian deception plan largely succeeded [but that the very operational security that enabled the successful deception [...] also led Russian forces to be unprepared at the tactical level to execute the plan effectively". As the authors argue, Russian forces had the initiative at the operational level in the initial stages, but Russian units at the tactical level were unprepared. On the Ukrainian side, in contrast, at the operational-level the Armed Forced of Ukraine was surprised. But the tactical level units "had been psychologically and practically preparing for this fight for eight years" [44]. The picture that is being painted is one in which strategic surprise is prioritized over effective and flexible command and control. This tendency also made itself evident in the assessment of battle damage, during which the Russian military equated ordering and carrying out an action with having successfully accomplished it [44]. The inability to adequately coordinate action between the tactical, operational and strategic levels within the conventional structures puts in doubt any ability to do so while using unconventional methods.

The previously mentioned report on cyber war by Mueller et al. for the Center for Strategic & International Studies (CSIS) sheds light on the degree of Russian coordination within the cyber domain. Material from Microsoft and Ukrainian sources shows that Russia attacks non-state actors to a significantly larger degree than it attacks state and local administrations and military targets. Such findings, the report argues, "cast doubt on the extent to which Russia has successfully integrated its conventional military operations with cyber effects". It concludes that "Russian military operations appear to struggle with integrating combined effects, especially across domains" [49]. Russia seemingly has not been able to change the style and severity of cyber operations despite the context of a full-scale war. Only the number of attacks was increased in an early stage of the full-scale invasion. "Russian criminal groups thrive, increasing ransomware campaigns and 'crime-as-a-service' campaigns globally, but Moscow proves unable to align cyber operations with its political objectives of winning the war in Ukraine and establishing Russian hegemony in its near abroad" [49]. There is thus reason to doubt Russia's ability to synchronize actions at different levels and in different domains that include non-military or unconventional ones like cyber. As in Donbas in 2014, Wagner is "supported by" and gradually "intertwined" with the GRU [45]. On the one hand, operations by Wagner units are integrated with Russian operational plans. On the other, "GRU has often routed political recommendations to Putin through Prigozhin rather than its own official chain of command" [45]. In a war conducted strictly in accordance with "hybrid" principles, one would expect one unified chain of command.

While a hybrid war framework might have been useful for examining the relationship between military and non-military means and the potential advantages their successful interplay would create, these points have now been communicated. Hoffman's early and quite focused definition of "hybrid" as the coordination of irregular and regular force, synchronized not only at a strategic level, but also at the tactical and operational levels, certainty sheds light on an interesting dynamic. But a lack of empirical evidence of correspondence between such narrower — and thus more useful — definitions of "hybrid" war and actual Russian behaviour in Ukraine suggests that the burden of proof lies with those who continue to use the term. Degree of popularization cannot alone legitimize continued use of a term. The hybrid concept does not get the most important aspects of Russian warfare right. Russia's unconventional means appear to be synchronized at different levels only to a limited degree, and are clearly meant to bolster conventional operations in reaching war aims rather than the other way around.

Attaching more importance over time to notions such as Russian imperial worldviews (with Ukraine featuring in a key role) can better explain *why* Russia continues to wage war on Ukraine, while examinations of strategic culture and the Russian way of war help to explain the *how*. It has repeatedly been pointed out that Soviet-era "active measures" and thinking about non-military means undermine claims that hybrid war is a novel phenomenon [32, 55, 56][7]. A feature that

---

[7] De Benedictis argues that the Russian operation annexing Crimea amounts to the "*modern application of historic Soviet political warfare practices — the overt and covert informational, political, and military tools used to influence the actions of foreign governments and foreign populations*"

often figures in accounts of hybrid war is the assumption that Russian operations in Crimea and the Donbas were part of a coherent and even pre-planned strategy [25, 26, 57]. The experience of the full-scale invasion – including the Russian difficulties in command and control – puts in doubt whether Russia has a strategic culture that enables it to sophisticatedly carry out and synchronize "hybrid" war.

1.3 MULTI-DOMAIN OPERATIONS IN HYBRID WARFARE

Andrii Ivashchenko, Dmytro Fedianovych, Tetiana Uvarova

ABSTRACT

The task to counter the aggressor, whose potential and resources significantly exceed the capabilities of the victim of the attack, remains relevant throughout the entire military history of civilization. To counteract such an aggressor, a wide range of measures are used, which have received the general name "asymmetric actions". At the same time, the issues of asymmetric strategies aimed at achieving victory over a superior enemy are not sufficiently developed. The purpose of this article is to consider certain basic principles and provisions of the Concept of Multidomain Operations and the possibility of their practical application when countering an enemy that is superior in terms of military potential and resources.

Let's define the main terms used in this study. *Multidomain Operations* are operations that are carried out simultaneously according to a single plan in several domains and controversial spaces in order to overcome the strengths of the enemy, putting it in front of several operational and tactical dilemmas through the combined use of multidomain units at precisely defined positions in space and time, the convergence of capabilities across domains, spaces, and functions across time and space to achieve operational and tactical objectives. *Domain* is a space within the operational environment (physical, virtual, cognitive) in which operations (actions) of the Defence Forces are conducted. The term "*multidomain*" means that simultaneous actions (operations) in more than one domain are considered, which are carried out according to a single plan. Controversial domains (spaces) are domains (spaces) on which the main efforts are focused in order to achieve the goals of the operation. *Cross-domain operation* involves the use of lethal or non-lethal weapons from one domain to another in order to achieve strategic (operational) priority over the enemy. All other terms in this study are used in accordance with NATO terminology [58].

KEYWORDS

Asymmetric actions, multi-domain operations, superior enemy, military potential, operational dilemmas, tactical objectives, convergence of capabilities, operational environment, physical domain, virtual domain, cognitive domain, operational plan, cross-domain operations, lethal weapons.

1.3.1 BASICS OF MULTI-DOMAIN OPERATIONS

After a large-scale invasion in February 2022, the Ukrainian Armed Forces successfully defend and repel Russian forces in many regions despite a number of obvious problems. To date, the

Ukrainian Armed Forces have demonstrated considerable flexibility during the war, the ability to effectively integrate foreign military assistance and force training during operations.

A large-scale war against Ukraine does not fit into the concept of a local conflict of medium intensity in terms of duration, spatial indicators, the number of forces involved, the list of weapons, and other high-tech equipment involved in the conflict. At the same time, the aggressor country uses the following methods of hybrid warfare: hiding the goals of aggression, destroying energy infrastructure facilities, denying strikes on civilian objects, destroying hospitals, residential buildings, terror against the civilian population, creating conditions for a global food crisis. Thus, despite the massive use of conventional weapons, Russia's aggressive strategy contains all the signs of a hybrid war, which is characterized by an increase in the number of spaces and operational domains of hostilities. In addition to the traditional operational domain of physical space — land, sea, air, space, operational domains of virtual space — cybernetic and informational, countering Russian aggression continues in new dimensions. Under the conditions of conducting hostilities on one's territory, carrying out de-occupation operations, the cognitive domain is of great importance.

Separate multi-domain actions were practically applied by the Ukrainian Armed Forces during operations to liberate territories in the Kharkiv and Kherson regions. At the same time, the prospects of a military campaign to liberate the occupied territories and further ensure the military security of Ukraine must be considered taking into account the complex and ambiguous combination of factors of Russian aggression in several domains. Only their full and comprehensive consideration, the achievement of synergistic effects in controversial domains, will create the prerequisites for the task of defeating the armed forces of the aggressor country and ending the destructive war.

One of the options for solving the problem is the further development of the theory and practice of the combat application of multi-domain operations.

The relevance of the concept is due to the hybrid nature of modern military conflicts, the development of technologies of information systems, artificial intelligence, analysis, and processing of large volumes of data (Big Data) [3]; the development of the strategy and tactics of the use of defence forces.

The idea of the concept is to use multi-domain formations of a new type — multi-domain battlegroup (MDB) under complex conditions of the military and political situation. MDB are equipped with promising weapons, military, and special equipment, and have the necessary capabilities for:

— *application in areas of restricted access* to areas of hostilities and in controversial domains;

— *maneuverability* — transfer of the necessary forces and means in a short period of time and increasing their operational and tactical independence for autonomous actions at a depth of up to 500 km for up to 30 days;

— *adaptability* on the battlefield, the ability to perform tasks under the changing conditions of the operational situation due to the use of new technologies, high qualification of personnel, and level of training;

— *universality* — acting at various stages of an integrated operation and in any domains of confrontation;

— *establishment of control over centers of activity* of various social groups (youth, national, and religious movements);

— *compatibility* (but at the same time remaining self-sufficient) with all components of inter-specific groups of troops (forces);

— *inflicting a fire defeat* on the enemy on land and in other operational domains;

— *network structure*;

— *functionality* that makes it possible to quickly move to the performance of tasks in difficult situations, to deploy in forward areas, to use the necessary forces and means in a specific place in a timely manner;

— *interactions* in all operational domains with general purpose forces, allies, and partners;

— the ability to train and arm *national resistance units* and volunteer formations, including for conducting non-traditional special operations;

— conducting operations with the use of both strikes with high-precision fire damage on individual targets, as well as subversive actions with non-military means in temporarily occupied territories and large-scale information campaigns;

— *use of non-military countermeasures;*

— *confrontation in the cognitive domain;*

— *conducting operations in densely built-up urban areas.*

Taking into account the forecast of the development of the operational situation along the entire line of contact, MDB are used in *areas of restricted access* to combat areas and in controversial domains, while solving the task of conducting special actions at the initial stage of the operation, identifying threats, reducing risks and creating "windows of opportunity" for the use of interspecific groups of troops (forces) during the operation.

The maneuver in the depth of the enemy's battle formations and rear is a precautionary measure that will be used by MDB in order to influence the situation and create problematic situations for the enemy. The ability to influence the course of the operation in areas inaccessible to general purpose forces is a critical capability of MDB. MDB needs the ability to operate in the enemy's rear area for up to 15 days, and in the future up to 30 days. The development of success in these territories will necessarily require the joint efforts of all types of armed forces, allies, and partners. But this process can be very resource-intensive. In addition, the acquisition of such capabilities requires administrative and operational changes in their structure.

Adaptability involves the use of high technologies and countering the enemy through the use of new approaches to the use of MDB, the involvement of the best specialists, and the implementation of the most modern concepts, strategies, and systems.

Versatility provides opportunities for early action and rapid response to crises. MDB designed to perform a defined list of tasks will have the ability to act in several additional functional directions. If necessary, they can be reinforced by units of general-purpose forces provided.

The MCG's capabilities for *using non-military means* must be significantly increased. In particular, capabilities are needed to ensure a timely response to crisis situations related to the enemy's

actions on civil infrastructure, a reliable assessment of the capabilities of the friendly and hostile local population and the corresponding impact on it.

The confrontation in the cognitive domain is a form of unconventional warfare, a struggle for the "hearts and minds" of people. The cognitive domain includes various operational spaces and actors, including national resistance, resilience, reflexive management, strategic communications, public relations, interagency coordination, civil-military operations, disinformation, and more. The specific goals of influence in the cognitive domain are subject to the overall strategy of the multi-domain operation. The combination of technologies of cognitive influence with technologies of digitalization, artificial intelligence, analysis, and processing of big data allows for a controlled influence on communities and individuals to change their cognitive frames and behavior, in particular influencing the procedures for making political and military decisions. The growing importance of the cognitive dimension gives rise to a wide range of research questions. The concept gives a new definition of the concept of "goal" in relation to the cognitive sector of struggle, which implies social consciousness and includes knowledge, information, needs, motives, value orientations, attitudes, interests, and other empirical elements of the social world, enclosed in socio-economic, socio- political, and socio-cultural fields. In the traditional sense, a goal is defined as an object or landmark in a physical environment. De-occupation operations make it necessary to focus efforts on achieving advantages in the virtual and cognitive domains. Objectives in hybrid warfare are becoming multi-domain and will remain so in the future. To conduct successful offensive actions in several domains, versatile operational groups of highly qualified professionals with a wide range of skills and abilities are required.

The units of national resistance, which are created by MDB, together with other formations are used to destroy the enemy's control centers, air defence facilities, and transport communications. In addition, informational and psychological influence on local target audiences is applied. The civilian population is mobilized to organize the collection of information on the movement of enemy forces. During the armed conflict, MDB, together with the national resistance units, will be involved in the interests of disrupting the enemy's plans to limit (prohibit) the access of the Armed Forces to the areas of the operation and organize maneuvers in the depth of its battle formations and directly in the rear.

De-occupation operations will be conducted both in open areas and in densely built-up urban areas. The complexity of densely populated urban areas from the point of view of politics, economy, infrastructure, demography, and culture determines the multi-domain nature of any operation to liberate large cities. Urban areas represent one of the most complex operational environments due to the confluence of different spaces, domains, and scales. Combat actions can take place at underground, surface, above-ground, and air levels. It is in densely populated urban areas that the effectiveness of the use of MDB can be the highest. The struggle unfolds in a relatively small space with a dense and complex population, and victory is variable and rapid in both spatial and temporal dimensions. Analysis of the features of different domains, convergence at their intersections can provide important information for the successful deoccupation of the urban environment.

1.3.2 CONCEPTS AND PLANS FOR THE IMPLEMENTATION OF THE CONCEPT OF MULTI-DOMAIN OPERATIONS

Most of the strategies for achieving victory in the new type of wars were developed by US military theorists. These include "Army After the Next" (2010), "Capstone Concept for Joint Operations" (2012), "Army Operating Concept" (2014), "AirLand" (2015), "Operational Concept of the US Marine Corps" (2016), "Concept of multi-domain operation" (2017). The goal of these strategies is to achieve victory in future conflicts with a powerful adversary and to respond to Russia's "New Generation Wars" [11] and China's hybrid warfare strategy [12].

In order to clarify certain provisions of the "Concept of Multi-Domain Operation" and its practical implementation during 2017–2022, a number of activities were carried out, as a result of which several scientific papers and guidelines were published. Thus, *the United States Ground Forces Unified Network Plan* [59] defines a set of measures to change the organizational and personnel structure, modernize weapons and military equipment, improve decision-making processes, control systems, and software in order to ensure readiness for multi-domain operations. The RAND Corporation's study *"Global Mobility: Future Force Structure 2040"* [60] substantiates the necessary capabilities to ensure the mobility and maneuverability of troops, the use of multifunctional platforms, additive technologies, and methods of analyzing large volumes of data (Big Data) [3] in multi-domain operations. In the study of the NATO Center for Excellence for Cyber Security *"Cyber potential and multi-domain operations in conditions of high-intensity conflict 2030"* [61], the requirements for the management system, its stability and cyber-defence when conducting multi-domain operations in the course of a high-intensity conflict are determined. *"Concept of maneuver in multi-domain operations 2028"* [62] considers the implementation of inter-domain maneuvers with the aim of defeating the dominant adversary. The strategy *"Army support in several domains"* [63] provides for the transformation of military bases and other facilities into "platforms" for the protection, support, and provision of armed forces units during multi-domain operations. A platform is a military base capable of deploying a brigade-sized force or larger in accordance with CCMD OPLAN requirements in 10 days or less and providing training, redeployment, or other activities related to the design of military power. The study *"Multi-domain transformation: readiness to win in confrontation and military conflict"* [64] in its content is a strategic plan for preparing for multi-domain operations, which describes how the armed forces must transform in order to increase combat capabilities and win in a military conflict with a powerful enemy. Doctoral papers ADP 3-0 [65] and FM 3-0 [66] define multi-domain operations as the main ones in future conflicts and contain the principles of planning and conducting such operations.

Already today, some countries are putting the concept of conducting multi-domain operations at the basis of a deep transformation of the national armed forces. Thus, in February 2022, the Center for the Study of Land Operations in New Delhi, India held a seminar *"Multi-domain operations – the future of conflicts"*. During the seminar, the issues of India's military strategy in future conflicts, readiness of the Indian armed forces for multi-domain operations, increasing interoperability in multi-domain operations, problems of convergence of joint forces were considered.

1.3.3 COMMAND AND CONTROL IN MULTI-DOMAIN OPERATIONS

The concept of multi-domain operations is based on autonomous interaction: unit – unit, by-passing the vertical unit – operation headquarters. Such interaction leads to the decomposition of the operation into separate combat actions. To avoid this, a reliable automated control and defeat system is needed, which involves combining all means of control, communication, intelligence, and information processing into a single network.

Among the elements of such a system, it is possible to attribute with confidence the auto-mated troop control system *"GIS Arta"* and the *Starlink* satellite system, proven by the practice of combat use.

The Ukrainian tool "*GIS Arta*" [67] has been used by the Ukrainian Armed Forces since 2014 and has shown high efficiency compared to traditional approaches to management and control. It is most widely used in artillery units, which is due to the specifics of planning and conducting combat operations, the requirements for factual data, and the urgency of obtaining information about the results of combat operations. At the same time, GIS Arta has proven well as a basic system of situation centers and control centers, a tool for planning, control, processing, and dissemination of the results of intelligence operations. The system is developed and modernized based on close work and constant consultation with direct users on the front lines of combat operations.

Starlink makes it possible to create a unique strategic advantage over the enemy and creates new opportunities for command and communication in a multi-domain operation. *Starlink* capabilities provide:

– conducting modern network-centric and multi-domain operations that are not available to the armed forces of the Russian Federation;

– exchanging video streams online in real time;

– creating combat chats and other management systems for data exchange between thousands of subscribers in real time;

– ensuring the concealment of communication from the actions of the enemy's radio-electronic intelligence at the expense of a narrowly directed communication channel to the satellite;

– ensuring a high level of data protection in transmission channels;

– support to Wi-Fi-based tactical communication network at each access point;

– deploying a communication and data exchange system within a few minutes in any hidden place;

– standard use on unmanned platforms of various types.

The experience gained shows that *Starlink* can be considered as one of the information exchange systems in multi-domain operations, primarily at the operational-tactical level.

Implementation of the concept of multi-domain operations is proposed in the following directions:

– *to organize* the deployment of additional joint forces, attracting the potential of allies, preventing the enemy from using hybrid warfare methods, and quickly defeating the enemy's armed forces;

– *to introduce* methods of using interspecific groups of troops (forces), which include new type units capable of operating separately from the main forces for a long time;

— *to concentrate* military and political efforts at crucial moments of time on the main directions, i.e., creation of "windows of opportunity" for the maneuver of groups of troops (forces);

— *to identify* a set of favorable conditions, factors, and vulnerable places that make it possible to gain an advantage over the enemy in various operational environments in order to capture, hold, and use the initiative for further defeating it.

According to the assessment of our strategic partners [68], the Ukrainian Armed Forces continue to demonstrate a high level of operational flexibility, motivation, and capabilities. The command structure of the Armed Forces is centralized in contrast to the more localized one that was demonstrated at the beginning of the war. The command of the Armed Forces has demonstrated flexibility and readiness to quickly adjust operations depending on changing circumstances, especially at the unit level. The Armed Forces continue to apply NATO-style command principles, such as delegation of authority to tactical-level commanders as well as junior officers.

The implementation of the concept of multi-domain operations is a complex task that the Ukrainian Armed Forces still need to tackle, taking into account both their own combat experience and the best practices of other countries. It will be much easier for NATO member states to prepare for these changes as NATO is now trying to unify countries' positions on multi-domain operations.

CONCLUSIONS

1. Planning and implementation of a multi-domain operation differ from a traditional military operation. The greatest effectiveness of a multi-domain operation, ensuring the deterrence and defeat of a numerically superior adversary can be expected when conducting inter-domain operations.

2. The practical application of the concept of multi-domain operations by the defence forces ensures the effective deterrence of the enemy's aggression, confrontation and forcing the enemy to end the conflict on unfavorable terms.

3. In the course of multi-domain operations, the enemy's decision-making process is complicated, its actions are limited and, as a result, defeat on the battlefield is achieved.

4. The result of the implementation of the Concept of multi-domain operations in the Ukrainian Armed Forces will be an increase in combat capabilities.

1.4 JOINT ALL-DOMAIN COMMAND AND CONTROL SYSTEM AS A BASIS OF THE MULTI-DOMAIN OPERATIONS CONCEPT FOR UKRAINE DEFENCE

Valerii Hordiichuk, Nina Andriianova, Oleksandr Peredrii

ABSTRACT

Quite a large number of modern scientists and publicists note that in the Russian-Ukrainian war at a certain stage, along with the supply of foreign military assistance, the factor of "rapid digitalization" of the Ukrainian Defence Forces played a key role in turning the tide of hostilities and disrupting the plans of the Russian occupation forces. In operational mode, the Ukrainian side was able to mobilize scientific and engineering potential. In Ukraine, by its own efforts and thanks to the transfer of technologies by partners, elements (and possibly a prototype) of the widely discussed in NATO Joint All-Domain Command and Control System (JADC2) have been created, which in Ukrainian military affairs is very similar in definition and tasks to the so-called Unified Automated Troop Control System (UATC2), which in Western terminology is known as the Joint Command and Control System (JCACS).

The concept, and later the JADC2 strategy, originated and developed in the USA as the basis of the concept, and later the doctrine of Multi-Domain Operations (MDO) in the United States of America (USA), which also found its place in the US National Defence Strategy.

A less rigid hierarchical structure of leadership than in the Russian Federation and the existential nature of this war led to the fact that various technologies in the areas of command and control, situational awareness, communication, computerization, cyber activity, intelligence and surveillance (C5ISR – Army Command, Control, Communications, Computers, Cyber, Intelligence, Surveillance and Reconnaissance) developed rapidly and were implemented asynchronously in Ukraine both at the state level and in individual military structures and units. Despite the lack of complete consistency of these systems and their models, the advantage in situational awareness and the speed of obtaining information by structures of all levels of management, including tactical, thanks to these technologies, proved effective in confronting the enemy's superior forces and means, which once again confirmed the important role of network-centricity in modern armed conflicts. Therefore, there was a need to analyze this technological case of the Ukrainian-Russian confrontation and outline the possible directions of its development.

This work examines the essence of the MDO concept, the synergy of the MDO and JADC2 concepts, and the convergence of UACS TL and JADC2; it analyzes the network-centric technologies of C4ISR (Army Command, Control, Communications, Computers, Intelligence, Surveillance and Reconnaissance) based on the experience of the Russian-Ukrainian war and defines the initial data for the development (improvement) of UACS TL in Ukraine and possible measures (directions) for its transformation.

KEYWORDS

Digitalization, Ukrainian Defence Forces, NATO, Joint All-Domain Command and Control System, Unified Automated Troop Command and Control System, multi-domain operations, situational awareness, computerization, cyber activity, intelligence and surveillance.

1.4.1 THE MULTI-DOMAIN OPERATIONS CONCEPT

The analysis of the last decades events shows the aggravation of the world political crisis, the complication of diplomatic relations and the confrontation between individual states and military-political blocs. Today, the issue of interstate strategic competition occupies a prominent place in the defence strategies of most of the world's leading countries, in particular the United States of America.

With the development of robotics, artificial intelligence, information and computer technologies, the methods of armed struggle have undergone fundamental changes, and confrontations between countries have moved into a multidimensional space and are considered comprehensively at all levels: strategic, operational, and tactical.

Strategic interstate competition begins not on the battlefield but far beyond it: in the political, diplomatic, economic, social, and informational sectors.

Armed confrontations between opposing sides at the operational and tactical levels, which not so long ago took place in three-dimensional space (on land, sea, and in the air), today extend to other environments: space and cyberspace, and if we look even deeper, to the cognitive (informative).

Based on the assessment of modern threats to national security, the leading NATO countries consider the concept of Multi-Domain Operations as a strategy for countering new threats. **Fig. 1.4.1** shows the evolution of U.S. defence doctrines depending on existing threats from 1982 through 2022.
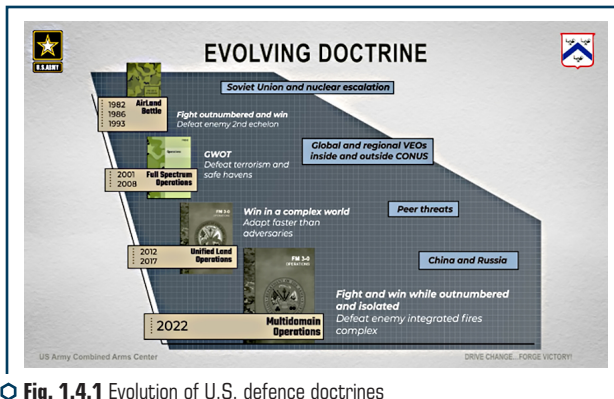
○ **Fig. 1.4.1** Evolution of U.S. defence doctrines
Source: [69]

Thus, expanding the environment of possible armed conflicts against the background of the global aggravation of interstate relations and rapid technological progress prompts the revision of existing and the creation of new conceptual approaches to the processes of planning and conducting military operations.

In the case of Ukraine, under the conditions of a large-scale war, it is also critically necessary to develop and implement an authentic concept that will meet modern challenges and threats.

1.4.1.1 THE UNITED STATES OF AMERICA AND NATO

For the first time, the term "Multi-domain Operations" was described in 2018 in the pamphlet "The US Army in multi-domain operations 2028" [70].

In the cited paper, "multi-domain operations" are defined as operations coordinated in place and time, conducted in several dimensions (domains) and spaces of confrontation to defeat the enemy through the combined use of troops (forces), the operational construction of a multi-domain group, in close interaction of all forces and means operating in different dimensions (domains), with the aim of achieving a defined operational-tactical goal (**Fig. 1.4.2**) [70].

The development of the MDO concept in the USA continued with the inclusion of relevant provisions in the 2022 National Security Strategy [71]. In this strategy, it is determined that the main threat to national security is interstate competition, and not terrorism, as it was defined in the previous document. The shift in emphasis is associated with behavior changes of important strategic competitors, primarily China and Russia, which with their foreign policy demonstrate the desire to form a new world order that will correspond to their authoritarian model with the right to veto security, as well as diplomatic and economic decisions of other countries.
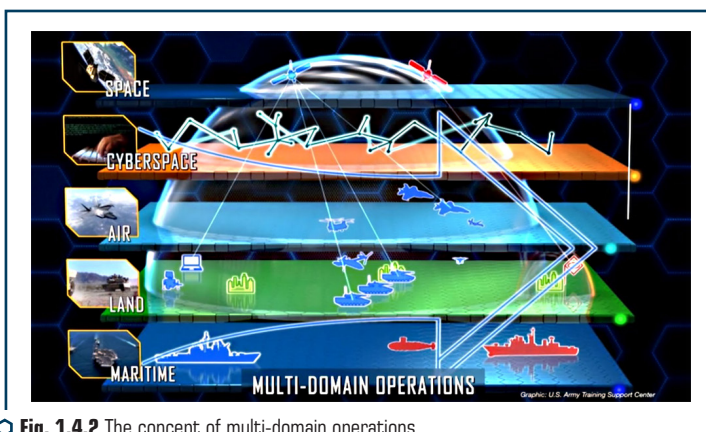
○ **Fig. 1.4.2** The concept of multi-domain operations
Source: [70]

Such strategic players at the first stages of "competition" try to use the conditions of the operational environment to achieve their goals, without resorting to armed conflict. The development of confrontation is conducted in the diplomatic, economic, informational (through mass media, social networks, etc.), cybernetic, other areas along with the use of regular armed forces. Such a confrontation has received the name of "unconventional" or "hybrid war" among the countries of the Western world. In traditional domains in all domains of multi-level space — on land, at sea, in the air, in space and in cyberspace, geopolitical players continued to use the acquired experience of military operations, taking into account the development of the latest technologies and means of warfare.

The result of five years work on improving the MDO concept was the publication in October 2022 of the new operational doctrine of the US Army, which replaced the document of 2017 and was titled "Field Manual 3-0 Operations" [69]. The US Army Command has emphasized that this doctrine will be the key operational guidance for the armed forces until 2030.

All modern operations are inherently multi-domain and are carried out in a multi-dimensional environment (**Fig. 1.4.3**). For example, Ground Forces during hostilities constantly use aviation and the navy to transfer troops, and the capabilities of space and cyberspace, which they do not directly control, are used to organize and provide satellite communication, navigation, intelligence, and surveillance [69].
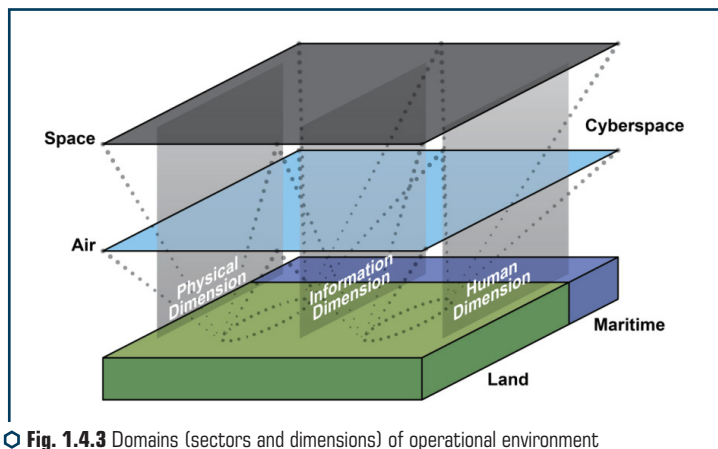
○ **Fig. 1.4.3** Domains (sectors and dimensions) of operational environment
Source: [70]

A multi-domain operation is a specific form of armed struggle — a joint campaign of all available forces. Before the start of an armed conflict, MDOs are used to deter the enemy and demonstrate the readiness of the armed forces to participate in hostilities. In the course of hostilities, MDOs are used as an asymmetric response to the enemy with the sequential performance of the following tasks: to get close to the enemy, to wedge into its operational structure, to seize critical

objects and areas of the terrain, to defeat the enemy, to establish control over the population and resources until the stability of the defined political decision. When performing the specified tasks, the use of the potential of the combined forces in all domains will make it possible to achieve the specified goal with the least loss of combat potential in each of them.

Thus, from a strategic point of view, a multi-domain operation is a comprehensive application of existing joint multifunctional forces' capabilities in all sectors and dimensions to create an advantage and use it to achieve the main goal – to defeat the enemy.

Outside the USA, other NATO member states view the concept of MDO differently, but regardless of what content different states put into the concept of MDO, there is a common understanding of the need to develop integration and new technical solutions that would meet the modern challenges of future high-tech military operations.

At the Supreme Headquarters Allied Powers Europe (SHAPE), the main task for the development of the MDO concept is considering the integration of all types of information, focusing on the use of the latest technologies to improve the effectiveness of decision-making process by commanders. For this purpose, the system of commanders and staffs collective training, in addition to training in traditional physical domains (land, sea, and air), includes other domains recognized by NATO: space and cyberspace. The purpose of such training is for any joint staff officer in the NATO command structure to have a clear understanding of the command-and-control system and the ultimate goal of the multi-domain operation as a whole, and to be able to perform the appropriate functions in similar headquarters. In other words, to be able effectively interact with other officers and perform tasks, using a single terminology of operational management that is understandable to everyone [72].

Great Britain has focused its efforts in this area on considering the possibility of implementing a similar concept – multi-domain integration (MDI) between three levels: government agencies, multi-domain operational environment, and allies (**Fig. 1.4.4**) [73].
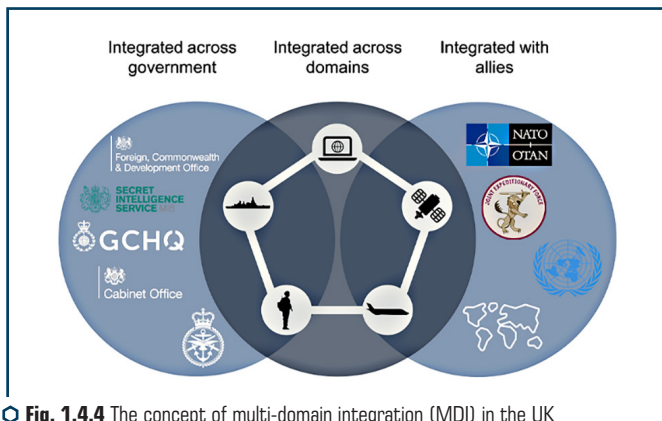
○ **Fig. 1.4.4** The concept of multi-domain integration (MDI) in the UK
Source: [73]

The main task of MDI is the possibility of ensuring the coordinated joint work of the entire defence system with other state structures and allies by [73]:

– integration of all available equipment and technologies in all areas into a single system;

– creation and improvement of IT networks that will ensure the exchange of data flows from measuring devices (platforms) in all areas;

– the use of artificial intelligence and cloud technologies for the fastest information processing and providing it to decision-makers in all state authorities;

– integration of all existing state information systems with information systems of partners and allies to avoid duplication;

– training of personnel in joint actions and the use of modern developments during complex exercises with partners and allies;

– early development of joint action plans with partners and allies, rather than reacting to threats on a case-by-case basis.

1.4.1.2 RUSSIA

In work [74], Reynold Dinsdale cites one of the examples of Russia conducting MDO, but this case is not unique. Thus, already in 2015, elements of MDO were clearly visible during the military campaign of the Russian invasion in Syria. Russian troops conducted combat operations in all five domains to achieve the set goal. The use of cruise missiles to strike from the Caspian region, the accumulation of missile submarines in the Mediterranean Sea, the creation of a complex and integrated air defence system, the establishment of logistics supply chains using the port of Tartus and the Khmeimim air base, the implementation of aerial reconnaissance and targeting with the help of aviation and unmanned aerial systems, carrying out an information campaign in mass media justifying the actions of the political regimes of V. Putin and B. Assad (**Fig. 1.4.5**).
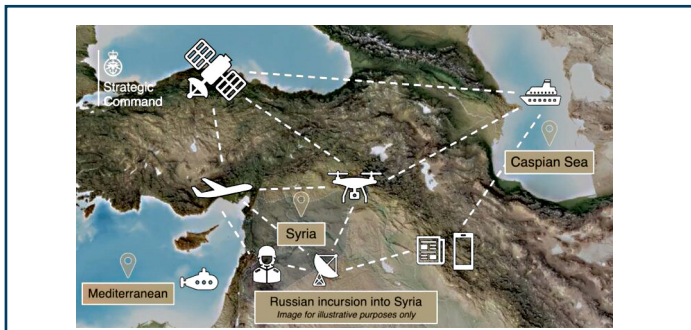
○ **Fig. 1.4.5** Application of elements of the concept of MDO of the Russia in Syria
Source: [74]

Regarding Russia's war against Ukraine, the military doctrine of the Russian Federation directly implies the creation of multifunctional battalion-tactical groups similar to Multitask Forces, which NATO creates to ensure its own MDO concept. In addition, the so-called "special military operation" has all the features of a multi-domain operation.

1.4.1.3 UKRAINE

A certain sequence of actions regarding the transition to the concept of multi-domain operations can be traced in a number of legislative norms of Ukraine in the sectors of national and military security. Without delving into the history of the origin and development of such aspects in Ukraine, it should be noted that the new edition of the Strategic Defence Bulletin put into effect by the Decree of the President of Ukraine in 2021 [75] states that during 2016–2020 the key tasks of the defence reform were fulfilled, in particular, the foundations of a new system of joint leadership of the defence forces and military management in the Ukrainian Armed Forces were laid in accordance with the principles adopted by NATO, by introducing separate positions of the Commander-in-Chief of the Ukrainian Armed Forces, the Chief of the General Staff of the Ukrainian Armed Forces, and the Commander of the Joint Forces of the Ukrainian Armed Forces, separation of the functions of strategic planning entrusted to the General Staff of the Ukrainian Armed Forces, formation, training, and development of troops (forces), which are entrusted to the command of types, separate branches of troops (forces) of the Ukrainian Armed Forces, from the functions of the use of subordinated troops (forces), which are carried out by the Command of the United Forces of the Ukrainian Armed Forces.

Appendix No. 1 to the Strategic Defence Bulletin "Prospective system of joint command and military management" determines that the direct use of troops (forces) is carried out by the Command of the Joint Forces of the Ukrainian Armed Forces through the command of operational-tactical groups. According to their structure, they can include the entire range of forces and means to solve the assigned tasks, which is nothing more than one of the basic principles of the multi-domain operations concept.

Thus, in the "Basic Principles for the Organization of the Management System", which is Appendix No. 2 to the Strategic Defence Bulletin, it is determined that the use of the Ukrainian Armed Forces and other components of the defence forces is entrusted to the Command of the Joint Forces of the Ukrainian Armed Forces. Principle No. 4 directly defines that all operations in any operational space (at sea, on land, in the air, and in cyberspace as a component of the information space) have a common (interspecific, interagency) nature. They are carried out by the forces and means of united (interspecific, inter-departmental) groups with the involvement of types and branches of troops (forces) of the Ukrainian Armed Forces and other components of the defence forces.

Thus, it can be confidently stated that the principles of the MDO concept formed the basis of national concepts and strategies for the development and use of the Defence Forces of Ukraine.

1.4.2 JOINT ALL-DOMAIN COMMAND AND CONTROL

1.4.2.1 THE UNITED STATES OF AMERICA AND NATO

Conducting modern MDOs involves, first of all, confrontation in the field of the latest technological achievements, therefore their technical component should contain advanced technologies that will provide an effective system of situational awareness and troop management. Such components are the basis of the Memorandum of Understanding between the Army and the US Air Force, which was named "Joint All-Domain Command and Control" (JADC2) [76]. For the US Air Force, the provision of MDO is the use of the most modern Army Command, Control, Communications, Computers, Intelligence, Surveillance and Reconnaissance System (C4ISR) for a similar system — Multi-Domain Command and Control (MDC2). The Joint Staff continues to work with technical companies to develop an integrated service for the combined various command and control systems, such as MDC2 and JADC2 [76].

In March 2022, the Strategy for Joint All-Domain Command and Control (JADC2) was published (**Fig. 1.4.6**) [77]. The Strategy identifies an urgent need for immediate action to provide Joint Force Commanders with the capabilities necessary to command the Joint Force in all areas and domains to deter and, if necessary, defeat any adversary at any time, in any place, at any point of the globe.

Fig. 1.4.6 JADC2 structure
Source: [78]

JADC2 is defined as a necessary warfighting requirement to deal with the big data and its complexity in modern warfare and defeat adversaries.

JADC2 enables the Joint Force to quickly "sense", "understand", and "act" on timely information about the progress of the war, using automation, artificial intelligence, predictive analytics, and "machine learning" technologies to prove the decisions made by the means stable and reliable network environment.

On March 15, 2022, the US Department of Defence announced the approval of the JADC2 Implementation Plan [78].

The JADC2 Cross-Functional Team (CFT), created by the US Department of Defence, will monitor the implementation of the JADC2 Strategy and its Implementation Plan. While the JADC2 Strategy outlines the vision and approach for defining, organizing, and providing the Joint Forces with enhanced C2 (command and control) capabilities, the Implementation Plan defines how the US Department of Defence will achieve this.

As stated in the press release [78], the JADC2 Implementation Plan is confidential and can be described as a document that details action plans, milestones, and resource requirements. It identifies the organizations responsible for acquiring JADC2 capabilities. The plan defines tasks for the Department of Defence to accelerate the decision-making cycle, eliminate operational gaps, and increase the stability of C2 systems. It will make it possible "to better integrate conventional and nuclear C2 processes and procedures and to strengthen operational interoperability and information exchange with partners". Since the document is secret, one can only assume what it actually provides for. However, by analyzing the trends of acquisition of capabilities in the direction of JADC2, we can make certain assumptions.

The first priority of the modernization of the US army in the near future is the improvement of ACS of the troops. To implement this idea, the US Army Futures Command (AFC) was formed. It included the Combat Capabilities Development Command (CCDC), which consists of seven centers. The main task of this command is the formulation of the concept of the future, as well as the integration and synchronization of scientific and technical units within the framework of measures to "create the armed forces of the future". The key direction of work for these structures is the further development of a unified information network, fully protected from the influence of the enemy. The technical details of these procedures are confidential. It is only known that the developers are focusing on four directions of modernization of ACS by the troops: direct creation and improvement of a single network; creation of a simplified set of team applications; improving interaction between elements of the army, partners, and allies; ensuring the survivability of command posts [77].

Timely and fast exchange of data between various subjects and headquarters involved in conducting MDO is the key to success. The main task of ensuring this is the choice of the optimal data exchange model. It is necessary to create a flexible and operationally compatible system of command and control since operations will be conducted in a dynamic environment and with limited resources.

The intelligence and surveillance (ISR) systems currently being developed to detect and track targets deep in the battlefield will continue to evolve, as will the means of engaging targets, which will

become more precise and capable of operating at even greater distances. Intelligence systems need to be quickly integrated into a single network that will allow receiving information from various sources, unmanned intelligence platforms, as well as ground, sea, air and space units and satellites, and for this, a single standardized protocol is needed that will ensure seamless connection of various information sources in the system is at the same time compatible with the allied one. After all, the successful conduct of MDO requires not only the involvement of the military component and the capabilities of partners but also all other available non-military means that can contribute to the achievement of the goal [77].

In 2020, the NATO Science & Technology Organization (STO NATO) conducted and published a special study "Trends in Science and Technology 2020–2040" [79]. According to it, the key task of the Alliance is to ensure the stability of the Army Command, Control, Communications, Computers, Intelligence, Surveillance and Reconnaissance System (C4ISR). However, open discussions are held only for tactical-level developments, which can be procured primarily within the Alliance. As one of the most reliable, the Sita Ware software package of the Danish company Systematic, which provides for the introduction of automated management at the level of divisions, is considered. This solution provides real-time management and information sharing from operational-level headquarters down to the individual crew or soldier. Also, Sita Ware can combine information from the battlefield into a single operational picture, which allows the commander and his/her subordinates to correctly and timely assess the current situation. It is known that such systems have been successful in NATO operations and were purchased by almost two dozen countries [80].

1.4.2.2 RUSSIA

On the website of the propaganda media group "Zvezda", along with the frank promotion of propaganda narratives, carefully written into the information streams, there is some data about combat automated control systems. So, if the information published there is to be believed, the main systems they use (or claim to use) can be listed.

ACS of the Armed Forces of Russia (ASU of the Armed Forces of the Russian Federation) (**Fig. 1.4.7**) is a unified system of management of all military formations that are part of the structure of the Armed Forces of the Russian Federation, including the nuclear triad, implemented in the National Defence Management Center of the Russian Federation [81].

The technical basis of the automated control system of the Armed Forces of the Russian Federation is the automated control system (ACS) "Akatsiya-M", which has a mobile analog in the separate unites and has been in service with the military districts of Russia since 2005 [81].

As stated in paper [81], the Akatsia-M ACS, in combination with deployed mobile options, provides operational-strategic and operational management of the Russian armed forces. Operational-tactical and tactical control of the troops is carried out by complexes of the Unified Automated Troop Control System (UACS TL), for example, such as "Sozvezdie-M2" (Ground Forces) and "Andromeda-D" (Airborne Forces).
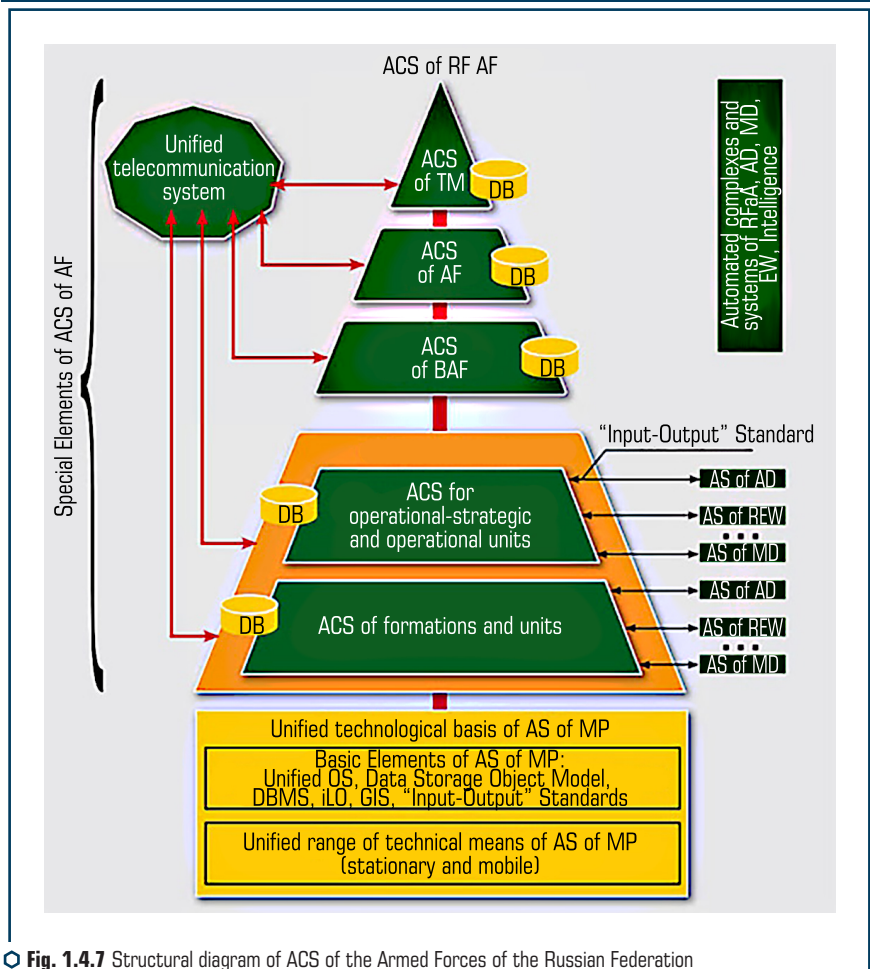
Fig. 1.4.7 Structural diagram of ACS of the Armed Forces of the Russian Federation
Source: [81]

UACS TL are designed for integrated control of troops using navigation systems, as well as satellite and unmanned guidance systems. The Sozvezdie-M2 UACS TL was adopted in 2018, although work on its development began more than twenty years ago, in the early 2000s. The Russian Federation claims that the UACS TL is a single battle control system, which includes 11 subsystems that control means of radio-electronic warfare, artillery, air defence, engineering and logistics systems, as well as a single information network that integrates various types of communication, including radio relay, tropospheric, and digital [81].

1.4.2.3 UKRAINE

As the experience of the world's leading states shows, in view of the existing threats to national security, the main tasks in the development and implementation of the MDO concept for the defence of Ukraine should be the creation of conditions for:

– maximum effective use of all available resources of the state to conduct hostilities in multidimensional space: on land, at sea, in the air, in space, and in cyberspace;

– improvement of the processes of planning and carrying out operations, simplification of management decision-making;

– increasing the stability, reliability, and confidentiality of information exchange in the management system of the Defence Forces of Ukraine;

– increasing the effectiveness of interaction between the components of the defence forces during the preparation (deterrence) of an armed conflict and during its conduct.

Modern war is characterized by rapid changes in the situation and, accordingly, limited time for decision-making. The results of tactical and operational tasks depend on the efficiency, flexibility, and effectiveness of management.

Therefore, at the stage of preparation and during operations, in order to make a timely decision, commanders of units of the combined forces must have:

– a single, simple, and clear doctrinal basis for conducting operations;

– trained and prepared personnel of subordinate headquarters;

– constant access to information about the state and position of the enemy and its troops in real time.

The technological aspect of the implementation of the MDO concept for the Armed Forces of Ukraine at the initial stage consists in the development and adoption of their own JCACS.

Taking into account these needs and the state of development of information and computer technologies, JCACS must meet the following requirements:

– use of a single database with the maximum speed of work and calculations;

– ensuring security of information storage and data encryption;

– provide for a procedure for reliable verification and identification of users, clear delimitation of access rights to information;

– have the most simple and intuitive interface.

In open sources, one can find a lot of information about automated and information systems and situational awareness systems of various levels, which are used by the Armed Forces of Ukraine in the Russian-Ukrainian war.

Most of them were developed and supported on a volunteer basis ("MyGun", "GisArta", "Kropyva", "MilChat", "Terminal", "ComBatVision", "Delta"), but there are also some that are being developed by government order ("Viraj-Planshet", "Dzvin-AS", "Prostir").

Volunteer inventions are often more convenient and easier for users, so they are used, but the volunteer IT movement, which is not controlled by the state, carries its own risks. In particular,

these are compatibility and security issues [82]. However, state developments also have advantages and disadvantages.

The Minister of Defence of Ukraine, Oleksii Reznikov, announced that from December 6, 2022, the Ukrainian Armed Forces adopted the automated combat control system "Dzvin AS" (**Fig. 1.4.8**) [83].
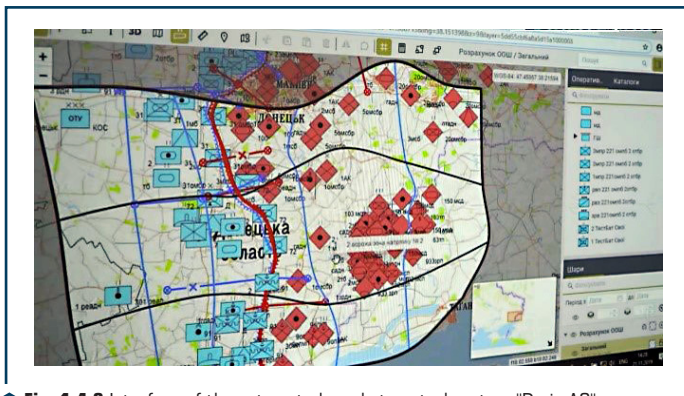
○ **Fig. 1.4.8** Interface of the automated combat control system "Dzvin AS"

As stated, the capabilities of this automated combat control system at the strategic, operational, and partly tactical ("brigade") levels allow for the following:

– to create combat control documents in semi-automatic and automatic modes;

– to create and control cartographic information;

– to receive comprehensive data on own troops; receive available intelligence data; receive data on enemy troops, their current and prospective support;

– to carry out calculations of the ratio of forces and means, the optimality of their use according to various scenarios of the development of events.

At the same time, on February 4, 2023, the Government of Ukraine decided to introduce the Delta system in the Defence Forces [84]. Delta is a situational awareness platform created by the Defence Technology Innovation and Development Center of the Ministry of Defence of Ukraine.

In addition, to date, the research and development works of other ACS have been completed, which in the future could be integrated into the JCACS of the Ukrainian Armed Forces. This is the aviation and air defence control system of the Air Force "Oreanda PS" and the control system of the tactical control link "Prostir". Many inventions of ACS for other branches of military and forces remained incomplete, or such information is not publicly available, in particular: "IT-Logistics", "IT-Regulation", "Basis", "Sphere", "IT-Artillery", "Advisor", etc.

A significant drawback of all the inventions listed above is the low level of process automation. According to their functionality, these technologies refer more to means of informatization (information systems) than to automation.

How the issue of integration of systems adopted into service and those used, but not adopted into service (perhaps yet) will be resolved, is not yet clearly understood.

In order for the prospective JCACS to meet the requirements of modern combat (operation), it is necessary to ensure the following:

– necessary bandwidth (information transmission time + decision-making time + movement time + combat deployment time in the aggregate must have a shorter term than the time set for the task);

– stability and concealment (survivability + intelligence protection + immunity to interference + immunity to interference after the impact of the enemy must ensure the minimum speed of information delivery and processing necessary for the performance of tasks);

– security of data transfer (confidentiality + availability + integrity of information);

– computing technologies and capacities for storing and processing large data sets (using cloud services).

To gain an advantage over the enemy, one needs to be one step ahead; for this purpose, one needs to implement breakthrough technologies now. Examples of such technologies are:

– the fifth generation of mobile networks (the fifth generation of wireless systems) – 5G;

– distributed databases created on the basis of blockchain technologies;

– mobile packet radio networks that do not have a fixed infrastructure are networks of stationary (Ad Hoc) and mobile (MANET) subscribers; various technologies based on artificial intelligence;

– new ways of using satellite communication, in particular with the help of a constellation of commercial satellites in low and medium orbits;

– so-called "war cloud" technologies to connect any sensor to any operator in all domains, etc.

However, the biggest problem is still the integration of all systems into a single automated system. Moreover, this system should unite not only all levels of management but also all domains – Joint All-Domain Command and Control System (JADC2).

CONCLUSIONS

Against the background of the existing political, diplomatic, economic, and military contradictions between the leading states of the world, as well as technological progress, the development of the military, information and telecommunications, computer technologies and artificial intelligence, modern wars and wars of the future are considered as those that have gone beyond the usual three-level dimension (land, sea, and air). They spread to other environments – space and cyberspace. Therefore, the planning and conduct of future military operations is considered by the overwhelming majority as a simultaneous comprehensive countermeasure against the enemy in a multidimensional space in all domains. In the military terminology of NATO countries, this type of operation is described as "multi-domain operation", and its basis is the Joint All-Domain Command and Control System (JADC2).

Based on the results of analyzing the current state of implementation and technologies within MDO concepts in the world leading countries, the following conclusions can be drawn:

1) modern challenges and threats to the national security of Ukraine require the military and political leadership of our country to respond quickly and effectively to all changes taking place in the world, and the primary issue in this direction is the development and implementation of authentic MDO concept for the Defence Forces of Ukraine;

2) taking into account a full-scale war with the Russian Federation; chosen military and political course for integration with leading Western countries; the rapid equipping of the Defence Forces of Ukraine with weapons and military equipment of NATO member states, the main vector of the development of military technologies for the Ukrainian Armed Forces is the development of its own Joint All-Domain Command and Control System (JADC2), which in the future can be integrated into similar systems of the Alliance;

3) the technical basis of the Ukrainian JADC2 system should be modern technologies of control, situational awareness, communication, computerization, cyber defense, intelligence, and surveillance (C5ISR).

The main areas of further research should include:

1) improvement of the doctrinal legal framework for the creation and provision of the MDO concept;

2) the organization of a personnel training system based on the principles adopted by NATO, with the simultaneous use of the capabilities of artificial intelligence technologies in the planning of collective training activities with the simulation of scenarios that include operational dilemmas arising from existing global political, economic, social, and cultural challenges and contradiction;

3) development of a unify automated control system of the Defence Forces of Ukraine, built using modern standardized technologies: artificial intelligence, high-speed networks and data transmission protocols, cloud services for data storage and processing, cryptographic protection of information (for example, blockchain technology), etc.

1.5 FOREIGN MILITARY ASSISTANCE TO UKRAINE AS A COMPONENT OF COUNTER MEASURES IN THE HYBRID RUSSIAN-UKRAINIAN WAR

Nina Andriianova, Mykola Shpura, Volodymyr Ilchenko

ABSTRACT

Since the establishment of the Euro-Atlantic course of development and integration [85], the Ukrainian Armed Forces have been moving towards the transition to the standards of the North Atlantic Treaty; a large-scale war forced to do it faster. After all, in order to effectively confront the aggressor, the Ukrainian army must have weapons a generation higher than those of the Russian occupying forces. And this is impossible without sufficient international support, without help from foreign countries.

Since the beginning of Russia's large-scale armed aggression against Ukraine on February 24, 2022, military assistance from other countries to Ukraine has reached a completely different level, and many allies have supplied Ukraine with lethal weapons for the first time. For some countries, such as Germany, and historically neutral countries such as Sweden, this meant a complete overhaul of their defence policy, which precluded the provision of offensive weapons.

At the summit of heads of state and government in Madrid at the end of June 2022, NATO partners agreed on the decision to expand the comprehensive program of assistance to Ukraine, which will provide long-term sustainable support to ensure the transition from Soviet-style weapons and military equipment (WME) to modern WME of NATO member states.

KEYWORDS

Foreign military assistance, military-technical aid, Ukrainian Armed Forces, NATO, international support, lethal weapons, non-lethal military aid, weapons and military equipment, meetings in the "Ramstein" format.

1.5.1 COORDINATION OF FOREIGN MILITARY ASSISTANCE

Great Britain, the United States of America, and Poland have taken the lead in coordinating international military assistance to Ukraine through the International Donor Coordination Center, the Ukraine Defence Contact Group, and the International Fund for Ukraine.

International Donor Coordination Center (IDCC). It was created in April 2022 by Great Britain together with partner countries in Stuttgart, the headquarters of the US European Command, with the aim of ensuring the most coordinated and effective military-technical aid of the international community to Ukraine.

The role of IDCC, which includes more than 100 military personnel from 30 countries, is to process Ukraine's requests for weapons, coordinate the allied response, and ensure the delivery of weapons and military equipment to Ukraine [86].

Coordination of military assistance to the IDCC is carried out with the assistance of the US-led Ukraine Defence Contact Group (created on April 27, 2022). The group met almost every month, with the aim of discussing the military needs of Ukraine and, accordingly, their provision. The sixth meeting of the group was held on October 12, 2022, in Brussels, and 50 countries took part in it. In addition, on September 28, under the auspices of the Contact Group, arms representatives of 45 countries also met to discuss some future challenges to the defence-industrial complex. At the meeting of the group, the participants agreed to use this mechanism to "support Ukraine's self-defence in the long term", including finding new and innovative ways to support the Ukrainian military.

International Fund for Ukraine (IFU). Created in April 2022, allies led by Great Britain created this fund to coordinate the purchase and transportation of military equipment to Ukraine from third countries or industry [87].

The European Union provides military assistance and external support to Ukraine through the European Peace Fund, EU macro-financial assistance programs, and the EU Civil Protection Mechanism:

— **The European Peace Facility** (EPF), established in March 2021 to finance all actions of the Common Foreign and Security Policy (CFSP) related to military and defence issues, with the aim of preventing conflicts, preserving peace, and strengthening international security and stability. In particular, the European Peace Fund allows the EU to finance actions aimed at strengthening the potential of non-EU countries, as well as regional and international organizations in military and defence matters. Thanks to EPF, the EU supports the Ukrainian Armed Forces by providing support packages [88];

— **The EU macro-financial assistance program** (MFA): assistance from the EU comes in the form of soft loans;

— **The EU Civil Protection Mechanism** is the world's largest system of providing international coordinated operational assistance in emergencies. The system includes various resources and forms of assistance from 28 member states and 4 EU candidate countries (32 countries in total). As part of the Civil Protection Mechanism, since the beginning of the full-scale invasion, Ukraine has received more than 70,000 tons of aid from EU countries, from food products to demining equipment and special equipment [89].

1.5.2 MEETINGS IN THE "RAMSTEIN" FORMAT AS A TOOL FOR COORDINATING AND SYNCHRONIZING FOREIGN MILITARY ASSISTANCE TO UKRAINE

Meetings at the American Ramstein base in Germany became an important event in the issue of foreign military assistance to Ukraine.

Meetings in the "Ramstein" format are high-level meetings between state leaders and high-ranking officials that take place on a regular basis to discuss important issues of international politics. These meetings were initiated directly to obtain operational information, the support of which the Ukrainian Armed Forces currently need, its discussion and the adoption of relevant decisions regarding the strengthening of Ukraine's defence capabilities in the Russian-Ukrainian war and security in the European region.

The first meeting at the Ramstein base. On April 26, 2022, a meeting of more than 40 defence ministers of the world was held, where they discussed ways to support Ukraine in the face of a full-scale war with the Russian Federation. In particular, the representatives of the defence departments reached a decision on the supply of new weapons to the Ukrainian state.

According to the Minister of Defence of Ukraine Oleksiy Reznikov, during the meeting the parties discussed three blocks of issues:

1. Creation of the Ukraine Defence Contact Group.

This group, as O. Reznikov claimed, would operate on a permanent basis — within its borders, the defence ministers of the partner countries would "calibrate the clock" once a month [90].

2. Integration of Ukraine into NATO.

According to O. Reznikov, Ukraine has been convincing its partners for a long time that, as support, it is necessary to provide the state with Western-made weapons that meet Alliance standards.

"The transition to Western calibers and equipment is a strategic decision that has finally been made. In particular, we are already receiving 155 mm artillery. Gradually, this will ensure the full interaction of the Ukrainian army with the armies of NATO countries, which will be a significant strengthening of the eastern flank of the Alliance," — the minister emphasized [90].

3. Training of the Ukrainian military in the use of Western weapons.

"Now the training programs will be scaled up and extended even to samples of weapons and equipment, regarding the provision of which to Ukraine there are still no political decisions. When these decisions are made, which I personally have no doubts about, we will be ready," added the official [90].

The second meeting at the Ramstein base was held on May 23, 2022, with the participation of the Minister of Defence of Ukraine and defence ministers of 47 countries. The results of the first meeting were discussed there, namely, M777 howitzers arrived in Ukraine in 4 weeks. Great Britain transferred missiles and short-range air defence systems. Many countries conduct training missions for the soldiers of the Armed Forces, which changes the situation on the battlefield in real time.

The Czech Republic handed Ukraine attack helicopters, tanks, and missile systems. Also, Italy, Greece, Norway, and Poland handed over artillery systems and ammunition to the Ukrainian army.

US Defence Minister Lloyd Austin summarized that Ukraine would receive attack helicopters, tanks, artillery, and missile systems, including long-range ones, such as HIMARS rocket launchers [91].

A total of 20 countries have announced new security aid packages for Ukraine, including armored vehicles.

The third meeting at the Ramstein base. It took place on June 15, 2022, at the NATO headquarters in Brussels, initiated by the US Secretary of Defence Lloyd Austin. Representatives of 50 countries discussed the current and urgent needs of Ukraine in military resistance to Russian aggression.

At the meeting, NATO Secretary General Jens Stoltenberg said that a comprehensive aid package for Ukraine in the long term would help the Ukrainian Armed Forces transition from Soviet-era military standards to modern NATO equipment, which would improve interoperability with Alliance standards.

US President Joe Biden announced the provision of a new package of military aid to Ukraine worth USD 1 billion. This package, which was to be divided into two parts, included anti-ship missile systems, artillery rockets, and howitzer munitions.

British Defence Minister Ben Wallace announced the provision of more than 20 155-mm M109 self-propelled artillery vehicle (SPAV) to Ukraine.

According to the results of "Ramstein-3", as part of the regular military assistance to Ukraine, Britain purchased more than 20 M109 self-propelled artillery vehicle (SPAV) from a Belgian arms company, which would be sent for the needs of the Armed Forces.

According to the results of the meeting, the Armed Forces received at their disposal the Bulgarian ZPG-9 Warrior mounted anti-tank grenade launchers from the BULARMAS company. Grenade launchers are delivered to the Ukrainian military together with PGDN-7VIR night vision sights, as well as with SPG-9-RCWS remote control [92].

The Armed Forces received 20 M109 self-propelled guns from Great Britain. The representative of the Federal Republic of Germany promised to send three MARS-type MLRS to Ukraine.

The fourth meeting at the Ramstein base. On July 20, 2022, the fourth meeting of the Ukraine Defence Contact Group, a platform for supporting Ukraine, took place. This format already unites 50 countries from all continents, that time the participants of "Ramstein" met online.

The following main issues were discussed at the meetings:

– increasing the capabilities of the Armed Forces to perform specific tasks, such as unblocking ports and ensuring security in the western part of the Black Sea;

– systematization of maintenance and repair of foreign equipment received by the Armed Forces: the need for coordination of many countries in the legal, financial, organizational and production capacity levels;

– ensuring transparency of accounting and use of international military assistance – the process of implementing the NATO LOGFAS program will be accelerated [93].

The fifth meeting at the Ramstein base took place on September 8, 2022, at a German air base. Minister of Defence Oleksiy Reznikov noted the progress in the decision regarding the supply of air defence systems, the next aid package to Ukraine in the amount of USD 675 million, as well as the effective training program for the servicemen of the Armed Forces in Great Britain.

"It so happened that at each "Ramstein" certain key words are heard, which determine the focus of the discussion. At the first meeting in April, these were the words Timing and Transition. Then

we convinced our partners to provide our army with heavy equipment of Western models as soon as possible and to start the transition to Western weapons in general" [94] – the minister wrote.

The results of the previous meetings were summed up. "Ukraine received hundreds of 105-mm and 155-mm artillery units and ammunition for them. Among 155 mm caliber, we have 7 types of guns and SPAV. Ukrainian soldiers terrorize the enemy with accurate and magical strikes of M142 Himars, M270 ML. HARM is already leaving the enemy without radars," writes O. Reznikov.

Particular attention was paid to the **NASAMS** systems and the creation of a three-level air defence / missile defence system that could ensure security over Ukraine. They also discussed the importance of training programs for Ukrainian defenders in Great Britain, where specialists from Canada, New Zealand, the Netherlands, Denmark, Norway, Sweden, and Finland are actively participating [95].

The sixth meeting at the Ramstein base was held on October 12, 2022, in Brussels. It was preceded by a massive missile attack on Ukraine on October 10. In conclusion, the head of the US Department of Defence said that the United States would provide Ukraine with air defence systems as quickly as possible. The German Ministry of Defence promised Ukraine self-propelled artillery installations PzH 2000 and multiple rocket launchers MARS II (that is, the European modification of the M270 MLRS). The Netherlands announced that the country's government would provide USD 15 million worth of missiles for air defence systems to Kyiv. In addition, Canada announced an additional USD 47 million aid package: it included artillery shells, winter uniforms and equipment, cameras for drones, and equipment for satellite communication.

The seventh meeting at the base Ramstein. The meeting took place on November 16, 2022. According to its results, Ukraine received air defence systems, shells for MLRS, tubed artillery, and winter equipment.

The eighth meeting at the Ramstein base. It took place on January 20, 2023, at the base of the US Air Force Base "Ramstein". The head of the Pentagon, Lloyd Austin, said that to protect the airspace of Ukraine, Germany, the USA, and the Netherlands planned to provide Patriot anti-aircraft missile complexes, and Canada – NASAMS missiles and ammunition. In addition, the Chairman of the Joint Chiefs of Staff of the United States, General Mark Milley, reported that the President of the United States signed the 30th package of military-technical aid for USD 2.5 billion, and Germany, for its part, is ready to provide EUR 1 billion (a total of about EUR 3.3 billion).

One of the central topics of the meeting was the possibility of transferring modern tanks (either American M1 Abrams or German Leopard 2) to Ukraine.

The ninth meeting at the Ramstein base took place on February 14, 2023, in Brussels. As a result of the meeting, the partners promised to transfer more air defence systems, more tanks, artillery, shells to Ukraine, and also undertook to expand the training of the Ukrainian military.

The aid provided within the framework of the agreements at the meetings at the Ramstein base is significant, primarily due to the active and large-scale inclusion of American partners in the process, who have adjusted their position on a number of aid issues. This has accelerated other countries as well.

1.5.3 ANALYSIS OF MILITARY-TECHNICAL AID TO UKRAINE

The foreign military assistance received by Ukraine from Western partners can be convention-ally divided into three main directions: financial, humanitarian, and military-technical aid.

It is necessary to define what the concept of "military-technical aid" includes. In some sources, military-technical aid is identified with the supply of weapons, but the concept of "military-technical aid" is much broader.

The main articles of military-technical aid are the following:

– services for education and training of military personnel, conducting military exercises, consultations;

– transport, logistics services, communication services, intelligence, etc.;

– non-lethal military aid (fuel, food, medical supplies, means of communication, vehicles, means of protection, etc.);

– weapons (military equipment, weapons of various types, ammunition).

The last two items together, armaments and non-lethal military aid, constitute what is some-times called "military property" or "military materials", the supply of which in physical form requires a delivery operation to the territory of a belligerent country.

According to the actual military status, as well as any other assistance, there are:

– committed, i.e., assistance for which official commitments have been made in the form of the adoption of relevant regulatory and legal acts;

– authorized – in respect of which an order has been given for its supply by representatives of the executive power;

– physically delivered to the territory of Ukraine.

Military-technical aid to Ukraine is provided both through various coordination funds and direct-ly from the governments of the states, taking into account the specifics of the legislative regulation of the transfer of weapons.

Table 1.5.1 gives a list and quantitative assessment of the military-technical aid, financial, and humanitarian assistance provided by the governments of 40 countries, including EU institu-tions, to Ukraine since the severance of diplomatic relations between Russia and Ukraine on Janu-ary 24, 2022. Quantitative assessment in billions of euros is provided. To estimate the provision of military equipment or weapons, market prices were used, and upper limits were taken into account in order to avoid underestimation of the true volume of bilateral aid.

The contribution of 40 countries is analyzed here, the largest group is the 27 EU member states. In addition, the table includes (the rest of) the G7 countries, as well as Australia, New Zealand, Nor-way, South Korea, Switzerland, and Turkey. We have considered assistance provided by the EU to the main database within the EU (Commission and Council), the European Peace Fund, the European Investment Bank [96]. It is worth noting that the largest provider of assistance according to all three indicators is the USA, followed by the EU institutions, which mainly provided financial and economic assistance, although funds were allocated for humanitarian and military aid. The next largest amount

is assistance from Great Britain, Germany, Canada, and Poland. Austria provided mostly humanitarian assistance. The table clearly shows that countries such as Switzerland, South Korea, Ireland, Taiwan, and Hungary are concentrated in providing Ukraine with mostly humanitarian assistance.

● **Table 1.5.1** Quantification of total assistance to Ukraine (billions EUR)

No. of entry	Country	Financial aid	Humanitarian aid	Military-technical aid	Total
1	2	3	4	5	6
1	USA	15,178	9,488	27,645	52,311
2	EU institutions	12,323	1,420	2,500	16,243
3	United Kingdom	2,545	0,365	3,740	6,650
4	Germany	1,150	0,950	1,200	3,300
5	Canada	1,812	0,295	0,931	3,038
6	Poland	1,018	0,103	1,823	2,943
7	Norway	1,034	0,036	0,319	1,389
8	France	0,800	0,130	0,216	1,145
9	Italy	0,510	0,032	0,150	0,692
10	Japan	0,607	0,006	0,000	0,613
11	Austria	0,010	0,547	0,004	0,560
12	Netherlands	0,349	0,027	0,171	0,547
13	Sweden	0,141	0,093	0,274	0,508
14	Denmark	0,050	0,037	0,300	0,387
15	Czech Republic	0,000	0,109	0,282	0,391
16	Spain	0,200	0,092	0,056	0,348
17	Latvia	0,015	0,001	0,298	0,314
18	Australia	0,000	0,053	0,246	0,300
19	Estonia	0,000	0,005	0,258	0,263
20	Portugal	0,250	0,001	0,011	0,262
21	Lithuania	0,005	0,052	0,187	0,244
22	Belgium	0,000	0,117	0,096	0,213
23	Slovakia	0,000	0,005	0,212	0,217

● **Continuation of Table 1.5.1**

1	2	3	4	5	6
24	Finland	0,082	0,046	0,029	0,157
25	Greece	0,000	0,000	0,161	0,161
26	Switzerland	0,000	0,104	0,000	0,104
27	South Korea	0,000	0,092	0,004	0,096
28	Ireland	0,000	0,068	0,000	0,068
29	Luxembourg	0,000	0,004	0,050	0,054
30	Hungary	0,000	0,046	0,000	0,046
31	Turkey	0,000	0,000	0,042	0,042
32	Slovenia	0,000	0,002	0,050	0,052
33	Croatia	0,000	0,006	0,016	0,023
34	New Zealand	0,000	0,002	0,014	0,016
35	Taiwan	0,000	0,013	0,000	0,013
36	Romania	0,000	0,007	0,003	0,010
37	Bulgaria	0,000	0,001	0,004	0,005
38	Cyprus	0,000	0,003	0,000	0,003
39	China	0,000	0,002	0,000	0,002
40	India	0,000	0,002	0,000	0,002
41	Malta	0,000	0,001	0,000	0,001
	Total	**38,076**	**14,364**	**41,291**	**93,732**

Fig. 1.5.1 shows military-technical aid from the governments of 19 countries that provided Ukraine with weapons and equipment, as well as financial assistance for military purposes in the period from January 24 to October 3, 2022 (only bilateral commitments in the military sector, information from open sources). To avoid double counting, **Fig. 1.5.1** does not take into account the contributions of the EU (the Commission and the Council of the EU). The financial assistance here is clearly defined and aimed at the purchase of anti-aircraft guns and other equipment for military purposes only.

According to the data shown in **Fig. 1.5.1**, the United States leads the list (EUR 23.96 billion in total military-technical aid, of which EUR 4.14 billion are commitments for arms and equipment and EUR 19.81 billion in military financial aid, of which EUR 4.14 billion – financial assistance). Next in terms of volume is the military assistance of Great Britain (EUR 2.38 billion, of which EUR 1.11 billion are obligations regarding weapons and equipment, EUR 1.26 billion are military financial aid).

Poland (EUR 1.8 billion, of which EUR 1.7 billion are for specific types of weapons and equipment), Germany (EUR 1.39 billion, of which EUR 542 million are obligations for weapons and equipment and EUR 850 million – financial aid for military purposes), etc. [97].
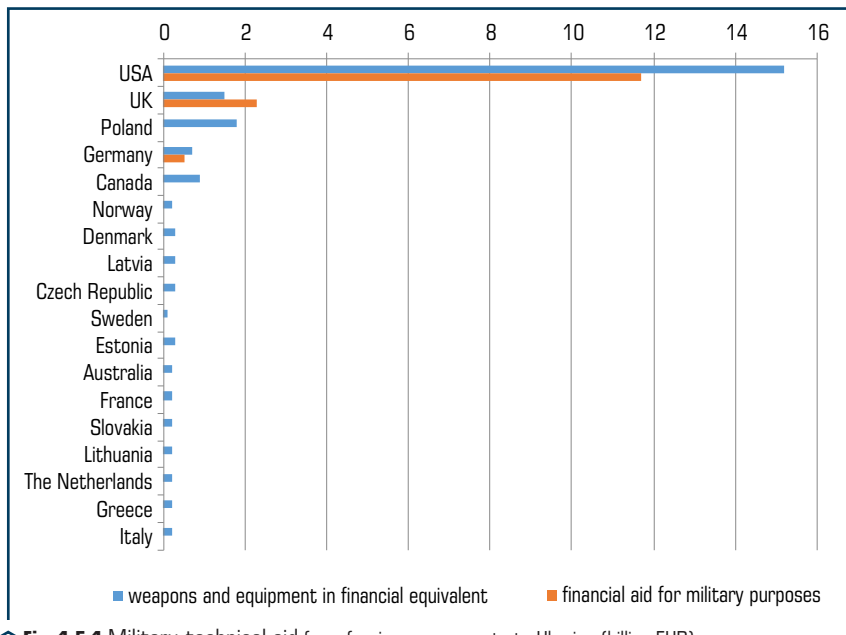
Fig. 1.5.1 Military-technical aid from foreign governments to Ukraine (billion EUR)

Table 1.5.2 systematizes the total number of weapons that were transferred and declared for transfer in nine categories for the period from January 24 to August 3, 2022. The table clearly shows the quantitative ratio of weapons and military equipment (WME) according to the Soviet and NATO models, compared to the statements of countries about already transferred and declared WME, as well as what Ukraine received as of June 9, 2022.

It covers the main types of weapons that Ukraine emphasized, especially heavy weapons and portable defence complexes. The list does not include light infantry weapons such as machine guns, rifles, or hand grenades, nor military equipment such as helmets or protective gear, nor ammunition. The table uses data from open, official sources.

In addition to the WME aid to Ukraine, the countries help in the training of the personnel of the Armed Forces. For example, the British government provided training for 10,000 soldiers of the Armed Forces. Approximately the same number of Ukrainian military personnel are trained by the USA and Germany (pilots, electronic warfare specialists, gunners, etc.), as well as other countries [93].

● **Table 1.5.2** Military-technical aid for the main categories of weapons delivered and declared between January 24 and August 3, 2022

Type of weapon	Delivered	Declared (promised)	Courtesy of the Ministry of Defence of Ukraine (June 9, 2022)
Artillery (howitzers):			
155 mm NATO artillery	191	66	150
Soviet-style artillery	29	–	50
Mortars	100	Not specified	100
Armored vehicles:			
APC	408	152	–
Patrol cars	120	–	–
Infantry fighting vehicle	40	–	–
Multiple launch rocket systems (MLRS):			
MLRS of the Soviet model	20	–	20
NATO model MLRS	15	4	–
Tanks:			
Soviet-style tanks	252	8	–
NATO model tanks	8	22	–
Air defence systems:			
Air defence systems	1	3	–
Coastal Defence Systems:			
Anti-ship missile	1	3	1
Coastal defence ships	not specified	not specified	–
River patrol boats and coastal zone boats	–	18	–
Man-portable air defence system and anti-tank systems:			
MPADS and anti-tank guided missiles	3 310	–	thousands
Other missile systems	36 031	8 750	–
Aviation:			
Attack helicopters	–	7	–
Transport/combat helicopters	16	4	–
Helicopters of an unspecified type	not specified	not specified	–
Unmanned Aircraft Systems:			
Combat drones	900	706	several thousand
other	more than 125	200	–

Fig. 1.5.2 shows the stocks of tanks, howitzers, and MLRS of NATO member states (excluding countries that are also part of the EU) and the EU in comparison with the amount of aid provided to Ukraine in the period from 01.24 to 10.03.2022. Stockpile data are taken from IISS, Military Balance (2022), and Kiel Institute of World Economics research and include only ready-to-use weapons. In **Fig. 1.5.2**, weapons purchased for the purpose of transfer to Ukraine as military-technical aid are not taken into account, only those weapons and equipment that are on the balance sheet of this or that country. **Fig. 1.5.2** shows the quantity of weapons and equipment transferred by EU and NATO member states.

From the data in **Fig. 1.5.2**, the contribution of the countries to the Ukrainian defence capability during the Russian-Ukrainian war can be clearly traced in relation to the total reserves of the EU and NATO. For example, according to data from open sources, 40 % of Javelin stocks from American warehouses were transferred to Ukraine. Only 266 tanks are officially in service in Great Britain, while we have up to 3,000. Some countries transfer to Ukraine almost everything they have in their own arsenal, for example, Slovenia transferred 28 modernized M-55S tanks (modernization of T-55) to Ukraine, according to Military Balance (2022) [98] 30 units are in service in its Ground Forces. Poland transferred T-72 M1 tanks, and this is almost half of its arsenal. Denmark handed over to the Ukrainian army all Caesar self-propelled artillery installations that it possessed. The amount of military-technical aid provided by Estonia to Ukraine amounts to more than 1 % of its GPD.
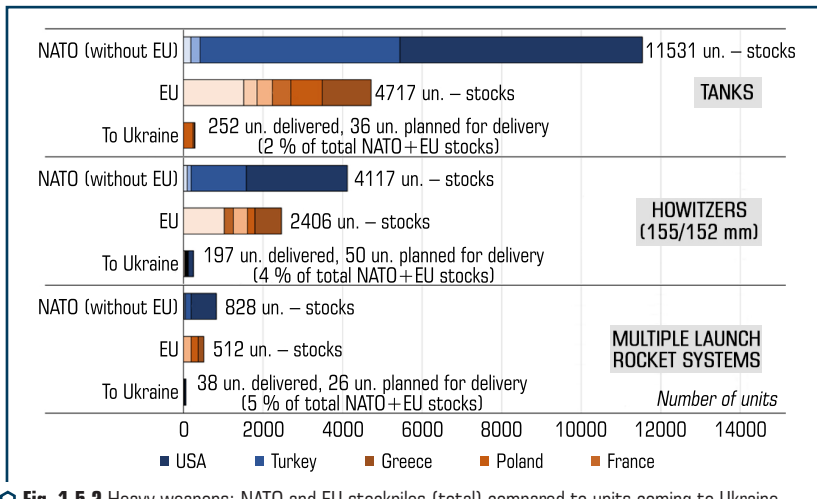
Fig. 1.5.2 Heavy weapons: NATO and EU stockpiles (total) compared to units coming to Ukraine

But, at the same time, as can be seen from **Fig. 1.5.2**, in comparison with NATO and EU stocks, only 2 % of the total stocks of tanks, howitzers – 4 %, and MLRS – 5 % were delivered to Ukraine, which means that many EU and NATO countries almost do not help Ukraine, having in

their arsenal such necessary supplies but still we hope for more support from our partners. The Russian Federation shares a common border with some EU and NATO member states, such as Estonia (324 km), Finland (1309 km), Latvia (332 km), Lithuania (261 km), Norway (191 km), Poland (210 km). Today, taking into account Russia's complete disregard of international treaties and the world order, it is impossible to provide any guarantees to the national security of these countries, what we cannot doubt is that the security of these countries also depends on, including, whether Ukraine will stand in an unfair and cruel war against Russia.

Since the beginning of the full-scale war, the Western allies have provided Ukraine with more than 4,000 units of armored vehicles, artillery guns, aircraft, and other weapons systems [99].

1.5.4 MILITARY ASSISTANCE FROM THE UNITED STATES OF AMERICA

The USA is an invaluable strategic partner of Ukraine, as well as a guarantor of its independence, sovereignty, and existing borders in accordance with the obligations of the Memorandum on Security Guarantees in connection with Ukraine's accession to the Treaty on the Non-Proliferation of Nuclear Weapons [100].

The US military and political leadership has supported Ukraine since the start of the Russian-Ukrainian war in 2014.

The following are the main mechanisms of US military assistance to Ukraine:

– **Presidential Drawdown Authority (PDA)** – a mechanism that allows the President of the United States to transfer weapons, military equipment, and military materials located at the bases and warehouses of the US Armed Forces, without consulting Congress within the framework of the maximum amounts of such supplies established by Congress;

– **Ukraine Security Assistance Initiative (USAI)** – the main supply channel of materials and services used by the Pentagon;

– **Foreign Military Financing (FMF)** – a supply channel mainly for materials provided by the US State Department;

– **International Military Education and Training (IMET)** – a supply channel mainly for services provided by the US State Department;

– **Export Control and Border Security (EXBS) Program** – a supply channel used by the US State Department mainly for border and customs services of Ukraine;

– **Global Security Contingency Fund** – a supply channel that is used jointly by the State Department and the Pentagon to train the Special Operations Forces, the National Guard, the police, and the officer corps of the Armed Forces;

– **Third Party Transfers (TPT)** – a channel for purchases in third countries of military materials for further transfer to Ukraine;

– **Foreign Military Sales (FMS)** – interstate sale of military materials for Ukraine, which is carried out at the expense of Ukraine;

– **Direct Commercial Sales (DCS)** – commercial sale of military materials of Ukraine, authorized by the US government, at the expense of Ukraine and third countries.

Currently, Ukraine receives military assistance from the US federal budget under three main programs: Ukraine Security Assistance Initiative (USAI), Foreign Military Financing (FMF), and Replenishment of U.S. weapons stocks.

On March 15, 2022, President J. Biden signed the Consolidated Appropriations Act of 2022, part of which was the *S.3811. Ukraine Supplemental Appropriations Act, 2022*. Within its framework, it is planned to replenish the *PDA channel*, which is used to provide military assistance to Ukraine.

On April 28, 2022, President J. Biden submitted to the Congress two related bills – "Addendum to the law on additional assistance to Ukraine" in the amount of USD 33 billion and about the fight against covid in the amount of USD 22.5 billion. During the discussion, the congressmen "unlinked" the first bill from the second and increased the amount of additional assistance to Ukraine to USD 40 billion. Congress approved the first document entitled *H.R.7691. Additional Ukraine Supplemental Appropriations Act, 2022*, and on May 21, 2022, the US president signed it. The law provides for spending USD 40.1 billion by the end of the budget year, which ended on September 30, 2022.

The Ukraine Democracy Defence Lend-Lease Act of 2022 was unanimously adopted by the US Senate on April 6, 2022, and by the House of Representatives on April 28 (417 for, 10 against). On May 9, the US president signed a law on providing a lend-lease program for Ukraine. After the law enters into force, the US President will have 60 days to develop an accelerated procedure for supplying weapons to Ukraine. The conditions for Ukraine are similar to those for the Allies during the Second World War.

The Lend-Lease Act simplifies the procedure for the supply of arms and accelerates the transfer of arms and equipment and other critical supplies to Ukraine and other Eastern European countries by reducing bureaucratic processes. The text of the draft law states that it was created with the aim of strengthening the defence capabilities of the specified countries and protecting their civilian population from a potential invasion or aggression from Russia.

Lend-lease should eliminate bureaucratic obstacles in the way of supplying military-technical aid to Ukraine. It gives the US president expanded powers to conclude an agreement with the government of Ukraine on the supply of weapons to defend against Russian aggression. The peculiarity of this law, as in the times of the Second World War, is that military equipment will be leased, and it will be necessary to pay for the destroyed.

The Lend-Lease Act was supposed to enter into force on October 1, 2022. Currently, Ukraine receives weapons from the USA free of charge under the programs listed above.

To date, the USA has announced the 33rd (from August 2021) transfer of American weapons and equipment to Ukraine in the amount of USD 400 million [101]. In general, since the full-scale invasion of the Russian Federation, Ukraine has received military-technical aid from the United States in the amount of approximately USD 31.8 billion.

On October 14, 2022, the US Ministry of Defence published a complete list of arms supplies to Ukraine, starting from February 24, 2022 [102] in this list, thousands of units of anti-aircraft missiles, of which M142 HIMARS missile and artillery systems – 38 units; NASAMS anti-air-craft missile systems – 8 batteries; M113 armored personnel carriers – 200 units; MaxxPro heavy armored vehicles – 440 units; Harpoon anti-ship missile systems – 2; multipurpose Mi-17 – 20 helicopters; light armored vehicles HMMWVs – hundreds (according to previous reports, at least 400 in total); Switchblade and Phoenix Ghost attack kamikaze drones – 1,400 M136 AT4 and M72 anti-tank grenade launchers – 37,000, and many others.

CONCLUSIONS

Foreign military assistance from the world's leading countries plays one of the key roles in counteracting the large-scale aggression of the Russian Federation, not only against Ukraine but also against the entire civilized world.

States and international organizations provide Ukraine with financial, humanitarian, and military-technical aid to strengthen the defence capabilities of our country.

Military-technical aid provided to Ukraine includes the provision of weapons, military equipment, training of military personnel, transport, logistics, communication, and intelligence services.

The initiation of monthly high-level diplomatic meetings in the "Ramstein" format, as a result of which 53 countries agreed to provide military assistance to Ukraine, became important in the coordination, systematization, and prompt response to Ukraine's military needs in confronting Russian armed aggression. As a result of the meetings, the Donor Coordination Center, the Ukraine Defence Contact Group, the International Fund for Ukraine were created, and important decisions were made regarding the provision of military assistance to ensure Ukraine's defence needs.

The largest supplier of military-technical aid to Ukraine is the USA. In 2022, the US delivered an unprecedented scale of aid, mostly modern weapons worth more than USD 18 billion. In many positions, primarily shells, the scale of supply exceeds the production capacity of the American industry at the moment. This is much more than what Ukraine had on February 24, 2022, in reserves and weapons in most positions, so such assistance is invaluable.

In 2022, the total amount of military-technical aid to Ukraine from world powers amounted to more than EUR 93 billion. International partners provide Ukraine with Soviet-style anti-air-craft weapons, the most modern anti-aircraft guns used by NATO troops. The modern systems IRIS-T, NASAMS and, Mars-2, Patriot, the main complexes with a large radius of action both in height and in range, self-guided anti-radar anti-aircraft missiles HARM should be especially noted. A consortium of countries, including Germany, Poland, Canada, Portugal, Spain, Norway, Denmark, and the Netherlands, joined forces to transfer Leopard battle tanks to Ukraine. Such WME in sufficient quantity is able to turn the tide of the war and allow Ukraine to regain the occupied territories.

Taking into account the quantitative advantage in the number of WME of the Russian Federation, the difference in the ultimate reach of the means of destruction to achieve at least parity in this war, the amount of WME delivered is extremely insufficient and is happening slowly.

The solution to this issue should be the establishment of supplies by Ukraine's partners to the Armed Forces of the Armed Forces of weapons systems or certain types of ammunition with the appropriate range. A comprehensive approach to the re-equipment of artillery, missile forces, tactical aviation and the Naval Forces of the Ukrainian Armed Forces and other components of their power must be applied. The discussion should be about building or building capacity in the short, medium, and long term.

1.6 INTERNATIONAL FINANCIAL ASSISTANCE AS A COMPONENT OF COUNTER MEASURES IN THE HYBRID RUSSIAN-UKRAINIAN WAR

Olha Demeshok

ABSTRACT

The full-scale war provoked by Russia, massive shelling and bombing of Ukrainian cities and towns, repression, and atrocities against the civilian population in the temporarily occupied territories, all these events had a significant negative impact on the economy of Ukraine and provoked its significant reduction in 2022. According to the UN, a harsh and prolonged war could lead to the fact that the poverty level in Ukraine will increase to 30 % of the population and destroy 18 years of economic progress. Thus, other states and international organizations focus on supporting the Ukrainian economy.

KEYWORDS

Full-scale war, Russia-Ukraine conflict, temporarily occupied territories, economic impact, United Nations, poverty level, economic progress, international organizations, Ukrainian economy, humanitarian crisis, reconstruction efforts.

Since the beginning of the Russian invasion, the European Union and its member states have shown sincere solidarity with Ukraine, provided it with powerful political, economic, financial, humanitarian, and military-technical aid.

According to the European Union, Ukraine needs urgent financial assistance of almost USD 4.8 billion every month for the vital activities of the state, and it is working on solving this need together with G7 partners [103].

Starting from February 24, 2022, the main sources of state budget financing are military bonds, loans from International Financial Organizations, as well as bilateral loans and grants (**Fig. 1.6.1**).

Note that the data are represented taking into account international grants, which for that period amounted to EUR 12,136.86 million (USD 13,068.51 million) allocated by the EU, USA, Canada, Norway, Germany, Denmark, Italy, Austria, Lithuania, Latvia, Belgium, Albania, and Iceland.

Thus, only about 25.5 % of the promised funding is a grant, that is, one that we will not have to return in the future, the rest of the funds will have to be returned over time (**Fig. 1.6.2**).

Assistance to Ukraine with the aim of achieving macro-financial stability in one form or another has been provided by more than fifty countries of the world, humanitarian and financial — by more than 30 foreign companies, as well as a number of international organizations, which largely cover the needs for financing state expenditures (**Table 1.6.1**).

	USD million	UAH million
NBU	12 477	400,000
USA	11 990	409,147
EU	7 961	280,806
OVDP (incl. military obligations)	7 692	250,771
IMF	2 693	88,181
Canada	1 889	60,503
Germany	1 584	47,855
World bank	1 385	33,635
UK	1 076	35,109
EIB	720	21,062
Japan	581	17,006
France	437	13,558
Italy	330	11,199
The Netherlands	318	11,003
Denmark	53	1,780
Sweden	49	1,438
Lithuania	22	761
Norway	22	629
Latvia	16	530
Austria	11	307
Belgium	5	182
Albania	1	37
Island	0.5	14
Total	**51,312**	**1,696,395**

MFO   OVDP
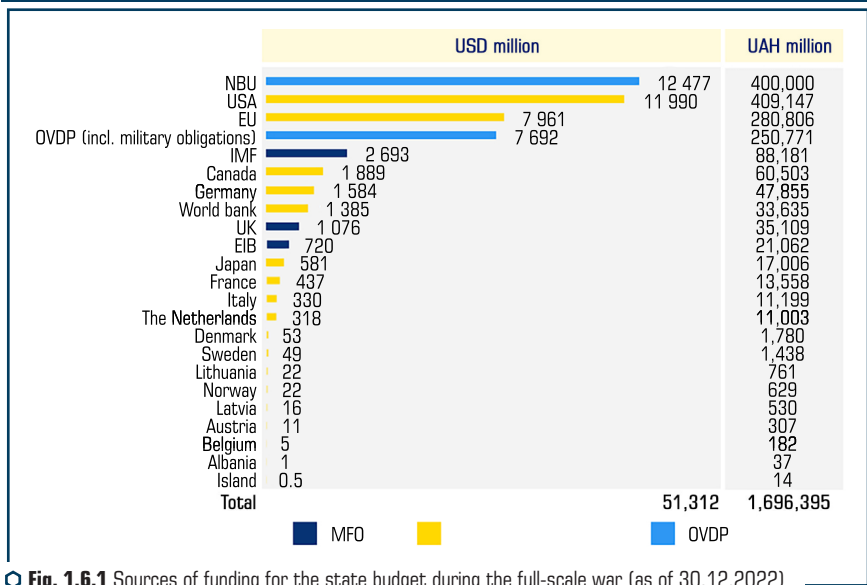
Fig. 1.6.1 Sources of funding for the state budget during the full-scale war (as of 30.12.2022)
Source: [104]
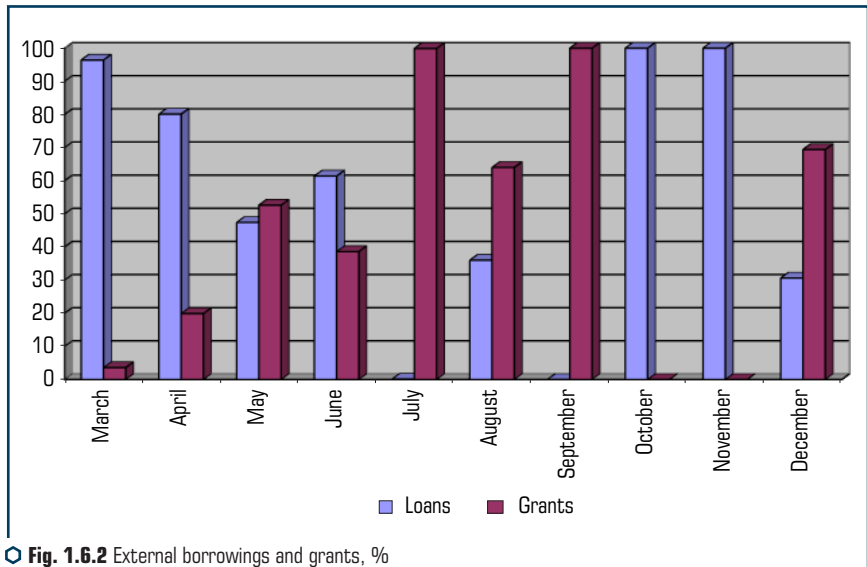
Fig. 1.6.2 External borrowings and grants, %
Source: [105]

● **Table 1.6.1** International financial assistance from countries around the world

Country	Purpose	Contribution
1	2	3
UK	Directly to the state budget of Ukraine in order to mitigate the financial pressure that arose after the Russian invasion [106]	USD 100 million
	Loan guarantees for the disbursement of World Bank funds at the end of the year [107]	USD 525 million
Denmark	Donation through the World Bank [108]	USD 134 million
Canada	Granting a loan to the Government of Ukraine [109]	USD 120 million
	Preferential credit [110]	USD 773 million
	Additional credit [109]	USD 500 million
Latvia	Riga City Council approves assistance to Ukraine [111]	EUR 500 thousand
	On February 26, 2022, the Latvian government approved 1 assistance to the Ukrainian Armed Forces [112]	EUR 1.2 million
Lithuania	28 February 2022 referred for medical care [113]	EUR 4 million
The Netherlands	A loan on preferential terms for Ukraine through the account of the International Monetary Fund [114]	EUR 200 million
Germany	Loan in March 2022 via EU [115]	EUR 240 million
	Loan and grant from the Credit Institution for Reconstruction for the implementation of the project "Refinancing Energy Efficient Investments of Small and Medium-Sized Enterprises of Ukraine through the Financial Sector (Entrepreneurship Development Fund III and IV)"	USD 7.08 million
South Korea	The unspecified amount of assistance was announced on March 8, 2022. Bilateral Official Development Assistance will be increased by designating Ukraine as a key "Priority Country for Cooperation" for 2021–2025 [116]	
Poland	On the first day of the invasion, the National Bank of Poland offered Ukraine a currency swap [117]	USD 875 million
Slovenia	The Slovenian government sent funding to the ICRC intended for Ukrainian refugees [118]	EUR 100 thousand
USA	In June 2022, Ukraine received grant assistance from the United States as part of a budget financing package of USD 7.5 billion [119]. These funds are provided from the World Bank's Multi-Donor Trust Fund as part of additional financing for the Public Expenditures for Administrative Capacity Endurance in Ukraine Project	USD 1.03 billion
	In the form of military-technical aid (USD 6.5 billion) and humanitarian assistance (USD 6.7 billion) to "respond to the situation in Ukraine" under the Consolidated Appropriations Act of 2022 of March 15, 2022 [120, 121]	USD 13.6 billion
	Grant for the Independence Day of Ukraine	USD 3000 million

● **Continuation of Table 1.6.1**

1	2	3
France	Granted in February 2022 [122]	EUR 300 million, increased by USD 100 million
Japan	Funded on 28 February 2022 [123]	USD 200 million
	preferential loan within the framework of a loan agreement	USD 500 million
Norway	Increase assistance to Ukraine. The funds will be used for humanitarian assistance, reconstruction of destroyed infrastructure, weapons, and support for state institutions	USD 30 million
		NOK 10 billion
Czech Republic	–	EUR 12 million
Ireland	–	EUR 10 million
Croatia	–	USD 1.35 million
Island	–	EUR 1.2 million
Estonia	–	EUR 200 thousand
Italy	Funds allocated to fight the occupying forces	USD 110 million
	Credit Assistance	EUR 200 million
Albania	Grant for urgent needs in August	EUR 1 million
The total amount of contributions		**USD 23833,35 million**

Thus, Great Britain in 2022 increased the total amount of fiscal support, including loan guarantees, to USD 1,500 million, and total economic and humanitarian support – up to USD 1,800 million.

Canada, through the mechanism of the administrative account of the International Monetary Fund, provided loans on preferential terms for a term of 10 years and an interest rate of 1.69 % per annum. These funds will be directed to the state budget to finance priority expenditures, namely the provision of priority social and humanitarian expenditures [110]. Also in June 2022, Canada allocated humanitarian support, support for development, peace, and security, which included 49 % of humanitarian assistance to provide Ukrainians with food, emergency cash payments, funds for protection, housing, and medical services; 34 % – for agricultural solutions, including granaries, to improve food security; 10 % to support demining operations and 7 % to establish responsibility for human rights violations [124]. And in August 2022, it provided a loan in the amount of USD 350 million for the purchase of gas before the heating season. On November 25, Canada allocates 10 million Canadian dollars (approximately USD 7.6 million) for the purchase and supply of generators for Ukraine [125]. On December 19, Ukraine received an additional 500 million Canadian dollars from Canada (USD 367 million) within the credit agreement between Ukraine and Canada. The total amount of the loan is 1.95 billion Canadian dollars (USD 1.432 billion) [126].

It should be noted that Germany became one of those European countries that sent the largest financial support, which amounted to EUR 1.3 billion, where 1 billion is a grant that does not need to be returned.

At the meeting of the Government of Ukraine in June 2022, a decision was approved to attract a loan and a grant from the Credit Institution for reconstruction in order to implement the project "Refinancing of energy-efficient investments of small and medium-sized enterprises of Ukraine through the financial sector". 94.6 % of credit and 5.4 % of grant funds will be used for the implementation of the project. The term of the loan is 30 years with a ten-year grace period at the rate of 2 % per annum [127]. Ukraine received this grant in July 2022. The funds received will be used to finance priority social and humanitarian expenses during martial law. Since the beginning of the full-scale armed aggression of the Russian Federation, Ukraine has received EUR 1.3 billion from Germany to support the financial and budgetary system [124].

As for the USA, the amount of assistance approved by Congress in accordance with the bill entitled Additional Ukraine Supplemental Appropriations Act, 2022, amounted to USD 40 billion. But in the "Lend-Lease" law signed by President Biden on May 9, 2022, there is no mention of any budget amounts for assistance to Ukraine.

Also, since the beginning of the full-scale invasion of Ukraine, as of 2022, the United States has provided almost USD 914 million in humanitarian assistance to meet the needs of people in Ukraine and those who left for neighboring countries [124]. Note that on December 15, 2022, the US Senate approved a law according to which defence spending will amount to USD 858 billion for 2023, of which USD 800 million will go to help Ukraine [124]. On December 23, 2022, the US Congress passed a bill on the budget with the support of Ukraine for USD 45 billion [124].

In June 2022, an additional agreement was signed with the Japanese government regarding the loan of the Japan International Cooperation Agency for development policy in the field of extraordinary economic recovery [128], according to which Ukraine received an additional approximately USD 500 million. The funds were directed to the state budget to finance priority social and humanitarian expenses, health care, etc. [129].

Currently, the largest financial donors of Ukraine are the European Union and the United States, which as of 2022 have provided Ukraine with financial support of more than USD 10 billion each. At the same time, 90 % of the US assistance is in the form of grants, and the EU's promised funds are loans, albeit on preferential terms (**Fig. 1.6.3**).

Although we note that there is a significant gap between financial obligations and donor payments, comparing the data of the website, which is regularly updated by the Ministry of Finance of Ukraine and the officially indicated international information, it does not take into account loans and grants that have a specific purpose, e.g., grants awarded for military or humanitarian projects.

Fig. 1.6.3 shows a large gap between the committed financial assistance and the disbursed financial assistance. As of January 15, 2023, only 48 % of the committed external budget support had been paid (EUR 30.99 billion out of total commitments of EUR 64.16 billion). The gap is most visible for the two main financial donors – the US and the EU. The EU institutions, for

example, have so far paid just over a third of their total financial pledges (EUR 12.85 billion out of EUR 30.32 billion committed), while the United States has only paid out about half (EUR 12.06 billion out of EUR 25.11 billion).
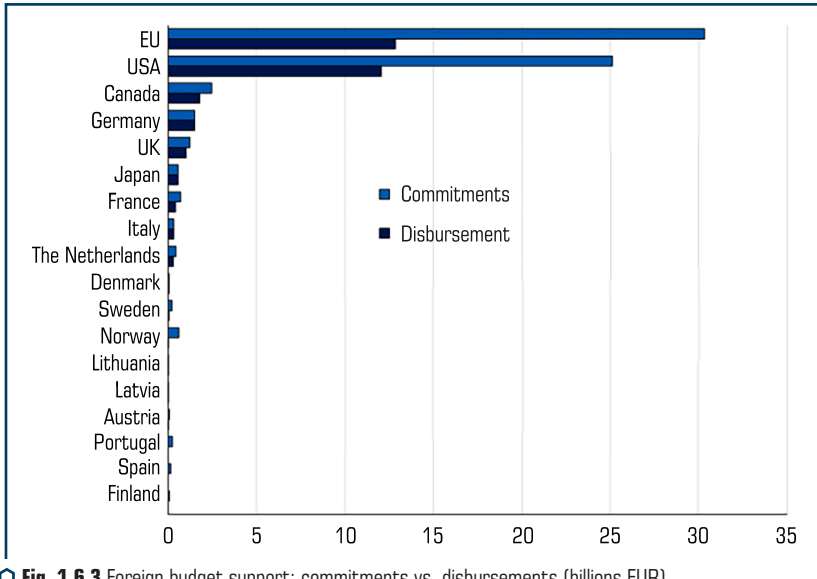
Fig. 1.6.3 Foreign budget support: commitments vs. disbursements (billions EUR)

In June 2022, the European Bank for Reconstruction and Development (EBRD) signed the Agreement on Amendments to the Guarantee Agreement (Project of Electrification of the Ukrainian Railways "Electrification of the Dolynsk – Mykolaiv – Kolosivka Railway Route"). In addition, the Agreement on Amendments to the Loan Agreement under the Railway Electrification Project was signed, which will provide an opportunity to direct part of the EBRD loan in the amount of EUR 50 million to ensure liquidity to finance the critical needs of Ukrzaliznytsia. The repurposed part of the EBRD loan will be guaranteed by the European Fund for Sustainable Development (EFSD), which is a financial mechanism of the EU External Investment Plan [130]. The EBRD also provided EUR 300 million to Naftogaz of Ukraine to strengthen Ukraine's energy security, which will be used for emergency gas purchases (a tranche of EUR 50 million) [131]. A loan in the amount of EUR 24 million was granted to the agricultural holding "Myronivskyi Hliboprodukt" (MHP). This financing will provide MHP with the working capital needed by the company for the agricultural season. The loan is supported by the technical assistance of the program to support the preparation of projects for agribusiness in Ukraine to cover the costs of legal expertise, financed by the Technical Cooperation Fund of Japan and EBRD [132].

The contribution of international organizations is focused on contributing to the Ukrainian economy, with the aim of supporting the vital activities of the state (**Table 1.6.2**).

● **Table 1.6.2** Financial assistance from international organizations

Organization	Contribution
EU	500 million EUR (USD 483 million) of macro-financial assistance [133]. In March and May 2022, Ukraine received two tranches within the framework of the EU's sixth macro-financial assistance program with a total volume of EUR 1.2 billion (USD 1,160 million). Within the framework of *the EU Program for supporting Ukraine in emergency situations*, Ukraine will receive EUR 330 million (USD 29 million) [134]. Funds are provided from the EU budget in accordance with the Neighborhood, Development, and International Cooperation Instrument. According to the results of the summit on June 24, 2022, a decision was made to provide Ukraine with macro-financial assistance in the amount of up to EUR 9 billion. Already in August, Ukraine received the first part of the package of macro-financial assistance. The second part of the aid in the amount of EUR 8 billion was planned to be provided in September 2022, but is delayed. On July 1 of the same year, the European Commission announced a decision to allocate additional financial support resources to Ukraine in the form of macro-financial assistance to the EU in the amount of EUR 1 billion [135]. Funds will be provided to Ukraine in the form of long-term loans on favorable terms. The aid will contribute to the macroeconomic stability and overall resilience of Ukraine in the context of Russia's large-scale military aggression and related economic challenges. On December 15, Ukraine received a grant in the amount of EUR 50 million for the repair of electricity, water, heat, and waste management systems in communities liberated from occupation in the Kyiv region. Funds were allocated for the restoration of infrastructure in Irpin, Bucha, Velyka Dymerka, Hostomel, Dymer, Slavutych, Nemishaieve, Kalynivka, Dmytrivka, Ivankiv, Borodianka, Piskivka, and in the Borshchahiv community [136]
IMF	A loan in the amount of USD 350 million was granted, as well as a loan of USD 140 million, financed by Sweden and the Netherlands. The USD 134 million donation was funded by Great Britain, Denmark, and other countries; donation in the amount of USD 100 million was provided by the Japanese government [108]
UN	The UN Office for the Coordination of Humanitarian Affairs provided USD 1,700 million to settle the migration crisis of refugees as a result of the Russian-Ukrainian war, of which USD 1,100 million is designated for humanitarian assistance to Ukraine [137]. In addition, the UN plans to provide another USD 1,500 million for this purpose[138]
World Bank	In March 2022, assistance in the amount of USD 1,400 million was approved [102]. In accordance with the signed Loan Agreement with *the International Bank for Reconstruction and Development* and the Financing Agreement (Project "*Supporting Public Expenditure to Ensure Sustainable Public Administration in Ukraine*») with *the International Development Association*. The bank plans to allocate another USD 1.7 billion until the end of 2023 (as of December, no grant was announced)
G7	G7 discussed the preparation of a financial assistance package for Ukraine in the amount of EUR 15 billion (USD 14.5 million) [139]
The total amount of contributions	**USD 10367.57 million**

It should be noted that only 8 % of EU contributions are grants and the rest are loans. The EU also helped with sanctions against the Russian Federation, which became another step towards curbing Russian aggression.

As of December 2022, the financial assistance of the IMF amounted to about USD 2.7 billion loan (for past debts, Ukraine still owes another USD 2.3 billion). Assistance in the amount of USD 3 billion was also announced, but Ukraine has not yet received these funds.

According to data in the table, we note that the contributions of the World Bank, namely the Project "*Supporting public expenditures to ensure sustainable public administration in Ukraine*" received financial guarantees from Great Britain, the Netherlands, Lithuania, and Latvia, parallel financing — from Italy, as well as the expected future guarantees, in particular from Denmark. The funds will be directed to the reimbursement of state budget expenditures made to ensure the remuneration of employees of state bodies and budgetary institutions in the field of education, both at the national and regional levels [140]. As part of the Project, Ukraine received a loan in June 2022, the total amount was EUR 446.8 million (USD 427.6 million). Within this financing, the guarantee of Great Britain amounts to EUR 424.6 million (USD 406.4 million) [141].

It should also be noted that in June 2022, funds from another loan from the *Credit Institution for Reconstruction* (KfW) in the amount of EUR 150 million (USD 144 million) were transferred to the state budget of Ukraine. They were provided as co-financing of the Additional financing of the loan for the development policy under the conditions of the extraordinary economic situation of the *International Bank for Reconstruction and Development*. The funds raised will be directed to social expenditures and expenditures in the field of education and health care [142]. Also, KfW will provide EUR 32.5 million in credit funds for the modernization of the electricity transmission network of NEC "Ukrenergo" [143].

Mainly, the specified and already received funds were directed to:

— maintenance of the balance of payments and exchange rate, fulfillment of debt and social obligations;

— humanitarian support — material assistance to the population affected by military actions;

— financing of the military sector — ensuring the functioning of the military sphere (except for the physical supply of weapons).

The European Bank for Reconstruction and Development and *the Netherlands* allocate EUR 372 million to the PJSC National Energy Company "Ukrenergo" for the repair of damaged energy facilities in Ukraine. Of these, the EBRD will allocate 300 million EUR of credit to the Ukrainian company, another EUR 72 million will be provided as a grant by the Netherlands. The funds were allocated within the financial package of EUR 3 billion, which the EBRD will direct during 2022–2023. Thanks to this financing, Ukrenergo will be able to carry out rapid emergency repairs of damaged equipment, high-voltage substations and power lines. This will ensure uninterrupted provision of vital electricity transmission services during the heating season for Ukrainian homes and businesses [144].

Between June and October 2022, there was almost no new assistance, except for a new US package of EUR 10.7 billion at the end of September. However, November and December

saw a very significant increase in assistance commitments: EUR 18 billion in new EU loans and EUR 37 billion from the US Ukraine Supplemental Appropriations Act of 2023 (**Fig. 1.6.4**).

In general, since the beginning of the full-scale war, foreign financing has covered 55 % of the needs for additional financing of the budget. Thus, foreign assistance covered 36 % of costs. The rest are tax and customs revenues (34 %), NBU hryvnia printing (20 %), military bonds (10 %).

It should be noted that in August 2022, foreign financing fully covered budget needs within one month, amounting to USD 4.7 billion in grants and loans (USD 4.2 billion budget deficit and debt repayment).
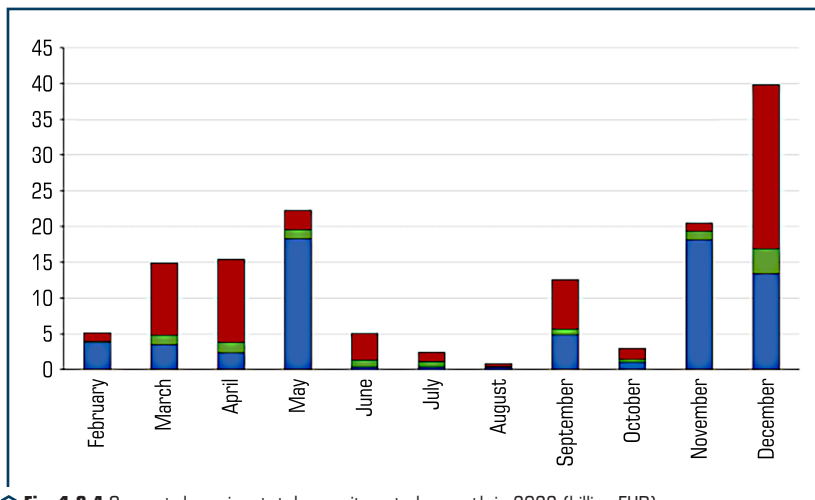
Fig. 1.6.4 Support dynamics: total commitments by month in 2022 (billion EUR)

However, we note that Ukrainian needs are so significant and so urgent that foreign assistance does not cover 100 % of all government expenditures, but only a third (36 %) of government expenditures. About a third (34 %) of all expenditures were financed by taxpayers and customs revenues; 10 % of expenses — sale of military bonds to banks, individuals, and legal entities; 20 % of expenses are financed by the NBU, by transferring its own profits to the budget and printing UAH 285 billion — a colossal amount that will eventually be reflected in the form of inflation.

In addition to the need to finance the needs of the security and defence sector and all antic-ipated social payments, expenses to ensure the functioning of the state and the recovery of the economy, in 2023 an additional factor of increasing the deficit will be an almost two-fold increase in payments for servicing the public debt (**Fig. 1.6.5**).

The budget provides for the financing of deficits and debt repayments through external bor-rowing (94 % of financing needs, or UAH 1.4 trillion). Only 6 % (s 90 billion) is a plan to borrow on

the domestic market. The largest creditor of the state budget in 2023 should be the International Monetary Fund. They hope to receive UAH 633 billion from it next year (USD 15 billion according to the average annual exchange rate).
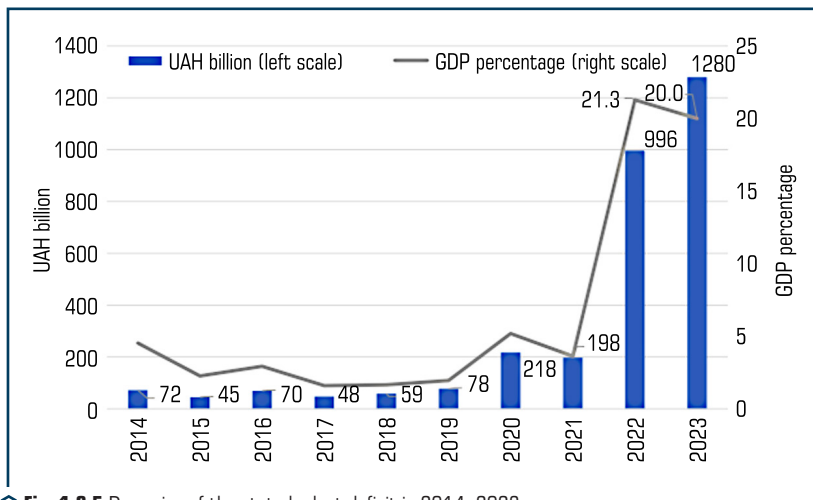
 Fig. 1.6.5 Dynamics of the state budget deficit in 2014–2023
Source: [141]

CONCLUSIONS

Thus, it can be argued that assistance commitments to Ukraine are cyclical, with most of the total funds dependent on large individual packages. Obligations are often paid late, including financial assistance. In general, assistance flows were difficult to predict, and assistance announcements were usually country-specific and uncoordinated. In the broader historical picture, assistance to Ukraine appears relatively limited. For example, the US annually spent many times more on wars in Korea, Vietnam, or Iraq (measured as a percentage of GDP). The same is true of Germany during the 1990–1991 Gulf War, when it committed more than three times as much to the liberation of Kuwait compared to Germany's bilateral commitments to Ukraine in 2022 (relative to GDP).

In general, the provided financial assistance generally has a positive effect on the socio-economic, political, and military development of sectors and regions, although the indicated results do not fully meet the defined criteria and needs.

It should be noted that as of December 31, 2022, the state and state-guaranteed debt of Ukraine amounted to UAH 4,072.85 billion or USD 111.38 billion. The national debt of Ukraine amounted to USD 101.59 billion. The state foreign debt amounted to USD 63.59 billion (57.10 %

of the total amount of state and state-guaranteed debt). The state-guaranteed debt of Ukraine amounted to USD 9.78 billion (8.78 %). During December 2022, the amount of the state and state-guaranteed debt of Ukraine increased by USD 3.87 billion [145]. According to the forecasts of the Ministry of Economy, the amount of public debt in 2023 will exceed the nominal amount of GDP and will amount to 102 % (if Ukraine receives the promised funds mainly in the form of loans and not in the form of grants). In the long term, such an indicator is pessimistic, accordingly – the recovery of GDP, even in the event of a quick end to the war, will last a long time, therefore it is worth conducting negotiations with creditors on debt restructuring and forming an attractive investment environment [146].

In order to stabilize the situation, it is necessary to carry out procedures for restructuring the debt of Ukraine and state companies, which will save USD 5 billion in the central budget for other needs; to use the budget as efficiently as possible; implement the direction for further containment of the economy to support the budget of Ukraine and the army.

Considering the significant amount of financial assistance and the guarantees of international partners that they will support Ukraine exactly as much as needed, the assistance received is not sufficient to fully meet Ukraine's needs.

At the same time, it is important to work on increasing the amount of foreign financial assistance because without it, there will be only one source of financing military expenses – uncontrolled printing of money, which can eventually lead to hyperinflation.

Therefore, in addition to increasing the amount of international financial assistance, it is also important for Ukraine to look for alternative ways of filling the state budget, which will be adapted to the needs of wartime and post-war economic recovery, which will make it possible to avoid the accumulation of a hypertrophied debt burden and will not create additional pressure on state finances in the future.

Thus, the possibility of implementing a full-scale plan for the post-war reconstruction of Ukraine and its success depend on the possibility of solving the problem of debt burden and transition to a more reasonable structure of external financing.

1.7 LOGISTICS SUPPORT UNDER THE CONDITIONS OF COUNTERACTION IN THE RUSSIAN-UKRAINIAN WAR

Oleksandr Ustymenko, Mykola Shaptalenko, Iryna Zahorka

ABSTRACT

One of the main principles underlying the logistical support of the defence forces during their preparation and in the course of deployment is the cooperation of the defence forces with the bodies of foreign states, international organizations, and the armed forces of other states in matters of providing the defence forces with material means and services during their preparation and in the course of application under the conditions of countering armed aggression.

Since the decision to join the North Atlantic Treaty (NATO) was made, work has continued to create an effective system of logistical support for the Ukrainian Armed Forces, capable of planning and managing the processes of logistical support of troops (forces) both in peacetime and in a special period, as well as being compatible with the NATO system.

KEYWORDS

Logistical support, defence forces, international organizations, preparation, deployment, armed aggression, NATO, effective system, planning and management, troops, special period, decision-making.

Logistics support is a set of activities including planning of logistics support; determination of needs in armaments and military equipment, special vehicles and vehicles (hereafter, armaments and military equipment), material and technical means and services; design, development (modernization and modification) of weapons, military equipment and material and technical means, their procurement, supply, storage, repair, maintenance, control of operation (use); sale, write-off and disposal of surplus weapons and military equipment and material and technical means; planning and implementation of military transportation by all types of transport; procurement of works and services of bath and laundry and trade and household services; food organization; quartering of troops (forces, bodies); procurement or construction, maintenance, operation of military infrastructure objects [147].

That is, we can state that the logistical support of the defence forces under the conditions of countering armed aggression, during their performance of tasks for the defence of the state, protection of its sovereignty, territorial integrity, and inviolability, is organized and carried out continuously with the aim of meeting the needs of the components of the defence forces in weapons and military equipment, material and technical means, services and creation of favorable conditions for their performance of state defence tasks.

When creating international forces, NATO countries defined strategic goals of logistics. Under conditions of immediate threat from the aggressor country, combat-ready and functionally compatible capabilities of joint logistics were created.

For this, management and control systems of material and technical support were created in order to achieve a higher possibility of rapid deployment of NATO forces and strengthening of their logistical support.

NATO countries have created multinational centers for the coordination of sea and air transportation. The formation of multinational joint logistics units is underway.

More experienced countries take on the role of mentor. Thus, the USA and Great Britain have much more experience than other states in conducting operations at a considerable distance from points of permanent deployment. NATO organizes logistics planning and creates management and control structures within the so-called smart defence projects. Management of the logistics system is being formed [148].

NATO uses two main types of planning processes. One of them covers planning related to specific operations (missions) – operational planning. Another process deals with the development of sufficient capabilities to carry out future operations – defence planning.

Logistics planning is part of both operational and defence planning. NATO's logistics capabilities are a key element of NATO's strategic documents. They should be designed in such a way as to increase the efficiency of the use of national resources, simplify and speed up logistics flows, and provide the command with assistance in carrying out tasks. This requires timely, correct, and accurate logistics information. The command must receive such information in the shortest possible time and must be regularly informed about changes.

The general management of the system of logistical support of the defence forces during their use is carried out by the General Staff of the Ukrainian Armed Forces, which, in accordance with the powers granted by the law, exercises direct military leadership of the defence forces. There is a vertical from the Main Directorate of Logistics of the General Staff to the lowest military unit of the tactical link – a brigade, a separate battalion, a division. The need is submitted vertically to the upper link. Provision is made in stages, based on the availability of material resources and their storage. For example, available material means are provided to the team that needs them. If there is not what is necessary at the tactical level, the supply of the brigade comes from the warehouses of bases and arsenals of the operational level - these are operational commands of the Ground Forces, and if it is the Air Force – air commands. In the absence of the necessary means, the need is provided from the warehouses of the Logistics Command of the Ukrainian Armed Forces.

Work continues on the creation of an effective system of logistical support of the Ukrainian Armed Forces, which should be able to plan and manage the processes of logistical support of troops (forces) both in peacetime and in a special period, as well as be compatible with the NATO system.

In order to define unified conceptual provisions regarding the formation and functioning of the logistics support system of the Ukrainian Armed Forces and other components of the defence forces during the joint implementation of state defence tasks, the Main Directorate of Logistics

of the General Staff of the Ukrainian Armed Forces developed the defining **"United Logistics Doctrine"**, approved by the Commander-in-Chief of the Ukrainian Armed Forces on September 19, 2020. It was developed on the basis of the provisions of the "Doctrine of the use of state defence forces", approved by the order of the General Staff of the Ukrainian Armed Forces dated 31.03.2020 No. 124/dsk and takes into account the basic principles and principles of logistical support of NATO, which are set forth in the doctrinal documents of the AJP-4 series.

This was preceded by the following guiding documents:

1. Order of the Ministry of Defence of Ukraine dated 11.10.2016 No. 522 **"Basic Provisions of Logistic Support of the Ukrainian Armed Forces"**.

2. Decree of the Cabinet of Ministers of Ukraine dated December 27, 2018, No. 1208 **"The procedure for logistical support of the defence forces during the performance of tasks for the defence of the state, protection of its sovereignty, territorial integrity and inviolability"**.

3. **"Temporary instruction on logistical support of the Ukrainian Armed Forces"**, part II, approved by the order of the General Staff of the Ukrainian Armed Forces dated March 12, 2020, No. 101/dsk.

4. **Directive** of the General Staff of the Ukrainian Armed Forces dated March 13, 2020, No. D-6 **"On the organization of the development of doctrinal documents of the Ukrainian Armed Forces**".

The doctrine of united logistics forms a system of views on the role, place, and tasks of united logistics in the general system of defence of the state, protection of its sovereignty, territorial integrity and inviolability, and also defines the general requirements and principles of logistics support.

The general structure of the hierarchy of doctrinal documents on logistical support is shown in **Fig. 1.7.1**, where it is clearly seen that the Doctrine is a key document on issues of logistical support for the military management bodies of the Ukrainian Armed Forces, other components of the defence forces, and is the basis for the development of other doctrinal documents regulating the order and principles of logistic support taking into account the features and specifics of their application.

The doctrine of unified logistics defines such basic concepts as **logistics** as the science and practice of planning and implementation of processes of deployment on the ground, movement of troops (forces) and providing them with the necessary weapons and military equipment (hereinafter WME), and material and technical means (hereinafter, MtM).

In a broader sense, these are aspects of military operations that relate to:

– design and development, procurement (supply), storage, transportation, distribution, maintenance, evacuation, use, removal, and disposal of WME and MtM;

– transportation of personnel;

– procurement, construction, maintenance, operation, and placement (deployment) of infrastructure facilities;

– procurement or provision of services.

United Logistics Doctrine VKP 4-00(01).01

Key publication

Defining publication

- Doctrine of the Logistics Forces VKP 4-32(41).01
- Doctrine of provision of material, works and services WCP 4-160(03).01
- Doctrine of provision, maintenance, restoration (repair) and use of weapons and military equipment
- Doctrine of the use of logistics forces VKP 4-32(03).01
- Doctrine on the organisation of movements and transportations CEP 4-00(03).01
- Doctrine of Infrastructure Support VKP 4-144(03).21
- Doctrine on Provision of Host Nation Support (HNS) VKP 4-145(03).01

Species doctrines

- BS CB Logistics
- BS Navy Logistics
- BS AF Logistics
- BS Airborne Logistics
- BS SSpO Logistics

- BS Army Logistics Operations
- BS Navy Logistics Operations
- BS Air Force Logistics Operations
- BS Airborne Forces Logistics Operations
- BS SSpO Logistics Operations

- BS Army Transport operations and military transport
- BS Navy Transport operations and military transport
- BS Air Force Transport operations and military transport
- BS Airborn Transport operations and military transport
- BS SSpO Transport operations and military transport

- BS Army Troop deployment operations
- BS Navy Troop deployment operations
- BS Air Force Troop deployment operations
- BS Airborn Troop deployment operations
- BS SSpO Troop deployment operations

Manuals

- Instruction on Combat Training of Logistics Forces VKDP 7-00(41).01
- Instruction Repair and Restoration Regiment VKDP 4-99(55).01
- Instruction Arsenal (base, warehouse) for the storage of ammunition VKDP 4-32(03).01
- Instruction Centre (base, warehouse) for fuel supply VKDP 4-94(50).01
- Instruction of the Centralised Logistics Centre for the provision of spare parts and equipment VKDP 4-97(50).01
- Instruction Institutions and food service (base, warehouse) VKDP 4.34(15).01

- Instruction on the operation of material warehouses, centralised storage facilities (institutions) VKDP 4-34(15-3).01
- Instruction Pipeline battalion VKDP 4-100(56).01
- Instruction Metrological military units and subdivisions of the State Military District of Ukraine 4-84(03).01
- Instruction Structure and functioning of the KCSL PU in operations VKDP 4-94(50).01
- Instruction Central automobile storage and repair base of the VKDP 4- 33(14).01
- Instruction Field artillery depot of the VKDP 4-85(54).01

- Instruction Field fuel depots VKDP 4-94(54)01
- Instruction Field depot for maintenance and repair materials VKDP 4-32(01).01
- Instruction Food base (warehouse) VKDP 4 34(15).01
- Instruction Vehicle brigade (regiment, battalion) VKDP 4- 32(03).01
- Instruction Housing and maintenance establishments and engineering and infrastructure support units VKDP 4-32(03).01
- Instruction of the Directorate (Commandant's Office) of Military Communications VKDP 4-101(03).01

- Regulation on the servic of support of the NSO
- Regulation on the service for the provision of munitions
- Regulation on the service on the service
- Regulation on the service for providing fuel and lubricants
- Regulation on the Service for the Supply of Material Support
- Regulation on the Metrology and Standardisation Service

- Regulation on the Aviation and Air Defence Support Service
- Regulation on the Engineering and Infrastructure Support Service
- Regulation on the Military Equipment Support Service
- Regulation on the Service for the Supply of Special Forces with Weapons and Equipment
- Regulation on the Food Supply Service
- Regulation on the Service for the Supply of Means of Close Combat and Reconnaissance
- Regulation on Transport Support Service

Fig. 1.7.1 Hierarchy of doctrinal documents on logistical support

Logistics support as a set of measures for:

– planning of logistical support;

– determination of needs for weapons, combat (military) equipment, special and regular vehicles, MtM, and services;

– design, development (modernization and modification) of WME and MtM, their procurement, supply, storage, repair, maintenance, control of operation (use);

– implementation, write-off, and disposal of surplus WME and MtM;

– planning and implementation of military transportation by all types of transport;

– procurement of works and services of bath and laundry and trade and household services;

– food organization;

– quartering of troops (forces, bodies); procurement or construction, maintenance, operation of military infrastructure facilities.

A number of existing guidance documents developed since 2016 were analyzed. It should be noted that different documents interpret these concepts differently. Therefore, with the approval of the Doctrine, the only key concepts applied by the defence forces in the direction of logistical support were finally introduced.

The doctrine clearly outlines **four main functions of logistics support**, namely:

– provision of material and technical means, works, and services;

– provision of weapons and military equipment, maintenance, restoration (repair), and use;

– movement and transportation;

– infrastructural support.

The performance of these functions is carried out according to the **types of logistical support** that are directly organized by the support services of military administration bodies and military units. The main functions of logistics support by types of logistics support are shown in **Fig. 1.7.2**.

The planning and provision of defence forces of WME and MtM during their use is carried out according to **supply classes**, which are similar to NATO classes. At the same time, supply classes can be divided into subclasses. Supply classes are shown in **Fig. 1.7.3**.

The purpose of logistical support is to ensure the needs of the defence forces in WME, MtM, service provision, and create favorable conditions for their performance of state defence tasks.

Based on the purpose and general functions of logistics support, all available so-called "logistics assets", which are management bodies, military units, information systems, WME, MtM stocks, are combined into a general system of logistics support, which is a hierarchical distributed logistics management bodies (strategic, operational, and tactical levels) with forces and means subordinate to them.

The logistics support system itself is one of the subsystems of **the general system of the use of defence forces**, which, in turn, requires coherency, coordination, and management. In accordance with the powers enshrined in the legislation of Ukraine, direct strategic management of the defence forces, including their logistical support, is carried out by the Commander-in-Chief of the Ukrainian Armed Forces through the General Staff of the Ukrainian Armed Forces, which provides it with comprehensive support in the implementation of leadership by conducting strategic deployment planning activities.

United Logistics Doctrine

Main functions:

Provision of weapons and equipment, maintenance, restoration (repair) and use

Provision of materiel, works and services

Infrastructure support

Movement and transportation

Types of logistics support:

1. Provision of munitions;
2. Artillery and technical support;
3. Tank technical support;
4. Automotive technical support;
5. Anti-aircraft and radio technical support;
6. Engineering and aviation support;
7. Aviation technical support;
8. Electricity and gas supply;
9. Ensuring the uniformity of measurements;
10. Technical support of reconnaissance means;
11. Technical support for support services;

12. Technical support for communication and automation of troop management;
13. Provision of fuel and lubricants;
14. Food supply;
15. Provision of clothing;
16. Airfield and technical support;
17. Technical support for ships (vessels);
18. Torpedo technical support;
19. Commercial and household services;
20. Transport support;
21. Engineering and infrastructure support;
22. Engineering and airfield support

○ **Fig. 1.7.2** Main functions of logistics support by types of logistics support

AFU supply class	Description	NATO supply class
I	Food (food and fodder) consumed by personnel and animals, for which uniform standards are established	I
II	Supply items issued according to the standards and time sheets established by states (weapons and armaments, military equipment and facilities, uniforms and equipment, tools, spare parts, etc.)	II
III	All types of petroleum products and fuels and lubricants, fuel	III
IV	Supplies that are not issued in accordance with established staffing levels and time sheets (fortification and construction materials).	IV
V	Various types of ammunition, explosives and chemicals	V

○ **Fig. 1.7.3** Supply classes

In order to ensure the coordination of the measures of the use of defence forces with the measures of their logistical support, the General Headquarters of the J-4 Logistics Directorate was established, which is intended for:

– determination of the need of the defence forces in material means by classes of supply;

– planning their support together with J-3 units;

– determination of priorities and coordination of logistical support.

In other words, J-4 is a connecting link between the system of application of defence forces and the system of their logistical support.

In a similar way, the vertical planning of logistical support is being built at the operational and tactical levels.

At the same time, **the basis of the logistics support system** is made up of the relevant management bodies for logistics support at the strategic, operational, and tactical levels with the forces and means subordinated to them. They are intended for the direct implementation of functions and solving tasks of logistical support of troops (forces).

At the same time, the logistics management bodies are assigned the role of **organizing** the satisfaction of the needs of the troops (forces) in material means and services, as well as managing logistics forces and logistics operations.

Logistics operations are a set of coordinated and interrelated measures that ensure the supply of the necessary military equipment, services, and works to the troops (forces) in the required quantity (in the required list, volume), in the required place, and at the specified time (Doctrine of the use of logistics forces).

In turn, the logistics forces are the direct executors of the tasks of logistical support of troops.

Thus, a **three-level** system of logistics support is created, which will have a certain set of forces and means (**Fig. 1.7.4**):

– **at the strategic level** – stationary arsenals, centers, bases, warehouses, automobile brigade;

– **at the operational level** – artillery depots, repair and restoration regiments, automobile battalions, battalions of material support;

– **at the tactical level** – units of technical and logistical support.

In general, the process of planning the logistical support of troops (forces) and the Armed Forces as a whole has the following form:

– J-4 of the General Staff forms the general need for material resources, received from the logistics units of the headquarters of the military administration bodies, which is shown in blue;

– on the basis of the received data, J-4 carries out planning to meet the specified need at the expense of existing stocks, the national economy, the provision of material and technical aid and defence purchases;

– subsequently, the directive document determines the task of the Command of the Logistics Forces and the command of the operational level to organize the provision of material resources to the identified groups, in accordance with the need, which is shown in red;

– at the operational and tactical levels, the process is similar.

Fig. 1.7.4 Three-level logistics system
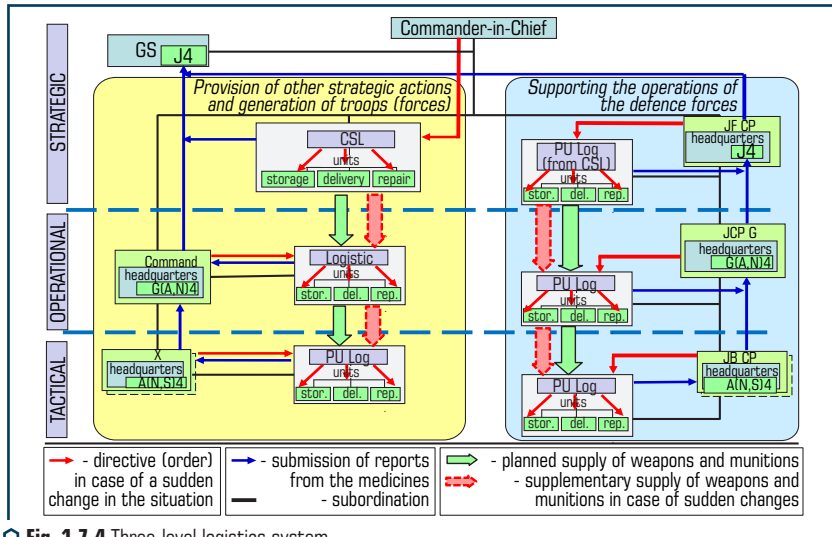
The Command of the Logistics Forces, the logistics of the military administration, on the basis of the directive document received, plans the use of subordinate logistics units.

The system of logistical support of the defence forces is shown in Fig. **1.7.5**.

Fig. 1.7.5 The system of logistical support of the defence forces
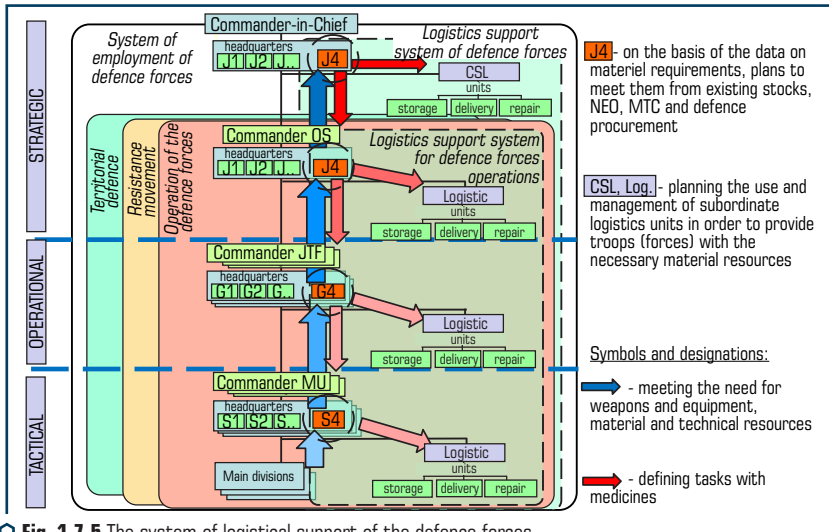
Directly during the use of troops (forces), the process of logistical support involves the following:

– planned delivery of material resources to the troops (forces) by the logistics forces, in accordance with the planned indicators;

– generalization of data of the logistics situation by structures J(G,N,A,S)-4 and, in case of sudden changes, clarification of the tasks of the logistics forces.

But the Ukrainian Armed Forces are undergoing not only "iron" but also organizational transformations in the context of NATO standards.

Logistic Functional Area Services (LOGFAS) is an integrated set of software systems designed to support NATO logistics support. The Service allows users to collect, store, process, analyze, display, and distribute information to support logistics operations.

In 2019, the then Deputy Chief of the General Staff, Lieutenant General R. Tymoshenko, signed a draft License Agreement between the Ministry of Defence of Ukraine and the NATO Communications and Information Agency, which was handed over to the Department of Automation Development of the Ukrainian Armed Forces for the completion of relevant procedures and further use of the LOGFAS software [149].

In particular, it is about the integration of the **LOGFAS** system, which is used to organize *logistics* accounting during operations and exercises, and the reform of the defence procurement system is underway.

According to the Minister of Defence of Ukraine, Oleksii Reznikov, when summing up the results of Ramstein-6, "We are implementing the NATO LOGFAS system to ensure accounting and logistics; according to my decision, the defence procurement system is being reformed according to NATO principles, we have mastered more than 300 NATO standards, etc." [150].

On October 21, 2022, the Minister of Defence of Ukraine and Secretary of the National Security and Defence Council of Ukraine O. Danilov presented the first results of the implementation of the **LOGFAS** logistics program to the ambassadors and defence attachés of the donor countries that help Ukraine in repelling Russian aggression.

The Ministry of Defence said that thanks to the integration of the **LOGFAS** system with the module of the information and analytical system "SOTA" regarding the monitoring of the supply of weapons to Ukraine from partner countries, full control of each unit of weapons that enters the territory of Ukraine is ensured.

Minister of Defence of Ukraine O. Reznikov noted that the implementation of this software has two dimensions.

"*First*, this will significantly increase the accountability of all processes related to the exploitation of weapons and other resources. We started the implementation of international aid accounting to ensure transparency and high efficiency of its use.

Second, we prove that even during the war, the defence sector of Ukraine is developing. We are increasing interoperability with the North Atlantic Alliance at the level of standards and procedures. My statement that Ukraine has already become a de facto member of NATO is not an exaggeration. And we will persistently move forward".

In addition, he emphasized that the implementation of **LOGFAS** eliminates the ground for any concern because it is a standard of accounting and planning that operates in the countries of the Alliance.

According to the Secretary of the National Security and Defence Council of Ukraine O. Danilov, the use of these systems by the Defence Forces of Ukraine will contribute to the most effective and transparent cooperation between Ukraine and partners.

The Ministry of Defence also noted that the **LOGFAS** scaling road map until the end of 2022 and 2023 has already been approved. As a result, this program will become one of the main tools of digitization of logistics in the Armed Forces and will provide logistical planning not only for international aid, but also for a complete list of resources available in the Ukrainian Armed Forces.

In addition, more than 300 **LOGFAS** operators have already been trained for the Ukrainian Armed Forces. By the end of November, 350 **LOGFAS** operator jobs were planned to be deployed to cover all levels from strategic command to brigade level.

"At the same time, the Karavai software was implemented to study the needs of the army. Among other things, this ensures proper transparency and control over the weapons and military equipment that Ukraine receives in the form of material and technical aid", said the head of the defence department [151].

According to him, the Ministry of Defence of Ukraine is in close contact with American partners and recently demonstrated the results of the implementation of these systems. Thanks to this, an unprecedented level of mutual trust is maintained, and all attempts by the enemies of Ukraine to block the supply of weapons are futile, O. Reznikov emphasized.

In addition, he noted, an important stage in the field of introduction of automated military control systems has been completed. The minister recalled that on December 6 he had signed an order on the adoption of the automated system of the operational control center "Dzvin-AS". "Our military is extremely interested in strategic-level ACS and has been waiting for its full deployment for a long time", he said [152].

The Ministry of Defence of Ukraine also received a positive expert opinion regarding the Delta Integration Platform special software package. This is an important stage in the formalization of the platform according to the approved roadmap. Next, a cycle of official tests will take place, based on the results of which a decision will be made on adoption, the head of the Ministry of Defence of Ukraine informed.

In his opinion, given the long-term challenges in the field of security and defence, the Ministry of Defence of Ukraine should become one of the leaders of digital development. According to the Minister, this task will be solved by increasing the competences of the Ministry of Defence and the Armed Forces, as well as through the implementation of policy directions that will promote public-private partnership in this field.

In particular, the activities of the Cyber Security Center of the Ministry of Defence of Ukraine and the MIL.CERT-UA military response team to cyber incidents have been launched. The Ministry of Defence of Ukraine acted as one of the initiators and organizers of the national defence hackathon.

"The enemy perfectly understands the importance of digitization. Therefore, it is making great efforts to discredit and disrupt this work in the Ukrainian army, as happened recently with the example of the Delta program. Cyber-attacks, disinformation campaigns, "useful idiots", etc. are underway – the entire range of countermeasures. This will not stop us", emphasized the Minister of Defence O. Reznikov.

He emphasized that it is possible to defeat the enemy only at the expense of the quality of the defence forces. "More perfect **logistics and effective ACS** will affect the results of hostilities no less than a dozen MLRS. This will save the lives of our soldiers and bring victory closer" [153].

As noted by the military and political leadership of our country, improvement of the logistics system will ensure the combat capability of our troops. Therefore, three levels of accounting for the supply and use of weapons have been launched in Ukraine:

– NATO **LOGFAS** program;
– a module based on the "**SOTA**" program;
– a new accounting and logistics program for military equipment **"Karavai"**.

LOGFAS is an integrated set of software systems designed to support NATO logistics and has been in use since 1995. The Service allows users to collect, store, process, analyze, display, and disseminate information to support logistics operations. LOGFAS is now successfully used to support NATO's logistical support during operations and exercises.

The IAS "SOTA" module on monitoring the supply of weapons to Ukraine from partner countries was put into effect on February 24, 2022. It allows one to monitor new arms supplies by status (for example, ready for shipment, on the way, or received by the Armed Forces) and donor countries, to analyze the supply of weapons in time, by periods of adoption, donor countries, compliance with NATO standards, classification to Soviet weapons samples, etc. The module provides for the possibility of calculating the supply of ammunition to weapons units, monitoring the implementation of supply plans, and distributing the received weapons.

The "Karavai" system is the result of the joint work of digital teams of Ukraine and the international community. It was created to manage the process of submitting applications for aid from Ukraine and the process of processing these applications by partner countries. A transparent process allows one to identify what help is needed, details about the specifics of that help, etc.

CONCLUSIONS

Logistic support of the defence forces under the conditions of countering armed aggression, during their performance of the task of defending the state, protecting its sovereignty, territorial integrity, and inviolability, is organized and carried out continuously with the aim of meeting the needs of the components of the defence forces in weapons and military equipment, material and technical means, services, and creation of favorable conditions for their performance of state defence tasks.

The improvement of the effective system of logistic support of the Ukrainian Armed Forces will be capable of planning and managing the processes of logistic support of the troops (forces) both in peacetime and under conditions of martial law, as well as being compatible with the NATO system. It should be noted that the application of the NATO **LOGFAS** program will increase the efficiency of interaction between Ukraine and partners, as well as speed up the logistics process and the process of managing the aid that Ukraine receives.

1.8 NATIONAL RESISTANCE AS A COMPONENT OF COUNTERMEASURES IN THE RUSSIAN-UKRAINIAN WAR

Mykola Shpura, Nina Andriianova, Mykhailo Lobko

ABSTRACT

The willingness of every Ukrainian to resist is an important factor in deterring Russian aggression. A nation armed, trained, and ready to counterattack will repel the very desire of the enemy to attack further. It is very difficult to capture a territory whose population will resist, and it is impossible to hold it.

Under the conditions of the large-scale invasion of the Russian Federation in Ukraine, reforming the army is not enough. A change in the consciousness of Ukrainians is needed. It should be understood that the protection of Ukraine is a common duty of citizens. Ukrainians must be ready to defend the country. Protection of territorial integrity is the duty of every citizen.

Protecting the sovereignty and territorial integrity of Ukraine, ensuring its economic and information security are the most important functions of the state, the work of the entire Ukrainian people [153].

In times of war, the readiness and ability to defend one's country becomes key. There cannot be a separate army and a separate country. Everyone should do what they can in their place. The army defends at the front, and order in its territory is everyone's business. First of all, it is peace in any village, at any farm. This is the general resistance to aggression, the general resistance to the enemy.

The mass readiness of society for armed resistance is what can help achieve victory in wars. Any enemy troops will feel extremely "uncomfortable" not only on the front line but also in any city where there will be citizens resisting the occupiers.

KEYWORDS

Ukrainian resistance, deterrence, Russian aggression, counterattack, territorial defence, capturing and holding territory, army reform, territorial defence forces, sovereignty, front line.

From January 1, 2022, in accordance with the Law of Ukraine "On the Basics of National Resistance" [154], territorial defence forces (TDF) are being deployed in the country.

Under the conditions of the escalation of hybrid aggression of the Russian Federation and the aggravation of the situation around our borders, this law is one of the fundamental safeguards, a mechanism for implementing the concept of comprehensive defence of our state, the use of asymmetric means.

National resistance is a set of measures that are organized and carried out with the aim of promoting the defence of Ukraine through the widest possible involvement of Ukrainian citizens

in actions aimed at ensuring military security, sovereignty, and territorial integrity of the state, deterring and repelling aggression and inflicting unacceptable losses on the enemy, given which it will be forced to stop armed aggression against Ukraine [154].

According to the Law of Ukraine "On the Basics of National Resistance", three components of national resistance are provided for (**Fig. 1.8.1**).

Territorial defence forces. In fact, it is light infantry that can help the main forces of the Armed Forces guard important objects or the border, be on duty at checkpoints, or counter subversive intelligence groups (SIG) or other illegal groups on their territory. Another function of TDF is assistance during emergencies. TDF report to the Commander-in-Chief of the Armed Forces through the Commander of the Territorial Defence Forces;

Resistance movement. Its tasks are to create resistance centers and "obstruct the actions of the aggressor's troops". In addition, the resistance movement can join special operations, in particular, intelligence or information and psychological operations. The leading role in the organization, preparation, support, and execution of resistance tasks should belong to the Special Operations Forces (SOF) of the Ukrainian Armed Forces, and the movement will be led by the Commander of SOF.

Preparation of citizens for national resistance. It provides for the creation of an appropriate system of training, military-patriotic education, and "preparation of the population for living conditions in the areas of (military) hostilities".
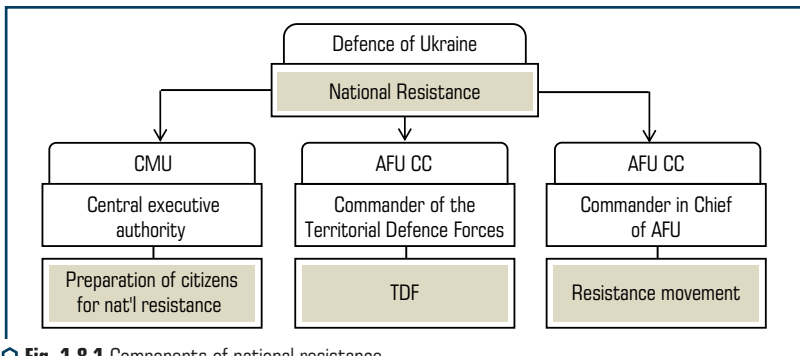
○ **Fig. 1.8.1** Components of national resistance

Russia's war against Ukraine demonstrated the lack of a clear front line, which requires a multi-level system of deterring a stronger enemy. And the use of asymmetric means (TDF as an element of asymmetry) made it possible to ensure confrontation with a stronger and more armed enemy.

Indeed, the capabilities of TDF to block the enemy's actions are obvious and indisputable: one can defeat the army, but you cannot enslave the people.

Territorial defence is a system of national, military, and special measures carried out in peacetime and in a special period with the aim of countering military threats, as well as providing

assistance in the protection of the population, territories, natural environment, and property from emergencies. Territorial defence includes military, civilian, and military-civilian components [154].

The military component of the territorial defence includes military management bodies, military units of the Territorial Defence Forces of the Ukrainian Armed Forces (a branch of the military), other forces and means of the security forces and defence forces involved in the performance of territorial defence tasks [154].

The civilian component of territorial defence includes state bodies, local self-government bodies, which are involved in territorial defence [154].

The military-civilian component of territorial defence includes the headquarters of zones (districts) of territorial defence and voluntary formation of the territorial community (VFTC), which are involved in territorial defence [154].

The scheme of territorial defence organization is shown in **Fig. 1.8.2** [155].

The Territorial Defence Forces of the Ukrainian Armed Forces play a leading role in the organization and execution of territorial defence tasks.

Territorial defence actually creates a whole network of citizens who, living their lives, are ready to take up arms at any moment.

A great responsibility in the matter of providing defence rests with local authorities.

The placement of brigades and battalions of the Forces of the Armed Forces of the Ukrainian Armed Forces, the creation of voluntary formations of territorial communities, the protection of the civilian population and critical infrastructure objects, these and many other related issues require the serious attention of leaders on the ground.

The military units of the Territorial Defence Forces today include [155]:

– military personnel under contract;

– conscripted officers;

– territorial reserve (reservists are persons who are serving in the military reserve of the Ukrainian Armed Forces, other military formations, and are assigned to their staffing in peacetime and in a special period).

Staffing of voluntary formations of territorial communities is carried out on a voluntary basis by civilians. A citizen of Ukraine over the age of 18 who lives in the territory of the community where the volunteer formation operates, who has passed a medical, professional, and psychological selection (check) and signed a territorial defence volunteer contract [156] can be a member of a voluntary formation, a volunteer.

Accordingly, persons who are in active military service or are in the reserve and who were previously sentenced to imprisonment for committing a serious or particularly serious crime, except for those who have been rehabilitated, or who have two or more convictions for committing intentional crimes are not allowed.

The activities of voluntary formations of territorial communities are carried out under the direct leadership and control of the commander of the military unit of the Territorial Defence Forces of the Ukrainian Armed Forces according to the territorial principle.

The statutes of the Ukrainian Armed Forces apply to citizens of Ukraine enrolled in the voluntary formations of territorial communities during their participation in the preparation and execution of territorial defence tasks.

Registration of citizens of Ukraine who have entered into a territorial defence volunteer contract is carried out by territorial recruitment and social support centers.
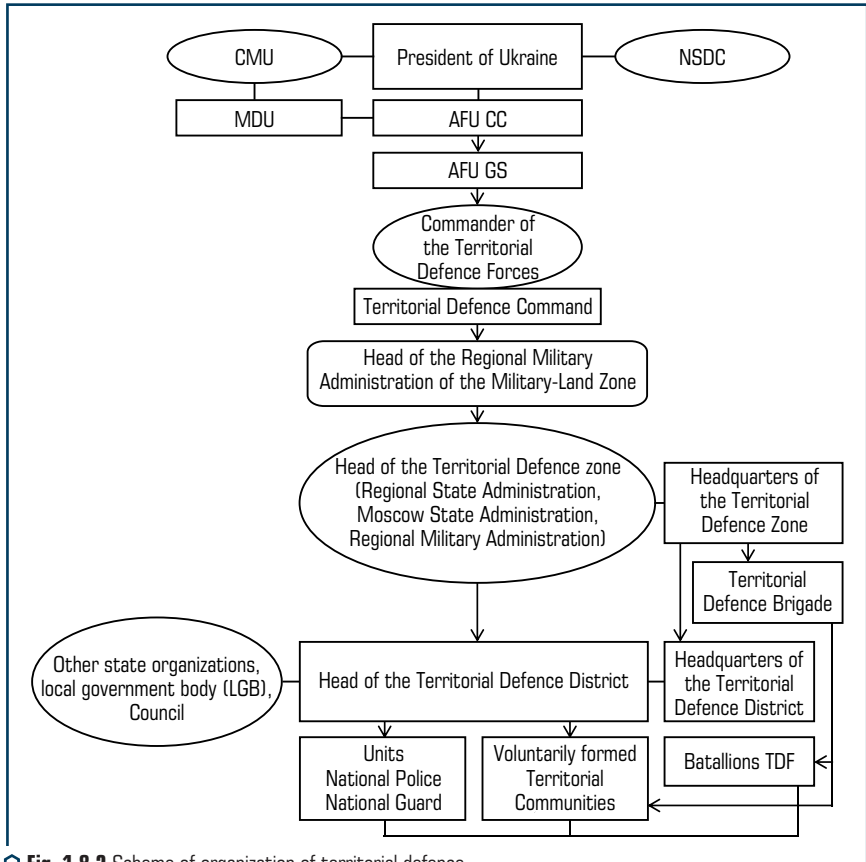
○ **Fig. 1.8.2** Scheme of organization of territorial defence

Membership in a voluntary formation does not exempt one from the obligation to perform fixed-term military service, military service upon conscription during mobilization, for a special period, military service upon conscription of officers, military service upon conscription of reservists during a special period.

During the mobilization, territorial defence volunteers who are fit for military service in wartime and have a military accounting specialty, if necessary, are called up to equip the military units of the Territorial Defence Forces of the Ukrainian Armed Forces and other constituent elements of the defence forces according to the territorial principle.

So, the voluntary formation of a territorial community is a paramilitary unit formed on a voluntary basis from citizens of Ukraine living within the territory of the relevant territorial community, which is intended to participate in the preparation and execution of territorial defence tasks within the territory of the relevant territorial community. A territorial community within the territory of responsibility may form several voluntary formations.

In accordance with the Law of Ukraine "On the Foundations of National Resistance", the Resolution of the Cabinet of Ministers of Ukraine dated 29.12.2021 No. 1449 "On Approval of the Regulation on Voluntary Formation of Territorial Communities" [156], the decision of the Commander-in-Chief of the Ukrainian Armed Forces dated 28.10.2022 and the minutes of the extended meeting on reforming and optimizing VFTC on October 28, 2022, the Commander of TDF by order No. 327 dated November 4, 2022 "On the dismissal of commanders and disbanding of volunteer formations of the city of Kyiv" [157] reformed and optimized VFTC in the city of Kyiv.

VFTC are formed taking into account the resource and human capabilities of the respective territorial communities.

The Command of the Territorial Defence Forces of the Ukrainian Armed Forces, together with local self-government bodies located within the territory of the respective territorial defence zone, develops and approves a single symbol for all VFTCs operating within the territory of the respective territorial defence zone.

Within the territorial defence tasks defined by the Law of Ukraine "On the Basics of National Resistance", volunteer formations can carry out the following activities [156]:

– to respond in a timely manner and take the necessary measures for the defence of the territory and the protection of the population in the specified area until the moment of deployment within such territory of a group of troops (forces) or a group of joint forces intended to conduct military (combat) actions to repel armed aggression against Ukraine;

– to participate in the strengthening of protection and protection of the state border;

– to participate in the protection of the population, territories, natural environment, and property from emergencies, elimination of the consequences of military (combat) operations;

– to participate in the preparation of Ukrainian citizens for national resistance;

– to participate in ensuring the conditions for the safe functioning of state authorities, other state bodies, local self-government bodies, and military administration bodies;

– to participate in the protection and defence of important objects and communications, other critically important infrastructure objects and objects of increased danger, the malfunctioning and disabling of which pose a threat to the life of the population;

– to participate in ensuring conditions for strategic (operational) deployment of troops (forces) or their regrouping;

– to participate in the implementation of measures to temporarily prohibit or restrict the movement of vehicles and pedestrians near and within the zones/areas of emergencies and/or conducting military (combat) operations together with the National Police;

– to participate in ensuring public safety measures and order in settlements together with the National Police;

– to participate in the introduction and implementation of measures of the legal regime of martial law;

– to participate in the fight against sabotage and intelligence forces, other armed formations of the aggressor (adversary) and paramilitary or armed formations not provided for by the laws of Ukraine;

– to participate in information activities aimed at increasing the level of the state's defence capability and countering the information operations of the aggressor (adversary);

– to cooperate with local self-government bodies and military units of the Territorial Defence Forces of the Armed Forces, collect and analyze information about threats to the security of the territorial community and scenarios for their containment;

– in cooperation with local self-government bodies, register, equip, and protect places of shelter for the population;

– to extract, collect, and generalize information that affects the performance of territorial defence tasks within the territory of the territorial community;

– to assist in the implementation of measures to counter information operations of the aggressor (adversary) within the territory of the territorial community;

– to organize the training of members of voluntary formations in order to effectively perform their tasks.

The activities of VFTC are carried out under the direct leadership and control of the commander of the military unit of TDF of the Ukrainian Armed Forces according to the territorial principle (**Fig. 1.8.2**).

Since the introduction of martial law in Ukraine, all VFTCs have been operationally subordinated to the commanders of the relevant military units of DTF Armed Forces of the Ukrainian Armed Forces.

The commander of the volunteer formation is responsible for the activities of the volunteer formation. The commander determines the tasks for the members of the volunteer formation taking into account their capabilities and, if necessary, the structure of the volunteer formation.

The locations of VFTC are determined by the Command of the Forces of the Ukrainian Armed Forces with the participation of the relevant village, township, and city councils and approved by the Commander-in-Chief of the Ukrainian Armed Forces.

During the period of martial law, by the decision of the Commander-in-Chief of the Ukrainian Armed Forces, VFTC can be fully or partially involved in the performance of territorial defence tasks outside the defined territorial defence zone, as well as be sent to the areas of military (combat) operations.

To fulfill the tasks of territorial defence within their borders, territorial communities initiate the formation of voluntary formations.

The Command of the Territorial Defence Forces of the Armed Forces, through the commanders of the military units of the Territorial Defence Forces of the Armed Forces, encourages residents of territorial communities to form voluntary formations by informing or taking other measures.

The voluntary formation is formed by meetings of the initiative group of residents of the territorial community in the presence of the commander of the military unit of the Territorial Defence Forces of the Armed Forces and authorized representatives of the local self-government body of the respective territorial community [156].

Meetings are considered legitimate if at least five people participate in them, as well as the commander of the military unit of the Territorial Defence Forces of the Armed Forces and representatives of the local self-government body of the relevant territorial community.

Based on the results of the meetings, the protocol of the meeting of the initiative group on the formation of the voluntary formation of the territorial community (hereinafter referred to as the protocol) is drawn up.

The protocol is drawn up in three copies in an arbitrary form and must contain the following information:

— the date of the event;

— venue;

— surnames and names of members of the initiative group, which participate in the formation of voluntary formations;

— surnames, first names and positions of invited persons, in particular the commander of the military unit of the Territorial Defence Forces of the Armed Forces and representatives of local self-government bodies of the relevant territorial community; the decision on the election of the chairman at the meeting;

— a decision on the formation of a voluntary formation;

— a decision adopted in accordance with the established procedure by the Command of the Territorial Defence Forces of the Armed Forces regarding the formation of a voluntary formation in this territorial community;

— a decision on approving a candidate for the position of commander of a volunteer formation;

— signature of the chairman of the meeting; signatures of the commander of the military unit of the Territorial Defence Forces of the Armed Forces and representatives of local self-government bodies of the relevant territorial community present at the meeting.

One copy of the protocol is kept by the members of the initiative group. Two copies of the protocol are submitted to the local self-government body, on the territory of which the volunteer formation will function, one of which is subsequently sent to the commander of the relevant military unit together with the decision of the relevant local self-government body to approve the formation of a volunteer formation and a recommendation for the appointment of a candidate for the position of commander of the volunteer formation Territorial Defence Forces of the Armed Forces.

The commander of the military unit of the Territorial Defence Forces of the Armed Forces prepares and sends the necessary documents for passing a special check of a candidate for the

position of commander of a volunteer formation in SSU and the National Police in accordance with the procedure defined by legislation [156].

If a candidate for the position of commander of a volunteer formation successfully passes a special check, the commander of a military unit of the Armed Forces Territorial Defence Forces sends an application for appointment to the position of commander of a volunteer formation to the Commander of the Territorial Defence Forces of the Armed Forces. The Commander of the Territorial Defence Forces of the Armed Forces appoints the commander of the volunteer formation in agreement with the Commander of the Special Operations Forces of the Armed Forces.

If the candidate does not pass a special check, the commander of the military unit of the Territorial Defence Forces of the Armed Forces initiates a repeat meeting of the relevant initiative group to approve another candidate for the position of commander of a volunteer formation.

The commander of the volunteer formation concludes a contract directly with the commander of the military unit of the Territorial Defence Forces of the Armed Forces.

Material and technical support and financing of VFTC activities are carried out at the expense of the State Budget, local budgets, as well as from other sources not prohibited by the legislation of Ukraine. Provision of VFTC with individual staff weapons and ammunition is carried out by the Ukrainian Armed Forces.

Members of VFTC have the right to use personal hunting weapons, small arms, other types of weapons and ammunition for them during the performance of ground defence tasks (for self-defence and repelling and deterring armed aggression) in accordance with the procedure approved by Resolution of the Cabinet of Ministers of Ukraine dated 29.12.2021 No. 1448 [158].

The reasons for disbanding the voluntary formation are [156]:

– the decision of the Commander of the Territorial Defence Forces of the Armed Forces to disband the volunteer formation;

– passing a decision on disbanding the voluntary formation at the general meeting of the members of the voluntary formation. Meetings are considered legitimate if at least 60 % of the total number of members of the voluntary formation participate in them. The decision of the general meeting of the members of the voluntary formation is adopted by at least 80 % of the persons registered at the meeting;

– termination of membership of all members of the voluntary formation.

In the case of a decision to disband a volunteer formation, contracts with territorial defence volunteers are considered terminated from the moment such a decision is made. At the same time, all the means of material and technical support received by them to fulfill the tasks of voluntary formation must be returned to the local self-government bodies.

Normative and legal acts related to territorial defence, the functioning of VFTC and the procedure for using weapons:

– Articles 17, 65 of the Constitution of Ukraine;

– Law of Ukraine dated July 16, 2021, No. 1702-IX "On the Foundations of National Resistance";

– Law of Ukraine dated 03.03.2022 No. 2114-IX "On ensuring the participation of civilians in the defence of Ukraine";

– Law of Ukraine dated December 6, 1991, No. 1934-XII "On the Ukrainian Armed Forces";

– Resolution of the Cabinet of Ministers of Ukraine dated 29.12.2021 No. 1449 "On Approval of the Regulation on Voluntary Formation of Territorial Communities";

– Resolution of the Cabinet of Ministers of Ukraine dated 12/29/2021 No. 1442 "On approval of the Standard Regulation on the Headquarters of the Territorial Defence Zone (District)";

– Resolution of the Cabinet of Ministers of Ukraine dated 12/29/2021 No. 1447 "On approval of the Procedure for the organization, provision and training of voluntary formations of territorial communities for the performance of territorial defence tasks";

– Law of Ukraine "On the Statute of Garrison and Guard Services of the Ukrainian Armed Forces". Statute, Form of a standard document, Procedure, Schedule, Journal dated 03.24.1999 No. 550-XIV;

– Law of Ukraine dated 03/24/1999 No. 550-XIV "On the Statute of the Internal Service of the Ukrainian Armed Forces" (Statute, Regulations, List, Order, Form of a standard document, Sample, Note, Description, Rules, Requirements);

– Resolution of the Cabinet of Ministers of Ukraine dated 12/29/2021 No. 1448 "On approval of the Procedure for the use of personal hunting weapons and ammunition by members of voluntary formations of territorial communities during the performance of territorial defence tasks".

Article 22 of the Law of Ukraine "On the Basics of National Resistance" refers to the last three normative legal acts in the part of the order of storage and use of weapons, military equipment, and special means during the performance of territorial defence tasks.

Part 2 of Art. 22 of the Law of Ukraine "On the Basics of National Resistance" also states that the use of weapons, military equipment, and special means by the Ukrainian Armed Forces, other components of the security forces and defence forces during the performance of territorial defence tasks is carried out in accordance with the legislation of Ukraine.

Such acts of legislation are:

– Articles 1, 1-1, and 9 of the Law of Ukraine "On the Ukrainian Armed Forces";

– The procedure for the use of weapons and combat equipment by units, military units, and units of the Armed Forces during their performance of tasks related to the repulsion of armed aggression against Ukraine, approved by the Resolution of the Cabinet of Ministers of Ukraine dated 10.10.2018 No. 828;

– The procedure for the use of weapons and combat equipment by units, military units, and units of the Armed Forces during their performance of tasks in the area of the anti-terrorist operation in peacetime, approved by Resolution No. 68 of the Cabinet of Ministers of Ukraine dated February 14, 2018;

– Articles 21–25 of the Statute of the Internal Service of the Ukrainian Armed Forces;

– Articles 60, 61, 195–202 of the Statute of the Garrison and Guard Services of the Ukrainian Armed Forces.

The use of firearms by civilians, obtained in accordance with the Law of Ukraine dated 03.03.2022 No. 2114-IX "On ensuring the participation of civilians in the defence of Ukraine",

is carried out similarly to the use of weapons by military personnel during their performance of tasks to repel armed aggression against Ukraine in order, approved by the Cabinet of Ministers of Ukraine (Article 2 of the specified Law), that is, in accordance with the above-mentioned legislative acts.

Acquisition of firearms and ammunition for them by civilians during the period of martial law is carried out in accordance with Article 1 of this Law in accordance with the procedure and requirements established by the Ministry of Internal Affairs of Ukraine.

According to the rules of Article 3 of the above-mentioned Law, civilians are obliged to hand over the firearms and unused ammunition they receive to the National Police of Ukraine no later than 10 days after the termination or cancellation of martial law in Ukraine. Civilians are criminally liable for violating the requirement provided for in this article.

CONCLUSIONS

Thus, the year of Russia's aggression against Ukraine shows that the created system of national resistance is the tool that helped mobilize the will, energy, and courage of the entire Ukrainian society in an organized way to repel the aggressor, and the developed territorial defence in Ukraine became one of the key elements of the asymmetric external confrontation aggression of the Russian Federation.

1.9 BUILDING NATIONAL RESILIENCE SYSTEM: UKRAINIAN AND INTERNATIONAL EXPERIENCE

Oleksandr Peredrii, Valerii Hordiichuk, Pavlo Shchypanskyi, Andrii Koretskyi

ABSTRACT

For Ukraine, under the conditions of a hybrid Russian-Ukrainian war, it is necessary to find ways how to resist the aggressor, to adapt to changes in the security environment, to maintain stable functioning, quickly to restore to the desired balance, so the issue of organization and ensuring national stability is not just important, but existential.

The large-scale armed aggression of the Russian Federation against Ukraine has been going on for almost two years. The ability to resist the aggressor is based, in particular, on the phenomenal national unity of the Ukrainian people.

Unity is a defining feature of resilience. The term "resilience" itself is used in various areas, but for Ukraine it has acquired a special meaning in terms of ensuring national security [159].

The concepts of national resilience and national security are inextricably linked. But, unlike national security, which is more military-oriented, national resilience is a broader concept and covers countering threats in all sectors — political, economic, military, informational, ethno-cultural, social, ecological, etc.

An important feature of national resilience is also the fact that the emphasis should be not only on responding to hybrid threats and destructive impacts but also on the application of strategies to prevent their appearance, the formation of a stable immunity to them in the state and society by creating a mechanism for countermeasures, adaptation and recovery [160].

As O. Reznikov notes, in Ukraine, research into the problems of national resilience began not so long ago and currently do not have a systematic nature. In the domestic expert environment, there is no unified understanding of key terms, objects, subjects, directions, processes, criteria, indicators of ensuring national stability, which are interdisciplinary in nature [159].

The purpose of this study is to devise approaches to improving the organization of the national resilience system based on the analysis of domestic experience and world best practices.

To fulfill the set goal in the work, the essence of resilience and the foundations of the theory of social resilience were investigated; the domestic and foreign experience of organizing national and collective resilience (NATO, EU, and individual member countries of these alliances) was analyzed; based on the results of research on these issues, approaches to improving national stability are proposed.

KEYWORDS

Security environment, national resilience, national security, hybrid threats, adaptation and recovery, social resilience, hybrid war, hybrid challenges, national resilience system, resilience.

1.9.1 THE ESSENCE OF THE RESILIENCE

The term "resilience" is widely considered in foreign literature, an apt definition of this term was given by Swedish scientists M. Bruno and A. Reinhorn, specialists in sustainable development, who defined resilience as the system's ability to absorb disturbances and reorganize during changes to maintain the same functions, structure, and feedback, and therefore identity; in other words, it is the ability to withstand changes, continue to develop, even if the environment has changed [161].

In his work, Columbia University Professor J. Bonanno [162] singles out three levels of resilience: individual, social, and national resilience. While supporting such a gradation, it should be added that there is also a collective resilience of alliances. Individual resilience is defined as a person's ability to maintain a stable level of functioning after traumatic events and as a "trajectory of healthy functioning over time" [162]. That is, as the ability to withstand and recover during and after a crisis. Accordingly, the level of human resilience is a key issue in buffering the negative psychological consequences of potentially traumatic events.

Social resilience is defined as "the ability to promote, participate in and maintain positive relationships in societies, as well as withstand and recover from life stresses and social isolation" [163]. According to these authors, social resilience is inherently multi-level and includes three characteristics: a) relationships between people (e.g., consent, trust); b) interpersonal resources and opportunities (e.g., exchange of ideas, support); and c) collective resources and affordances (e.g., group identity, centrality).

In study [164], national resilience is considered as a social phenomenon in the state, covering various sectors of life, based on patriotism, social optimism (or faith in the future of society), social integration, and trust in political and state institutions. But it should be noted that the national level of resilience is formed based on the previous two: individual and social.

In addition, S. Pirozhkov gives a definition of constructive national resilience — stability that is consolidated, innovative, flexible, and open, which necessarily strengthens and humanizes the civilizational subjectivity of the country. At the same time, such resilience is not only a response to challenges and a means of neutralizing threats but also a tool for countering manipulative influences [165].

Western scientists determine such a property as resilience vitality, the ability to recover [165].

In the legislation of Ukraine, national resilience is one of the three main foundations of the National Security Strategy, which is defined as the ability of society and the state to quickly adapt to changes in the security environment and maintain sustainable functioning, in particular by minimizing external and internal vulnerabilities [166].

According to the Concept of ensuring the national system of resilience (hereinafter referred to as the Concept), put into effect by the Decree of the President of Ukraine dated September 27, 2021 No. 479/2021, "national resilience is the ability of the state and society to effectively resist threats of any origin and nature, to adapt to changes in security environment, maintain sustainable functioning, quickly recover to the desired balance after crisis situations" [167].

The national unity of society, government, clergy, power structures, their trust and mutual support are important for the national resilience system of Ukraine. Supporting the statement of O. Reznikova, in general, the following main areas of ensuring national resilience can be defined: social, economic, ecological, technological, geopolitical, and the sphere of public relations [159].

1.9.2 PECULIARITIES IN THE DEVELOPMENT OF THE NATIONAL RESILIENCE SYSTEM IN UKRAINE

Ukraine's experience in forming and ensuring the functioning of the national resilience system is the subject of special attention and research. Destruction and elimination of critical infrastructure objects; natural disasters (forest fires, floods, earthquakes, etc.); accidents at enterprises and man-made disasters of natural and man-made origin, in particular as a result of missile attacks and bombings, remain sources of constant danger for Ukraine. All this can happen both sequentially and simultaneously, which under the conditions of war has become and continues to be a real shock test of the national resilience system. This provides invaluable experience to the world community, for which Ukraine is paying a heavy price.

In Ukrainian legislation, it is defined that the national resilience system is a set of purposeful actions, methods, and mechanisms of interaction of state authorities, local self-government bodies, enterprises, institutions, organizations, civil society institutes, which guarantee the preservation of safety and continuity related to the functioning of the main sectors in the life of society and the state until, during, and after a crisis situation [167].

According to the mentioned Concept, the following principles are the basis of the national resilience system: comprehensiveness, broad interaction and awareness of security subjects, predictability (timely identification of threats, identification of vulnerabilities and risk assessment), reliability, readiness, mobility (main and reserve forces, means, resources), adaptability, availability of reserves, continuity, subsidiarity [167].

One of the universally significant components of Ukraine's national resilience has also become the ability to resist disintegration influences, the rooting of one's own civic identity as dominant over local, regional, religious, ethnic, linguistic, and other contradictions. This manifestation of a clear civic identity is an important condition for the existence of civilizational subjectivity. This determines the ability to resist and prevent territorial encroachments, separatist attitudes in society, provided that the territorial cohesion of one's own country is prioritized over the regional or local interests of the local community.

Ukraine has gained unique experience in the area of protection of critical infrastructure objects, in particular in matters of their cyber protection, as well as protection against the enemy's means of fire. Energy supply facilities are protected by elements of engineering structures, recommendations have been developed to protect them from striking elements of ammunition and missile fragments. The norms for the installation of such objects are being reviewed, in particular, taking

into account the possibility of their being buried in the ground. Thanks to the measures taken, the stability of Ukraine's energy system, water supply, functioning of transport and transport infrastructure facilities has been ensured. The issue of using small modular reactors (taking into account passive nuclear safety) and implementing the transition to alternative energy sources is also on the agenda in Ukraine.

Russia's massive missile strikes, and power outages did not destabilize the banking system of Ukraine, and the energy terror did not affect financial stability [168].

In order to strengthen the ability of the health care system to function under conditions of increased loads, increase the effectiveness of measures to preserve the lives and health of citizens, and improve the qualifications of relevant specialists, Ukraine is conducting the second stage of the transformation of the emergency medical care system (hereinafter referred to as EMC), outlined in the Ukraine EMC Development Concept [169]. Disaster medicine is increasing its technical capabilities. The system of interaction between the Ministry of Health and the Command of the Medical Forces of the Ukrainian Armed Forces is also being improved in order to support the full, timely, and high-quality provision of medical services to all those who participate in repelling the armed aggression of Russia.

In our opinion, the role of the religious factor is special in the issue of Ukraine's national resilience. In the course of Russia's full-scale aggression, Ukraine actively opposes attempts to use this factor to legitimize the occupation activities of the Russian Federation and artificially create contradictions, conflicts, and disunity in Ukrainian society. For example, criminal proceedings were opened against authorized persons of the Ukrainian Orthodox Church of the Moscow Patriarchate for calling for the overthrow of the constitutional order, inciting inter-ethnic enmity. In the future, it is possible to create a legislative mechanism for normalizing the activities of destructive religious organizations in Ukraine [170].

Continuity of governance is ensured by the state. Society constantly supports and provides for the Defence Forces of Ukraine, which in the course of conducting operations and hostilities (mission tasks) acquire new capabilities and constantly inflict irreversible losses on the enemy.

In addition, for Ukraine, an important component in the development of the national resilience system was the support of the EU, NATO, and partner countries in resisting Russian armed aggression. This includes both cooperation with the EU, NATO, and partner countries in the development of conceptual frameworks for the national resilience development, as well as military assistance (military-technical aid, financial and economic, humanitarian assistance). The amount of assistance that partner countries have provided to Ukraine since the beginning of the Russian invasion to ensure its right to defence has exceeded EUR 100 billion [171]. The partnership, which provides our country with essential aid in the supply of modern weapons and in the training of units of our forces for their use, plays an important role. NATO's Strategic Concept 2022 [172] declares: "We will increase the scale and scope of our security aid and capacity-building support to vulnerable partners, both in our neighborhood and further afield, to increase their readiness and resilience, as well as improve their ability to resist malicious interference, prevent destabilization, and fight aggression".

The above gives reason to believe that the support of the EU, NATO, and partner countries should supplement the list of basic elements in the national resilience system of Ukraine.

1.9.3 PECULIARITIES OF INTERNATIONAL EXPERIENCE IN BUILDING RESILIENCE AND ITS IMPACT ON UKRAINE

The task of ensuring resilience has become especially important for NATO as a defence alliance. The North Atlantic Treaty Organization was one of the first to start developing its principles for building resilience. The principle of resilience, enshrined in Article 3 of the Founding Treaty of the Alliance, requires all members of the Alliance to "maintain and develop their individual (here we mean individual for a single country – national) and collective ability to resiliently resist an armed attack" [173].

The concept of national and collective resilience for NATO has undergone a certain evolution and acquired a much broader meaning. Until 2014, the concept of resilience mainly involved civil protection. However, with the intensification of Russian hybrid aggression, NATO began to fill the concept of ensuring (strengthening) resilience with a broader meaning. In 2016, at the Warsaw Summit, the leaders of the Alliance countries undertook to strengthen resilience by fulfilling seven basic requirements that underlie this resilience [174] (**Fig. 1.9.1**):

– ensuring uninterrupted governance and provision of basic public services;

– sustainable energy supply;

– the ability to effectively control the movement of large masses of the population;

– sustainable supply of food and water;

– sustainable health care system (ability to overcome problems caused by a large number of victims);

– sustainable civil communication systems;

– sustainable public transport systems.

It should be noted that at the same Warsaw Summit [175], an important decision for Ukraine was made regarding the creation of a new Alliance mechanism, the purpose of which is to counter manifestations of hybrid warfare, namely the Ukraine-NATO Platform for countering hybrid warfare, and practical support was significantly increased to Ukraine by NATO and formalized in the form of the Comprehensive Assistance Program (CAP), these decisions were aimed at increasing Ukraine's resilience and ability to guarantee its own security.

The need to expand the areas of resilience in NATO was explained by the fact that military forces are increasingly dependent on civilian and business support in the areas of transport, communication, and supplies, for example, water and food. Reductions in defence budgets since the end of the Cold War have increased the use of civilian capabilities in the security and defence sector. As a result, the lion's share of critical infrastructure in most of the member states of the Alliance is privately owned. In particular, according to data released at the Brussels Summit in 2018,

90 % of military transport for major military operations is chartered or requisitioned in the commercial sector. On average, 30 % of satellite communication used for defence purposes is provided by the commercial sector [176, 177].

The Declaration of the Summit in Brussels (2018) [178] consolidated the ideas of building collective and national resilience even more widely and deeply. In response to growing hybrid threats, allies are "strengthening their resilience, improving situational awareness, and accelerating the construction of deterrence and defence systems", as well as "continuing to support partners in strengthening their resilience in the face of hybrid challenges" [178].

At the same time, the issue of resilience in the mentioned Declaration appears not only in the general provisions; paragraph 66 deals with Ukraine: "We welcome the development of cooperation between NATO and Ukraine on the security of the Black Sea. We will also support Ukraine's efforts to increase resilience against hybrid threats, in particular by intensifying actions under the auspices of the NATO-Ukraine platform to counter hybrid warfare".

In the 2021 Brussels Summit Communiqué, the word "resilience" already appears 38 times and is used in the context of terrorism, hybrid threats, energy security, the state of the armed forces, politics, space, and more. A view on the issue of building a system of resilience and priorities in this area is being formed. Attention is focused, first of all, on national responsibility for building resilience and its development [179].

In a report to the 2021 NATO Parliamentary Assembly, it is noted that NATO recognizes that the military capabilities and actions of the Alliance today are largely dependent on the support of the civilian sector and its infrastructure. Not all security threats faced by the Alliance are "conventional" and therefore have a negative impact on various aspects of society. Accordingly, there is a need for a combination of military and civilian response to threats [177].

In 2021, the heads of state and government of the North Atlantic Alliance officially determined that "national and collective resilience is the necessary basis for reliable deterrence and defence (...) and vital for the security of society, population and shared values", which is reflected in the NATO Review "Strengthening resilience obligations" [180].

An important event at the stage of building Ukraine's national resilience system was the first joint Ukraine-NATO exercises "Coherent Resilience" which took place in September 2021. The exercises were aimed at increasing Ukraine's ability to protect critical infrastructure, maritime security, cyberspace, and energy systems. Attention was paid to effective interagency cooperation, coordination between civil and military structures, planning, preparedness, and the level of cooperation between the public and private sectors [181]. In the process of establishing interoperability between Ukraine and NATO, the elements of the sustainability system can open up additional areas of cooperation that will contribute to the Euro-Atlantic integration of Ukraine and additionally strengthen the national resilience of the state.

In today's conditions, NATO focuses on the problem of resilience and the need to ensure it. In the NATO Strategic Concept, adopted by the Heads of State and Government at the Madrid Summit on June 29, 2022 [172], the strengthening of individual and collective resilience is defined

as one of the main goals and principles of NATO and are decisive for the fulfillment of the Alliance's fundamental tasks.

Testing the resilience of the Alliance is defined as a challenge to the interests, values, and democratic way of life. NATO's response to threats coming from Russia is, first of all, to strengthen resilience. "We will significantly strengthen the deterrence and defence of all members of the Alliance, increase resilience in the face of force pressure from Russia, and support our partners in resisting malicious interference and aggression" [172]. The same response is formulated to systemic challenges to Euro-Atlantic security from the PRC — increasing resilience and readiness, as well as protection against the PRC's forceful tactics and attempts to sow discord within the Alliance. Partnerships are crucial for protecting the commons, increasing the resilience of societies, and upholding the international order [172].

The foundations of collective resilience and the basic requirements are inviolable for all member states of the Alliance, but at the same time, the models of national resilience systems of NATO member states differ in structure and components and have their specific characteristics. Also, views on the order to legislatively consolidate issues for organizing resilience systems and coordinating actions of their elements in different countries are different.

The review of resilience, which was conducted by an expert group within the framework of the 2022 PROTECT (Promoting Reform Objectives through Technical Expertise and Capacity Transfer) research project, implemented by the international consulting company "Alinea" in Ukraine in order to support the Action Plan for the Implementation of the Concept of Ensuring the National Resilience System of Ukraine, absorbed the experience and best relevant practices of a number of countries (including those that are not members of the Alliance). From the analysis of the mentioned review, it can be concluded that NATO member states are increasing their own resilience, in particular, they will develop action plans at the national level, guided by the goals jointly determined by the Alliance member states [182].

It is noted that these countries have some differences in their approaches to the problem of forming concepts of national resilience, but the main features of these approaches can be identified, they are as follows:

1. The concept of national stability of NATO and EU member states emphasizes the balanced development of national capabilities, relying on military, financial, and other support from the EU or NATO (for example, the Baltic states, Finland, Poland, Great Britain, Romania, Bulgaria).

2. States that are not members of NATO mostly rely on their own national capabilities, which are strengthened by non-aligned partners (for example, Israel).

3. Nuclear-weapon states, regardless of their membership (e.g., the United Kingdom), combine national capabilities, partnership support, and the very fact of possessing such weapons as a powerful and decisive deterrent.

In the work "Resilience and the EU's Eastern Neighborhood Countries" [183], an overview of the collective system of resilience of the EU and the features of national resilience of the EU member states was carried out. Let's make a brief review of them.

Resilience is a "key concept of EU foreign policy". The approach to resilience, as a new paradigm of the EU's security strategy, puts European societies at the center of interaction with external partners, especially with their immediate neighbors. The concept of collective resilience of the EU is presented in four interrelated dimensions: socio-economic, geopolitical, environmental, digital. It should be noted that the revision of the country's national security strategy and the updating of national resilience strategies were somewhat influenced by the outbreak of COVID-19.

A feature of Finland's national security model is its complexity — it covers different levels of state bodies and representatives of society. Here, the government, state authorities, business operators, regional authorities, municipalities, and such structures as universities, research institutions, organizations, other bodies and subjects form a network of comprehensive interaction on matters of national security, to some extent with decentralized construction topology. In this network, information is exchanged, common goals and obligations for cooperation are established.

The national resilience systems of the Baltic countries are centralized, they are focused on crisis management (civil protection). This type of system is characterized by a rigid vertical, which is controlled by the central national body of civil protection. Civil protection bodies at the local level, in turn, coordinate civil protection measures in crisis situations in administrative territories. In the Baltic States, resilience, as the ability to prevent and avert security threats, depends on the readiness of mission-critical services. The task of preventing social risks has a significant impact on the formation and implementation of national, economic, and social policy.

In Romania, resilience is strategized for the long term. In addition, the national resilience framework of this country also takes into account environmental challenges. Here, the Ministry of Internal Affairs is the leading body in the field of coordination of national efforts to ensure resilience and the fulfillment of NATO's basic requirements.

The concept of national resilience in the Bulgarian security context is still debated by society. In particular, Bulgaria continues to explore its most effective option on how best to link the concept of national resilience with other concepts of national security.

Poland is only taking the first steps to integrate the concept of resilience in management practice, but it should be noted that the high institutional capacity of state bodies and the support of various social groups allow the authorities to successfully implement effective solutions. Consistency of the foreign policy and military-policy course in relation to NATO and the EU in a dynamic security environment is one of the key factors that contributed to the achievement of positive results in the governance of Poland regarding the management of the development of the national security system and resilience.

Israel's model of national resilience has historically had significant public support and has depended on military structures with strong influence and broad powers. At the same time, Israeli society is convinced that it has sufficiently stable democratic institutions and does not see the expediency of granting broad powers to the military, considering it a threat to democracy [182].

As O. Reznikova states, there is no universal model for ensuring national resilience that could become a model for every state, as the mechanisms and practices that have demonstrated

sufficient effectiveness in certain countries may not meet the conditions and needs of others. Studying the experience of other countries, the recommendations of leading international organizations will allow the implementation of the best global practices, taking into account national interests, the presence of challenges, threats, risks, security conditions, and peculiarities of the development of the Ukrainian state and society [159].

The NATO resilience system is a system of collective sustainability. The principles (requirements) to which all member states of the Alliance must comply are established normatively. The national resilience system can be broader because it takes into account the peculiarities of each country separately, therefore, additional bases of resilience are determined in accordance with the existing and possible challenges and threats relevant for a specific country in accordance with the adopted national security strategies.

In the NATO 2022 Strategic Concept [172] it is determined that the security of the states applying to join the Alliance is inextricably linked with the Alliance's own security. And assistance in increasing resilience against malicious interference and building their capacities is one of the tasks of the Alliance.

In order to determine to what extent the Concept of National Resilience in Ukraine meets the requirements of NATO, let's compare their basic elements.

Fig. 1.9.1 shows the Scheme of compliance of the basic elements of the national resilience system of Ukraine with the basic requirements of the NATO stability system established at the Warsaw Summit in 2016.

As can be seen from **Fig. 1.9.1**, the basic elements of the national resilience system meet the basic requirements of NATO resilience. In addition, a number of elements were added in the Concept of National Resilience in Ukraine (as a reaction to ongoing hybrid aggression in accordance with historical experience).

The security environment is changeable and dynamic, radical changes in the security environment were caused by Russia's large-scale aggression against Ukraine. The basic requirements for NATO resilience, defined by the 2016 Warsaw Summit and even the basic elements of the national resilience system of Ukraine, defined by the Concept of 2021, need to be revised, updated, and expanded, as well as the determination of specific ways of their implementation.

NATO continues to strictly adhere to the seven basic requirements of resilience, and at the same time, taking into account the growth of challenges and threats caused by, including the aggressive war of the Russian Federation against Ukraine, in the NATO 2022 Strategic Concept [172] the requirements for stability were expanded, so, Article 26 declares the following: "We will pursue a stronger, unified, and better coordinated approach to build resilience at the national level and in the Alliance as a whole against military and non-military threats and challenges to our security. This is the duty of individual NATO member states as well as the collective obligation enshrined in Article 3 of the North Atlantic Treaty. We will work to identify and reduce strategic vulnerabilities and dependencies, particularly in our critical infrastructure, supply chains, and healthcare systems. We will strengthen our energy security and make investments in stable and reliable energy supply,

search for suppliers and sources of energy resources. We will ensure the readiness of civil society to guarantee continuity of governance, the sustainable provision of essential services to the people of our states and the provision of our armed forces by the civilian sector. We will improve our ability to prepare for, withstand, respond to, and rapidly recover from strategic shocks and disruptions, as well as to ensure the continuity of the Alliance's activities".
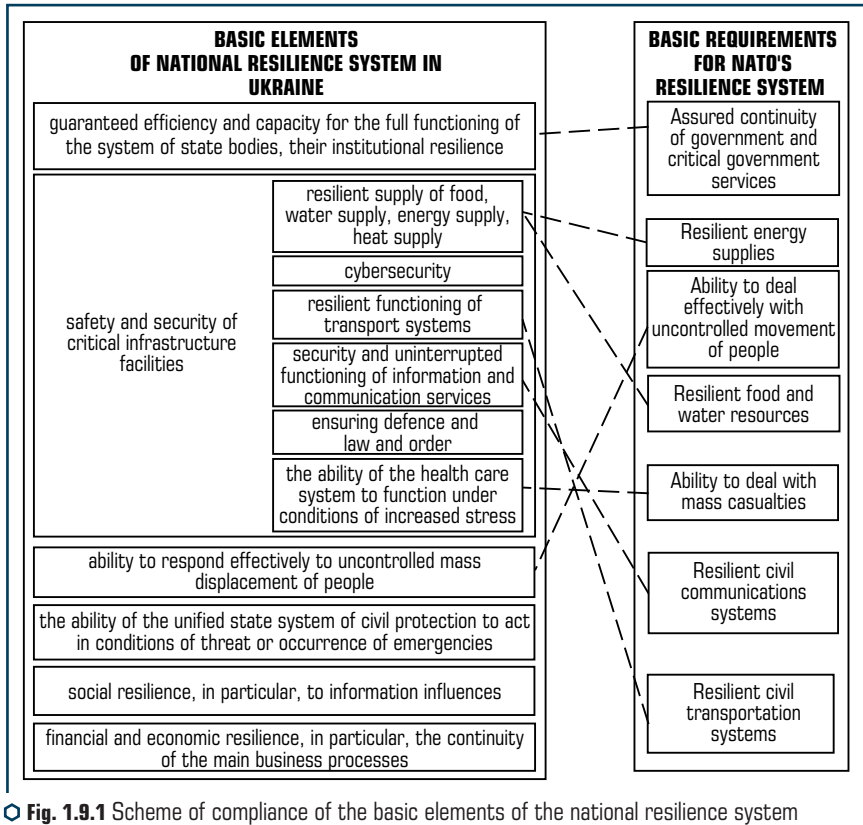
Fig. 1.9.1 Scheme of compliance of the basic elements of the national resilience system of Ukraine with the basic requirements of the NATO resilience system

Analyzing NATO's strategic documents in the part devoted to the problem of ensuring resilience, we can conclude that the meaning of collective and individual (national) resilience has evolved and become more global. But, taking into account the priority of this task, in our opinion, NATO should establish the principles, tasks, goals, etc. for ensuring collective and individual resilience in a separate document (for example, a strategy for ensuring resilience).

1.9.4 APPROACHES TO IMPROVING THE NATIONAL RESILIENCE SYSTEM IN UKRAINE

The challenges brought about by the war presented Ukraine with a number of new security dilemmas and exacerbated the previous ones. For example, issues related to the formation of state policy regarding national resilience and the improvement of national legislation in order to systematize the mechanisms of comprehensive assessment of risks and capabilities, identification of threats, and detection of vulnerabilities, etc. [159].

In modern conditions, the potential for the stability of the state and society as complex systems requires development and adaptive management. These functions are designed to unite the system of ensuring national resilience. Some of its mechanisms are used in Ukraine. However, their complex implementation based on a systemic approach requires changes in the formation of the state's security policy, improvement of organizational and legal support in the field of national security and state administration, streamlining of interaction between existing and those being created, state-wide systems (civil protection, counter-terrorism, medical aid, social protection, cyber security, law enforcement, banking, etc.), ensuring proper synergy of security and defence forces, state and local authorities, business and civil society, establishing effective coordination of such activities, implementing the principles of resilience in various sectors of activity, primarily in the sector of national security, etc.

On the one hand, until February 24, 2022, the creation of a system for ensuring national resilience for Ukraine was perceived as a new complex project. On the other hand, in practice, it turned out that such a system exists and works but needs improvement.

In order to implement the National Security Strategy of Ukraine, approved by Decree of the President of Ukraine No. 392 of September 14, 2020, Decree of the President of Ukraine No. 479/2021 of September 27, 2021, the Decision of the National Security and Defence Council of Ukraine (hereinafter referred to as the NSDC) of August 20 was implemented 2021 "On the introduction of the national resilience system" [166, 167]. In accordance with this decision, the Cabinet of Ministers of Ukraine is tasked with:

– to approve within three months the Plan of measures for the implementation of the Concept of ensuring the national resilience system;

– to form a mechanism for ensuring the national resilience system and to form a relevant governmental coordinating body;

– to resolve in the established manner the issue of creating a state institution "Center of excellence in the field of ensuring national resilience" for information and analytical support of the functioning of the national resilience system.

But in connection with the complication of the foreign political situation, and later with the beginning of the war, the decision of the NSDC of Ukraine was not implemented. These tasks must be completed, but now the Concept itself, which was put into effect by this decision, needs to be revised.

By Resolution No. 787 of CMU of July 12, 2022, a decision was made regarding the creation of the State Service for the Protection of Critical Infrastructure and Ensuring the National Resilience System of Ukraine, but this resolution has not yet entered into force.

The question of restoring the Ukrainian identity in the occupied territories remains relevant, considering that during the occupation people are instilled with foreign values, identities, and political consciousness. Therefore, the strengthening of civic identity and territorial cohesion should also be considered among the priority areas of Ukraine's national resilience strategy [184].

It is not entirely true to ignore threats to environmental resilience. Global and regional environmental problems remain in the list of destructive consequences of national resilience violation. The growing level of consequences of the Russian-Ukrainian war and other global threats in the field of the environment should encourage the search for new ways of protecting people from natural disasters and ensuring life processes in crisis conditions. Not only infrastructures, but also ecosystems should be sustainable. From the point of view of ecological challenges, the ability of complex ecosystems to self-renew and adapt to various changes is of particular importance [185].

In order to further develop, expand, improve, and ensure the sustainable functioning of the national resilience system in Ukraine, it is necessary to create a body that would generate and implement a policy in the field of national resilience. The components of national resilience, its objects, subjects, and their tasks must also be foreseen at the level of legislation.

At the same time, in the near future, in the interest of ensuring national resilience, Ukraine needs to resolve a number of issues related to the systematization of mechanisms for comprehensive assessment of risks and capabilities, identification of threats and detection of vulnerabilities, as well as the formation of appropriate state policy and the improvement of national legislation, etc. [159].

CONCLUSIONS

Under conditions of the undeclared war of the Russian Federation against Ukraine, when the aggressor significantly exceeds our state in terms of quantitative indicators, uses non-traditional methods of warfare in addition to regular troops, national resilience acquires existential importance as the only worthy response to unprovoked aggression and a guarantee of effectively resisting war, adapting to changes in the security environment, maintain sustainable functioning, quickly recover to the desired balance after crisis situations. All citizens of Ukraine, society, government, clergy, defence forces, mass media, etc. should be united in opposing the enemy at the state, regional, and local levels, their activities should be coordinated and aimed at solving the tasks of ensuring the basic elements of the national resilience system in Ukraine.

The current work examines foreign and domestic approaches to understanding resilience, analyzes the evolution of approaches to ensuring resilience in NATO, the EU, and leading countries, and provides their experience in governing in the direction of ensuring resilience.

The basic requirements for ensuring stability in NATO are unwavering to be fulfilled by all the member states of the Alliance, but the national resilience systems of the member states have differences and peculiarities. Therefore, it can be concluded that there is no universal model for ensuring national resilience that could become a template for every state, because threats,

challenges, and levels of their danger are different for everyone, so the mechanisms and practices effectively applied by some may not meet the needs of others. But the principles and basic requirements must be unitary, especially for block formations such as NATO and the EU, so Ukraine, which has constitutionally fixed the course of joining NATO and the EU, must comply with them.

The Ukrainian concept of national resilience meets NATO's basic requirements for resilience, but in response to existing and projected threats, the basic elements of Ukraine's national resilience system have been expanded and specified.

The experience of Ukraine's resistance to large-scale Russian aggression has shown that its national resilience systems exists and works but needs improvement. In the interest of ensuring national resilience, Ukraine needs to solve a number of problems, in particular, improving legal support in the field of national security and state administration; regulation of interaction between the authorities, state institutions, business, civil society; involvement and establishment of effective coordination in synergy of all structures that can be involved in ensuring resilience. Certain approaches to improving the national resilience systems in Ukraine are proposed in the work.

CHAPTER 2

DOMAIN-TO-DOMAIN ANALYSIS OF THE RUSSIAN-UKRAINIAN WAR: LAND, AIR, SEA, CYBERSPACE

2.1 ANALYSIS OF COMBINED ARMS FORMATIONS ACTIVITIES FORMATIONS IN THE RUSSIAN-UKRAINIAN WAR AND PERSPECTIVES ON FURTHER POSSIBLE DEVELOPMENT OF THE SITUATION

Vasyl Shvaliuchynskyi, Serhii Pochynok

ABSTRACT

History shows that combined military formations, in the vast majority, play a decisive role in achieving a strategic goal during military conflicts. The Russian-Ukrainian war is no exception, during which the military leadership of the Armed Forces (AF) of the Russian Federation and the Ukrainian Armed Forces bet on ground groups of troops, the main purpose of which is to capture or hold territories (objects, settlements, etc.).

Analysis of actions of the enemy's combined military formations at various stages of armed aggression is the basis for forecasting its further activity and, as a result, devising options for effective countermeasures. We argue that work on such an analysis should be based on real facts obtained as a result of communication with direct participants in military operations, study of operational and combat documents, study of other available sources, as well as personal combat experience (if any).

Since the materials of interviews with direct participants in operations and operational (combat) documents, as a rule, will have access restrictions, we used open sources of information, personal experience gained during participation in an anti-terrorist operation in December 2014 – April 2015 for the analysis, experience of participation in the preparation and conduct of a defence operation as part of the group of forces and means of defence of the city of Kyiv (March – July 2022). To describe the likely development of the situation in the future, the approaches of the armed forces of NATO member states, which are contained in some domestic and foreign publications, were used.

KEYWORDS

Armed forces, ground groups of troops, analysis of enemy actions, forecasting, effective countermeasures, operational and combat documents, personal combat experience, access restrictions, anti-terrorist operation, effective countermeasures.

2.1.1 ANALYSIS OF THE RUSSIAN COMBINED ARMS FORMATIONS USE AT THE INITIAL STAGE OF THE WAR

The aggressor's probable intent to use Ground Forces may include the purpose of the action, key objectives, and end-state expectations. The purpose of the actions was probably to seize the

territory of Ukraine and reach the conditional line located between Moldova in the south and the Republic of Belarus in the north, overthrowing the state power.

The key tasks of the aggressor were:

1. Carrying out an offensive operation from the side of the Republic of Belarus with the aim of encircling the capital of Ukraine, Kyiv, and overthrowing the state government.

2. Carrying out offensive operations from the north-eastern direction with the aim of seizing the central part of Ukraine and exiting to the river Dnipro.

3. Carrying out an offensive operation on the part of the Autonomous Republic of Crimea and seizing the southeastern coast of Ukraine.

4. Surrounding the main part of the Defence Forces of Ukraine on the territory of Donetsk and Luhansk regions and creating conditions for their defeat.

5. Realization of regrouping, replenishment of material reserves, and exit to the conditional line.

The final state that the enemy tried to achieve: most of the territory of Ukraine was captured, the state government was overthrown, the main parts of the Defence Forces of Ukraine were surrounded in the territory of Donetsk and Luhansk regions.

To achieve the aggressor's above-mentioned intention, the enemy chose the following course of action for the ground component.

Operation concept:

a) decisive operations: at the end of February, the first echelon of the enemy's strategic strike group struck in five directions: the first — Mozyr, Chernobyl, Kyiv; the second — Kursk, Sumy, Kyiv; the third — Belgorod, Kharkiv, Dnipro; the fourth — Dzhankoi, Armyansk, Kherson; the fifth — Dzhankoi, Melitopol, Zaporizhzhia, with the aim of breaking through the front edge of the defence of our troops, their encirclement, access to important administrative centers in the interior of the country and blocking them;

b) formative operations: December 2021 — February 2022, groups of enemy troops in the Donetsk and Luhansk directions increased the intensity of hostilities with the aim of restraining the forces and means of the Defence Forces, which were involved in the operation of the United Forces and misleading about the direction head impact; part of the forces of the enemy's first strategic strike group in cooperation with the Armed Forces of the Republic of Belarus carried out demonstrative actions on the state border in the Polissya Operational District; part of the forces of the first echelon of the strategic strike group of the enemy's troops with the beginning of the aggression chained a significant part of the Defence Forces of Ukraine along the Chernihiv direction;

c) support operations: for logistical support of operational groups of troops in the northern, eastern, and southern directions, communication routes from the Republic of Belarus, logistical corridors from Rostov-on-Don, Donetsk, Luhansk, AR Crimea were used;

To achieve the goal of the operation, five groups of troops (forces) were formed from the forces and means of the Southern, Central, Eastern, and Western military districts: "South", "Center", "East", "West", Russian Guard. By February 24, 2022, the Russian Federation completed the

deployment of the specified grouping of troops (forces) and the logistical support system along the Western and South-Western strategic directions near the borders of Ukraine.

In the direction to the Polissya Area of Operations (AO) – a grouping of troops of the Eastern Military District (MD), reinforced by units of the Airborne Forces (ABF) with forces of up to 23 battalion tactical groups (BTG) (on the territory of the Republic of Belarus up to 16 BTG, on the territory Russian Federation – up to 7 BTG) from the composition of formations, military units of 5, 35, 36 A, coastal forces of the Pacific Fleet (POF) of the Eastern Military District and ABF of the Armed Forces of the Russian Federation.

The group included: personnel – up to 14,100 people, OTMS – 12, tanks – 160, AFV – 807, artillery systems – 210, MRLS – 68 units.

Along the Western strategic direction, the grouping of troops (forces) was created at the expense of formations, military units of the Western, Central, and Eastern military districts, the Air and Space Forces, and ABF. The grouping included up to 41 BTG (over 39.5 thousand people, OTMS – 38, tanks – 869; AFV – 1764, artillery systems – 454, MRLS – 226 units) along the specified directions.

Along the direction to the Siversky AO – a grouping of troops of the Central Military District with forces of up to sixteen BTG and fifteen tactical groups (TG) from the formations, military units of 2, 41 A, and 90 td of the Central Military District.

The group numbered 16,500 people, OTMS – 20, tanks – 348; AFV – 959, artillery systems – 237, MRLS – 114 units.

Along the direction of Slobozhansky AO – a grouping of troops of the Western Military District (WMD) with forces of up to twenty-five BTG from the composition of the formations, military units of the 6th, 20th Army, 1st Tank Army (TA) of the Western Military District and PF.

The group numbered up to 23 thousand people, OTMS – 18, tanks – 521, AFV – 805, artillery systems – 217, MRLS – 112 units.

Along the South-Western strategic direction, the grouping of troops (forces) was created at the expense of formations, military units of the Southern and Central Military Districts, the Black Sea Fleet, PKS and ABF.

The grouping included up to forty-three BTG (up to 83,700 people, OTMS – 16, tanks – 966; AFV – up to 2,970, artillery systems – up to 1,290, MRLS – 407 units) along the specified directions.

Along the direction to the Donetsk AO – a grouping of the Russian occupation forces (ROF) with forces of up to seventeen BTG from the formations, military units of the 8th Army of the Southern Military District with possible reinforcements from the formations of the 2nd Army of the Central Military District.

In addition, in the temporarily occupied territory of Donetsk and Luhansk regions there operated 1 and 2 AK with a total number of more than 35 thousand people.

The group numbered up to 58,200 people, OTMS – 16, tanks – 794, AFV – 1,654, artillery systems – 950, anti-aircraft guns – 264 units.

Along the direction to the Tavriya AO (Crimean AO) and the Azov OZ – a grouping of the Southern Military District in the Crimean Military District and ABF with forces of up to twenty-six BTG from the formations, military units of 8 A, 22 AK, 58 A of the Southern Military District, BV Black Sea Fleet, KFl, and 7 amphibious assault divisions ABF.

The group numbered up to 25,500 people, 172 tanks, AFV – 1311, artillery systems – 337, MRLS – 143 units.

In total, the total number of Ground Forces along the state border of Ukraine and on the TOT of the Autonomous Republic of Crimea included up to 107 BTG and numbered over 138.5 thousand servicemen, RP OTMS – 66, tanks – up to 2,000, AFV – more than 5,570, artillery systems – up to 1,950, anti-aircraft guns – up to 700 units [186].

Analysis of the use of the Ground Forces of the Russian Federation in the military phase of the hybrid war made it possible to determine the main trends that influenced the use of: offensive operations by the enemy were carried out, as a rule, by battalion tactical groups, of which, according to data [187], there were about 170 in Russia as of August 2021. It should be noted that a battalion tactical group (BTG) is an Combined Arms maneuver unit of the Russian army, which is kept on high alert and usually consists of a battalion (usually motorized rifle) of 2–4 companies reinforced by air defence, artillery, engineering, and logistics units formed from the brigade. In addition, the BTG is reinforced by tank units and artillery units [188]. The formation and use of battalion tactical groups, based on the experience of conducting an anti-terrorist operation in the Donetsk and Luhansk regions, the Russian Federation began back in 2014–2015.

Battalion tactical groups in the Russian army arose quite spontaneously. Within the framework of the wars in Chechnya, under conditions of a lack of capable of conducting combat operations, the Russian command resorted to the creation of temporary joint battalions based on separate regiments. As part of the current defence reform, there was talk of creating at the level of each motorized rifle brigade at least one BTG from contract personnel, with a subsequent increase in the number of relevant groups to two or even three for each motorized rifle brigade.

At the same time, according to the materials of an article in "Defence express" [189], the high readiness forces of the Russian Federation (land and airborne troops, as well as the marines) are 70–90 % complete. That is, if we assume that the motorized rifle brigade has 3,500 servicemen, in peacetime it could have only 2,500 servicemen. Taking into account 30 % of the conscripts, this meant that no more than 1,700 servicemen would be considered suitable for the formation of battalion tactical groups. That is, the BTG, which was involved in conducting offensive operations on the territory of Ukraine, had a staff of up to 570 servicemen, while the opportunities for replenishment or rotation of personnel were reduced to nothing.

At the same time, the bet on battalion and company tactical groups by the military leadership of the Russian Federation was due to the fact that they made it possible to expand the offensive front. The lack of a solid front line, the expansion of the offensive front, by using mobile and self-sufficient units in terms of fire, allowed the enemy to enter the flanks and rear, carrying out fire damage from several different directions and accelerating the pace of the offensive.

Our analysis of the offensive operations of the groups of the Russian Federation made it possible to establish that, especially at the initial stage of a large-scale invasion, the advance of the enemy began from the starting areas for the offensive as part of BTG and were carried out according to similar scenarios – the rapid advance of large columns of troops of ground groups to the main administrative centers with the aim of capturing them or blocking (encirclement), along with attempts to capture important infrastructure facilities by advanced units or tactical landings. At the same time, reconnaissance of the enemy on the advance routes was carried out by reconnaissance units on light armored vehicles of the "Tiger" type. In addition, on some routes, civilian cars were used for reconnaissance, in which Russian servicemen drove under the guise of the local population or refugees.

Today, the armed forces of the Russian Federation are moving away from the classic use of units of the "division" and "brigade" type. Instead, the focus is on smaller, but at the same time self-sufficient units such as battalion and company tactical groups with appropriate means of reinforcement, including army and tactical aviation. This makes it possible to expand the front of the offensive, and therefore to contribute to the faster encirclement and destruction of the enemy's forces.

A separate area that requires attention during the study is the logistical support of the armed forces of the Russian Federation during a full-scale invasion of the territory of Ukraine.

Thus, according to the article of I. H. Davydov and co-authors [190], an important component of the forces and means of material and technical support (MtM) of the operational link, which are actively involved in the provision of troops (forces) of the Armed Forces of the Russian Federation in Ukraine, was a separate brigade of MtM, which is part of the system of material and technical support of the Armed Forces RF, being its mobile component.

A separate brigade of material and technical support of the troop group is intended for:

– reception and maintenance of established stocks of various types of material and technical means (and under special local conditions – water), their transport (issuance) to the troops;

– medium and current repair of weapons and military equipment (AME);

– evacuation of defective, unnecessary for the operation of WME, other property and trophies;

– mass refueling of military equipment;

– provision of bread and water to units, military units that do not have their own technical means of baking bread and transporting water;

– laundry service of compounds, military units (subunits), which do not have their own technical means of bath and laundry service.

The brigade contains reserves that provide the two-day needs of a group of troops from two combined armies and a set of units and parts of a group of troops (forces) operating along their directions and in the rear areas of these associations, which is: fuel – 12,000 m^3; dry cargo – 8760 tons.

At the same time, it should be said that the strength of the Russian Armed Forces is the presence of a fairly developed system of military communications and the presence of 10 railway brigades in the

Russian Armed Forces. Brigades of the railway troops are able to perform the tasks of protection, construction, and repair (restoration) of railways, while rolling stock is provided by civilian state companies. This allows for the transfer of large volumes of WME and MtM in a short time, which was demonstrated at the very beginning of the operation. The volume of MtM transportation is evidenced by the destruction in the Chernihiv region of a military transport consisting of 56 tanks with diesel fuel (3,000 tons). In order to eliminate the possibility of Russian railways delivering personnel, WME and MtM of the Armed Forces of the Russian Federation, the next logical step of the Ukrainian Armed Forces was the destruction of the railway connection between the Russian Federation and Belarus.

Already on February 26, 2022, the Ukrainian military blew up all railway junctions connecting the Ukrainian railway with the Russian one. The attempt to resupply the Russian army outside the railways forced them to rely mainly on road transport. The limited number of freight transport, the low capabilities of the SLBn units of the operational and tactical units of the MtM of the troops (forces) led to the collapse of the entire MtM system of the Russian Armed Forces groups in the north of Ukraine. In addition, MtM analysis suggests that support units are able to effectively perform their assigned tasks only if the nearest source of supply is less than 140–150 km from the battlefield. At the same time, for example, the shortest route of the Russian troops to Kyiv was more than 230 km, in particular from the Belarusian Gomel, and therefore the need for vehicles almost doubled.

The evidence of the above is the information of the Main Directorate of Intelligence of the Ministry of Defence, which states that the entire logistical scheme of the Russians is unable to meet the needs of a significant number of troops at a distance of more than 100 km from their own border [191].

Another problematic issue of logistical support for the Russian Federation is the use of civilian trucks instead of military ones that were lost in battle. This is due to the fact that civilian trucks are not designed to transport goods and military equipment and cannot be used in off-road conditions. In addition, the replacement of military trucks with civilian ones creates a maintenance problem, as spare parts may be incompatible [192].

At the same time, the widespread use of railways in the temporarily occupied territories for the transportation of MtM allowed the enemy to ensure the restoration of ammunition stocks with the massive use of tank units, rocket troops, and artillery along the Severodonetsk, Slavyansk, Bakhmut directions, etc.

Thus, analysis of the operation of the MtM system of the Armed Forces of the Russian Federation, created during the armed aggression against Ukraine, allows us to draw the following conclusions:

– in connection with the fact that the system of MtM of the Armed Forces of the Russian Federation was not transferred to functioning in wartime, the SLB were not reformed into the SLB, which significantly limited their ability to provide troops (forces) in Ukraine;

– the SLB are not designed to ensure a large-scale offensive at a long distance from their railways, and therefore the destruction of railway communication facilities (roads, bridges, railway junctions) is one of the most important factors affecting the MtM system of the troops of the Armed Forces of the Russian Federation in Ukraine.

Thus, our analysis of the use of the Ground Forces of the Russian Federation in the military phase of the hybrid war revealed that the Ground Forces play a decisive role in order to achieve the goal of operations; the main tactical unit used by the Armed Forces of the Russian Federation in Ukraine are battalion tactical groups; the execution of combat tasks by the military formations of the Russian Federation in the course of a full-scale Russian invasion of Ukraine is possible only under the condition of creating an effective system of logistical support.

Summarizing the results of the analysis of the use of the Ground Forces of the Russian Federation in the military phase of the hybrid war, the following conclusions can be drawn:

1. The Russian Federation created a sufficiently powerful offensive group to invade the territory of Ukraine but as a result of simultaneous actions in many directions, it significantly dispersed the accumulated forces – battalion tactical groups, which allowed the invaders to fulfill the task of seizing part of the territory of our state only partially.

2. Management of the actions of a large number of battalion tactical groups from control centers of operational and operational-strategic levels, as well as the system of their comprehensive support (excluding the brigade/regimental level) turned out to be insufficiently effective in comparison with the management and support systems, which are built according to subordination: OGT (OTGT) – brigade (regiment) – battalion (BTG).

3. The military formations temporarily created by the Russians – battalion tactical groups are self-sufficient only for a short time, which was not enough to organize comprehensive support and establish logistics at the operational level, and at the tactical level there was a lack of means of fire support, engineering support, material reserves technical means and possibilities for repairing and evacuating equipment.

4. The means of fire and air support of the enemy at the beginning of the armed aggression significantly increased the effectiveness of the actions of its ground offensive group but thanks to the gradual restoration and increase of the capabilities of the air defence system in both the Ground Forces and the Air Forces of the Ukrainian Armed Forces, the increase in the capabilities of domestic rocket forces and artillery in including due to the receipt of foreign samples of weapons and equipment, the effectiveness of fire and air support from the enemy is significantly reduced.

The enemy was forced to switch to defensive, in some areas of the front deterrence actions or withdrawal, and currently holds the initiative only in a small area in the east of Ukraine; in order to seize the initiative on the entire front and resume offensive operations in the future, the aggressor will have to attract a powerful mobilization reserve and spend significant resources in order to staff and comprehensively support its military formations.

2.1.2 PREDICTED VARIANTS OF THE RUSSIAN ARMED FORCES MILITARY ACTIONS ON LAND

Analyzing the operational-strategic situation in Ukraine and around its borders, as well as the results of the assessment of the situation by the top military-political leadership [1], we can come

to the conclusion that certain operational prospects are visible for the enemy along the Izyum and Bakhmut directions. Access to the administrative border of Donetsk region can be considered as the probable ultimate goal of such actions. The prospect of advancing along the Zaporizhzhia direction may look even more attractive to the enemy. It ensures further actions to the north and the creation of a direct threat of taking over Zaporizhzhia and the city of Dnipro, which in turn will lead to the Ukrainian side losing control over a large part of Left Bank Ukraine. A return to the plan to capture Kyiv and the threat of renewed hostilities from the territory of the Republic of Belarus are not excluded from the agenda.

But further advancement in the South Buz direction from the operational bridgehead on the right bank of the Dnipro River opens up the most opportunities. Success in the South, provided it is used quickly and faithfully, can have a double effect. On the one hand, the prospects of capturing Mykolaiv and Odesa are quite real. On the other hand, the creation of a threatening direction along the direction to Kryvyi Rih, and in the future, threats to the central and western regions of Ukraine.

Taking into account the above conditions, the mission of the aggressor may be to isolate the main part of the Defence Forces of Ukraine or Ukraine in general from the supply of weapons, equipment, ammunition, and other material and technical means from the partner countries, to exhaust or defeat the main Defence Forces of Ukraine and to force the military and political leadership of our country to negotiate on the terms of the aggressor.

An aggressor's probable intent may include the purpose of the action, key tasks, and end-state expectations, which are listed below.

The purpose of the actions: to occupy the eastern and southern regions of Ukraine and create favorable conditions for further negotiations regarding the signing of the armistice agreement.

Key tasks of the aggressor:

1. Blocking the main part of the Defence Forces of Ukraine along the entire front line, northeastern, northern, and western sections of the state border of Ukraine with Russia, Belarus, and Transnistria.

2. The encirclement or isolation of the main part of the Defence Forces of Ukraine from the supply of weapons, equipment, ammunition, and other material and technical means from partner countries and the creation of conditions for their defeat.

3. Full occupation of Luhansk, Donetsk, Zaporizhzhia, Kherson, Mykolaiv, and Odesa regions.

4. Forcing the government of Ukraine to capitulate and sign an armistice agreement on the terms of the aggressor.

The expected final state: the main part of the Defence Forces of Ukraine, or Ukraine in general, is deprived of military-technical aid and humanitarian assistance from partner countries, Luhansk, Donetsk, Kherson, and Zaporizhzhia regions are completely occupied, and as a result of the treaty imposed by the aggressor, Mykolaiv and Odesa regions (possibly Kharkiv) became part of the Russian Federation.

To achieve the aggressor's above-mentioned intention, several options for actions can be developed for the land component, the concepts of which can include decisive, shaping, and sustaining operations.

The concept of operations according to the first option (the most likely) can be as follows:

a) decisive operations: the first echelon of the enemy's strategic strike group during D20-D30 strikes in three directions: the first – Kherson, Mykolaiv, Odesa; the second – Melitopol, Zaporizhzhia, Dnipro; the third – Homel, Chernihiv, Kyiv with the aim of breaking through the front edge of the defence of our troops, their encirclement, access to important administrative centers deep in the country and blocking them;

b) shaping operations: a part of the enemy's first echelon forces during D5-D7 conducts limited offensive actions, fire damage to our troops along the entire front line with the aim of restraining the main part of the Defence Forces of Ukraine. During D7-D15, operational groups of troops carry out offensive actions in secondary directions: the first – Belgorod, Kharkiv; the second – Kherson, Kryvyi Rih, Dnipro with the aim of supporting the offensive of the main strategic group of troops and restraining our forces. During D30-D40, the main and supporting forces of the enemy block the administrative centers, the Defence Forces in the operational areas in order to exhaust them, force them to surrender, and sign armistice agreements on the terms of the aggressor;

c) sustaining operations: for the logistical support of operational groups of troops in the southern direction, communication routes from the Crimea peninsula along the direction to Melitopol and Kherson will probably be used. Groupings of troops in the eastern direction can support logistical corridors from Rostov-on-Don to Donetsk and Luhansk. The northern direction will probably be provided by the Belarusian dictator. The main efforts for logistical support of the first course of action should be expected along the Crimean direction.

The concept of operations according to the second option (the most dangerous) can be as follows:

a) decisive operations: the enemy troop group "ZACHID" during D20-D30 conducts an offensive operation along the direction to Pinsk, Lutsk, Ivano-Frankivsk with the aim of blocking Ukraine's land connections with European countries;

b) shaping operations: the first echelon of the enemy's strategic grouping of troops during D-D15 conducts limited offensive operations along the entire front line and provocations in the northeastern, northern, and western sections of the border with Russia, Belarus, and Transnistria with the aim of distracting (shattering) the main units of the Defence Forces of Ukraine and creation of favorable conditions for the offensive of the strike group of troops "ZACHID" along the border with Poland and Romania. Enemy forces along the entire front line during D30-D60 conduct offensive and defensive raids with the aim of exhausting the Defence Forces of Ukraine and forcing them to surrender and sign an armistice agreement on the terms of the aggressor;

c) sustaining operations can be organized similarly to the first option, except that the main efforts for logistical support of the enemy's operations should be expected along the northern (Belarusian) direction, which is currently undergoing a gradual build-up and modernization both by Russia and efforts of the armed forces of Belarus.

Summing up the analysis of the predicted variants of the military operations of the Russian Armed Forces on land, the following conclusions can be drawn:

1. The resumption of large-scale offensive operations by the aggressor along the entire front in the future is possible but judging by the military-strategic situation that has developed in the north, east, and especially in the south of Ukraine (along the Kherson direction) it is unlikely in the near future.

2. Taking into account the significant losses in tactical and army aviation, the enemy is betting on unmanned aircraft complexes, which significantly reduces its costs for the production of new aviation equipment and the training of personnel, which were lost during the war but these means cannot provide sufficient air support for offensive actions of Ground Forces, therefore the enemy needs to accumulate assault and army aviation and solve the issue of overcoming the air defence systems of the Ukrainian Armed Forces.

3. A significant decrease in the number of means of fire damage and ammunition for them in the Ground Forces of the Russian Armed Forces does not give the enemy the opportunity to mass artillery fire along secondary directions in order to bind part of the Defence Forces of Ukraine and along decisive directions in order to support the offensive of its main strike groups.

Taking into account the above, one of the decisive indicators that will affect the outcome of future military campaigns (perhaps the center of gravity) is the time that the enemy needs to restore its offensive potential, therefore one of the most important tasks of the Defence Forces of Ukraine may be to deprive the enemy of time to restore its offensive capabilities, seizing and holding the initiative until the successful completion of the counter-offensive operation and liberation of the territory of Ukraine from occupation.

2.1.3 COUNTERING RUSSIA'S ARMED AGGRESSION AGAINST UKRAINE IN A HYBRID WAR ON LAND

To formulate options for actions (concepts) regarding countering armed aggression against Ukraine in a hybrid war on land, approaches were used that were reflected in temporary combat statutes [193, 194], which were developed by the Ground Forces Command of the Ukrainian Armed Forces based on NATO standards as well as doctrinal publications of NATO member states [69, 195]. On the basis of these approaches, the expected mission of the land component, the intention regarding its actions, as well as the concepts of operations under two options, which can ensure the achievement of the final goal, are proposed.

The mission of the ground component of the Defence Forces of Ukraine may consist in blocking the enemy's actions on land and participating in the liberation of temporarily occupied territories from the aggressor.

The intention of the commander-in-chief regarding the use of the ground component in operations to repel armed aggression of the Russian Federation may include the purpose of operations, key tasks, and the end state that the Ground Forces will try to achieve as a result of successful operations.

The goal of operations of the ground component may be to defeat the enemy in the designated operational areas and to seize the frontiers along the state border.

Key tasks that will ensure the achievement of the goal:

1. Blocking the enemy's actions along the entire front line.

2. Covering areas of the state border.

3. Destruction of the enemy that wedged into the defence.

4. Participation in counteroffensive operations and the liberation of temporarily occupied territories from the aggressor.

5. Participation in stabilization operations in the depths of the country and in areas liberated from the occupiers.

The final state: the territory of the country has been liberated from the occupiers, the situation has stabilized, the activities of local authorities in all regions of the country have been established.

The concept of operations in each variant of actions may include decisive operations (which are directly aimed at achieving the goal and the final state), shaping operations (aimed at the formation of an operational environment favorable for the successful conduct of a decisive operation), as well as sustaining operations (logistical and medical support of decisive and forming operations, safety of operations, etc.).

It is proposed to consider two main options for actions of the maneuver component, which includes mechanized, motorized infantry, mountain assault, tank, and anti-tank military units. The concept of operations in accordance with the **first proposed option** may involve the following:

a) decisive operations:

– the main strike groups are participating in counteroffensive operations simultaneously along the Donetsk and Crimea directions with the aim of liberating the eastern and southern regions of Ukraine from occupation and creating conditions for de-occupation of the Crimea;

b) shaping operations:

– groups of troops along other directions conduct defensive, offensive, raid and other demonstration actions with the aim of misleading about the directions of the main strike and restraining significant enemy forces in secondary directions. The Combined Arms reserves and the second echelons of the strike groups of the troops are increasing their efforts in order to maintain the offensive momentum and ensure the fulfillment of the ultimate goal of the counteroffensive;

c) sustaining operations:

– the main efforts of logistics and medical support can be directed to support the decisive operations of the main strike groups along the Donetsk direction since there the Russian occupiers have less shoulder to supply their resources. Of great importance in terms of the security of operations will be the covering of sections of the state border with Belarus, as well as the masking and covering of convoys with ammunition, fuel and lubricant materials (FLM), and other material and technical means from the western regions of the country, from the attacks of the air enemy, and the maintenance of access roads and railway routes.

The concept of operations in accordance with the **second proposed option** may involve the following:

a) decisive operations:

– the main strike groups take part in counteroffensive operations sequentially: the first phase – along the Crimea direction with the aim of liberating the southern regions of Ukraine from occupation, creating conditions for the de-occupation of Crimea, and withdrawing a significant part of the enemy's forces in Crimea; the second phase – along the Donetsk direction with the aim of liberating the eastern regions of Ukraine from occupation;

b) shaping operations:

– during the first phase of the decisive operation, troop groups along the Donetsk direction conduct defensive, offensive, raid and other demonstration actions with the aim of misleading the direction of the main attack and restraining significant enemy forces along the Donetsk direction. During the second phase of the decisive operation, groupings of troops along the Crimea direction move part of the forces to defensive actions, part of the forces continue to conduct offensive, raiding actions, demonstration actions for the creation of tactical air and sea landings with the aim of misleading about the direction of the main attack and restraining significant enemy forces on Crimea direction. Under favorable conditions, they participate in the capture of the bridgehead on the Crimean Peninsula and its liberation from occupation;

c) sustaining operations:

– the main efforts of logistical and medical support can be directed: during the first phase of the decisive operation to support the strike groups along the Crimea direction; during the second phase of the decisive operation to support the strike groups along the Donetsk direction. The need to reliably cover sections of the state border with Belarus will remain, as well as ensuring the supply of resources from the western regions of the country, maintenance of access roads and railway routes, as was indicated in the first option of actions.

Each option of actions according to different evaluation indicators has certain advantages or disadvantages in relation to another option. The results of a comparison of the proposed options for actions of the maneuver component in operations to counter Russian aggression according to some evaluation indicators are given in **Table 2.1.1**.

Depending on the military and political situation that may develop in the near future, the availability of resources, etc., the indicators in **Table 2.1.1** can have different priorities. If there are problems with the accumulation of resources, the creation of reserves and the expansion of the management system, then it will be appropriate to choose the second method of action of the ground groups of troops. The implementation of the first method of action requires significant resources, but this method will contribute to restraining the enemy along the entire front line and contribute to its defeat simultaneously in all important directions of action. To compare options for actions, it is advisable to carry out their quantitative and qualitative assessment using mathematical methods, which requires further research, the results of which will be reflected in the next section of the research paper.

● **Table 2.1.1** Results of a comparative analysis of the proposed options for countering Russia's armed aggression against Ukraine in a hybrid war on land

Evaluation indicators	Action Option 1		Action Option 2	
	advantages	disadvantages	advantages	disadvantages
Simplicity	–	simultaneous execution of missions in two strategic directions	mission fulfillment first in one strategic direction, and then in the second strategic direction	–
Flexibility	extensive use of reserves at the operational level	insufficiency in reserves at the strategic level	the ability to have a strong reserve at the strategic level	–
Concentration of efforts	–	forces can be scattered along the entire front	it is possible to concentrate combat power on one strategic direction	–
Pace	simultaneous access to the borders in all directions	slow advance along the entire front line	it is possible to quickly get to the border on one of the directions	without success in the first phase, it is impossible to start the second phase of operation
Security of operations	–	fewer reserves to cover the border with Belarus	opportunity to have more reserves near the border with Belarus	–
Misrepresentation	it is difficult for the enemy to determine the direction of concentration of efforts	–	–	if the intention is exposed, the enemy may disrupt the offensive
Management	–	two strategic groupings at the same time	at the same time, one strategic grouping	–

CONCLUSIONS

Thus, summing up the analysis of possible ways of countering Russia's armed aggression against Ukraine in a hybrid war on land, the following conclusions can be drawn:

1. In order to defeat the enemy, the Defence Forces of Ukraine need to take the initiative, accumulate the necessary resources faster than the enemy, and proceed to offensive actions (conducting counter-offensive operations) simultaneously or gradually along the entire front line.

2. The available means of air and fire support for actions on land, the means of air defence are quite effective, but their number is also limited, which will probably encourage the military and

political leadership of the state to choose the second proposed or another (undeclared) course of action, the essence of which will consist in successive defeat of the enemy; the significant increase of domestic capabilities in terms of fire, aviation support, and air defence is currently possible only under the condition of consistent support from partner and allied countries.

3. After the completion of the counteroffensive operation, it will be necessary to switch to defensive or stabilization actions, which will also require the involvement of significant forces, means, and resources in order to demonstrate to the aggressor the readiness to resolutely retaliate in the event of further attempts to resume military operations against our state.

Volodymyr Prymirenko

ABSTRACT

The world's leading scientists characterize the Russian Ground Forces (GF) as a combination of tank formations with a relatively large amount of artillery, multiple rocket systems, as well as tactical and operational-tactical missile systems. The above description was formed due to the fact that the Russian Armed Forces during almost the entire time of its existence single out the dominant role of fire damage to the enemy by rocket forces and artillery (RF&A) in ensuring the defeat of the enemy and the successful actions of its combined military units. Despite the increase in the combat capabilities of the Russian Aerospace Forces, the fact is obvious that due to a number of objective reasons (sustainable air defence system of Ukraine), a significant part of the volume of fire missions still relies on RF&A of its SV [196].

In contrast to the increase in artillery and aviation capabilities of the aggressor country, Ukrainian capabilities decreased due to a number of subjective and objective reasons after Ukraine gained independence. Only since 2014, the number of military units and artillery units in Ukraine began to gradually increase, but it has not even reached its initial level (at the time of Ukraine's independence).

The above indicates that from the side of the Armed Forces (AF) of Ukraine, the main means of defeating the enemy and fire support for land groups is RF&A, and the analysis of their combat use under conditions of comprehensive opposition by the enemy will make it possible to find ways to improve the forms and methods of combat use of RF&A and predict possible options for the development of military operations.

KEYWORDS

2.2.1 ANALYSIS OF THE RUSSIAN FEDERATION GROUND FORCES ROCKET FORCES AND ARTILLERY COMBAT USE

According to the words of some military personnel of Ukraine's partner countries, in the first hours of the war, they watched with fear through mass media the long columns of various military equipment of the enemy, which were moving from different directions to Kyiv, in the south and

northeast of Ukraine. However, at the same time, they were shocked by the fact that weapons and equipment were moving in columns along asphalted roads. Whether this was done by the leadership of the armed forces of the aggressor country according to the principle of "shock – bind – defeat" units of the Ukrainian Armed Forces, or because of the enemy's poor assessment of the terrain and determination of approaches and maneuvers, remains an open question. However, the fact that the units of the aggressor country were dependent on paved roads, on the one hand, increased the speed and ease of their advance, and on the other hand, it meant an increase in the possibility of their detection by Ukrainian intelligence means (military intelligence units, unmanned aerial systems, etc.), timely blocking combined forces units of the Ukrainian Armed Forces and creation of conditions for defeat by artillery and aviation units.

Artillery, helicopters of the army aviation, and aircraft of the Aerospace Forces of the aggressor country played the main role in ensuring the advance of their land groups. To conduct offensive actions of their combined military units, the Russian Army used massing fire by the method of fire combing. This method was used along the directions of the main attacks of their offensive groups, even in densely populated areas. However, mass fire increased the need for ammunition, and accordingly, for its carriage. In order to disrupt ammunition logistics, artillery units of the Ukrainian Armed Forces destroyed critical elements of the logistics system (loading and unloading points, main delivery routes), which disrupted the operation of the entire ammunition supply system when they were damaged. It is worth noting that according to the approaches of the aggressor country, ammunition stocks are divided into the following levels: tactical, operational, and strategic. They are characterized by the number and types of ammunition stored on them and, accordingly, by their distance from the line of battle. At the same time, it is worth knowing that damage to logistics elements has a certain feature, which is that when a lower level (i.e., tactical) is damaged, the effect of its damage (lack of ammunition) occurs faster than when an operational level is damaged, but they have much less important than from a lesion of the operative.

Since in the Ukrainian Armed Forces the main fire support units of the combined military units are RF&A units, the enemy pays special attention to the performance of counter-battery combat tasks. For this purpose, the adversary integrates reconnaissance means (radar, air, sonar, optical) with almost the entire available set of long-range means of conducting indirect fire, self-propelled, trailer-mounted guns, and rocket systems of salvo fire. There were cases when the Russian troops used the Iskander operational-tactical missile system (according to the NATO classification – SS – 26) for counter-battery tasks, trying to hit high-priority targets, such as units of the missile forces.

An artillery unit needs "eyes on the target" to fire missions. This is slang used to indicate that the purpose of intelligence and surveillance. The enemy uses unmanned aerial systems as the main tool for reconnaissance of artillery positions. The front line, and therefore the search for artillery units of the Ukrainian Armed Forces, is relatively large, so the enemy uses the following method for reconnaissance of RF&A units. According to the results of the terrain analysis, it determines the most suitable areas for firing positions. In order to conduct radar reconnaissance, it designates areas of special attention in such places for artillery reconnaissance units, which are armed

with "Zoopark" radar reconnaissance and fire control complexes. After targeting shots with such a complex, the control authorities send an unmanned aerial system (UAS) to the area of targeting for the purpose of reconnaissance. To speed up the reaction time, a UAS that is already in the air can be redirected to the area of the target crosshairs. As the main reconnaissance UAS, Russian units use Orlan-10, which is characterized by relative cheapness, ease of preparation for launch and control. There were also cases of the use of UASs capable of conducting reconnaissance at night. However, the countermeasures of the Ukrainian Armed Forces make it possible to neutralize the capabilities of UASs at night.

To identify the positions and bases of important units, such as artillery units, the Russian special services use various methods, including "spies", who are outwardly no different from ordinary local residents. Based on the results of the movement of the units, the specified persons monitor the routes and directions of movement and can send their curators the appropriate photo or video material, which makes it easier for the Russian troops to identify the locations of RF&A units. This requires the commanders of units of the Ukrainian Armed Forces to better plan their actions, including movement from the places of execution of tasks to waiting areas, as well as to allocate forces and means for the protection of units at positions and during movement. This, in turn, can negatively affect the situation on the line of contact with the enemy because in order to protect RF&A units, there is a need to allocate additional units from among those that can conduct defensive or offensive actions.

Russian Army use battalion (company) tactical groups [197]. The results of the analysis indicate that, at least at the initial stage of a full-scale invasion, the enemy used such groups due to the impossibility of using brigades and regiments in full strength due to a number of objective reasons, such as the lack of a sufficient number of personnel or serviceable equipment. Such groups are reinforced by artillery (reactive artillery) divisions (batteries). This significantly increases the combat capabilities of battalions (companies) and gives their commanders the opportunity to act decentralized; increases the efficiency of opening fire on battalion (company) attack targets. However, the key factor for the successful actions of such tactical groups is the granting of rights and powers to the commanders of such groups to implement their intentions without prior approval of their decisions with senior commanders (chiefs), which is unlikely under the conditions of the Russian Armed Forces. The tactics of the use of such groups were observed in those areas where the enemy faced strong resistance. Therefore, it switched to the tactics of sending waves of such groups to storm populated areas with the support of RF&A units.

2.2.2 ANALYSIS OF THE UKRAINIAN ARMED FORCES GROUND FORCES ROCKET FORCES AND ARTILLERY COMBAT USE

RF&A units are gradually moving to NATO standards. In some cases, units use best practices (which are specified in standards, field statutes) even before the corresponding standard is adopted or implemented in the system of doctrinal documents of the Ukrainian Armed Forces.

This testifies to the non-standard approach of artillery commanders and chiefs of the Ukrainian Armed Forces to the planning and conduct of combat operations with the prevailing enemy forces. In many cases, this approach became the key to success.

Thus, in accordance with the approaches of the armed forces of NATO countries, field artillery can be involved in performing a variety of tasks, including in decisive, forming, and supporting operations [198].

Decisive operations lead to the destruction of key enemy objects, for which one can mass fire at a decisive time and in a decisive place.

Formation operations are conducted to create and maintain the conditions necessary for decisive operations, which may include detecting and striking key enemy capabilities in order to delay, deflect, and weaken them.

Support operations involve actions and measures taken to protect forces and preserve their freedom of maneuver.

At the same time, the main purpose of the combat use of RF&A of the Ukrainian Armed Forces was to support the actions of the combined military units. The main content of the combat use of RF&A was fire (strikes) in order to defeat the enemy and maneuver to ensure the survivability of its units and the subsequent implementation of fire and strikes. In order to focus the fire along the directions of the main effort, artillery unit maneuvers and fire maneuvers were used.

For the purpose of echeloning fires, management and control over the execution of firing tasks, RF&A units were distributed according to the elements of the operational construction of troop groups (in battle formations of military units, units).

The distribution was carried out in accordance with the design of the operation (battle) and the situation and included: units of missile forces; general support artillery (fire support in the interests of the entire operation) – units of the artillery brigade; direct support artillery (fire support in the area of operations of combined military units) – brigade artillery, battalion artillery; units of artillery reconnaissance (radar, optical, and air reconnaissance means of domestic and foreign production). The specified echeloning of artillery was carried out for the distribution of powers regarding reconnaissance and destruction, as well as ensuring the guaranteed destruction of enemy targets.

Almost every artillery unit had air reconnaissance in its composition, based on the results of which the commanders of the artillery units independently made decisions on hitting targets. For this purpose, commanders of artillery units were assigned an area for searching and destroying targets. Thus, the "Zone-target" method of fire damage to the enemy was implemented. The specified method of searching for and destroying enemy objects was unofficially called "Free Hunting".

To detect and scout targets, the Ukrainian Armed Forces also use their own development, in particular "Zoopark-3", which provides a sufficiently large radius of action. In addition, the partner countries provided the Ukrainian Armed Forces with anti-battery radars AN/TPQ-36, AN/TPQ-48 (49). To improve the effectiveness of fire missions, long-range weapons were combined with intelligence (radar, unmanned aerial systems). In this way, reconnaissance and fire complexes were created, the scientific justification of which is reported in a number of scientific works [199].

To perform firing tasks in artillery units, combat duty was organized. To carry out combat duty, the unit was divided into fire groups. At the time when one group was on combat duty, others were preparing for combat duty. The combat duty was organized in shifts. Moreover, to perform fire missions in the group that was on combat duty, fire sections were created in the composition of 2 guns, which were located at relatively large distances from each other during the performance of fire missions, which made it possible to increase the flexibility and survivability of units. It is worth noting that this approach to combat use did not exclude, if necessary, the possibility of concentrating the fire of all guns (even those located in the waiting area) on high-priority enemy targets.

The main objects of damage were artillery batteries, mortar batteries, command posts, manpower in concentration areas, accumulations of weapons and equipment, radars, air defence equipment, and other important objects.

The organization of the management of artillery units was carried out through closed communication channels based on the availability and condition of forces and means of communication, the characteristics of the combat area and other factors. Starlink satellite communication and a coded radio communication network are widely used for communication.

The presence of Starlink in almost every unit made it possible to create at the workplaces of the RF&A units' control bodies, starting from the division level and above, means of covering the situation online and to coordinate the fire support and fire adjustment of their unit. Thus, having a UAS, Starlink, radio stations, and at least one monitor, one can create a network through which the UAS will transmit video to the monitor screen located at the control center of the artillery unit. By communicating with the UAS operator and the unit, one can respond in time to identified targets, enemy actions, adjust your unit's fire, etc. The main advantage that was achieved with the help of this method of performing tasks was the refusal to perform firing tasks at non-observable targets, the sections of guidance documents, instructions, and rules devoted to such shooting. Firing only at an observation target significantly increases the effectiveness of firing and reduces the consumption of ammunition and the time of completing the firing task, and accordingly, the survivability of the entire unit.

Ensuring the survivability of artillery units was carried out by dispersing artillery units along the front and in depth, masking positions, implementing engineering equipment for firing positions, and maneuvering along the front and in depth. The maneuver was carried out immediately after the completion of firing tasks, with the calculation that the artillery unit would stay at one firing position for no more than 10...15 minutes, depending on the combat situation.

The Ukrainian Armed Forces received a large number of new weapons, including HIMARS (MLRS, MARS), which were equipped with certain artillery military units. The method of their combat use was almost the same as that of missile units armed with the Tochka missile complex. Its content is as follows. A missile unit before receiving a combat mission is in a camouflaged state in anticipation of a combat mission, usually in a remote area. Upon receipt of the corresponding combat task, the unit advances to the area of the task (starting positions), builds up readiness for launching missiles and launches them at the target. After launching the missiles, the unit urgently leaves the starting positions, maneuvers either to the reserve starting position or to the waiting area, where the

post-launch maintenance of the installations and their charging with new missiles is carried out [200]. In photos and videos in the mass media, HIMARS units are often shown on an asphalt road during missile launches. This indicates that in order to save time for searching, occupying, and leaving the areas of the starting positions, they are chosen on the roads. So far, this approach has proven to ensure the survivability of launchers. Commanders avoid long-term placement of launchers in launch areas, leaving assets uncloaked only for the time necessary to execute the launch. All of this is done in conjunction with intelligence and security units to counter air or ground surveillance, as Russian surveillance assets typically track individual launchers to determine the location of the entire unit's base area.

This method of combat use of missile units significantly increases the unit's survivability without reducing the intensity of missile strike missions.

At the same time, RF&A units received high-precision projectiles. The use of such types of ammunition makes it possible to hit important enemy targets with high precision and relatively high efficiency. As one knows, the price of such projectiles is several tens of times higher than conventional high-explosive fragmentation ammunition. However, despite this, less ammunition is required to achieve the desired effect on the targets, and this compensates for their high cost. Less ammunition also reduces the burden on logistics. The main feature of the use of such types of ammunition is the need to determine the exact coordinates of the target and carefully conduct preparations for firing, carrying out topogeodetic reference of the firing position of the unit entrusted with such a task. Accordingly, the accuracy of determining the position of the target when using high-precision ammunition must correspond to the first category (error in determining the target coordinates from 0 to 6 m). Such accuracy cannot be ensured by any intelligence tool that is currently in the RF&A units of the Ukrainian Armed Forces. For such accuracy, there is a need to determine the coordinates of the target in more accurate ways, for example, with the help of artificial Earth satellites.

Units of the Ukrainian Armed Forces have always looked for ways to automate and support the decision-making process. The way out of this situation was the creation of the "Nettle" system. This system, which is used in the Ukrainian Armed Forces, enables each separate artillery installation to perform firing tasks independently since with its help, in a short period of time, one can at least calculate the installations for firing at the target, carry out its aiming and fire correction, that is, carry out those measures, which always required a lot of time and resources. The low cost of the system carrier (any Android device) combined with the software, which is essentially free, creates an effect similar to that of high-priced foreign counterparts. The main advantage of this system is the simplicity of its interface and functions. Even a person who has never held a tablet with the "Nettle" system in its hands can learn to use its basic functions after demonstrating the procedure for working on it. A huge advantage of the developers of this system is that they always respond to requests from the troops to improve the interface, functions, and capabilities of this system. The system found its users not only in RF&A divisions but also in other divisions of the Ukrainian Armed Forces. However, there is one problematic issue – the system covers the needs only at the tactical level: it helps the military to perform tasks more quickly directly on the battlefield. However, the Ukrainian army needs a general automated system of operational level [201].

Summarizing the above, we can draw a conclusion about the change in the methods of combat use of RF&A in the Russian-Ukrainian war, which was facilitated by both the situation itself (quantitative and qualitative advantage of the enemy) and non-standard approaches to the order of planning and execution of combat tasks, automation of certain processes.

2.2.3 PREDICTED VARIANTS OF ACTIONS OF RF&A UNITS OF THE RUSSIAN TROOPS

As mentioned above, the Russian military has historically given fire damage the main role in the operation. On land, Russian tactics are likely to reflect a heavy emphasis on massed fire (especially long-range fire) [202]. Since the air defence system of Ukraine is gradually becoming stronger every day, this may lead to the non-systematic use of aviation of the Russian Aerospace Forces to directly support the actions of its units. Therefore, the main means of fire damage will continue to be Russian RF&A. The main purpose of the combat use of the enemy's artillery units will most likely be the defeat of the units of the Ukrainian Armed Forces, the support of the actions of the combined military units (units), and the conduct of harassing fire with the aim of exhausting the forces and suppressing the morale and psychological state of the personnel of the combined military units of the Ukrainian Armed Forces. The main content of the combat use of artillery units will be fire and maneuver for the purpose of further fire.

The main objects of damage will be artillery (mortar) batteries at firing positions, field artillery depots, observation posts, platoon strongholds, command posts, manpower in concentration areas, accumulations of weapons and equipment, radars, air defence equipment.

It is likely that the enemy will try to create a fire advantage by maneuvering fire in order to focus it along main directions in order to achieve the required density of fire in the areas of breakthrough of its attacking units, violation of the system of control of troops and weapons, logistics. However, given the losses suffered in the artillery during the war, they are unlikely to succeed.

Taking into account the above, this way of performing tasks by the enemy's artillery will require a large amount of ammunition, and therefore the load on logistics, the dependence of the actions of the combined military units on the logistics of artillery ammunition.

This creates prerequisites for the need to identify critical points in the enemy's defence. Identifying critically vulnerable elements of the enemy's logistics and timely, accurate and effective destruction of them (with the help of the approaches described above) can deprive the enemy of defensive (offensive) actions, create an advantage in their favor, and win this unprovoked war.

CONCLUSIONS

Taking into account the above, it can be concluded that since the RF&A of the Ukrainian Armed Forces is the main means of fire damage to the enemy, the success of defensive and expected

counteroffensive actions of the combined military units (subunits) of the Ukrainian Armed Forces will depend mainly on the capabilities of RF&A to effectively hit the enemy's high-priority targets.

Knowing this, the enemy will focus the main attention on finding and defeating the RF&A units of the Ukrainian Armed Forces, the destruction of which can significantly weaken both the stability of the defence and the pace of the offensive of the combined military units, which will break through the enemy's battle formations with the support of RF&A units. Given the importance of RF&A units, the enemy will try to hit them without waiting for the detection of the entire unit, for example, a platoon or a battery. Knowing that the RF&A units of the Ukrainian Armed Forces carry out firing tasks in firing groups of 2...4 guns, and in some cases in a cannon, the enemy will also accept single guns for damage.

The main problematic issue is the ability not only to effectively hit the enemy's high-priority targets but also to ensure the survivability of its units, which under the conditions of the growing role of the enemy's counter-battery fight will require the implementation of complex measures, the content of which will consist in the implementation of fire and a quick maneuver to reserve positions after the execution of fire missions with in order to perform the next firing task. Thus, this method of performing firing tasks expands the boundaries of the areas of fire positions, and in some cases their purpose loses its meaning altogether because the maneuver is limited to a space of 3 km behind the front and in depth makes it much easier to detect firing batteries by the enemy, in contrast to the use of the method of maneuvering behind the front in the entire defensive (offensive) lane. Of course, such methods will require detailed coordination of the actions of artillery units and combined arms units, both in order to ensure the support of the latter, and in order to avoid friendly fire. In addition, increasing the survivability of RF&A units will require the dispersion of fire means at firing positions. The distances between fire means should be such that when the enemy hits a detected fire means, the one that was not detected is not affected.

Thus, it can be concluded that a comprehensive approach in planning and coordinating the fire support of the combined military units and implementing measures to ensure the survivability of RF&A units will significantly increase the chances of the Ukrainian Armed Forces to implement measures, the realization of which will ensure that the combined military units restore the lost position and restore the territorial integrity of Ukraine.

ANALYZING THE APPLICATION OF GROUND FORCES OF THE RUSSIAN FEDERATION DURING THE MILITARY PHASE OF THE HYBRID WAR AND THEIR EFFECTS ON THE COMBAT APPLICATION OF ARMY AVIATION OF THE GROUND FORCES OF THE UKRAINIAN ARMED FORCES

Oleksandr Malkov

ABSTRACT

Army aviation (hereinafter, AA) is the most mobile component of the Ground Forces of the Ukrainian Armed Forces [203], which has accumulated vast experience in combat application and performance of special tasks in various operational environments. This includes participation in peacekeeping operations as part of designated units, combat duty as part of air defence, search and rescue tasks, elimination of the consequences of emergencies and man-made disasters, execution of combat and special tasks during anti-terrorist operation (ATO) and operations of the joint forces (JF) on the territory of Luhansk and Donetsk regions, as well as the execution of combat missions in the interests of the defence of Ukraine in the course of repelling a full-scale invasion of the Russian Federation on the territory of Ukraine.

Accumulated experience shows that within the operational environment, army aviation can expect to encounter a wide range of participants, such as enemy government armed forces, multinational friendly forces, intergovernmental institutions, non-governmental organizations, private organizations, private security organizations, mass media, criminal organizations, insurgents, radical extremists, tribal and ethnic groups. The combination of these actors and other elements, combined with changes in the operational and tactical environment, create a complex operating environment.

KEYWORDS

Army aviation, mobile component, Ground Forces, operational environments, peacekeeping operations, air defence, emergencies and man-made disasters, anti-terrorist operation, operational experience, insurgents, radical extremists, tribal and ethnic groups.

According to the military experts of the member states of the North Atlantic Alliance (NATO), the term hybrid threat reflects the complexity and erosion of traditional elements of the conflict.

Thus, according to the definition of military experts of the United States of America [204], a hybrid threat is a diverse and dynamic combination of regular armed forces, illegal armed formations, terrorist forces, and/or criminal elements united to achieve a mutually beneficial effect, that is, a common goal.

From this it follows that the hybrid threat includes traditional, non-traditional, and hybrid strategies that threaten the functioning of AA while supporting the ground component of the Defence Forces of Ukraine.

Since 2014, the armed forces of the Russian Federation have combined traditional and non-traditional methods of warfare, hybrid threats are constantly changing their tactics, techniques, and procedures to obtain asymmetric opportunities to weaken the technical advantage of AA in a direct combat encounter.

The adversary, using hybrid methods of armed struggle, tried to disrupt the combat use of AA by prohibiting free movement in the area, combining the blocking of force columns and means of providing flights to the civilian population in the area of anti-terrorist operation (ATO) and subsequent fire damage to these columns, creating obstacles to air traffic and intentional disruption of the operation of areas of the presence of army aviation, such as jump sites, sites of various purposes (landing, evacuation, and others), AA base areas, and airfields. In addition, the enemy seeks to use meteorological, environmental restrictions, international procedures, and other influential political factors in their interests, with the aim of simultaneously disrupting the capabilities of the combat use of AA.

So, for example, on February 10, 2015, a missile attack was carried out on the Kramatorsk airfield; 2 Mi-24 helicopters and 3 Mi-8 helicopters were damaged [205].

In the course of a massive air and missile attack on Ukraine on February 24, 2022, the enemy carried out targeted strikes on the main airfields of the army aviation: Brody, Kalyniv, Poltava, Kherson. The helicopters of the army aviation brigades were withdrawn from the strikes to the areas of dispersion.

The helicopters of the Group of Forces and Means of Defence of the city of Kyiv were withdrawn from the enemy's attack from the airfields to the prepared bases.

The loss of helicopters in the course of a massive missile-air strike was not allowed [206].

Modern and promising technologies have significantly accelerated the pace of improvement of existing, as well as the creation of new traditional and non-traditional threats to AA.

Among the traditional threats to aviation, the following should be highlighted [207]:
– unguided projectiles;
– anti-aircraft artillery;
– portable air defence systems (MANPADS);
– surface-to-air missiles (SAMS);
– possibilities of electronic warfare (EW);
– combat aircraft (fighters).
Non-traditional threats to aviation include:
– improvised explosive devices;
– cybernetic capabilities;
– anti-tank guided missiles (ATGM);
– passive detection;
– a directed energy weapon.

Existing and potential threats to AA are the following systems and factors:

– ***weapons that use unguided projectiles*** (weapon systems that fire unguided ammunition along a ballistic trajectory, including small arms, rocket-propelled grenades, unguided rockets, artillery and mortar homing fire, medium and heavy machine guns (from 12.7 to 14.5 millimeters), which are capable of hitting aviation systems at different heights or AA equipment on the ground).

The combat use of AA helicopters starting from April 2022 was carried out only under a pitch-up mode, which involves careful preparation of the crew for a combat sortie, calculation of the combat flight route, exceeding the launch point and the target. The enemy calculated possible launch points, and began to use artillery in these places, so when conducting combat flights for use in the Dovhenkee area for a covert approach to the target, the AA crews used beams near Bilbasivka, the launch of unguided aerial missiles (UAR) was also carried out from the beam. As this was one of the two possible flight routes, the enemy applied barrage fire with rocket artillery at a distance of 6,500–6,200 meters to the target, which was observed by the crews as separate gaps in the terrain [208];

– ***anti-aircraft artillery*** (weapon systems with the ability to fire bursting projectiles of 20 mm or more, which use visual, electro-optical, infrared, or radar guidance channels and ballistic computers, capable of hitting aircraft, including at high altitudes. The bases for placing anti-aircraft artillery systems can be special wheeled and tracked machinery, stationary installations, non-standard (technical) vehicles and marine platforms);

– ***portable anti-aircraft missile systems*** (MANPADS are portable guided missile weapons that use the infrared or ultraviolet spectrum with active infrared, ultraviolet, laser or optical guidance, capable of effectively hitting aviation systems. MANPADS can be used both in a portable version and mounted on ground vehicles or sea platforms, the launch is carried out in manual and automatic mode, as a rule, limited only by the operator's ability to visually detect and accompany the air target until the moment of launch);

– ***surface-to-air missiles*** (SAMS from short to long range, using radar and/or electro-optical/infrared target detection and tracking. SAMS are capable of hitting all types of aviation systems up to and including high altitudes. As a rule, SAMS are installed on special platforms, including stationary, wheeled, and tracked vehicles, as well as naval platforms. SAMS have the ability to operate as a component of an integrated (combined) air defence system with the support of early detection and tracking radars; however, it should be noted that a number of systems have been developed that can operate autonomously using on-board detection, targeting and guidance stations).

During the first month of intensive military operations, army aviation lost 11 helicopters, including 3 Mi-24 and 8 Mi-8. An analysis of the conditions for the execution of combat tasks and the existing operational and tactical situation shows that the main characteristics of the losses were:

– according to the type of weapons used by the enemy:

a) losses from small arms – 27 % (2 Mi-24, 1 Mi-8);

b) losses from MANPADS and short-range SAMS – 73 % (1 Mi-24, 7 Mi-8) [206];

– ***improvised explosive devices*** (IEDs are typical devices made from readily available materials, which have a low cost and are usually relatively easy to set up. Use of non-standard approaches to the use of explosive devices (such as artillery shells, home-made explosives, mines) with activation through various channels (for example, infrared, wired, radio frequency, pressure action) is able to significantly limit the possibilities of using the terrain, create obstacles on land and air communications, cause mass casualties among the local population in crowded areas, or provide cover for enemy ambushes in places near the location of friendly forces (for example, landing zones, buildings, observation positions). IEDs are capable of hitting AA when flying at extremely low altitudes);

– ***anti-tank missile complexes*** (ATMCs are designed to defeat armored vehicles, however, they can also be used against low-speed, low-flying targets such as helicopters. ATRCs are usually guided to a target using visual or electro-optical channels and are controlled by command wire signals, laser, passive electro-optical, infrared, or active radio frequency guidance).

On April 25, 2014, at the Kramatorsk airfield at about 11:20 a.m. Kyiv time, during testing of the Mi-8MT helicopter for taxiing from part of the civil sector of the airfield to part of the military sector, the crew felt an explosion in the area of the partition of the crew cabin and the cargo cabin on the right side. A fire broke out, the crew left the helicopter. The crew commander was injured, the helicopter burned down. The helicopter was hit by an anti-tank guided missile, which was launched from a residential building in the nearby territory of the city [205];

– ***anti-helicopter mines*** (anti-helicopter mines are designed using an acoustic system, capable of detecting low-speed, low-flying targets such as helicopters at a distance of up to 1 km, after which they turn the warhead towards the target and, by scanning, with the help of a multi-frequency infrared sensor, determine the effective direction to the target and the moment of detonation directed action charge. Aiming is carried out in the upper hemisphere with the aim of damaging the helicopter's engines and support system. Mine installation can be carried out both manually and using ground and air means of delivery);

– ***creation of radar interference, EJ, interception of signals*** (hybrid methods of warfare involve the wide use of inexpensive commercial devices in the process of influencing the performance of military navigation and information communication systems, create the likelihood of interference in the control circuits and ensuring the conduct of military operations of AA, violation of its stability by setting trouble);

The enemy is actively using EJ, so helicopter crews have lost signals or interfered with the operation (shifting of the coordinate grid) of GPS navigation devices [208].

– ***passive detection*** (such systems as image intensifiers, night vision goggles, infrared devices, low-light cameras, acoustic or seismic detectors provide the ability to detect aircraft using uncontrolled and reflected radiation from airplanes and helicopters. Devices for recording this radiation are widely represented on the commercial market at a relatively low price. However, their use in combination with such types of weapons as MANPADS, small arms, large-caliber machine guns under conditions of limited visibility or at night significantly increases their combat capabilities);

– **the threat of aviation** (the hybrid nature of the modern Russian-Ukrainian war involves the wide use of the capabilities of aviation complexes, namely military and civilian aircraft and helicopters, commercial and industrial unmanned aerial systems (UASs) in order to hinder the activities of AA not only in the air but also during its presence on the ground, in the basing areas, by delivering and using weapons against ground targets. UASs pose additional unique threats. The key tasks of UASs are to conduct reconnaissance and observe the functioning of AA units and units on the ground and in the air, to install improvised explosive devices against stationary and stationary objects on the ground, such as taxiing helicopters, as well as creating hazards to aircraft in the areas of large airfield hubs and busy air traffic).

The enemy continues to use all available means to detect our aircraft in the air. Thus, along one of the directions, the enemy organized the joint use of A-50 long-range radar detection aircraft and Il-22 radio technical reconnaissance aircraft together with fighter aircraft, which increased the effectiveness of its air defence system in this direction, reduced the effectiveness of the use of MiG-29 type fighters as cover and false targets and led to the loss of helicopter crews, as they are less protected and less maneuverable than airplanes. As a result of such enemy actions, several AA crews were shot down [208];

– **cybernetic threat** (hybrid threats involve the enemy conducting cyber-attacks on unprotected or poorly protected networks and systems, which will be aimed at disrupting the control system and the system for ensuring the conduct of combat operations of the AA);

With the beginning of the full-scale armed aggression of the Russian Federation against Ukraine, the enemy began to actively send messages with disinformation in various messengers and social networks, which made it difficult to assess the situation in the areas of the execution of AA tasks, in addition, there were recorded attempts to hack the automated control systems of the type of KROPYVA and DELTA, used during application of AA [206];

– **directed energy** (specified energy threats include laser pointers, laser rangefinders, and laser receivers in precision missile (munition) guidance devices. Directed energy weapons are anti-personnel, anti-sensor, and other combat systems that use transmitting energy to disrupt a combat mission, damage, or destroying an aircraft or crew member. Directed energy weapon capabilities range from commercial handheld laser pointers to high energy/high frequency acoustic or radio frequency transmitters. The use of anti-sensor and combat laser systems is most likely for point defence of certain key positions, facilities, equipment. Possible bases for mounting energy weapons are vehicles, marine platforms, and fixed stationary positions, in the future – combat spacecraft).

CONCLUSIONS

Thus, after conducting an analysis of the use of the Ground Forces of the Russian Federation in the military phase of the hybrid war and their impact on the combat use of army aviation of the Ground Forces of the Ukrainian Armed Forces, it is possible to conclude that hybrid threats with

a full range of sectors of their distribution and struggle under complex conditions with dynamic tasks that are rapidly changing will dominate the future security environment. They can disrupt the execution of tasks by helicopter units (subunits) due to the prohibition of air traffic, disruption of the operation of refueling points, provision of aviation means of destruction, jump sites, airfields, and can also use the forces and means of the Defence Forces of Ukraine and their allies, weather and environmental restrictions, other factors affecting the use of navigation accuracy and information networks (systems), etc.

Using local populations, information operations, cyberattacks, deception, terrorist activity, decentralized small-unit operations, or more massive conventional operations to achieve a tactical advantage in forces and assets, the adversary continuously adapts its hybrid operations to achieve the desired effect at the tactical, operational, and strategic levels of warfare.

To ensure the achievement of victory in the Russian-Ukrainian war and the formation of the desired security environment in the future, the governing bodies using army aviation must understand the complexity and rapidity of the situation of modern operations (combat activities). Understanding the possibilities and limitations of future threats, the ability to effectively use army aviation under any conditions against a wide range of potential dangers is a necessary condition for successful and decisive actions of groups of troops (forces), joint actions of units (parts) of all components of the defence forces in the course of conducting combined operations.

2.4 PARTICIPATION OF AIR DEFENCE TROOPS OF THE GROUND FORCES IN COUNTERING ARMED AGGRESSION OF RUSSIA

Oleksandr Yanenko

ABSTRACT

The experience of the Russian-Ukrainian war shows that one of the main features of the conduct of hostilities (operations) is the wide use of various types of air attack by the opposing sides. Despite the presence of a large fleet of aviation equipment in the Russian Federation, the course of hostilities proved that the enemy during the entire period of large-scale armed aggression was not able to gain a strategic advantage in the entire airspace of Ukraine. This was prevented by the professional actions of the defenders of the sky of Ukraine, in particular, the military units and air defence units of the Ground Forces made a significant contribution.

KEYWORDS

Conduct of hostilities, air attack, fleet of aviation equipment, strategic advantage, defenders of the sky, military units, air defence units, Ground Forces, airspace control, counter-air operations.

2.4.1 ANALYSIS OF THE USE OF AVIATION AND UNMANNED AERIAL SYSTEMS OF THE RUSSIAN FEDERATION BY MILITARY UNITS AND UNITS OF THE GROUND FORCES

At the beginning of the invasion, the armed forces of the Russian Federation constantly provided air support for the combat operations of the ground group with attack aircraft and helicopters at all altitudes. In total, during the day of the operation, 4–8 Su-35 aircraft were deployed to strike targets in the lane of one operational group of troops and provide air support for the offensive actions of the enemy ground group. with the task of airspace control and missile strikes, Su-34 – 4–8 units with the task of searching, detecting, and destroying objects, Su-25 – 2–4 units with the task of striking predetermined targets, as well as A-50U – 1 unit, IL-22P – 2 units with the task of conducting radio and radio-technical intelligence, control, and guidance of aviation. In the defence zones of the military units, the air enemy carried out an average of 4–6 sorties per day [209].

Most of the means of air attack tried to use airborne weapons against groups of troops and units, without entering the zone of defeat of the air defence means of the Ground Forces (hereinafter – GF ADM), while the flights were carried out in the mode of radio silence at extremely low altitudes, using the topography of the area, along the riverbeds. The main directions of strikes by tactical aircraft were:

– in the Northern operational zone: Mozyr – Makariv; Mozyr – Chernihiv;

– in the Eastern operational zone: Belgorod – Kharkiv; Belgorod – Sloviansk; Rostov-on-Don – Mariupol;

– in the Southern operational zone: Dzhankoi – Kherson; Dzhankoi – Melitopol – Tokmak; Saki – Odesa.

In addition to tactical aviation, helicopters of the enemy's army aviation played a significant role in inflicting fire damage on the units and facilities of the Defence Forces of Ukraine, especially with regard to the task of striking units and facilities of troop groups near the front edge and in tactical depth. Combat helicopters were used mainly for fire support of battalions (battalion tactical groups) and operated in pairs outside the flight path of artillery shells.

The actions of combat helicopters in the lanes of military units and subunits were aimed at destroying armored vehicles, suppressing firepower in strongholds, artillery and anti-aircraft weapons in positions. During the strikes, combat helicopters fired at a depth of up to 3–5 km from the front edge from a height of up to 30 m.

There were cases of combat helicopters operating at a depth of 20–30 km from the contact line, while the columns of military units and units were struck during the advance, as well as at the deployment lines. Cases of attack by combat helicopters on convoys of civilian vehicles during evacuation were recorded several times.

In order to ensure the efficiency of solving tasks, to maximize the depth of hostilities, army aviation was located at prepared basing sites at a distance of up to 80 km from the contact line, and for temporary deployment or refueling and replenishment of ammunition at pre-equipped jump sites at a distance of 20–40 km from the contact line.

In addition, the enemy made attempts to use combat helicopters as part of airmobile tactical groups to ensure the landing of tactical airborne troops and subversive intelligence groups (squads) with the aim of capturing and holding the approach of the main forces of important state facilities and infrastructure facilities, but due to due to the skillful actions of the air defence units of the Ground Forces, almost all these attempts failed.

After stopping the advance of the ground enemy, disrupting its efforts to resume the offensive, and, apparently, having analyzed its losses in aviation, the air enemy directed the actions of attack aircraft and combat helicopters to suppress the positions of the front edge of the Defence Forces of Ukraine with unguided shells and rockets in the manner of strafe from a range of 6.5–8 km, which significantly reduced the effectiveness of its actions.

The Russian Federation attaches great importance to the use of Orlan-10, Layer-3, Eleron, Granat, and Tachyon unmanned aerial systems (UASs), constantly improving the forms and methods of their combat use. The main tasks of the UAS during operations on the units and subunits of the Defence Forces of Ukraine were: conducting aerial reconnaissance (primarily detection of control centers, artillery units and air defence equipment) and evaluating the results of the use of artillery, aircraft, cruise and ballistic missiles, to determine the need for subsequent strikes; implementation of fire and radio electronic suppression (RES) of air defence means; adjustment of

artillery fire and issuance of target designations to strike aircraft; carrying out sabotage from the air on storage facilities of material and technical means and important state facilities.

The scale of the use of UASs in the combat zone depends on the presence of UASs at the enemy, taking into account losses. For example, 5–7 UASs of various types (including up to 3–4 at the same time) could operate in the zone of responsibility of the brigades during the day.

The nature of the actions of enemy UASs is determined by the respective tasks they solve, namely:

– UAS aerial reconnaissance is conducted at a wide range of altitudes depending on the task, type of equipment, and weather conditions. UAS groups are used to increase the efficiency of reconnaissance. A group can consist of two or three UASs. For example, the first of them conducts reconnaissance from heights of 50–500 m, the second, when detecting the operation of the air defence system, sets up obstacles (electronic warfare UASs with a flight height of 1–2.5 km), the third is a repeater that transmits intelligence information to the control center of the UAS (altitude 4.5–5 km and more). More often, the group consists of two UASs – a scout and a repeater, the altitudes of which correspond to the above. In groups of two UASs, additional equipment can be installed on the scout to create active noise interference;

– UASs of the "multicopter" type are used to carry out sabotage from the air. In this case, sabotage groups launch them from small sites at a distance of up to 5 km from the object. After launch, the UAS is brought to an altitude of 300–500 m to survey the area and clarify the flight direction, and then switch to the flight mode according to the program to the sabotage object at a height of 100–200 m. During the approach to the object, course correction can be carried out UAS, dropping 1–2 incendiary explosive devices and rapid departure of the UAS to the launch site or to another site.

Starting from the beginning of September 2022, the Russian Federation received Iranian "kamikaze" drones of the "Shahed-136" type and began to actively use them in the war against Ukraine by units of the Defence Forces of Ukraine, striking military and other equipment and critical infrastructure objects. The marking applied to them shows that the Russian army uses these UASs under the code "Geran-2" [210].

To destroy military equipment, the enemy used "Shahed-136" mainly in pairs with a difference of a few seconds, and the accuracy of the damage testifies to the rather high training of UAS operators. At the same time, priority was given to single objects (tanks, armored fighting vehicles, artillery systems, cars). Hitting previously scouted targets occurred with almost 100 % probability.

The tactics of using "kamikaze drones" "Shahed-136" of the armed forces of the Russian Federation envisages the possibility of their massive use to damage military and civilian infrastructure objects in the depths of the territory, as well as to expose the positions of air defence units in order to further damage them.

The use of "kamikaze drones" "Shahed-136" by the armed forces of the Russian Federation was carried out during the day, but the most frequent and most effective is their use in the dark time of the day in order to complicate their visual detection, determine their number and reduce the effectiveness of the use of air defence means, which have an optical method of guidance and machine guns.

The flight path of "kamikaze drones" "Shahed-136" is straight on the marching area. The average speed observed during their combat use is 140–150 km/h (movement with V, km/h is also noted – 80, 70, 130, 150, 190, 200, 230, 400), and the flight height on the march area from 700 to 2000 m, in the area of the target it decreases to 200 m. Most of the flight routes of "kamikaze drones" "Shahed-136" are carried out from the south, along highways, riverbeds, and estuaries in order to mask the sound of UAS engines and the ability to fly at the minimum possible height (from 20 m) without obstacles of a natural and urban nature (power lines, high-rise buildings, etc.).

At the same time, in order to exert informational and psychological pressure on servicemen of the Ukrainian Armed Forces, the enemy is also actively distributing on the Internet video recordings of the successful destruction of weapons, military equipment, and personnel.

The advantages of the "Shahed-136" UAS are:

– the long flight range of "kamikaze drones" "Shahed-136" allows it to be used to hit stationary targets deep in the territory of Ukraine;

– the possibility of preparing for launch in the field by downloading the flight task using a portable computer (laptop, tablet).

The disadvantages of the "Shahed-136" UAS are:

– the tactics of application do not involve hitting moving targets;

– low accuracy of hitting targets due to "accumulation of errors" in determining the location of the device during flight with an increase in its range and wind speed (an inertial navigation system is used);

"Shahed-136" UASs of the "kamikaze" type are not equipped with means of communication, which makes it impossible to control them in real time during long-distance use, or to change their flight task;

– combat units are less powerful than Russian high-precision weapons. To hit one target, it is usually necessary to use several UASs;

– due to its effective scattering surface, large size and loud engine operation, it is a sufficiently visible object for detection (radar, visual, and acoustic), tracking and destruction by fire means.

The main ways of using UASs are [211]:

– bypassing the "kamikaze" type UASs of the defeat zones of air defence systems;

– delivery of strikes in real time (detection of the target, assignment of the strike, assessment of the results of the defeat to determine the need for a second strike);

– striking by a large number of kamikaze-type UASs.

2.4.2 PREDICTED VARIANTS OF RF APPLICATION OF UNMANNED AERIAL SYSTEMS

The tactics of using unmanned aerial systems in a conflict depends on the specific political and military situation, the strategic context, and a number of interdependent factors, such as the achieved technological level of development (for example, regarding the autonomy of the means

of action), as well as the nature of the countermeasures used by the enemy, and the effectiveness of operations usually is achieved by a combination of actions of various forces and means.

Based on the analysis of the use of unmanned aerial systems of the Russian Federation by military units and subunits of the Ground Forces, it is possible to predict that the unmanned aviation component of the armed forces of the Russian Federation may inevitably be integrated into a larger and more complex setup of combat systems.

In the event of a stoppage of the active phase and a hybrid conflict, Russia's goal may be to influence Ukraine, maintain tension through the flexible and non-standard use of unmanned aircraft systems:

– unmanned aerial systems are most suitable for regulating the state of military tension. And in the case of the absence of appropriate anti-aircraft systems in the Defence Forces of Ukraine, which are capable of detecting and destroying them in a specific operational zone, it may allow Russia to use them relatively freely to achieve this goal;

– unmanned aerial systems will be used to obtain situational awareness, to deceive the Defence Forces of Ukraine, to damage critical infrastructure, as well as to support the conduct of informational and psychological operations;

– the use of widely available commercial UASs will also make it possible to deny the involvement of Russian special services or military formations in such actions, as well as local, illegally created armed formations close to them. At the same time, the Russian Federation, as usual, will deny involvement in these actions and show its inability to oppose Russia's large-scale use of unmanned aerial systems in the airspace;

– the mass use of UASs for the purpose of harassing and intimidating the civilian population or servicemen of the Defence Forces of Ukraine, as well as for disrupting the operation of critical service infrastructure (for example, civil aviation, maritime transport, telecommunications, or energy supply) will create additional psychological stress in society.

During the continuation of open armed aggression:

– Russia's deployment of its combat unmanned aerial systems will take place mostly for the purpose of identifying and locating units and facilities of the Defence Forces of Ukraine, including in rear areas to ensure the advance of its troops;

– the mass use of UASs by the Russian Federation, which, due to their high degree of autonomy (the lack of need to maintain constant communication between the UAS and the command center) during the execution of tasks and cheapness, can make the measures of RES of the Defence Forces of Ukraine and the countermeasures of air defence assets ineffective;

– unmanned aerial systems can become an integral part of the Russian automated military control system, which will lead to a high degree of autonomy of the actions of the enemy's units during the execution of the assigned tasks.

The Defence Forces of Ukraine will be forced to constantly be distracted by unmanned systems, which will carry out single or mass rotations in the air in order to search for and destroy targets in designated operational areas. The ability to concentrate and disperse UASs can provide a dynamic opportunity to overload the capabilities of the air defence system of the Defence Forces of Ukraine

to monitor the air situation and conduct effective countermeasures; the presence of Russian UASs on the battlefield and in rear areas may become permanent. Unmanned systems can be used in units of all levels, and the information collected and processed by them will be communicated vertically and horizontally. This will allow maintaining the operational pace and using fire as optimally and efficiently as possible.

Regardless of how the situation will develop further, there is a possibility of increasing the effectiveness of the use of UASs to suppress the air defence system of the Defence Forces of Ukraine.

All this allows us to draw a conclusion about the further development of the strategy of conducting the Russian-Ukrainian war, in terms of increasing the use of UASs. In the future, a mass multi-stage and multi-echelon application of groups of light reconnaissance and reconnaissance-strike UASs, as well as "kamikaze UASs" is possible.

2.4.3 THE PARTICIPATION OF THE AIR DEFENCE FORCES OF THE GROUND FORCES IN COUNTERING RUSSIA'S ARMED AGGRESSION

The task of combating the air enemy in a combined military battle and operation is solved by conducting air defence of the troops.

Air defence troops of GF in the zone of military (combat) operations (conflict zone) perform the task of covering troops and objects from enemy air strikes in operations and in all types of combat operations, during regrouping (movement) and deployment of troops in place.

Anti-aircraft defence of troops is part of a combined military battle (operation). One of the conditions that ensures the achievement of the goal of a combined military battle (operation) is the prevention of inflicting such losses on the troops by airstrikes, as a result of which they will not be able to fulfill the assigned combat mission.

The main goal of the air defence forces of GF is to disrupt or repulse the enemy's air attack in order to maintain the combat capability of the troop groups and create favorable conditions for the operation.

The tasks of the air defence troops of GF are [212]:

– detection of the enemy's air attack means in the air, alerting the troops (forces) that are taking cover, issuing combat information about the actions of the air enemy at command posts (control posts) of troop groups and military units;

– covering of troop groups (forces) during their deployment and operations (combat operations), covering of rear and communications facilities;

– fight against enemy airborne troops in flight.

To perform the tasks of covering troops and objects from air strikes, an air defence system was created, which is a component of the defence structure and includes: a system of reconnaissance of the air enemy and notification of troops about it; anti-aircraft missile and artillery cover system; management system.

The system of reconnaissance of the air enemy is organized by the deployment of air observation posts, with overlapping areas of observation of the air enemy and various types of radar stations.

Alerting of units about means of air attack is carried out by the air situation display system "Viraj-Planchet", the workplaces of operators of which are deployed at command posts and control centers. Also, air surveillance posts and fire units have been organized to receive alerts from the "Viraj-Tablet" network on tablets with "Kropyva" software, with the possibility of manually entering air targets into the alert system if they are detected by the relevant air surveillance posts.

The system of anti-aircraft missile and artillery cover was created in echelons using mixed anti-aircraft missile and artillery groups:

– on the first line of the first defensive line of the brigades – the platoons are armed with portable anti-aircraft missile systems and anti-aircraft installations, which create a continuous area of anti-aircraft missile and artillery cover over the units of the first line with the main efforts being focused on the destruction of air targets at extremely low altitudes;

– on the second line of the first defensive line of the brigades – air defence units are armed with short-range anti-aircraft missile systems with a focus on the destruction of air targets at heights of up to 1000 m;

– on the second echelon of air defence, air defence units armed with short-range SAMS are located, for covering KP, artillery, and mobile air defence fire groups for timely transfer of efforts to the identified directions of actions of the air enemy, simulation of the creation of a continuous area of anti-aircraft missile cover, and in some areas, the concentration of the main efforts to cover command posts of military units, artillery units at altitudes from 1000 to 3000 m.

The main methods of conducting combat operations (anti-aircraft combat) of military units and air defence units of GF during the Russian-Ukrainian war were:

– conducting a battle as part of a grouping of air defence forces and means and conducting independent actions by an air defence unit of GF;

– focusing fire on the most important targets to increase the probability of hitting them;

– dispersion of fire to inflict maximum losses on the aerial enemy;

– independent destruction of the enemy by batteries, installations, and combat vehicles;

– construction of an atypical order of battle;

– the use of mobile fire groups, which include various types of anti-aircraft missile and anti-aircraft artillery complexes, the composition of which depends on the combat tasks and actions of the air enemy;

– actions of air defence units of the GF from the bases.

The management organization of military units and air defence units of GF is organized through closed communication channels. For the organization of communication, Starlink satellite communication and coded radio communication network can be widely used.

In connection with the fact that in most cases the on-board weapons of aircraft and combat helicopters were used without the entry of air attack means into the zone of defeat of anti-aircraft complexes, ambushes were the main way of combating attack aircraft and combat helicopters. But their

creation requires either the presence of a supply lane (gray zone) or the exit of small groups of anti-aircraft gunners beyond the front edge of our troops, which greatly complicates the execution of tasks.

At the same time, the course of hostilities proved the insufficient efficiency of the existing means of air defence of GF, which have an infrared homing head, in countering helicopters that have aviation on-board countermeasures complexes (type L-370 Vitebsk). Therefore, with the aim of guaranteed destruction of helicopters and airplanes, their shelling was carried out by concentrating the fire of air defence means of GF.

Effective firing at night was with MANPADS "Perun" and "Stinger DMS" in the presence of a combined sight. The use of air defence units at the armored base, which have a significantly limited zone of defeat (Strila-10, ZSU-23-4, Tunguska), was complicated by the open topography of the area, as well as by the altitude of the enemy's aircraft from 5000 m and above and the ranges from 7,000 to 15,000 m).

CONCLUSIONS

The experience of combating the air enemy during a large-scale invasion of Russian troops, despite the scale, shows that it can be effectively combated if the air defence system of the troops is created taking into account their strengths and weaknesses.

Firstly, taking into account the tactics of air attack means, namely the use of on-board weapons of aircraft and combat helicopters without the air attack means entering the zone of defeat of anti-aircraft systems, one of the main problematic issues regarding the construction of an anti-aircraft missile and artillery cover system is the inconsistency of tactical and technical characteristics means of air defence, which are in service with the air defence units of the combined military formations. Accordingly, the possible ways to solve this problematic issue are the development of the existing one and the creation (purchase) of the latest models of short-range anti-aircraft weapons to increase the defeat zone of the air defence systems of the Ground Forces.

Secondly, it is expedient to strive to build an air defence system based mainly on maneuverable forces and means. Changing the positions of anti-aircraft systems at least once every one or two hours will dramatically reduce the probability of their damage.

Thirdly, to carry out a sufficient amount of operational masking measures, which will not only make it possible to hide the objects of the strike, but also, in the case of an air strike, will significantly reduce the accuracy of aiming at the target or lead to a false one.

In general, it can be stated that the Russian Federation has a powerful aviation component. However, with any means of attack there is always a means of defence. The experience of the combat use of the enemy's air attack means and the analysis of the capabilities of the existing air defence systems show that the creation of an effective countermeasures system is possible under the conditions of an integrated approach to the creation of the air defence system of the troops and comprehensive provision of measures for its construction.

2.5 ANALYSIS OF THE FIGHT IN THE AIR AND INFORMATION DOMAINS BASED ON THE EXPERIENCE OF THE WAR IN UKRAINE

Olena Korshets, Volodymyr Horbenko

ABSTRACT

The Russian Federation, in its neo-imperial desire to reproduce the USSR and build a "Russian world", set itself the goal of weakening and decentralizing Ukraine. Bringing the pro-Russian leadership to power was supposed to disrupt the course towards European integration, deprive Ukraine of its actual sovereignty, and bring it back under its control using all possible spheres of influence. At the same time, Ukraine's active countermeasures with the use of military force starting in 2014 and until the start of a full-scale invasion in February 2022 did not allow the "Crimean" scenario to be fully implemented. In fact, the "hybrid war" has turned into a prolonged positional armed conflict between the two countries.

KEYWORDS

Air attack, air domain, dysfunctions of the state system, multi-domain operating environment, objects of critical infrastructure, operational environment of the Air Force, operations based on effects, Russian-Ukrainian war, strategic air operation.

2.5.1 ANALYSIS OF EXISTING CONCEPTS AND FACTORS DETERMINING THE CONDITIONS OF THE OPERATIONAL ENVIRONMENT OF THE AIR FORCE OF THE UKRAINIAN ARMED FORCES

The analysis of the research directions of military specialists of the Russian Federation in the field of military science, carried out even before the start of open aggression, shows clearly formed trends aimed at the gradual implementation of concepts: strategies of indirect actions, "soft power", technologies of "controlled chaos", "color revolutions" [213, 214].

It should be noted that these theories are based on the views of Sun Tzu and Clausewitz, who gave primary importance to the political aspects of war and the manipulation of state leadership, rather than the destruction of military power [215, 216].

Thus, victory over the enemy is achieved by the dysfunction of its state system without the complete destruction of its critical components — the political leadership of the country, vital resources, infrastructure, population, deployed groups of troops known as John Warden's "five rings" (**Fig. 2.5.1**).

According to this theory, in order to disrupt the functioning of the enemy state, it is necessary to strike certain critical nodes of the state system, the so-called "centers of gravity" and the connections between them.

If any "ring" is neutralized, the effective functioning of the entire system is disrupted. At the same time, the criticality of functioning is determined depending on the place of the "ring" in the state system.
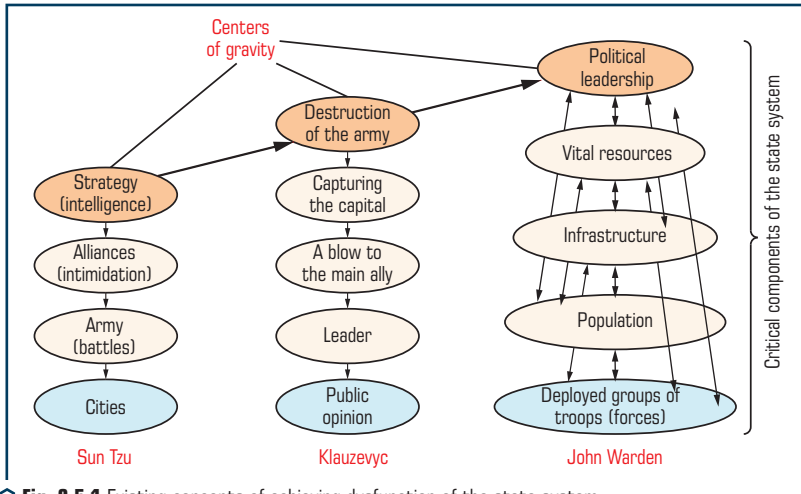
Fig. 2.5.1 Existing concepts of achieving dysfunction of the state system

The improved model of the modern operating environment based on J. Warden's theory is supplemented with one more ring – information that unites all the others (**Fig. 2.5.2**).
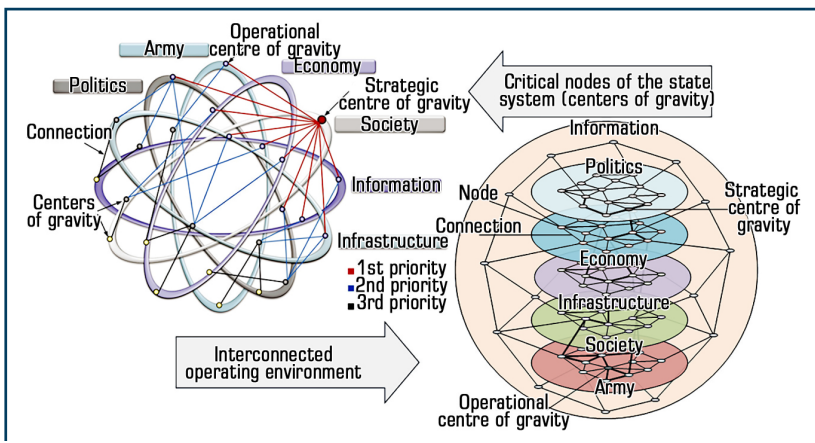
Fig. 2.5.2 An improved model of the modern operating environment for effects-based operations

Given the outlined trends, it was quite likely that the Russian Federation could choose the concept of "strategic paralysis" to implement the force scenario [213, 214].

The optimal actions for the implementation of this concept should have been air strikes on the main strategic targets throughout the country, primarily on the objects of the state structure, the economy, and not on the troops (forces).

This would avoid a direct clash of troops, achieve a political goal without ground invasion and occupation, and minimize possible losses, costs, and risks.

In combination with a powerful information campaign, a combined (physical, functional, and psychological) effect (operations based on effects) could be achieved – acceleration of the depletion of national resources, the emergence of a feeling of insecurity among the population, disappointment and dissatisfaction with the country's leadership, suppression of the will to resist.

Thus, conducting an operation based on effects due to a powerful complex purposeful informational and physical impact aimed at the "centers of gravity" and their destruction, can create chaos, and provoke public protest.

As the experience of local wars and armed conflicts shows, only the air force can ensure the achievement of effects by hitting the key "centers of gravity" throughout the territory of the enemy's country at the same time. Air and information space (sphere, domain) are the only ones that are not tied exclusively to the line of contact of the parties, the location of troops. The results of physical and mental actions (operations) in these domains have an impact not only on combatants but also on the civilian population of the country.

For a long time, Russia implemented its insidious neo-imperial policy against Ukraine in the form of a so-called "hybrid war", which was characterized by both the conduct of military operations and the use of a wide range of political, economic, energy, and information-propaganda measures.

Back in 2019, in published studies, we predicted that in the event of failure to achieve the required arrangement of political forces in Ukraine, the enemy would use force, namely, launch a massive integrated attack on Ukraine simultaneously from several directions with the use of regular troops with the aim of forming an arc under the control of the Russian Federation, which connects Transnistria and Crimea with its own territory.

However, the implementation of the specified scenario required significant resources and did not correspond to the real state of the economy of the Russian Federation and its foreign policy ambitions. The actions of the Russian Federation in the East of Ukraine and in the annexed Crimea, as well as in South Ossetia, Abkhazia, Nagorno-Karabakh, and Transnistria, were similar. However, in none of the conflicts created by the Russian Federation in the post-Soviet space, the final strategic goal was achieved. The number and duration of conflicts constantly increased, the costs of maintaining them increased, but this did not give the Russian Federation the expected results.

An analysis of the lessons of open aggression by Russia in 2014–2016 with the use of military force showed an increase in the losses of the aggressor and an increase in resistance as it advanced deeper into the territory of Ukraine. A further invasion would inevitably lead to an increase in the grouping of troops and an increase in the duration of the operation, and therefore the costs

of its implementation. During the active phase of the conflict, the Russian Federation managed to achieve only tactical successes in certain areas. Achieving operational success required the Russian Federation to increase the scale of aggression [213].

It was also predicted that under such conditions, it is possible to use two tools of hybrid warfare – this is influence in the information sphere by the forces and means of information warfare, and simultaneous influence in different physical spheres (domains).

It was assumed that a complex purposeful informational and physical impact on vital resources for the population, their destruction, can create chaos, and protest sentiments are directed at the country's leadership.

At the same time, the use of military force as an effective tool in order to speed up the effect of "controlled chaos" was quite probable.

At the same time, it was assumed that if the ultimate goal of the Russian Federation is to capture part of the territory of Ukraine, then the air phase of the armed conflict will be aimed at creating favorable conditions for a land (sea) invasion, i.e., the task of gaining air superiority and air support of troops. Conducting an offensive counter-air by the aggressor with the aim of gaining air superiority was supposed to destroy the air defence system and create favorable conditions for conducting the next strategic air operation, the purpose of which is the destruction of strategic and regional systems vital to the population.

It was emphasized that in order to quickly achieve an acceptable result of a strategic air operation, it was enough for the enemy to concentrate their efforts on only one city – the capital of the state. A similar strategy of achieving political goals with airstrikes on selected objects at a significant distance from the strategic "center of gravity" in combination with the minimization of accompanying losses could create in the public mind the idea of "non-involvement" of the Russian Federation in these events. A strategic air operation in combination with an information operation aimed at planting the narrative: "the government and the president are unable to find effective mechanisms to improve the situation", with the subsequent removal of the ruling power "from the game" were supposed to lead to an increase in popular discontent, and, as a result, to another revolution with a predicted and controlled change of power for the Russian Federation.

Today, it became possible to compare the results of air operations similar in scope and tasks, using the example of "Desert Storm" and the ongoing military campaign of the Russian Federation against Ukraine.

The results of the comparative analysis reveal that in the case of conducting an offensive counter-air at the first stage with the aim of gaining superiority in the air, following the example of "Desert Storm", it would make it possible to destroy the air defence system in 3–5 days (up to 450 sorties) due to the destruction of only airfields, aircraft on them, means of anti-aircraft missile troops and radio engineering troops of the Air Force of the Ukrainian Armed Forces (**Fig. 2.5.3**).

However, the Armed Forces of the Russian Federation, not having achieved the goal of the Offensive Counter-Air (OCA) – not having gained superiority in the air, simultaneously began the ground phase of the offensive operation. This approach scattered the forces and means of

the Russian Air Force on many different tasks in different directions and led to an increase in losses and, as a result, to a decrease in the effectiveness of the OCA as a whole. That, in turn, affected the effectiveness of the actions of the enemy's ground group.
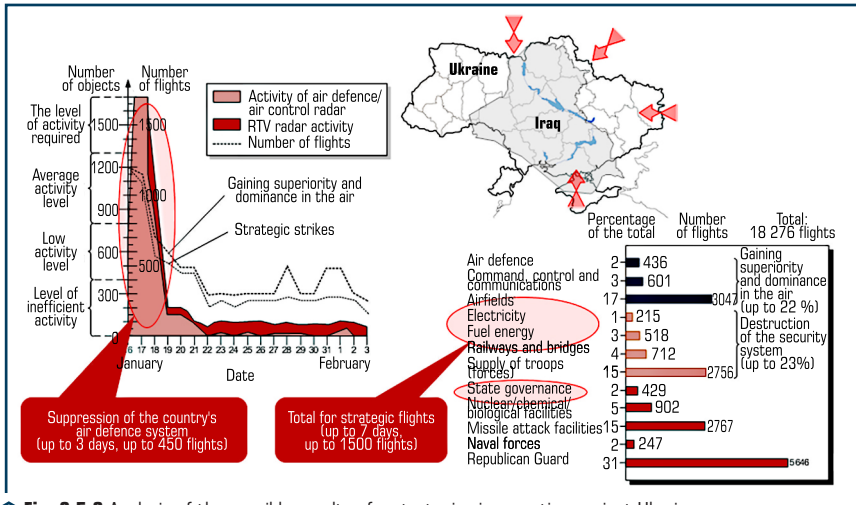
◯ Fig. 2.5.3 Analysis of the possible results of a strategic air operation against Ukraine

Gaining air superiority was supposed to create favorable conditions for conducting the next strategic air operation against Ukraine with the aim of destroying strategic and regional systems vital to the population: electricity supply, provision of fuel and lubricants, etc. Under such conditions, the enemy had the opportunity to perform the main tasks of the operation within 7–10 days, making up to 1,200–1,500 sorties.

2.5.2 THE RUSSIAN-UKRAINIAN WAR IN THE AIR AND INFORMATION DOMAINS AND SCENARIOS FOR THE USE OF THE AIR FORCE

From the first day of the full-scale Russian-Ukrainian war, the Russian Aerospace Forces tried to gain superiority (dominance) in the airspace of Ukraine. Around the state border, the enemy created an aviation group that numbered about 700 combat aircraft and rotorcraft. However, the Russian Federation, having spent most of its aviation and missile resources, having suffered significant losses in anti-aircraft battles with the Ukrainian Armed Forces, was forced to abandon the large-scale use of its aviation in the airspace of Ukraine. Today, only missiles and UASs are the only available tools for destroying objects in operational and strategic depth. However, their number is

constantly decreasing (they are means of one-time action), and the pace of restoration of these means will not make it possible to significantly influence the course and final outcome of the war.

From the first days of the so-called "special military operation", the aggressor carried out concentrated, group and single missile and air strikes against objects of military infrastructure, aircraft at airfields, positions, and locations of military units (subunits) of aviation, anti-aircraft missile and radio engineering and special troops of the Air Force (**Fig. 2.5.4**) [208].
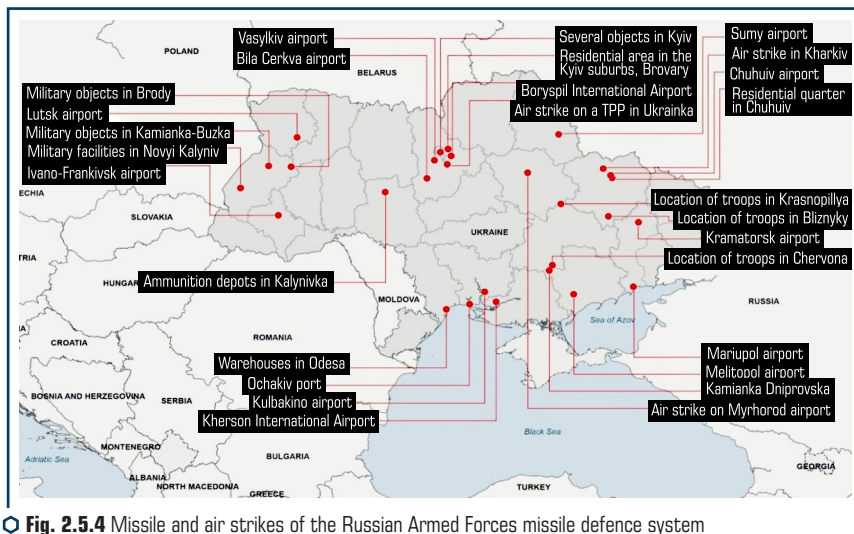
Fig. 2.5.4 Missile and air strikes of the Russian Armed Forces missile defence system on the territory of Ukraine, February 24, 2022 (data from open sources)

However, the desire for a quick victory, which was based on the principles of the Soviet military theory – the sudden offensive, the attack on a wide front, led to the dispersion of efforts and resources in many directions, which did not allow the aggressor to perform the main operational tasks of the first stage of the invasion.

In the first weeks of the invasion, Russian troops ignored the need to cover from the air the convoys of troops that were hit by air strikes. Despite the presence of Russian air command posts and long-range radar detection aircraft, the coordination of air forces' actions was entrusted to the command posts of military districts, and not to a single air operations control body.

Another aspect of the air operation was that the priority of the objectives of the air and space forces was determined primarily by the needs of the Ground Forces. With the beginning of the ground invasion, the Russian aviation moved from actions to seize air superiority (suppression of air defence) to the performance of air support tasks. The depth of aviation operations decreased and was tied to the directions of the Ground Forces' offensive. Thus, not only management, but also

the logic and priority of aviation goals was determined by the tactical tasks of the Ground Forces, due to the failure to implement the plans of the Air and Space Forces to establish airspace control.

The three-day war, as the enemy dreamed, did not happen. Despite regular shelling and strikes on objects and populated areas of Ukraine, the enemy has not achieved its strategic goal — the political leadership has not been destroyed, the defence forces are putting up strong resistance, critical infrastructure is being restored in time, chaos and despair are not observed.

The Air Forces of the Ukrainian Armed Forces, due to decisive, active, and anticipatory actions, managed not only to preserve the combat potential but also to disrupt the offensive counter-air of the enemy, achieve parity and maintain control of the airspace over most of the territory of Ukraine.

Within a few hours, it was possible to remove the main part of the aviation, anti-aircraft missile, radio engineering and special forces groups, as well as trained and experienced personnel; the combat potential of the Air Force remains effective and sufficiently powerful.

We have examples of heroic actions of our fighter pilots, which Ukrainians are inspired and proud of. However, heroism is not considered in the classical theory of military art. Heroic acts are the exception to the rule, the result of the flaws and miscalculations of those who plan and make decisions. Professionalism, serviceability of weapons and military equipments, timely logistical support, preparation, and perfect planning of operations (combat actions) are decisive for an effective response to the actions of a significantly superior enemy.

Already from the first days of the war, enemy pilots began to avoid direct clashes with our fighters. Two months after the start of the aggression, the enemy's combat aircraft refused to operate in the airspace controlled by the Ukrainian Armed Forces.

The enemy lost time and opportunities to launch intensive massive missile and air strikes. Conducting simultaneous air and ground offensive operations did not allow the grouping of the Russian Aerospace Forces to massively use air attack means to achieve the main goal — gaining superiority in the air. The enemy was forced to withdraw from many directions, to abandon the declared strategic military and political goals. The war has entered the phase of prolonged confrontation to attrition. The enemy air strikes are currently focused on the successive destruction of critical infrastructure facilities, components of the population's life support system.

Strategic aviation missile carriers of the Aerospace Forces Tu-22M3, Tu-95MS, and Tu-160 from the first days of the war served as air platforms for launching cruise missiles Kh-22/Kh-32, Kh-55/Kh-555, and Kh-101 for destruction of objects deep in the territory of Ukraine. The use of the Kinzhal missile complex by the MiG-31K airplane has been recorded. However, some of the operational and sometimes strategic fire missions were performed by Iskander land-based missile complexes and modernized S-300 SAMS.

While the effectiveness of air defences to intercept manned aircraft, cruise missiles and drones increased steadily throughout the war, ballistic missiles proved extremely difficult targets to intercept. The problem of creating an effective anti-missile defence is relevant to this day.

Despite the fact that the war mainly takes place on land, many military-political centers, industrial and energy facilities need reliable air defence.

Anti-aircraft missile forces and fighter aircraft are important components of the air defence system. Another important factor in increasing the effectiveness of air defence was the widespread use of portable anti-aircraft missile systems in all units of the defence forces. They became important as an element of counteraction to Russian dominance in the air at low altitudes, enhancing the capabilities of anti-aircraft missile systems.

Today, the aggressor continues to use air attack means (MAA), mainly air, sea and land-based missile means from the waters of the Black and Caspian seas, the temporarily occupied territories of Ukraine, the territory of the Russian Federation and Belarus. The volumes and intensity of use of modern air-launched cruise missiles have significantly decreased. The enemy is actively using air-guided missiles of the Kh-59M type. It began to use P-800 "Onyx" anti-ship missiles and even outdated Soviet-made Kh-22 missiles, which it has in significant quantities, to destroy ground objects. Anti-aircraft guided missiles, S-300, are also used to strike ground targets, resulting in significant collateral damage and casualties among the civilian population.

Russia continues to strike critical infrastructure facilities (**Fig. 2.5.5**). More than 80 attacks have already been carried out on Ukrainian electricity facilities, 51 of them in October alone. The Russian Federation struck the most attacks in the Dnipropetrovsk region (8), Lviv region (6), Vinnytsia region (5), Sumy region (4), and Kharkiv region (4), and in Kyiv (4).
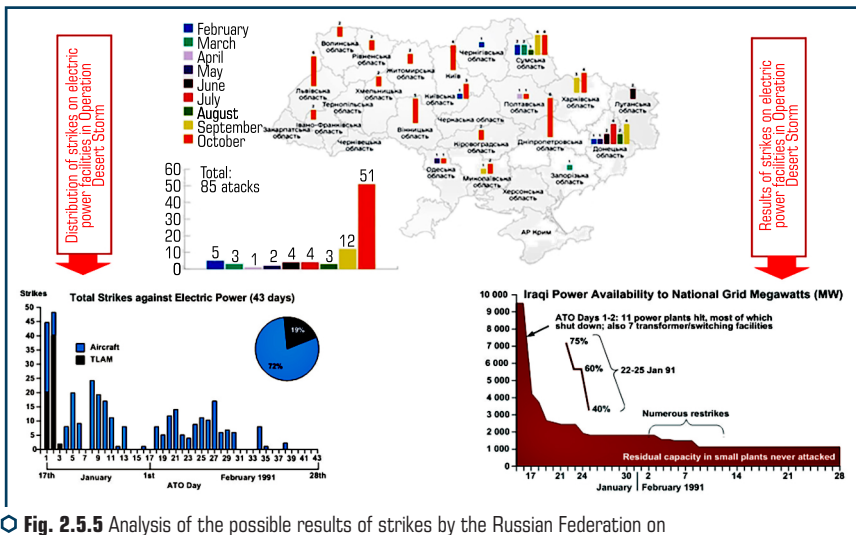
Fig. 2.5.5 Analysis of the possible results of strikes by the Russian Federation on electricity facilities of Ukraine (data from open sources)

This strategy is aimed at destroying Ukrainians by creating conditions unsuitable for life, suppressing resistance, resistance to aggression, and the will to win.

In the winter period, the Russian leadership deliberately seeks to deprive the population of Ukraine of critically needed resources for life support – water, electricity, and heat – by increasing air strikes.

At the same time, from the beginning of the full-scale invasion, the official rhetoric of the Russian Federation was that it would only hit military facilities. Today, the information campaign is openly aimed at the complete destruction of the country's energy system, which proves the close mutual connection of the information and air operational environment (domains).

The lessons of combat in the information and air space testify that the means of combat in the air (aircraft, anti-aircraft missile complexes, radar stations, control centers) were and will be the most valuable not only from the point of view of the price of each sample (unit) of weapons and military equipment but also the duration of their production (restoration), as well as taking into account the duration of crew training (combat calculations). The information (propaganda) resonance from the loss of an aircraft is the greatest and can only be compared with the loss of a warship. At the same time, each of the parties plays an antagonistic game for superiority in the air. And this game takes place not only on the physical but also on the mental and informational levels.

A vivid example of such a struggle is the so-called "Ghost of Kyiv", as a collective image of the defenders of the sky of Ukraine, indomitable spirit, inevitable losses of the enemy.

In the game on the information field, false messages about the real losses of both sides are widely used, using a wide range of all possible media information methods and means.

We can single out a new aspect of the information campaign: "information itch" – an artificially created and in every way supported desire to be the first to cover news, any details, details, circumstances of events. Thanks to this, the enemy has the opportunity to receive data on the results of strikes almost online and to quickly correct them.

Today, the use of the Ukrainian Armed Forces in the conditions of a defined operational environment is based on research of both existing forms of actions and methods of application in joint operations, the theory and practice of which have been studied and worked out in detail, as well as on the lessons of the ongoing Russian-Ukrainian war [70, 218, 219].

The analysis of the use of the Ukrainian Armed Forces grouping during repelling aggression in the airspace shows that the main tasks in the operational environment have not changed. Air operations and combat actions remain the main forms of actions of AF group. However, in the early stages of the development of the military conflict, when there is no or limited armed conflict, the use of these forms did not meet the tasks of the defence forces in implementing a complex of strategic deterrence measures. This period was characterized by an increase in the scale of information warfare and the use of special operations forces. Under such conditions, in order to prevent the resolution of a military conflict, or its development into larger-scale military actions, the units of the Ukrainian Armed Forces were supposed to use a unified plan together with other components of the defence forces.

In the case of military conflicts of varying intensity, as part of the implementation of a complex of strategic deterrence measures, "new" or "unconventional" forms of actions by air force groups were proposed, such as actions to support the level of potential threat to the enemy, special aviation actions, etc.

When the enemy conducted an offensive counter-air, the main tasks of the Ukrainian Armed Forces were:

– prevention of damage by enemy aircraft to critical objects, air defence systems, forces and means of the Air Force (AF);

– repelling means of air attack, disrupting the enemy's OCA and achieving parity in the air strikes;

– conduct of air defence in areas of responsibility and in designated directions;

– implementation of cover and aviation support for the actions of groups of troops (forces);

– restoration of the air defence system in threatening directions.

The specified tasks, with the beginning of the repulsion of armed aggression, were carried out by the Ukrainian Armed Forces in full and continue to be carried out.

Our analysis and the lessons of the war show that the "new" forms of action are, in fact, only a compilation of already existing methods of application and tasks. However, each form of action of AF group is characterized by certain qualification features, namely, the level and scope of the tasks and the capabilities (capabilities) of the military formations for their implementation. The choice of certain forms of actions of AF groups is influenced by a fuzzy set of factors, the main of which are:

– the scale of the armed conflict (spatial scale of actions, composition of forces and means involved, projected duration of actions);

– purpose, goals, and objectives of the grouping of AF in the operational environment;

– probable scenarios of application of the grouping of AF.

The methods of application of AF grouping are determined for specific forms of action and depend exclusively on the purpose, objectives, and tasks of the operation, the composition, state of forces and means of the created groups, the conditions of the existing situation. Their content is the sequence of execution of operational tasks, use of forces and means, implementation of maneuver.

Thus, the forms of actions and methods of application of the Air Force in the operational environment depend on:

– the method of creating a group of AF (operational construction, order of regrouping and comprehensive support);

– capabilities (capabilities) of the created air force group, readiness level of deployed military units (units, crews, services, etc.), available time for training;

– the availability and possibilities of using the combat-ready reserve;

– provision of spare bases (airfields), prepared positions;

– effectiveness of cooperation with partners (allies).

Under such conditions, the purpose of the use of air defence systems of the Ukrainian Armed Forces in the modern operational environment is the effective solution of information and power tasks, which will not allow the enemy to gain and maintain superiority in the air.

Our analysis of the war of the Russian Federation against Ukraine made it possible to predict probable scenarios of the use of the Air Force in the future operational environment, which is a combination of forms of actions in various domains – on land, at sea, in the air, in space; in informational, mental, and cybernetic space. This approach makes it possible to compensate for

the insufficient capabilities of groups of troops (forces) in a separate domain (or several domains) and to achieve the overall success of actions in the operational environment, which confirm the lessons of the ongoing war.

Therefore, already today, AF of the Ukrainian Armed Forces should be ready for use in multi-domain operations (battles) (**Fig. 2.5.6**) [70, 218, 219].
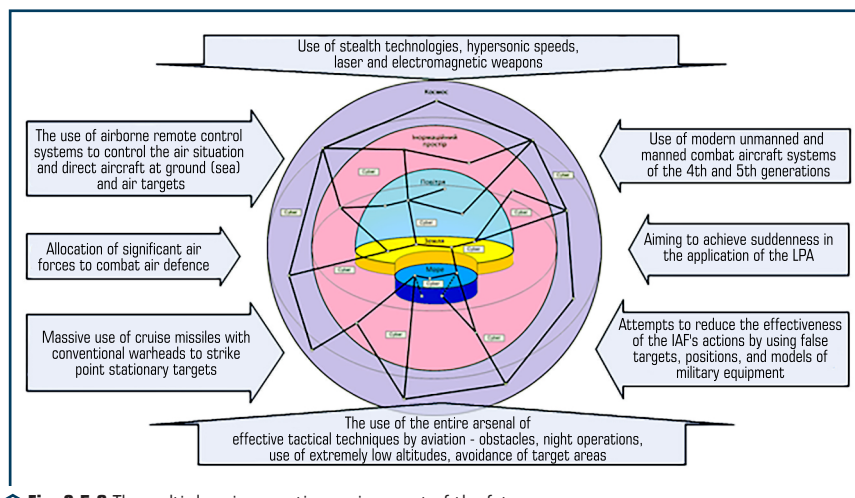
○ **Fig. 2.5.6** The multi-domain operating environment of the future

Under such conditions, they will perform tasks in new forms of action with a jointly defined final goal, simultaneously or sequentially in different domains, where grouping of troops (forces) of different types is only one of the subsystems of a complex system.

At the same time, the main trends that will affect the use of the Air Force of the Ukrainian Armed Forces in the future multi-domain operational environment are:

– the use by aviation of the entire arsenal of effective tactical techniques, the sudden use of anti-aircraft missiles, the use of extremely low altitudes, bypassing the zones of damage of anti-aircraft weapons, actions at night and under the cover of radio-electronic interference;

– the use of aviation long-range radar detection and control systems to control the air situation and guide aircraft to land (sea) and air targets;

– the use of modern unmanned and manned combat aviation complexes of the 4th and 5th generations;

– use of "stealth" technologies, hypersonic speeds, laser, and electromagnetic weapons;

– massive use of high-precision guided weapons, cruise missiles with conventional combat equipment for strikes against point stationary objects, including ballistic missiles of various ranges;

– the allocation of significant aviation forces to combat air defence;

– the desire to reduce the effectiveness of the actions of means of air attack due to the use of false targets, positions, mock-ups of military equipment, etc.

Armed conflict in the operational environment of the Air Force will be determined by the development and application of the latest technologies, the increase in the effectiveness of weapons and the widespread use of high-precision weapons. Under such conditions, operations and combat actions can take place without a ground component, missile and air strikes will acquire a "point" character, which in turn will make it possible to reduce their number, to carry out fire damage to the entire depth of the operational formation of the enemy's troops and the country's territory, to reduce the overall duration of operations [218, 219].

Under such conditions, the main directions of increasing the capabilities of the AF of the Ukrainian Armed Forces should be: the organization of centralized planning and management of the use of heterogeneous and multi-departmental forces and air defence means; increasing the volume of joint tasks to combat air targets operating at extremely low altitudes; concentration of complex fire damage on reducing the combat potential of the grouping of the enemy's air attack means and their logistical support system; performance of tasks under the conditions of constant threat of sabotage and intelligence actions of the enemy [220].

The purpose of the use of the Air Force in the future operational environment will be the effective performance of tasks that will not allow the enemy to gain and maintain superiority in the air.

At the same time, the probable scenario of the development of a military conflict should provide for such forms of actions and methods of application of the Air Force that would be adequate to the predicted actions of the enemy and determine the required capabilities of the Air Force groups in a separate domain or in several domains at the same time.

CONCLUSIONS

Thus, the actions of the Russian Aerospace Forces in Ukraine are characterized by a concentration on long-range missile strikes on Ukrainian military and civilian objects in order to weaken the ability to wage a war of liberation, suppress the resistance of the Ukrainian population, and punish the country for its chosen pro-Western course of development. For many years, the Russian Federation has been developing C4ISR-type systems to ensure the high intensity of missile and air strikes.

These systems were integrated into the all-Russian systems of "reconnaissance strike complexes", which were designed for the coordinated use of high-precision long-range weapons in integration with intelligence data in real time. To identify targets in a complex operational environment, the Russian military widely uses integrated aerial platforms, including unmanned aerial systems.

In the early stages of the war, the Russian Federation aimed to suppress Ukrainian air defences at a strategic level, striking with ballistic and cruise missiles throughout the country, both from the airspace of the Russian Federation and Belarus. Subsequently, the Russian Aerospace Forces

expanded the list of targets to include Ukrainian military infrastructure, facilities for the supply of weapons and military equipment from partner countries, the energy and fuel sectors, elements of transport communications and even civilian facilities. The Russian Federation used more than 1,100 missiles in the first 21 days of the war and 2,125 missiles in the first 68 days of the war, and this process is still ongoing.

However, the aggressor faced numerous difficulties in carrying out its air campaign.

First, the Russian Aerospace Forces failed to achieve air superiority because of the air defence capabilities of Ukraine, which are constantly increasing thanks to the help of Western countries. This became the main obstacle to the actions of the Russian aviation over most of the territory of Ukraine. Therefore, strikes by cruise missiles and strike UASs became the main means of action of the Russian Aerospace Forces.

Secondly, the Russian Aerospace Forces are constantly faced with logistical problems, including a shortage of long-range precision munitions. Already three weeks into the war, the Russian Aerospace Forces were experiencing a shortage of high-precision munitions, such as laser- and satellite-guided bombs.

This forced the Russians to use an increasing number of unguided missiles, as well as missile forces and long-range ground artillery. The use of ballistic missiles of the "Iskander" complex was also limited due to the consumption of a large part of their reserves intended for the war with NATO. In addition, hundreds of Russian UASs such as Orlan, Eleron, and Outpost were lost over the battlefield. These problems have been exacerbated by the inability of Russia's domestic military industry to rapidly ramp up production of guided missiles and UASs and growing sanctions pressure.

In the long term, Russia may face a supply chain problem due to US and other Western sanctions. These problems are likely to affect Russia's short- and long-term missile attack capabilities, forcing it to seek alternative markets.

Taken together, these factors have undermined Moscow's attempt to establish air dominance over Ukraine, deliver effective precision strikes, and support Russian Ground Forces on the battlefield.

Thus, the confrontation in the air-information sphere was, is, and will be decisive for achieving the goals of operations and the war as a whole. Implementation of the concepts of "combat operations in a single information space" and "multi-domain operation (battle)" will allow the Ukrainian Armed Forces to conduct joint actions at a qualitatively new level as part of united groups of diverse, disparate forces.

Taking into account the results of the analysis of the use of air defence systems in the current and future operational environment, the country's defence capabilities should be further strengthened in all spheres, primarily in information and air. The intra-troop integration of separate systems of intelligence, management, and defeat of air defence systems into a complex system will ensure prompt response to changes in the situation, adaptation (change or clarification) of air defence tasks with anticipation of the enemy in decision-making and actions, and in the future its integration into a single system of types of the Ukrainian Armed Forces and other countries-partners.

Thus, the analysis of the experience of the use of the Air Force of the Ukrainian Armed Forces in the ongoing Russian-Ukrainian war proves the need to improve the existing structure of military formations and military command bodies, the use of modern weapons and military equipment, and the search for effective ways of their use.

The purpose of using the air defence systems of the Ukrainian Armed Forces remains the effective solution of information and power tasks, which will not allow the enemy to gain and maintain superiority in the air. As the experience of repulsing aggression from the air shows, we have every reason to get rid of the innate inferiority complex. Our goal should be more ambitious – to gain and maintain superiority (dominance) in the airspace of Ukraine. Therefore, the main forms of actions of the Air Force are and will remain air operations and combat operations. The Air Force of the Ukrainian Armed Forces should continue to be used according to a unified plan together with other components of the security and defence sector.

2.6 ANALYSIS OF THE EMPLOYMENT OF RUSSIAN TASK FORCES IN WARFARE IN THE BLACK AND AZOV SEAS: BACKGROUND, EXPERIENCE, PROSPECTS, AND COUNTER STRATEGY

Stepan Yakymiak

ABSTRACT

Achieving success in the fight against the enemy and the liberation of all Ukrainian territories temporarily occupied by the Russian Federation, the restoration of Ukraine's control over its own territorial sea and exclusive (maritime) economic zone cannot be ensured without a constant analysis of the war experience gained and the implementation of a rational countermeasure strategy. Therefore, an important scientific and practical task is the constant analysis of the experience of the use of forces, in particular at sea, the study of prerequisites, the determination of prospects and relevant strategies, which determines the relevance of our research.

It should be noted that in the course of the study, the requirements of the key guiding documents (standards) regarding the use of the Naval Forces of the Ukrainian Armed Forces [221] (hereinafter referred to as the Navy of the Ukrainian Armed Forces) and their development [222], directions for the development of the maritime strategy of the state [223] should be taken into account, ensuring the maritime security of EU [224] and NATO [225], views on the prospects for the development of the forces' capabilities [226], as well as conclusions and lessons from the experience of using forces at sea under the conditions of an anti-terrorist operation (ATO) [227], operations of the United Forces (OUF) and during the full-scale invasion of the Russian Federation into Ukraine [228].

KEYWORDS

Warfare at sea, naval forces, lesson learned, maritime robotic complexes, war risks area at sea, strategy at sea.

2.6.1 PRECONDITIONS OF WARFARE AT SEA

The full-scale military invasion of the Russian Federation against Ukraine, including at sea, was determined by a number of factors and prerequisites. The main social, cultural-civilizational, geopolitical prerequisites include the following [228]:

— significant differences in the main social values and views on the way of organizing life;

— the European vector of Ukraine's movement and the desire to develop its own sovereign and independent state;

— historical and modern contradictions between the Russian Federation and Ukraine regarding the ownership of certain areas of the land territory, the territorial sea and water areas of the Azov Sea, in particular the Azov Sea, the definition of borders, including at sea.

The most influential of the military-political, military-strategic, and operational prerequisites were [229]:

— capture by Russia in 2014 and keeping under its own control the territory of Crimea, certain districts of Donetsk and Luhansk regions;

— continuation of the Russian Federation's actions in 2014–2021 regarding the constant escalation of the conflict, conducting hybrid actions, in particular, an information campaign, political, economic, diplomatic, and other actions to weaken Ukraine's defence capabilities;

— the Russian Federation's build-up and deployment of interdepartmental groups of forces (armies) around Ukraine, the implementation of intimidation and the realization of the threat of using military force;

— a significant increase in the strike and amphibious capabilities of the Russian Forces in the Azov and Black Seas [230].

In the end, the above prerequisites and the corresponding decisions of the top military-political leadership of the Russian Federation led to the beginning of a full-scale military invasion of Ukraine by the enemy on February 24, 2022, in particular to the beginning of active military operations at sea.

On the eve of the full-scale invasion of the Russian Federation in the Black and Azov Seas, the following general conditions developed.

In order to ensure the intentions of the Russian Federation to establish full control over Ukraine and expand its influence in the Mediterranean region and the Middle East, it provided for the priority development of the forces and troops of the Southern Military District (USK "South") and operationally subordinated military associations, associations Aerospace Forces, created interspecies groups, in particular in Crimea, the Black Sea Fleet, and the Caspian Flotilla. First of all, in comparison with other fleets, efforts were focused on the development of offensive capabilities. During the period from 2015 to 2021, the striking capabilities of the Black Sea Fleet increased several times. Thus, the composition of the fleet during this period was increased due to the adoption of new warships with shock weapons (the Kalibr missile complex, surface, and underwater modifications with a range of up to 1,500 km at ground targets with conventional, non-nuclear weapons) [231]:

— 3 frigates of project 11356R (8 PU RK each);

— 6 large submarines of project 636.3 (4 KR each);

— 4 small missile ships of project 21631 (8 PU RK each);

— 4 patrol ships of project 22160 (with the possibility of modular installation of a missile complex, 8 PU RK each).

The total conditional missile volley of missiles of the "Caliber" complex amounted to 80 missiles (together with patrol ships – 112).

The Black Sea Fleet also included coastal missile complexes "Bastion" and "Bal".

In addition, the capabilities of the Black Sea Fleet increased due to the following measures: formation of 22 AK; increasing the capabilities of naval aviation; acceptance into the composition of the Black Sea Fleet of small combat boats (landing boats, amphibious assault boats, patrol boats), etc.

Due to the constant involvement in tasks, in particular long sea campaigns, the execution of combat tasks during the wars in Georgia (in 2008), in Syria (since 2011), during the armed aggression against Ukraine since 2014, the level of combat training of military units and subunits of the Russian Armed Forces in the region has significantly increased. The enemy's strike forces, in particular the surface ships and submarines of the Black Sea Fleet, gained combat experience in conducting joint strikes against ground targets.

On the eve of a large-scale military invasion of Ukraine by the enemy under the guise of exercises, a grouping of forces was deployed in the region, coordination of their actions was carried out. In order to strengthen the landing capabilities of the Black Sea Fleet, 6 amphibious ships from other fleets of the Russian Navy entered the Black Sea before the start of the military invasion, in particular: LLS project (pro.) 11711 – 1 unit, LLS pro. 775 – 2 units from Northern Fleet; LLS pro. 775 (775M) – 3 units from Baltic Fleet.

Before the beginning of the military invasion by the enemy, measures were taken to complete the creation of an inter-fleet (integrated) grouping of heterogeneous fleet forces for operations in the Black and Azov Seas, in particular, a grouping of heterogeneous strike forces, including operational missile groups of surface ships and submarines with guided missile weapons (GMW) long-range, marine amphibious forces grouping, aviation grouping, coastal troops grouping, special purpose forces grouping for conducting sabotage and reconnaissance actions at sea, support forces grouping.

An appropriate control system was created with the deployment of the forward (ship) control center of the group of heterogeneous forces of the fleet on the Moscow naval base, control centers of tactical groups and groups of surface forces – on ships, other forces – at control centers deployed on the territory of Crimea and in Novorossiysk.

As a conclusion, it should be noted that the implementation of the above measures allowed the Russian Federation to create favorable conditions for the start of a full-scale military invasion on February 24, 2022, including the conduct of military operations at sea.

At the time of the beginning of the full-scale invasion, the Russian Federation deployed a group of heterogeneous forces in the northwestern part of the Black Sea, with a total composition of up to 10 ships with GMW, up to 14 amphibious assault ships and boats, up to 3 anti-mine ships, up to 10 support vessels, up to two fighter-bombers on duty in the air above the sea at the border of Cape Tarkhankut – Zmiinyi Island, units of the coastal missile complex "Bastion" on the northern coast of Cape Tarkhankut.

Most of the ships of the enemy forces were at sea. As expected, the enemy could use amphibious ships to transport and disembark marine landing forces of up to 3 BTGr from the Black Sea, Baltic, and Northern fleets. The area of operations was determined by the enemy, which was declared unsafe for navigation by all merchant ships.

2.6.2 ANALYSIS OF THE PURPOSE, TASKS, OPERATIONAL STRUCTURE AND ACTIONS OF THE RUSSIAN FORCES AT SEA IN THE INITIAL PERIOD

Analysis of the enemy's actions in the Black Sea maritime operational zone and the conclusions from the assessment of the situation testified that the enemy acted at sea with the aim [231] of seizing and maintaining dominance in the northwestern part of the Black Sea; blocking the actions of a group of disparate forces and seaports of Ukraine in this area; conducting demonstration actions at sea; creation of favorable conditions for the landing of marine landings.

In the Azov operational zone, the purpose of the enemy's actions was to assist the troops carrying out offensive operations from the Crimea in the direction of Berdiansk and from the east in the direction of Mariupol and carry out sea transportation in their interests.

In order to achieve the goal of operations at sea, already from the first day of hostilities, the enemy with a determined composition of forces performed the following tasks:

– maintaining a permanent presence in the northwestern part of the Black Sea, maneuvering ships in coastal areas, approaching certain areas of the coast and provoking our forces to open fire;

– conducting reconnaissance by ships, manned aircraft, and UASs in the sea and over the coast;

– conducting demonstration actions by surface forces, including the partial deployment of naval strike groups and amphibious forces, their maneuvering on the approaches to likely landing areas;

– isolation of the area of hostilities from the southern direction, implementation of control over the Zmiinyi Island and control in coastal areas;

– transfer of subversive intelligence groups to our coast by sea and air;

– striking by ships and aircraft against military and civilian objects, in particular bridges, ports, control centers, base points, civilian vessels, warships at sea and military and civilian objects in the entire depth of the territory of Ukraine.

On the basis of the analysis of the actions of the enemy forces at sea, starting from February 24, 2024, the operational construction of the grouping of the enemy forces (troops) for actions in the Black Sea was determined – the grouping of heterogeneous shock and marine landing forces as a component of the interspecies interagency integrated grouping of troops (forces) for actions in the Crimea and the Black and Azov Seas, subordinate to the operational-strategic command "South" of the Southern Military District. The operational structure of the enemy's disparate strike and naval amphibious forces group consisted of disparate strike force groups (surface ships and submarines with strike missile weapons, coastal missile units); groups of disparate naval amphibious forces (landing ships, boats and marine units); aviation group (parts of the naval aviation of the Black Sea Fleet and additional forces from the Aerospace Forces of the Russian Armed Forces); groups of intelligence and special purpose forces (reconnaissance boats and special boats, special purpose units); grouping of support forces (search and rescue support vessels, technical, rear and

navigation support vessels); the reserve of forces, which probably included other forces from the composition of the Black Sea Fleet, which are not included in the above groupings of the forces of the fleet.

Forces from the Novorossiysk Naval Base, in particular, brigade 184 of ships protecting the water area, as well as specially designated forces from the Black Sea Fleet and the Caspian Flotilla, were involved in conducting operations in the Azov Sea. To ensure the protection of the Crimean Bridge, the use of the specially created in 2018 interdepartmental grouping of forces with the involvement of a certain composition of ships, boats of the Black Sea Fleet and the Coast Guard of the Border Service of the FSB of the Russian Federation continued [232].

In the initial period of operations in the Black Sea, the enemy's tasks were carried out in the following order.

In order to capture and maintain dominance at sea, to implement a permanent presence and block the activity of forces at the base points and ports of Chornomorsk, Odesa, and Pivdenny, deployment to the coast of Odesa and Mykolaiv regions and maneuvering at a distance no closer than 25–30 km from the coast of the detachment of enemy warships was carried out. For the demonstration actions of the landing of marine landings, amphibious detachments consisting of up to 7 ships were deployed and maneuvered. Groups of special purpose boats were used for reconnaissance and landing of special purpose groups in the areas of Koblevo – Rybakivka, Karoli-no-Bugaz – Hrybivka (probably), the mouth of the Danube. Also deployed and maneuvered in the reconnaissance area near Zmiinyi Island to conduct reconnaissance was ship of project 18280. To isolate the area of hostilities, control over Zmiinyi Island, detachment of warships consisting of a missile cruiser and several patrol ships and support vessels was used for surveillance and control in coastal areas.

Attacks on warships (boats, supply ships) were carried out in the shortest possible time, with the detection of the departure of ships from base points or on sea crossings with the use of ship artillery weapons and anti-aircraft missiles, as well as aviation missiles of fighter-bombers Su-30, Su-34, which were on duty in the air above the sea at the border of Cape Tarkhankut – Zmiinyi Island. Attacks on military and civilian objects, in particular on control centers, base points, bridges, ports, and civilian ships, were carried out by the enemy according to intelligence, in particular with the use of anti-aircraft missiles, manned aircraft, and with the use of shock missile weapons of ships, planes, coastal missiles divisions from duty areas, respectively, at sea, in the air, and on the coast. Attacks on military and civilian objects in the entire depth of the territory of Ukraine were carried out by enemy surface ships and submarines using cruise missiles of the Kalibr complex in cooperation with the forces of long-range bomber aviation of the Russian Air Force.

The enemy's disparate assault and naval amphibious forces operated with the support of manned aviation, UASs, and other forces. Enemy aviation, including unmanned ones, carried out reconnaissance flights along the Black Sea coast in the area of Zatoka, Odesa, Pivdenny, Ochakiv in order to expose the anti-aircraft and anti-aircraft defence of the troops (forces).

2.6.3 STAGES OF WARFARE AT SEA IN 2022-2023 AND THEIR MAIN CONTENT

The analysis of already conducted military operations at sea allowed us to carry out their periodization. Significant changes in the nature of actions that affected the achievement of the goals and objectives of the use of forces by the parties were taken as the main classification feature for the periodization of military operations at sea. Taking into account the mentioned approach, the following main stages of military operations at sea have been determined as of November 22, 2022 [233]:

1st stage (24.02 – 01.04.2022) – conquest and maintenance of sea dominance by the enemy, the initial period of actions;

2nd stage (02.04 – 21.07.2022) – disruption of the enemy's dominance at sea and the withdrawal of its main forces to the coast of Crimea;

3rd stage (22.07 – 28.10.2022) – the actions of the parties in terms of concluding and implementing agreements on the export of grain by sea;

4th stage (29.10.2022 – present time) – the enemy loses control over the waters in the area where the forces are based.

Let us consider the combat episodes in each of the stages, which characterize the peculiarities of actions at sea, their impact on the situation and consequences [234].

As you know, during the actions to strengthen mine barriers to ensure the anti-landing defence of the coast, the diving vessel of the Ukrainian fleet "Pochaiv" with only small arms on board was forced to engage in battle with the frigate "Makarov". The frigate, chasing the ship, successively struck with artillery and anti-aircraft missiles. However, as a result of the joint coordinated actions of the anti-landing defence forces and the diving vessel, the frigate was driven out of the coastal waters under the blows of coastal artillery. This example demonstrates the effectiveness of the system of anti-landing actions and, in particular, the created mine-missile-artillery positions, which combined the influence of sea and engineering mines, artillery, anti-ship complexes, other forces and means. From that time on, the enemy became more cautious and did not approach too close to the coast.

One of the most influential factors in actions at sea has become maritime robotic systems, in particular, Turkish and Ukrainian unmanned aerial systems, other new types of weapons, and the Ukrainian coastal missile complex "Neptun". Timely detection and recognition of enemy surface ships at distances of up to several hundred kilometers and high-precision damage using a low-altitude trajectory and methods of protection against enemy EW ship complexes determined combat success in operations at sea. Also extremely important factors were the fighting spirit of the personnel, their indomitability and efficiency; round-the-clock, practically scientific, analysis of enemy actions, acquired experience, situation and simulation of enemy actions; effective interspecies management system using modern information systems; the persistence of rocket sailors and representatives of manufacturing enterprises for the adjustment of weapons; the validity of the decisions and the demonstrated professional wisdom of the commanders in the implementation of a rational naval strategy built on asymmetric approaches in the fight against a repeatedly superior enemy!

It should be noted that the enemy also made its "contribution". It is likely that the unsatisfactory level of information about the real capabilities of the Ukrainian fleet did not allow the enemy to correctly assess the situation and protect the ships from the attacks of drones and anti-ship missiles. For a long time, enemy ships maneuvered within the range of our weapons.

After the April 2 strike on the Essen frigate and its refusal to fulfill its mission and hurriedly return to Sevastopol, the enemy limited the maneuvering areas of its ships no closer than 80 kilometers from the Ukrainian coast. At the same time, as is known, the MC "Moskva" continued to maneuver in the area between the gas production platforms of the Odesa gas field and Zmiinyi Island since the beginning of the enemy's invasion of Ukraine. From the experience of the Russian-Georgian armed conflict in the Black Sea in 2008, it was known that the command post of the commander of the force group operating at sea and the forward element of the control post (ship control post) of the commander of the Black Sea Fleet are traditionally deployed on the cruiser. In addition, being close to the outer border of the "war risk area" announced by Russia on February 24, the cruiser could simultaneously perform tasks related to the isolation of this area.

Under such conditions, despite the priority of defeating landing ships with marine landing troops on board, it became logical to consider the issue of inflicting damage on the cruiser.

When determining the priority of targets, an important aspect was determining the level of the cruiser's ability to repel a missile strike, in particular [234]:

— the technical readiness of weapons and ship systems, including the system of fighting for the survivability of the ship;

— the degree of modernization of radar and anti-aircraft missile weapons, including the ability of complexes to timely detect and destroy air targets at extremely low altitudes;

— the level of combat training of the crew, including the professional skills of young conscripts and training in combat calculations of the ship;

— the crew has experience of participating in military operations in Georgia, Syria.

The analysis of this combination of factors and the importance of destroying the ship, which is the flagship of the fleet and has the name of the capital of the state, as an element of moral and psychological influence, determined the priority of this goal among all others.

The first attempt to strike the cruiser on April 4, 2022, was unsuccessful due to it occupying a favorable position behind the gas production platforms. However, this experience and analysis of the cruiser's maneuvering was used to create a favorable environment and launch a successful missile attack on it on April 13, 2022, which caused a fire, an ammunition explosion, and sank the cruiser within a day, despite the actions of other relief ships.

2.6.4 ANALYSIS OF THE CONSEQUENCES OF SUCCESSFUL STRIKES ON LARGE RUSSIAN SHIPS AT SEA

The destruction of the cruiser led to a number of significant consequences that decisively affected the change in the situation at sea, in particular:

– tactical consequences:

– the destruction of the cruiser required its replacement with another warship to perform the tasks of isolating the area, covering the garrison of Zmiinyi Island, and ensuring the control of forces at sea;

– a significant decrease in the overall combat capabilities of the enemy group operating at sea;

– a negative impact on the morale and psychological state of the crews of warships and other forces of the group that performed tasks in the area of hostilities;

– operational consequences:

– the need to make changes in the distribution of tasks by forces in operations, in the operational construction and organization of the management of the grouping of enemy forces at sea;

– shifting the areas of operations of the forces to the east, in fact to the coastal areas of Crimea, primarily with the aim of securing ships of the main classes from entering the zone of damage of the Neptune missile complex;

– strategic consequences:

– the enemy's refusal to use most of the area of military operations and, in fact, the disruption of the enemy's dominance at sea;

– a significant reduction in the probability of a sea landing and, accordingly, a threat to Ukraine regarding the emergence of a new dangerous strategic direction in the war;

– a significant negative impact on the moral and psychological state of the population and the military and political leadership of Russia.

In the course of further actions at sea, an important aspect became the conclusion of agreements regarding the export of grain from Ukraine from three Ukrainian ports – Odesa, Chornomorsk, Pivdenny. Over 3 million tons of agricultural products were exported in July–September. In fact, this agreement became another case of hybrid actions of the Russian Federation, which in this way resolved the issue of strengthening its authority among poor African countries and increasing its own foreign exchange earnings, that is, financing the war, thanks to the export of stolen grain and fertilizers by sea. Under the terms of the agreements on the export of grain, the nature of operations at sea has changed significantly, because the "grain corridor" defined at sea and the constant movement of ships have limited the enemy's ability to conduct active operations at sea. The enemy continued provocations and selective strikes against forces in the areas of their bases.

Significant changes in the nature of actions at sea took place on October 29, 2022, when a complex attack by unmanned aircraft and unmanned surface systems was successfully carried out against enemy forces at the base point of Sevastopol and on the approaches to it [235]. As you know, according to experts, at least two warships of the Russian Federation were damaged. At the same time, the Ministry of Defence of the Russian Federation recognized the damage of only one warship – the sea minesweeper 266M "I. Golubets". Thus, despite the fact that the enemy's combat losses were probably few, the main consequence of the attack of the robotic systems was the enemy's loss of control over its own water areas in the main base of the Black Sea Fleet in the city of Sevastopol and on the approaches to it.

The analysis of the actions at sea proved that the Russian Federation did not achieve the specified goals and was forced to change the tasks and the order of operations of the forces of the groups at sea as a result of the actions of the groups of the Defence Forces of Ukraine that were involved in the actions at sea, primarily groups of heterogeneous forces of the Navy.

Separately, it should be noted that the overall superiority of the Russian forces at sea did not ensure the achievement of the specified goals. Analysis of the balance of forces showed that as of February 24, the enemy had a decisive advantage in main forces: one to twelve. Moreover, the enemy had complete dominance in the air, which is a critical condition for creating conditions for sea dominance in general. Round-the-clock duty in the air of at least two or more fighter-bombers at the border of Cape Tarkhankut – Zmiinyi Island provided constant surveillance, quick detection and destruction of surface targets.

The achieved result of the use of groups of the Defence Forces of Ukraine in the Black and Azov seas is confirmed, first of all, by the combat losses suffered by the enemy in actions at sea. So, as of June 2022, the enemy suffered the following losses in surface forces in the Black and Azov seas:

– the missile cruiser pro. 1164 "Moskva", the flagship of the fleet, was destroyed (April 13–14, 2022, Black Sea, displacement – 11,280 tons);

– the large amphibious ship of project 1171 "Saratov" was destroyed (March 24, 2022, Azov Sea, displacement – 4,650 tons);

– destroyed project support vessel 22870 "V. Beh" with air defence systems and other weapons (June 17, 2022, Black Sea, displacement – 1,670 tons);

– 5 combat boats with weapons and assault units were destroyed (May 2–7, 2022, Black Sea, total displacement – 200 tons);

– the frigate of project 11356R "Essen" was disabled (for 10 days) (April 2, 2022, Black Sea);

– the large amphibious ship "Novocherkassk" was damaged (March 24, 2022, Azov Sea);

– the large amphibious ship "Ts. Kunikov" was damaged (March 24, 2022, Azov Sea).

– sea minesweeper project 266M "I. Golubets" was damaged (October 29, 2022, Black Sea) [236].

Thus, the total number of enemy forces destroyed – 2 large warships (missile cruiser, large amphibious ship), 5 warships, 1 support vessel; damaged (with partial loss of combat capability and a certain term) – 3 large warships (two large amphibious ships, a frigate).

As a result of the inflicted combat losses, the combat capabilities of the enemy forces were significantly reduced.

Thus, as a result of the losses incurred in the capabilities of the enemy's strike forces, in particular the strike groups of ships carrying anti-ship missiles (SMS), the Black Sea Fleet decreased by 36 % (**Fig. 2.6.1**).

The ability of the enemy's amphibious forces to transport and land amphibious assaults was also significantly reduced. Thus, after the attack on the large amphibious ships in the port of Berdiansk, taking into account only irreversible losses, the specified capabilities decreased by 11 %, and taking into account the temporary disabling of two damaged ships – by 26 % (**Fig. 2.6.2**).
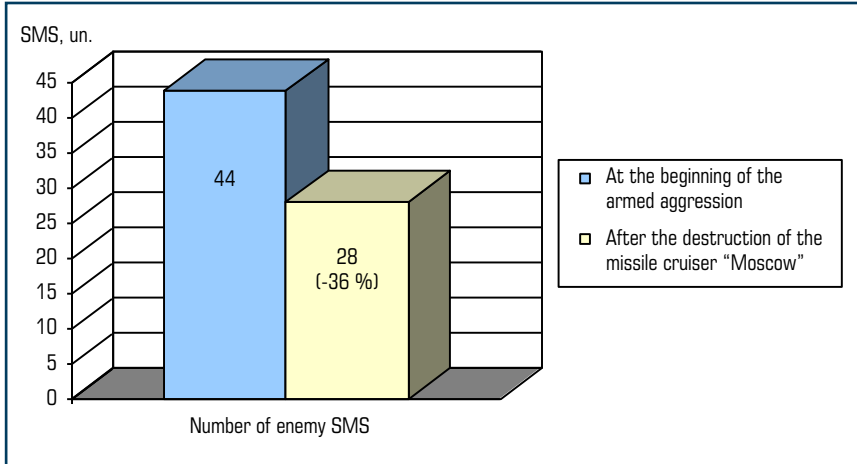
○ **Fig. 2.6.1** Reduction of the enemy's striking capabilities due to combat losses in actions at sea
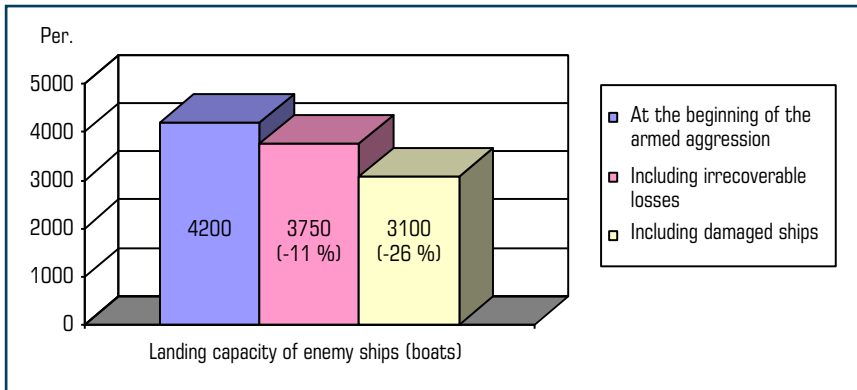
○ **Fig. 2.6.2** Reduction of the landing capabilities of the enemy as a result of combat losses in actions at sea

Summarizing the analysis of the results of actions at sea, it should be noted that the strategy chosen by the Russian Federation for actions at sea turned out to be ineffective because the goals defined by it were not achieved.

Only one of the tasks was successfully carried out by the Russian Federation at sea – striking by operational missile groups and individual surface ships and submarines carrying long-range cruise missiles of the Kalibr missile complex against important state and military objects in the entire depth of the state's territory.

These forces were deployed to strike the areas of firing positions that, in the interest of ensuring the safety of missile carriers, were located near the coast of Crimea, which made it impossible to defeat them by the available forces of the heterogeneous forces of the Navy of the Defence Forces of Ukraine. The fight against these forces requires longer-range missile systems and the use of other forces, in particular units of the Special Operations Forces, bomber (missile-carrying) aviation, and attack naval robotic systems. Under the condition of acquiring such capabilities, the Defence Forces of Ukraine will be able to neutralize the actions of the Kalibr cruise missile carriers and ensure the implementation of a more successful strategy of operations at sea.

The following conclusions and proposals were determined from the analysis. During the first stage of military operations, the groups of the Defence Forces of Ukraine, which were involved in operations at sea, primarily the groups of heterogeneous forces of the Naval Forces, under the conditions of the prevailing forces of the enemy, managed to fulfill the assigned tasks, which made it possible to achieve the strategic goal of preventing the invasion of the enemy from the sea direction and significant complication for Ukraine of the military-strategic situation in the south of the country.

During the second phase of naval operations, which began with a partial disruption and continued with a complete disruption of the enemy's dominance at sea, there was a complete change in the nature of operations at sea. The Defence Forces of Ukraine, in particular the grouping of heterogeneous forces of the Naval Forces, not only ensured the achievement of the strategic goal of preventing the landing of marine landings and the invasion of the enemy from the sea direction but also seized the initiative in actions at sea and forced the enemy to refuse to conduct active actions within the "war risks area" declared by it.

The main conclusions from the experience of military operations include the following:

– the successful conduct of military operations by the Navy group of forces (troops) in the northwestern part of the Black Sea operational zone disrupted the enemy's domination of the sea and limited the areas of combat maneuvering of its strike forces to the limits of the coastal waters around Crimea;

– due to the effective organization of the defence of the sea coast, in particular with the creation and use of mine-missile-artillery positions (with a combination of sea mine barriers, anti-aircraft missile strikes, coastal artillery fire, engineering barriers), as well as due to the disruption of the enemy's offensive in the Mykolaiv direction and domination of the sea, it was not allowed to conduct a sea landing operation and a sharp change in the strategic situation in the war;

– the incomplete creation (at the beginning of the military invasion) of a group of heterogeneous forces of the Navy for conducting combat operations in the Azov operational zone, the absence of a military command body of the Navy to manage this group, as well as general problematic issues of preparing and conducting the defence of the Azov coast, did not allow the completion of defence tasks states from this sea direction in this zone;

– the absence of long-range weapons in one's forces (troops) does not make it possible to pre-emptively destroy the enemy's sea-based cruise missile carriers and significantly reduce its

negative impact on the general military-strategic and operational situation, avoid damage to important military, defence-industrial, energy, infrastructural and other objects to the entire depth of the state territory and victims among the civilian population.

Based on the analysis of actions at sea and the conclusions defined above, it is possible to formulate the following proposals regarding the conduct of further military operations at sea:

— for effective warfare at sea against a superior enemy, operational (combat) capabilities based on modern maritime robotic systems, in particular unmanned aircraft, unmanned surface and underwater systems, and appropriate methods of action at sea should be developed;

— in order to ensure the success of the strategy in actions at sea in the presence of the enemy's carriers of sea-based cruise missiles, it is necessary to have appropriate means of neutralizing them, first of all, long-range anti-ship missile complexes of sea, shore and air bases, as well as to use other forces and means, in particular bomber (missile-carrying) aviation, naval robotic systems, units of the Special Operations Forces.

The implementation of the above proposals will ensure superiority over the enemy at sea at a specified time and place, reduce combat losses, and achieve strategic goals and objectives in future operations at sea.

2.6.5 PROSPECTS OF WARFARE AT SEA

Let's consider the predicted variants of military operations of the Russian Armed Forces at sea. It should be noted that in order to forecast the future environment, it is necessary to take into account the results of a retrospective analysis of the development of the situation in the past, in particular the hybrid actions of the Russian Federation and the activities of foreign states in the Black Sea region [237], existing approaches to ensuring the national security of Ukraine at sea [238], views on the development of the situation in the region of domestic specialists [239], foreign experts [240], leading scientific centers of the world or so-called "think tanks" [241]. The content of options for the actions of interdepartmental (integrated) groups of Russian forces in the Black and Azov Seas in the next period of military operations of the Russian Federation against Ukraine will depend on a number of factors, the main of which are:

— the general nature of the actions of the parties in the war in the current period, the state and position of the forces of the parties, in particular those operating in the coastal areas;

— nature, results, and consequences of previous actions at sea;

— the existing capabilities of the groups of forces of the Russian Federation involved in actions at sea, and the possibilities of their expansion, in particular, the involvement of additional human and material resources, primarily naval weapons and military equipment;

— the role of actions at sea and, in particular, groups of forces of the Russian Federation involved in actions in maritime areas (zones), in the plan of further military operations of the Russian Federation against Ukraine;

– the state, capabilities and chosen option of conducting the operation of the Defence Forces of Ukraine to liberate the occupied territories;

– the general level of national stability of Ukraine, in particular the moral and psychological stability of the population, the stability of the energy system and other elements of critical infrastructure;

– the state of opposition to the Russian Federation by foreign states in the economic, political, diplomatic, informational, and other spheres of activity, the state of material, technical, and financial support of Ukraine by foreign partner states and international organizations, the timeliness of the provision and volumes of the necessary foreign weapons and military equipment that will be transferred to strengthen the capabilities of Ukraine, etc.

As of the end of November 2022, the general nature of the actions of the parties in the war was determined by Ukraine seizing the initiative in the war, the continuation of active offensive actions in the eastern direction to liberate the occupied parts of the Luhansk and Donetsk regions and in the southern direction to liberate the occupied parts of the Mykolaiv, Kherson, and Zaporizhzhia regions, which are seaside. Trying to counterattack in Bakhmut and other nearby directions and retreating from Kherson to the left bank of the Dnieper, the enemy is trying to restrain the advance of Ukrainian troops and prevent the further liberation of the territories of Ukraine occupied by them. The indicated actions of the parties determine the increase in the importance of the actions of groups of forces at sea in terms of promoting the offensive (defence) of the troops operating in the coastal areas.

The actions of the Defence Forces of Ukraine regarding the liberation of the Kinburn Peninsula, which are ongoing, will have a significant impact on accelerating the flanking of the enemy's troop groups defending on the left bank of the Dnieper and covering the land approaches to the occupied Crimea. If the offensive of the Defence Forces groups in the Kherson region on the left bank of the Dnieper is successful, the enemy will be forced to retreat in the direction of Crimea, as well as Melitopol and Berdiansk, and the conditions for the defence of Crimea will significantly worsen for it. This nature of actions on land causes changes in the tasks of the use of groups of forces of the parties operating at sea.

In the future, if the enemy retreats from the territory of Zaporizhzhia and southern Donetsk regions, there will be a possibility of access of the Defence Forces of Ukraine to the Azov Sea, creating conditions for conducting an operation to liberate Crimea and restore control over Ukrainian waters in the Black and Azov Seas. The specified actions on land will require changes in the tasks of the groups of the Defence Forces of Ukraine operating at sea, in particular, they will involve focusing efforts on creating favorable conditions for the actions of troops that will advance in the coastal areas, including neutralizing the actions of the enemy forces group operating at sea, the main shock and other forces of the Black Sea Fleet, involved forces from the Caspian Flotilla, Baltic and Northern Fleets. In case they carry out the evacuation by sea of enemy troops and materiel from Crimea to the continental part of the Russian Federation, in particular to Novorossiysk, the task of disrupting this evacuation and destroying the enemy's forces on sea communications will arise.

The conditions for conducting actions at sea will depend significantly on other factors as well. If the opposition to the Russian Federation and the support of Ukraine from foreign and international countries in the economic, political, diplomatic, informational, military, financial, and other spheres will continue at a sufficient level and the level of stability of Ukraine will not decrease, but will increase, then the general conditions of military operations, in particular at sea, will be favorable for the successful achievement of the strategic goal of actions of the Defence Forces of Ukraine regarding the liberation of the occupied territories of the state.

At the same time, negative factors that can complicate the conditions of operations at sea are:

– non-reduction or increase in the rate of providing enemy forces operating in the Black and Azov Seas with missiles, ammunition, other material and human resources;

– leaving at the existing level or increasing the capabilities of the Russian Federation to maintain dominance in the air over the waters of the Black and Azov Seas;

– the Russian Federation's use of blackmail practices regarding the use of tactical nuclear weapons;

– increasing the enemy's capabilities to counter the latest means of reconnaissance and destruction used by the Defence Forces of Ukraine, in particular, unmanned aircraft and unmanned surface and underwater complexes;

– improvement of the quality and efficiency of the enemy's activity in terms of adjusting (adapting) its methods of action and the general strategy in relation to the actions of Ukraine regarding the liberation of the occupied territories, in particular, conducting military operations on land, in the air, and at sea.

According to the results of the analysis of the above-mentioned conditions and taking into account the trends and forecasts of the development of the general situation, the following two variants of the enemy's actions at sea should be considered the most probable:

Option 1 – "strategy of restoration and maintenance of dominance at sea".

Option 2 – "strategy of minimizing losses in operations at sea".

According to Option 1 ("the strategy of restoration and maintenance of supremacy at sea") under the conditions under which the Russian Federation will try to fulfill at least the minimum tasks of the so-called "special military operation" and the territory of Ukraine, in particular regarding the establishment of full control over the territory of the Luhansk and Donetsk regions (under favorable conditions – Kherson and Zaporizhzhia regions), the aim of the enemy's actions at sea will be:

– restoration of full control over the areas where the forces are based in the Black Sea and the creation of an advantage in the sea areas from which missile strikes from carrier ships of the "Caliber" missile complex are launched against important state and military objects throughout the territory of Ukraine;

– restoration and maintenance of dominance in the entire area of operations at sea previously declared by the Russian Federation (north-western part of the Black Sea) and assistance to the troops operating in the south of Ukraine in the areas adjacent to the Black and Azov Seas.

According to Option 2 ("strategy of minimizing losses in actions at sea"), under conditions in which the offensive of the Defence Forces of Ukraine will continue with the successive liberation

of the occupied parts of the Kherson and Zaporizhzhia regions in the south of the state, and in the future – an operation to liberate Crimea and restore control over Ukrainian waters in the Black and Azov Seas, the aim of the enemy's actions at sea will be:

– assistance to the troops operating in the south of Ukraine in the areas adjacent to the Black and Azov Seas, to maintain the southern areas of the Kherson, Zaporizhzhia, and Donetsk regions and to prevent the restoration of control by the Defence Forces of Ukraine over Crimea;

– ensuring the sea evacuation of troops (forces) and material resources from the Crimea to the ports of the Russian Federation in the eastern part of the Black Sea (in the Krasnodar Territory on the Caucasus coast).

– Under both options, the continuation of the participation of the Black Sea Force forces in the offensive counter-air of launching missile strikes from surface and underwater carrier ships of the Kalibr missile complex on important state and military objects throughout the territory of Ukraine will be assumed.

Also, according to both variants of actions, the use of forces at sea will be constantly supplemented (combined) with elements of hybrid actions, in particular measures of an economic, political, diplomatic, informational, and other nature. Russia's hybrid use of the Black Sea Grain Initiative agreements to influence Ukraine's position will continue.

Given the low level of probability of the implementation of the first option of the enemy's actions, we will consider in more detail Option 2. The main tasks for achieving the specified goals of the enemy's actions under Option 2 will be as follows: in the Black Sea – conducting reconnaissance in certain areas of the northwestern part of the Black Sea; maintaining supremacy in the air over the sea and striking the forces of the grouping of heterogeneous forces of the Defence Forces of Ukraine, in particular warships, vessels at base points and at sea; remote blocking (with missile weapons within the firing range) of the actions of a group of heterogeneous forces of the Defence Forces of Ukraine in the areas of their bases and at sea; launching missile strikes from the sea and the coast against the troops of the Defence Forces of Ukraine, important objects of critical infrastructure and artillery support of the troops conducting offensive (defensive) actions in the coastal areas, on the coast of the estuaries; ensuring the withdrawal by sea and the return of subversive intelligence groups; carrying out the landing of tactical sea landings, sea transportation of troops and material resources to the ports of Crimea and in the opposite direction – carrying out the evacuation from them of the wounded, the bodies of the dead, damaged military equipment and property; in the Azov Sea – maintaining a favorable operational regime in certain areas, primarily in the coastal areas near Mariupol and Berdiansk, on the approaches to the Kerch Strait; protection of the main sea communications, in particular the removal of stolen Ukrainian grain and rolled metal from the ports of Mariupol, Berdiansk; carrying out sea transportation of troops and material resources to the ports of Mariupol, Berdiansk and in the opposite direction – carrying out the evacuation from them of the wounded, bodies of the dead, damaged military equipment and property.

For conducting reconnaissance, fighter-bombers will be used from the position of rotation in the air over the sea at the border between Cape Tarkhankut and Zmiinyi Island or on other frontiers,

depending on the situation, using anti-aircraft missiles, space reconnaissance, reconnaissance ships from positions in reconnaissance areas along the coast of Crimea or from base points. Groups of special purpose boats – up to 3 units – will be used to conduct reconnaissance and special operations. each consisting of up to 2 LCM pro. 02510 "BK-16", up to 3 pka pro. 03160 "Raptor" with groups of SpP – up to 30 people. In order to maintain dominance in the air over the sea and strike against the forces of a group of heterogeneous forces of the Defence Forces of Ukraine, in particular warships, vessels at base points and at sea, fighter-bombers will be used from the position of duty in the air over the sea at the border between Cape Tarkhankut and Zmiinyi Island or on other frontiers, depending on the situation, shock BpAK. For remote blocking (with missile weapons within the firing range) of the actions of groups of heterogeneous forces of the Defence Forces of Ukraine in the areas of their bases and at sea, launching missile strikes from the sea and the coast against the forces of the Defence Forces of Ukraine, important objects of critical infrastructure, providing artillery support of the troops, which will conduct offensive (defensive) actions in the coastal areas, on the coast of the estuaries, the enemy's naval strike groups using missile and artillery weapons, coastal missile divisions will be used. For the landing of tactical sea landings, the sea transportation of troops and material resources to the ports of Crimea and in the reverse direction – the evacuation from them of the wounded, the bodies of the dead, damaged military equipment and property will be used by ship and boat landing groups, groups of support vessels, warships and ships that can transport additional material means.

To carry out tasks in the Sea of Azov to maintain a favorable operational regime in designated areas, primarily in the coastal areas near Mariupol and Berdiansk, on the approaches to the Kerch Strait, to carry out sea transportation of troops and material resources to the ports of Mariupol, Berdiansk and in the reverse direction – to carry out to evacuate from them the wounded, the bodies of the dead, damaged military equipment and property, naval search and strike groups, minesweeper ships, ship and boat amphibious landing groups, groups of support vessels, warships and vessels that can transport additional material resources will be used. To strike at military and civilian objects, in particular at control centers, base points, bridges, ports, and civilian vessels, the strike missile weapons of ships, aircraft, coastal missile divisions from duty areas (areas of operations), strike BpAK and fighter and bomber aircraft. To carry out the task of striking military and civilian objects in the entire depth of the territory of Ukraine, the Kalibr cruise missiles will be used by operational missile groups of surface ships and submarines from the areas south of the Crimean Peninsula and areas located along the Caucasus the coast of the territory of the Russian Federation in cooperation with the forces of the long-range bomber aviation of the Russian Air Force.

In order to fulfill the above-mentioned tasks, the grouping of heterogeneous shock and naval amphibious forces of the Russian Federation in the Black and Azov Seas will probably have the following operational structure:

– in the direction of concentrating the main efforts (restraining the actions of our forces and assisting the Russian troops operating on the coasts of the seas and estuaries) the main group will act – a group of heterogeneous strike forces consisting of: up to 3–5 ship and missile-boat

strike groups from ships: FF GMW pro. 11356R – 2 units, ES pro. 1135 – 1 unit; SAS pro. 1124M – 3 units, PC pro. 22169 – 3 units, RKPP pro. 1239 – 2 units; MB pro. 12411 – 3 units; up to 3 coastal strike groups from the composition of the SCMD ASMS "Bal", the SCMD ASMS "Bastion";

– for hitting objects in the entire depth of the territory of Ukraine – 2 operational missile groups in the composition: GMC pro. 21631 – 3 units: LS pro. 636.3 – 4 units (ships can also act alone);

– for the landing of marine landings and transportation by sea – a grouping of marine landing forces consisting of: up to 4 ship and boat landing groups (LLS pro. 11711 – 1 unit, pro. 1171 – 2 units, pro. 775 (775M) – 6 units, LC pro. 11770 – 3 units; aviation grouping – units of the Black Sea Fleet's naval aviation and additional forces from the Aerospace Forces of the Russian Armed Forces; intelligence and special purpose forces groups – up to 2 srzk pro. 18280 and pro. 861, LCM pro. 02510 "BK-16" – 3 units, pka pro. 03160 "Raptor" – 3 units, SpP groups – up to 30; grouping of support forces – up to 14 support vessels; force reserve, which probably included other forces from the composition of the Black Sea Fleet, which are not included in the above groups of fleet forces.

To conduct operations in the Azov Sea, in addition to forces from the above-mentioned groups, forces from the group for the protection of the Crimean Bridge and forces from the Novorossiysk Naval Base, in particular, brigade 184 of ships for the protection of the water area, specially designated forces from the Caspian Flotilla will be involved.

Let's make a general assessment of options for action. The first of the above options is less likely. The second option, which is discussed in detail above, has a high probability of implementation. At the same time, the analysis of the actions already carried out proves that the grouping of the forces of the Russian Federation in the Black and Azov Seas is not ready for actions under the conditions of the use of new, more technological, types of weapons, in particular, such as MLRS with a significant firing range (over 300 km), unmanned surface complexes. The use of such weapons requires changes in the tactical use of forces, which are not currently being implemented. In addition, the positive side of the actions of our forces (troops), which will negatively affect the actions of the Russian Federation at sea, is the possession of the initiative and the widespread introduction of new weapon complexes, determination, persistence in actions and the suddenness of these actions for the enemy.

On the basis of the above forecasting of options for the enemy's actions at sea, we will consider promising directions for countering the armed aggression of the Russian Federation against Ukraine in a war at sea. Under the conditions of the continuation of the further offensive of the Defence Forces of Ukraine (the main option), the successive liberation of the occupied parts of the Kherson and Zaporizhzhia regions in the south of the state is foreseen, and in the future – the operation to liberate Crimea and restore control over Ukrainian waters in the Black and Azov Seas. Under such conditions, the strategy of countering the armed aggression of the Russian Federation against Ukraine in a hybrid war at sea will involve a complex impact on the enemy in various spheres. To ensure a comprehensive impact, the following measures should be implemented: informational

and psychological (influence on the personnel of the enemy's forces at sea and on the population of Crimea and other regions); economic (expansion of sanctions against the Russian Federation, seizure of civilian vessels of the Russian Federation, use of seized property and financial resources of the Russian Federation for the development of the capabilities of the Navy of the Ukrainian Armed Forces, etc.); political and diplomatic (expansion of existing and introduction of new UN resolutions regarding influence on the Russian Federation in actions at sea, increasing cooperation with partner countries, in particular with the countries of the Black Sea region, and alliances of states, in particular NATO, the EU with their introduction of measures of deterrence and coercion of the Russian Federation to peace, etc.); military and others.

The goal of the strategy of countering Russia's armed aggression against Ukraine in a hybrid war at sea, in the part that concerns military measures, should be to create conditions at sea under which the Russian Federation will not be able to effectively counter the offensive of our troops on land and will be forced to evacuate troops from Crimea (forces), including the Black Sea Fleet. To achieve the specified goal of the strategy, it is necessary to provide for the following tasks in military operations at sea:

— inflicting damage (or creating a threat of damage) to the main strike forces of the Black Sea Fleet, primarily to warships with the greatest combat potential (FF pro. 11356P, GMC pro. 21631, other warships and boats, including carrier ships of the KR "Kalibr"), through the use of long-range rocket launchers, coastal missile systems "Neptune", "Harpoon", shock anti-aircraft missiles, unmanned surface systems;

— assistance to the troops that will carry out offensive actions along the coast and in the Crimea, including the provision of artillery support and ensuring the landing of tactical sea landings and the transportation of troops and material resources by sea;

— conducting reconnaissance in designated sea areas and ensuring the actions of Special Operations Forces groups;

— defence of areas where forces are based.

With the liberation of the coastal areas of the Azov coast of Ukraine, it is necessary to provide for the above-mentioned tasks in the Azov Sea and to create a grouping of heterogeneous forces of the Navy of the necessary composition in it.

Further actions should include the restoration of control over the entire territorial sea of Ukraine, the implementation of measures to provide assistance to authorities during the reconstruction period, and the implementation of measures to maintain a favorable operational regime in all sea areas adjacent to the land part of the territory of Ukraine.

CONCLUSIONS

1. From the analysis of military operations at sea, it was determined that the integrated (inter-troop, inter-fleet) grouping of the enemy's heterogeneous strike and naval amphibious

forces in the Black and Azov Seas could not realize a significant advantage in operational (combat) capabilities.

2. Thanks to the effective management of forces and the successful use of coastal missile and unmanned aircraft systems, reconnaissance means, modern information support systems, other forces and means, the grouping of heterogeneous forces of the Navy of the Ukrainian Armed Forces together with other components of the Defence Forces of Ukraine disrupted the enemy's dominance at sea and, accordingly, a possible attack of the enemy from the south-western direction on the central part of Ukraine. These actions created favorable conditions at sea for the start of an offensive operation by troops to liberate Crimea.

3. In further actions at sea, the aim of the enemy's actions may be to assist the troops operating in the south of Ukraine in the areas adjacent to the Black and Azov Seas, to hold the southern regions of the Kherson, Zaporizhzhia, and Donetsk regions and to prevent the restoration of control by the Defence Forces of Ukraine over Crimea, as well as ensuring the sea evacuation of troops (forces) and material resources from Crimea to the ports of the Russian Federation in the eastern part of the Black Sea.

In order to ensure success in the fight against the aggressor, the goal of the strategy of the Defence Forces of Ukraine to counter the enemy at sea should be to create such conditions in certain sea areas under which the Russian Federation will not be able to effectively resist the offensive of our troops on land and will be forced to evacuate troops from Crimea (forces), including the Black Sea Fleet. To achieve this goal, it is necessary to provide for the performance of a number of relevant tasks in military operations at sea.

An important condition for the success of the implementation of the proposed strategy of combating the enemy at sea is the creation and effective use of means of combat at sea received from partners and maritime robotic systems created in Ukraine, the use of which ensures an asymmetric impact on the enemy and the effectiveness of priority tasks, in particular regarding the destruction of surface and underwater long-range sea-based cruise missile carriers.

2.7 WAR IN CYBERSPACE AS A COMPONENT OF THE RUSSIAN-UKRAINIAN HYBRID WAR

Valerii Hordiichuk, Petro Snitsarenko, Yurii Sarychev, Vitalii Hrytsiuk

ABSTRACT

It is well known that any war is essentially hybrid. Russian aggression began to be widely called a hybrid war in Western scientific schools of military conflictology; according to their understanding, a hybrid war is a new type of conflict in which it was transformed with the development over time of confrontation forms and methods in all aspects. In essence, this concept appeared with the aim of uniting the new features of modern military conflicts in all areas and dimensions.

As mentioned earlier in this monograph, military conflicts are multi-domain in their complexity[8] — operations and other actions are carried out simultaneously in all aspects and dimensions in order to present the enemy with several dilemmas (tactical, operational, strategic) at the same time in order to achieve one goal — to force it to abandon its plans. In the concept of multi-domain operations, along with traditional operational environments (land, sea, air, space), the information environment is also considered, primarily its integral component — cyberspace, as such, which today makes it possible to dynamically influence the course of events during operations (combat actions). Hybrid war is a concept that includes, along with the above, other components of life, such as economic, social, cultural, diplomatic, etc. All of these components can be used individually or in combination to achieve strategic objectives in hybrid warfare. It is worth noting that hybrid warfare is quite a dynamic phenomenon, and new areas and dimensions can constantly emerge. Therefore, it is important to continue to explore its essence for a proper understanding in the interests of effective countermeasures, particularly in the cybersegment.

In the Russian-Ukrainian war of the 21st century, the confrontation in cyberspace took on a considerable scale. It is characterized by the wide use of different strategies, tactics, techniques, and methods. At the same time, the fact that aggression in cyberspace is carried out by Russia both for separate tasks independently and in synergy with other components of hybrid warfare deserves its own investigation.

Awareness of the cybersecurity importance, unfortunately, came rather late in Ukraine. Historically, the Ukrainian Armed Forces began to deal with the issue of activities in cyberspace approximately from 2010. At that time, the USA had already created a cyber command as a separate type of its armed forces. In addition, in our opinion, the role of cyberspace as a warfare environment is still underestimated. Currently, there are a lot of cyber security specialists in Ukraine who deal with tactics, techniques, procedures, and methods of cyber warfare, but not enough attention is paid to the research of cyber warfare at the operational and strategic levels. Therefore, it is necessary to analyze and systematize the features of cyber confrontation as a component of hybrid

---

[8] Here "domain" is understood as "area" in contrast to the name of a hierarchical address structure on the Internet [242]

warfare in order to understand the general picture of what is happening in the cyber cluster of the Russian-Ukrainian war in order to develop appropriate strategies for countering cyber aggression.

Using the method of empirical analysis the following were analyzed and systematized:

– the chronology and statistics of Russian cyber aggression;

– systemic features in the use of kinetic weapons and acts of cyber aggression by the Russian Federation in synergy;

– the most significant cyber incidents at security and defence sector facilities;

– actors of cyber aggression and their main tactics (methods, techniques);

– peculiarities of Ukraine's cyber resilience;

– strategic aspects and factors influencing the course of cyber confrontation.

The results make it possible to assess the general nature of the cyber confrontation during the hybrid Russian-Ukrainian war of the 21st century and to provide recommendations for improving the cyber defence of Ukraine as a component of ensuring the cyber security of the state.

KEYWORDS

Hybrid war, multi-domain operations, information environment, cyberspace, cyberwar, cyber-attack, cyber aggression, cyber domain, hackers, Russian-Ukrainian war.

2.7.1 CHRONOLOGY AND STATISTICS OF THE RUSSIAN CYBER AGGRESSION

Russia launched a full-scale invasion of Ukraine on February 24, 2022, but systematic Russian cyberattacks against Ukraine have continued since Russia's illegal annexation of Crimea in 2014, intensifying just before a full-scale invasion in 2022. During this period, the state, energy, media, financial, business, and non-commercial sectors of Ukraine were most susceptible to cyberattacks [243].

From 2021 to 2022, Russia attacked more than 150 military and government targets on the gov.ua and mil.gov.ua domains. The main goals were information and communication systems of military and diplomatic institutions and organizations, state bodies and services. **Fig. 2.7.1** shows the Top 10 targets of Russian cyberattacks in Ukraine according to Google company [244].

In work [245], the Research Service of the European Parliament generalized the cyberattacks of the Russian Federation on the information and communication systems of Ukraine's' infrastructure objects. The most significant of them are the following.

As noted by Microsoft [246], until February 24, 2022, cyber operations were mainly associated with actions aimed at reducing the capabilities of the Ukrainian Government, disrupting the operation of critical infrastructure facilities, and limiting the Ukrainian public's access to information.

The cyberattacks intensified in the run-up to the Russian invasion, when another cyber unit, IRIDIUM, also affiliated with the GUR of the Russian Armed Forces, launched the "FoxBlade" malware (also known as "HermeticWiper") to destroy approximately 300 systems at more than ten

government, IT, energy, agricultural, and financial sectors of Ukraine. Unlike IRIDIUM's NotPetya malware, the deployment of FoxBlade was tailored to specific environments. After penetrating the system, the virus moves rapidly to affect all devices connected to the network [246].

Fig. 2.7.1 Top 10 objects of Russian cyber-attacks
Source: [244]

Let's note cyber-attacks after the start of a large-scale invasion.

According to the data announced by the head of the State Special Communications Service [247], in 2022, the Government Computer Emergency Response Team CERT-UA registered 2,194 cyber incidents.

Among the first cyberattacks were: cyberattacks on the communication systems of the newspaper "Kyiv Post" and the satellite network "KA-SAT" an hour before the invasion (February 24), a cyberattack by the destructive malicious software "IssacWiper" on government websites (February 25), a cyberattack on a border control center aimed at preventing the departure of refugees to Romania (February 25), a cyber-attack on the digital infrastructure of Ukraine, which led to the blocking of access to financial services and energy resources (February 28).

In March, cyber-attacks continued, including with the aim of informational and psychological influence to demoralize the population of Ukraine. For example, on March 3, fake messages about the capitulation of Ukraine and the signing of a peace treaty with the Russian Federation appeared on the websites of the territorial communities of Volyn, and on March 16, another fake text message purporting to be the President of Ukraine, Volodymyr Zelensky, appeared on the air of the TV channel "Ukraine 24" in a moving line calling on the population to surrender[9].

---

[9] *"Ukraine 24" broadcast Zelensky's fake message about "surrender", the president denied it [248]*

On March 14, the CaddyWiper malicious software penetrated the systems of several Ukrainian public and financial sector organizations, on March 28, cyberattacks on Ukrtelecom and WordPress websites caused communication interruptions and restricted access to financial and government websites, and on March 30, access was obtained with the help of the MarsStealer information stealer to the credentials of Ukrainian citizens and organizations.

In April, hackers similarly extracted confidential information and credentials of users in Ukrainian government institutions and media structures (April 2 and 7), as well as seized banking and payment data of citizens with the help of a Trojan program (April 14) and a fraudulent survey through pages in social networks (April 19). And on April 8, there was an attempt to disrupt the operation of power plants and stop the supply of electricity to millions of people.

Hackers also carried out a distributed denial of service (DDoS) attack on some Ukrainian telecommunications operators to filter and redirect Internet traffic to the occupied territories (May 9).

Subsequently, hostile cyberattacks, after some reduction, continued and are almost continuous. **Fig. 2.7.2** shows the time distribution schedule of the set of cyber incidents of various threat levels recorded in 2022, presented in the report of the State Service of Special Communications and Information Protection of Ukraine [243]. Here, the threat levels are probably determined according to the generally accepted system of ranking the vulnerabilities of information and communication systems [249].
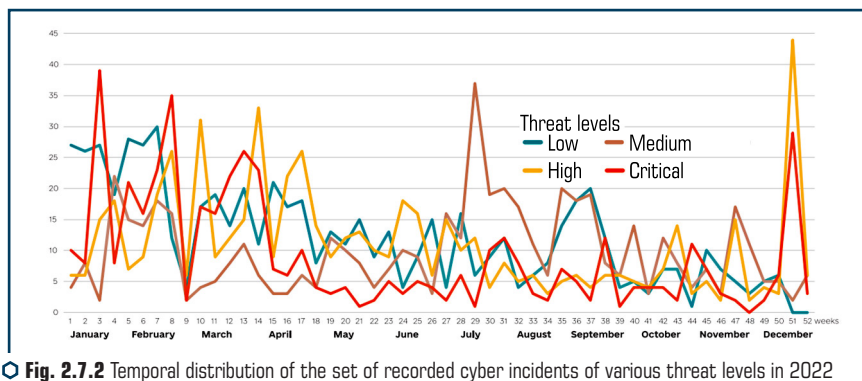
Fig. 2.7.2 Temporal distribution of the set of recorded cyber incidents of various threat levels in 2022
Source: [243]

The plot shows that after the month of May, with Ukraine's breakthrough in kinetic warfare, the intensity of cyberattacks decreased, but the systematics of attacks with a probing of the entire spectrum of possible vulnerabilities of information and communication systems remained and was dynamically tied to events in the political sphere and the activity of kinetic warfare, which will be discussed in more detail later.

So, statistics show that the main goal of Russian attacks on Ukrainian cyberspace is blocking or destroying information infrastructure objects, espionage (obtaining spying on logistics, weapons,

plans and operations of the Defence Forces), as well as information and psychological actions and operations (with the aim of undermining trust in state authorities, spreading panic among the population, etc.).

2.7.2 HYBRID SYNERGY OF THE RUSSIAN KINETIC WEAPONS AND ACTS OF CYBER AGGRESSION

According to Microsoft [246], since the beginning of Russia's large-scale invasion of Ukraine on February 24, Russian cyber units have been conducting activities to support the achievement of their military strategic and tactical goals.

Fig. 2.7.3 shows the synergy of kinetic and cyber activity of the Russian Federation against Ukraine from 23.02.2023 to 06.04.2022 according to the analysis conducted by Microsoft in its report [246].
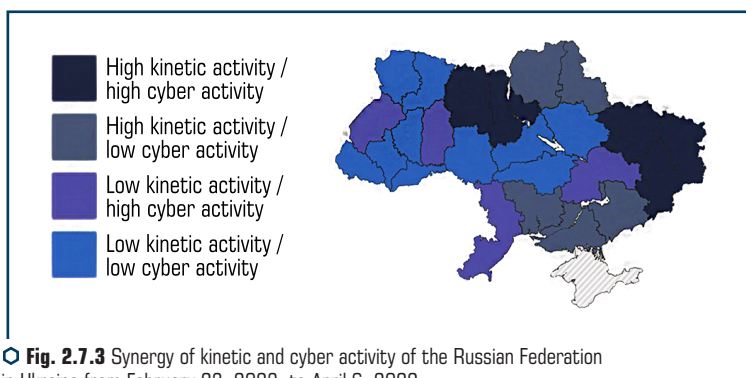
Fig. 2.7.3 Synergy of kinetic and cyber activity of the Russian Federation in Ukraine from February 23, 2023, to April 6, 2022
Source: [246]

In the figure, the kinetic activity in the relevant region of Ukraine was assessed as "high", where 90 % or more reports from official information resources reported various kinds of Russian kinetic strikes (missile, artillery, etc.). In turn, cyber activity was assessed as "high" in regions where, of all cyber threats detected and blocked by Windows Defender Antivirus, more than 80 % have indicators that are characteristic of previously known Russian and pro-Russian cyber terrorist groups (inherent software, methods, hosts, etc.).

Throughout 2022, this synergy is also demonstrated by the plot of aggressive cyber intensity in **Fig. 2.7.2**, which shows the initial period of Russian aggression (February–April), the beginning of the battles for Bakhmut (July–August), the period of Kharkiv and the beginning of Kherson operations (September), intensification battles for Bakhmut (December).

The chronology of military strikes and cyber-attacks shows several examples of their combined use, which seem to be in tandem. Thus, cyberattacks on government websites, telecommunications services, and infrastructure were often accompanied by kinetic warfare. For example, the attack on the Odesa City Council took place during the rocket attack on the residential quarters of the city (May 7). In the fall and early winter of 2022, after a series of cyberattacks on the energy industry, the Russian Federation launched several waves of missile attacks on the energy infrastructure and at the same time conducted a propaganda media campaign with the aim of shifting responsibility for the consequences (power outages) to Ukrainian state authorities, local self-government, or a large Ukrainian business.

Although it is not clear whether there was a coordination, centralized management for such correlation, or whether it is individual active actions according to defined priorities, but the trend is noticeable.

Also, study [250] shows that Russian cyberattacks fully correspond to Russia's general military strategy, when cyberattacks are often coordinated with other attacks: kinetic on the battlefield, as well as with informational, psychological and propaganda actions through controlled mass media.

Study [251] concluded that cyberattacks were designed to increase the chaos of a "conventional" invasion, reduce the governability of the country, and also damage the infrastructure. In the same study, there is a list of typologies of other correlations of cyberattacks tracked during the Russian-Ukrainian war:

1) match by subject:

— geographical correlation — different attacks occur in relation to one object or in relation to one territorial unit;

— industry correlation — various attacks occur in relation to a certain area, for example, energy;

2) temporal coincidences:

— preparatory attacks — cyber-attacks precede conventional attacks;

— synchronous attacks — cyber-attacks increase the negative consequences of conventional attacks;

— attacks-responses: attacks for revenge; attacks against other states (to undermine international support).

It should be noted that the level of enemy actions' synergy was additionally increased by launching targeted fire strikes at elements of the information infrastructure of Ukraine, as well as by physically destroying communication facilities during hostilities and after them, already in the occupied territory, or by switching to the operators of the enemy side. Such actions of the adversary should be considered part of its cyber campaign in order to reduce the possibilities of using the national cyberspace of Ukraine, thereby leveling the administrative functions of the state in the conditions of hybrid aggression.

Thus, the simultaneity of Russian kinetic strikes and cyberattacks testifies to the systematic nature of such a correlation as one of the manifestations of the Russian Federation's modern military strategy and an essential sign of its hybridity.

2.7.3 ANALYSIS OF THE MOST SIGNIFICANT CYBER INCIDENTS AT THE FACILITIES OF THE SECURITY AND DEFENCE SECTOR OF UKRAINE

Cyber-attack on Viasat satellite service [252–254].

Time: 05:00 – 09:00, February 24, 2022.

Targets: fixed broadband customers in Ukraine and Europe.

The motive behind the cyber-attack: disrupt military command and coordination.

Methods: DDoS, AcidRain.

Description. The digital outage on the satellite service began on February 24 between 05:00 and 09:00, just as Russian forces began moving in and launching missiles, striking major Ukrainian cities, including Kyiv. Hackers disabled modems that communicate with Viasat Inc's KA-SAT satellite, which provides Internet access to customers in Europe, including Ukraine. Certain users remained "offline" for more than two weeks.

It is likely that the attackers managed to hack the Gateway Earth Station by breaking the control protocol, deploying malicious software on the terminals through a firmware update.

Later, SentinelLabs researchers discovered a new piece of malware they called "AcidRain", the use of which was confirmed by Viasat in a February 24 cyberattack on modems.

Further investigation by Viasat revealed an intrusion into the terrestrial network using a VPN misconfiguration to gain remote access to the trusted KA-SAT network control segment.

Identified attackers: APT28/Sandworm.

Identified flaws (vulnerabilities):

– there is no duplication of communication channels using different technologies, cyber protection means, etc.;

– there is a lack of quality coordination and cooperation between the various units involved in the localization and settlement of cyber incidents.

Attempts to hack the "Kropyva" combat control system [255, 256].

Time: 5:00 a.m. on May 22, 2022.

Objectives: the tactical combat control system "Kropyva".

Motives: disrupt military coordination in the combat management system.

Methods: spam, DDoS.

Description. The tactical combat control system "Kropyva" is a battle-tested system designed to automate individual management tasks at the level of a battalion (division), company (squadron), platoon, and a separate unit. "Kropyva" can be used by various units of the Ground Forces: artillery, infantry, tank units, military intelligence, air defence units of GF, engineer units, etc.

On May 22, at 5:00 a.m., the hacker groups XakNet and Killnet organized a spam attack on Telegram servers. Information about the location of the enemy's troops was needed for the artillery coordination. One of the data collection methods was the use of Telegram messenger channels to receive an information from the population. Anyone could connect to the "Kropyva" system and write or call via Telegram, providing the necessary coordinates. The groups XakNet and Killnet

orchestrated a spam attack on Telegram to bring chaos and disinformation into the combat control system. This partially affected the coordination process, but not critically, as any provided coordinates go through a pre-identification process, so users were not affected.

Along the way, a DDoS attack was carried out on the system's servers, but to no avail.

Identified attackers: XakNet, Killnet.

Identified flaws (vulnerabilities):

— while the involvement of civilians in intelligence and information gathering is quite useful for rapid response on the battlefield, it requires a more complex process of pre-identification and the need to establish, maintain and secure public information gathering channels.

Attack "Cobalt strike beacon" [257–259].

Time: April 18, 2022

Targets: User machines on public networks.

Motives: user disruption, cyber espionage.

Methods: phishing, malware.

Description. On April 18, 2022, the Ukrainian cyber incident response center CERT-UA warned about ongoing cyberattacks on Ukrainian organizations using the "Cobalt strike beacon" malware. The authors of this campaign distributed phishing e-mails with the subject "Urgent!", which contained malicious macros. The macros is activated after the file is opened. Downloading the macros creates a file called "pe.dll" on disk and executes it, causing further damage to the system by the Cobalt strike beacon malware. The pe.dll file is protected by a cryptographic program probably developed by the TrickBot group. The CERT-UA Computer Emergency Response Team recommends stopping the use of office programs such as EXCEL.EXE, WINWORD.EXE, as well as running dangerous files such as rundll32.exe, wscript.exe, etc.

The military's open public access network was also cyberattacked. This malware was confirmed to exist on some computers (infected in late April) with established network connections to suspicious hosts: the root cause of the infection was the use of USB flash drives with infected Word files. Upon further investigation, it was also discovered that the attacker was using other suspicious hosts, revealing a much wider application network than expected.

Identified attacker: TrickBot.

Identified flaws (vulnerabilities):

— the use of unauthorized USB flash drives is one of the big security problems that must be properly addressed, it is extremely important to raise the awareness of the staff about modern cyber threats;

— security systems require regular review of their policies and search tools due to the constant change in malicious programs and methods of cyber-attacks;

— monitoring of outgoing traffic and detection of illegal connections should be part of the overall cyber security policy.

Combined attacks on the Delta situational awareness system [260, 261].

Time: July 26, 2022 – August 27, 2022, and periodically, including present time.

Objectives: situational awareness system (SAS) "Delta".

The motive of the attack: to gain access to the data of the "Delta" SAS and reveal information about the units deployment.

Methods: phishing, DDoS.

Description and influence. "Delta" [262] is military-grade software used for situational awareness of military and paramilitary formations. The system provides the Defence Forces with up-to-date verified data about the enemy and its forces and assets.

Starting from February 24, 2022, the number of new users of the "Delta" SAS increased rapidly, in connection with this, it was decided to create a public service in the form of a web resource (introduced in June 2022). Taking into account the popularity of the "Delta" SAS and its importance, the cyber security forces of the Ukraine's Ministry of Defence implemented a line of protection for the "Delta" SAS assets: system components, data and services.

Starting from July 27, 2022, reconnaissance and exploitation attempts by cyber groups affiliated with the Russian Federation were recorded, but they were unsuccessful. At the same time, actors of cyber aggression created fake sites (for example, with domains similar to delta[.]milgov[.]ua) to enable a large-scale phishing campaign, and some accounts were hacked. However, cyber defenders noticed such accounts and took them under control.

On August 15, 2022, a powerful DDoS attack was carried out as a cover for another malicious activity. At the same time, attackers tried to penetrate the system using compromised accounts, but WAF and network administrators blocked all these actions.

The impact was minimal, the system never went down, critical data was not disclosed, but public (publicly available) data, as well as the authorization and authentication process had to be improved.

As of August 20, 2022, cyber-aggressors continue to use the same approach: phishing sites (or messages in messengers), attempts to compromise accounts, and DDOS activity to cover up a system intrusion.

Identified perpetrators: cyber units affiliated with Main Intelligence Service (GRU) of the Russian Federation.

Disadvantages (vulnerabilities) identified: people's low awareness of phishing tactics.

Operations of the Gamaredon cyberterrorist group [263].

Time: July 2021 — up to now.

Targets: public networks with domains of military structures.

Methods: phishing, malware.

Description and influence. The "Gamaredon" group (aka Shuckworm, Armageddon, Actinium, Primitive Bear, Trident Ursa, UAC-0010) affiliated with the Federal Security Service (FSB) of the Russian Federation continues to carry out espionage cyberattacks against Ukraine.

The group is known to use phishing emails containing malicious Word documents to distribute its customized malware called Pterodo/Pteranodon or freely available remote access tools including Remote Manipulator System (RMS) and UltraVNC. As soon as the user opens

the attachment, a command is instantly executed to launch a malicious VBScript (VBS) file known as Pterodo.

The criminal cyber group is also known to use the Taint Shared Content technique. Attackers use VBScript to go through all documents in the file system and replace the document template with a reference to the remote template. An attacker can also infect the Normal.dotm file, which is the default template, and then opening any standard document causes the template to be replaced. This can lead to the mass distribution of malware among users of the same network.

Cyber terrorists continue to download and install variants of their backdoor (authentication bypass malware). They also use the flush DNS command to update DNS records. Next, the new file is loaded and executed. This file is a dropper for a VNC client that establishes a connection to a remote server they control. After installing the VNC client on the compromised computer, several documents are opened that try to collect and steal confidential information.

Attackers have been observed using phishing emails disguised as newsletters and battle orders in the infection chain. These emails eventually led to the deployment of GammaLoad.PS1_v2, a PowerShell malware. They also supplied two additional backdoors, named Giddome and Pterodo. At its core, Pterodo is a Visual Basic Script (VBS) malware with the ability to execute PowerShell scripts, use scheduled tasks to maintain persistence, and download additional code from a command-and-control server. The Giddome implant is capable of taking screenshots, recording audio, logging keystrokes, and obtaining and executing arbitrary executables on infected hosts. These implants additionally deploy legitimate software such as Ammyy Admin and AnyDesk to establish remote access.

In August 2022, Gamaredon attackers continued espionage operations to deliver information-stealing malware to victims' systems. The infection chain relies heavily on a few modular PowerShell and VBS scripts. An information stealer is a dual-purpose malware that can steal a specific file type and deliver additional binary and script payloads to a compromised system. An attacker distributes Microsoft Office documents containing remote templates with malicious VBScript macros via phishing emails. These macros download and open RAR archives containing LNK files, which then allow the next stage payload to be downloaded and activated on the victim's system. This includes an additional PowerShell script that is used to provide continuous access to infected devices and distribute new malware, such as one capable of stealing files from your computer and any connected portable drive.

A new Gamaredon phishing campaign has been spotted since November 2022. The attacker was distributing phishing emails allegedly on behalf of the State Intelligence Service in Ukraine. These emails are sent from the @mail[.]gov[.]ua domain to trick users into believing their authenticity and clicking on the attached link. When a user clicks on a malicious link, an HTML file with embedded JavaScript is downloaded to the system, which additionally archives the data on the victim's computer in RAR format. This RAR file contains a shortcut file (.lnk), opening which leads to a sequence of downloads. First, the HTA file is automatically downloaded and launched. This creates a scheduled task to maintain persistence and subsequently runs the VBScript. Finally, other malware, such as information stealers, are downloaded onto the victim's system.

The above statistics and analysis confirm Microsoft's research, the results of which are published in report [246], where the main families of malicious programs used for destructive activities (overwriting data and preventing the computer from booting) are listed as follows: "WhisperGate"/"WhisperKill", "FoxBlade", aka "Hermetic Wiper", "SonicVote", aka "HermeticRansom", "CaddyWiper", "DesertBlade", "Industroyer 2", "Lasainraw", aka "IssacWiper", "FiberLake", aka "DoubleZero". The FiberLake malware is used to delete data, the "SonicVote" program is used to encrypt files (sometimes used in conjunction with "FoxBlade"), and the "Industroyer 2" program specifically targets the destruction of industrial technologies and processes.

Therefore, Russian cyberattacks were directed at the range of basic properties of information (the triad: CIA — Confidentiality, Integrity, Availability), which are subject to protection at all levels of the OSI (Open Systems Interconnection) network model, in all electronic exchange environments and information processing. At the same time, the most significant (priority) targets of such cyberattacks were objects of the security and defence sector, and the main tasks were cyber-espionage (violation of confidentiality — obtaining information), cyber sabotage (violation of the integrity and availability of information), support of other actions (disinformation, propaganda, manipulation, establishing remote access, stealing funds, etc.).

2.7.4 ACTORS OF CYBER AGGRESSION AND THEIR MAIN TACTICS (METHODS, TECHNIQUES)

Fig. 2.7.4 shows the hierarchy of Russian government cyberaggression actors presented by Microsoft [246] that functioned before the large-scale invasion and examples of their main activity:

GRU (General Staff of the Armed Forces of the Russian Federation): STRONTIUM/APT28 group — data theft, phishing of military facilities, IRIDIUM/SANDWORM — destructive influence (destruction of data and software), DEV-0586 — destructive influence, data theft, information influence operations.

The Russian Foreign Intelligence Service: NOBELIUM/UNC 2452/2652/COZY BEAR group — password cracking, phishing (targets — Ukraine and NATO countries).

Federal Security Service of the Russian Federation: ACTINIUM/ ARMAGEDDON/ GAMAREDON/ PRIMITIVE BEAR group — data theft, phishing; BROMINE/ ENERGETIC BEAR — data theft; KRYPTON/ Turla — reconnaissance, phishing.

These units have been preparing for a large-scale invasion since at least March 2021. While before it they acted chaotically, from that time they began to carry out more targeted actions against organizations inside Ukraine or its allies. According to a number of independent expert groups, despite the fact that it is difficult to assess the level of coordination between various cyberterrorist groups, their main activity before the large-scale aggression was aimed at obtaining and collecting strategically important information, and with the beginning of the large-scale invasion of Ukraine — at facilitating kinetic strikes of the military Russian Federation.

○ **Fig. 2.7.4** Russian subjects of cyber aggression under the leadership of government organizations
Source: [246]
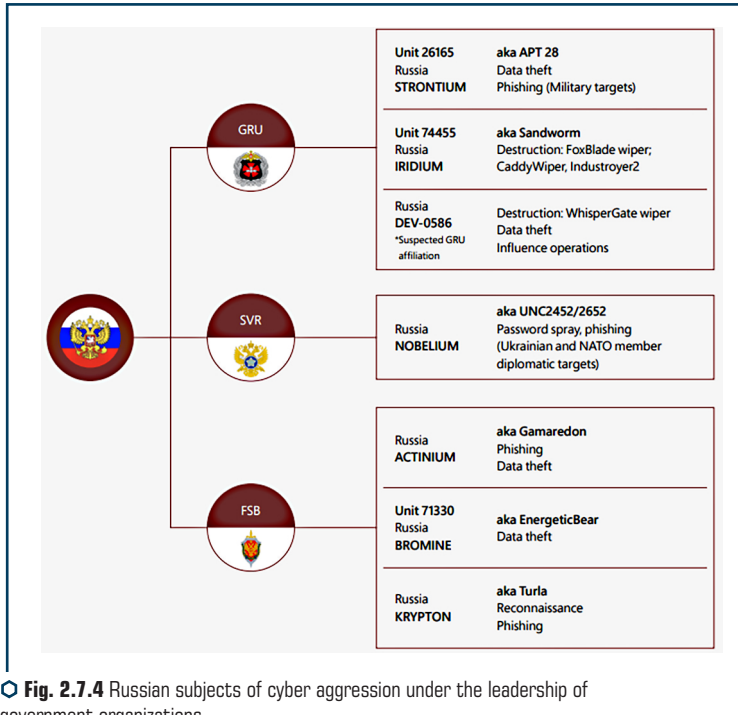
According to the State Service for Special Communications and Information Protection [243], Russian government cyber structures are usually limited in resources/manpower. They can't recruit more people because there are trust constraints, and talented cyber professionals working in the commercial sector don't want to work for a criminal government (in many cases, often driving them out of the country). Government cyber units also have strict rules and severe restrictions. Typically, such a group includes 5 to 10 hackers and 10 to 15 analysts. This is probably why the Russian special services have transferred part of their tasks and goals of cyber influence to criminal hacktivist organizations. Thus, the Russian Federation actually carried out cyber operations together with illegal hacker groups, such as: CONTI RAAS GROUP, XAKNET, KILLNET, Z-TEAM, CYBERARMYOFRUSSIA_REBORN (pro-Russian cyber terrorists), STORMOUS RANSOMEWARE, COMING PROJECT, etc. (**Fig. 2.7.5**).

It should be noted that the cyber group UNC1151, also known as GhostWriter, whose activities are associated with the Belarusian special services, has joined the list of supporters of Russian cyberterrorism. It has repeatedly shown aggression against Ukraine, in particular, this group is accused of the following:

– hacking websites and posting threatening messages before Russian troops crossed the border into Ukraine;

– installation of a backdoor on Ukrainian government systems to gain unauthorized access and violate authorized user access;

– launch of a phishing campaign against the websites of the Ukrainian and Polish governments and military websites with the aim of compromising user authorization data;

– hacking of electronic accounts of the Ukrainian military during massive data phishing with the aim of pressure and causing panic;

– a phishing campaign using compromised e-mail addresses of Ukrainian military institutions, sending e-mails with the Sunseed malware targeted at European government personnel helping Ukrainian refugees, with the aim of intimidation and disruption of work, etc.

Fig. 2.7.5 Pro-Russian and anti-Russian cyber groups
Note: [https://blog.equinix.com/]
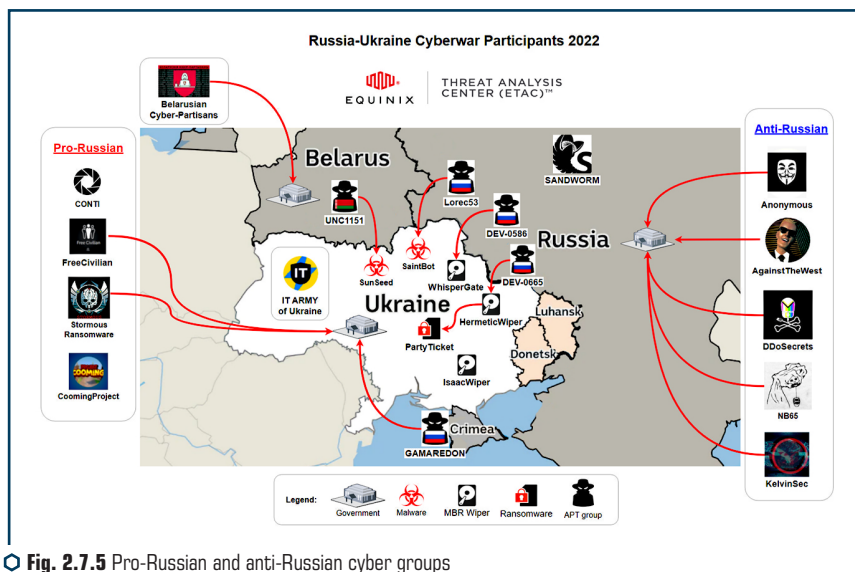
In another report "Dark Covenant 2.0: Cybercrime, the Russian State, and the War in Ukraine" [264], which is a continuation of the previous report for September 2021 of the year "Dark Covenant: Connections between the Russian State and Criminal Actors" [265], the INSIKT GROUP company, which specializes in investigating crime using artificial intelligence technologies intelligence, analyzed the secret connections between government organizations of the Russian Federation, cybercriminals and self-proclaimed hacktivists in the Russian Federation itself and Eastern Europe in the context of Russian aggression in Ukraine.

Among the conclusions of the report:

– there is a high probability that the Russian intelligence, military, and law enforcement services have long had tacit agreements with cybercriminals, while in some cases these institutions maintain established and systematic relations with cybercriminals using threats, indirect cooperation, and recruitment;

– it is quite likely that cybercriminals act together with government organizations of the Russian Federation, strengthening planned cyber operations with unified coordination;

– several areas of cybercrime underwent transformations with the beginning of the Russian-Ukrainian war, the landscape of cyber threats changed, in particular: malicious software can now be ordered as a service (MaaS – Malware-as-a-Service); partial "legalization" of cybercriminals took place; with the change in the "demand market" there has been a retargeting of cybercriminals; accordingly, with this reorientation, there have been changes in the infrastructure of cybercriminal groups and their hosting; increased intensity of fraud with payment cards from the Russian Federation directed to the "foreign market", etc.

Basic methods, techniques, tactics of cyber aggression.

According to the report of the State Intelligence Service of Ukraine [234], the most common methods of malicious cyber influence remain phishing, various malicious software for destructive and espionage purposes, compromising authorized access, as well as denial-of-service attacks (DoS and DDoS).

Common families of destructive malicious software are listed above according to the Microsoft report [246].

Among the most common tactics (techniques) of cyberattacks used in 2022, the most characteristic according to data [243, 246]:

– use of public programs with attachments/links for initial access – phishing;

– credential theft and use of valid accounts throughout the attack lifecycle, making "identity" a key attack vector;

– using valid administration tools and practices for parallel migration using compromised credentials of users with administrator rights;

– the use of well-known publicly available offensive cyber arsenals, such as CobaltStrike, Sliver and others, sometimes hidden using methods specific to individual actors of cyber aggression.

2.7.5 THE PHENOMENON OF CYBER RESILIENCE OF UKRAINE UNDER CONDITIONS OF LARGE-SCALE MILITARY AGGRESSION

According to the Cybersecurity Strategy of Ukraine, put into effect by the Decree of the President of Ukraine of August 26, 2021, No. 447/2021 [266], cyber resilience is the ability to quickly adapt to internal and external threats in cyberspace, to support and restore the sustainable functioning of the national information infrastructure, primarily critical objects of information infrastructure.

With the beginning of the large-scale invasion, Ukraine faced an unprecedented cyber aggression of the prevailing enemy. But, as a number of international cyber experts point out, the cyber aggression of the Russian Federation did not achieve its goals, which was also confirmed by the deputy head of the State Service of Special Communications and Information Protection of Ukraine [267]. We shall present the main factors that influenced the development of cyberwarfare and became the cause of the cyber resilience phenomenon in Ukraine.

Ukraine has been dealing with continuous Russian systematic cyber terrorism since 2014; such actions were sporadic previously. During this time, state institutions and their respective structural subdivisions have already developed certain mechanisms for countering cyber aggression.

In particular, international cooperation in the field of cybersecurity and integration into the international security cyberspace became a powerful factor in strengthening Ukraine's cyber resilience after 2014. The effective areas of such cooperation were:

– information exchange;

– exchange of SOPs (Standard Operating Procedures) and TTPs (Tactics, Techniques, Procedures) with partner countries;

– participation in joint projects and programs (consolidated cyber units, cyber exercises, hackathons, contests, etc.);

– training of Ukrainian cyber specialists by the forces of partners, etc.

A certain assessment of international support for Ukrainian cyber defence was carried out in work [268], but the assessment is not complete. The main significant examples of international cooperation, in our opinion, are the following.

International projects.

The Permanent Structured Cooperation (PESCO) [269] project is a part of the security and defence policy of the European Union (CSDP – security and defence policy). In 2021, Ukraine decided to join some projects within the framework of PESCO. Our state is already participating in such projects as:

– Cyber Rapid Response Teams And Mutual Assistance In Cyber Security (CRRT);

– Cyber Threats And Incident Response Information Sharing Platform (CTIRISP) – a platform for exchanging information about cyber threats and incident response;

– EU Cyber Academia and Innovation Hub (EU CAIH) – joint hub of academic and innovation efforts of the EU);

– European Secure Software Defined Radio (ESSOR).

CTAC project (Cyber Threat Analysis Center) [270]. An official division of the Regional Cyber Security Center (RCDC), territorially located in the Republic of Lithuania, which consists of appointed international experts whose purpose is to analyze cyber threats and develop standard practices for information exchange. The center includes cyber experts from Lithuania, the USA, Georgia, and Ukraine.

Five-year project for the development of Ukraine's cyber potential, proposed by Estonia: "Shield Wall". The purpose of the project is to exchange of special technologies and to traine Ukrainian cyber specialists, as well as the strengthening of interdepartmental, international and industry cooperation.

NATO CCDCOE (Cooperative Cyber Defence Center of Excellence) [271]. The goal of the center is to exchange between NATO member states and partners unique interdisciplinary experience in the field of research, training of specialists, organization of exercises and training in cyber defence, covering the main areas: technologies, strategies, operations, and law.

International joint studies.

Cyber Coalition [272] is NATO's main cyber defence exercise and one of the largest in the world. The exercise tests and trains cyber defenders from across the Alliance on their ability to protect NATO and national networks. CCDCOE experts participate in the planning and execution of exercises, providing operational, technical, and legal stories to develop their overall objectives.

Coalition Warrior Interoperability eXploration, eXperimentation, eXamination eXercise (CWIX) [273] is an annual event approved by the North Atlantic Council and managed by the NATO Military Committee, aimed at continuously improving interoperability between the Alliance and partner nations, to achieve interoperability to eliminate vulnerabilities to the state of "day-zero".

Amber Mist [274] is an exercise organized by the Joint Staff of the Armed Forces of Lithuania, during which interdepartmental and international military cooperation is practiced protecting information infrastructure important for the Lithuanian Armed Forces from cyber threats. The exercise assesses the ability of Rapid Response Teams (CRRT) to conduct defensive cyber security operations — to assess enemy actions in cyberspace, detect and identify cyber threats, prevent potential cyber-attacks, and neutralize their consequences.

Locked Shields [275] is an annual exercise organized by the CCDCOE since 2010, allowing cyber security experts to improve their skills in protecting national IT systems and critical infrastructure from real-time attacks. The focus is on realistic scenarios, advanced technologies and modeling the full complexity of a large-scale cyber incident, including strategic decisions, legal and communication aspects.

Defence Cyber Marvel [276] is an annual training and education competition organized by the UK Army Cyber Association to enable personnel from across the Armed Forces to develop their cyber and electromagnetic skills. The competition tests participants' skills in stopping potential cyberattacks on allied forces in real-world scenarios.

With the beginning of a large-scale war with a dominant enemy, Ukraine simply did not have enough forces and means to resist cyber aggression, even with the acquired experience. But let's note that the state bodies quickly adapted to the prevailing conditions and made a number of non-trivial decisions in the direction of mobilizing cyber resources, launched a number of joint IT projects with volunteers and hacktivists to counter aggression. In addition, some cyber-activist groups self-organized and united to counter the cyber aggression of the Russian Federation. The following were the indicative results of this.

Assistance of volunteer and hacktivist organizations of Ukraine.

Volunteer (hacktivist) cyber organization "IT-Army of Ukraine" [277] (created at the end of February 2022 to combat cyber intrusion into Ukrainian information space, in particular cyberspace). After the start of the Russian invasion of Ukraine on February 24, 2022, in particular,

the group has been conducting organized offensive cyber operations. At this time, the organization's activities are aimed at the aggressor's economy.

"Volunteer Hub of State Special Communications" [278]. The purpose of the hub is to help the defenders of Ukraine with the necessary means of communication, information protection, software, telecommunications, and other equipment, which is necessary for defeating the enemy on the battlefield and in the information space of the state.

Ukrainian Cyber Alliance (UCA) [279] is a community of Ukrainian cyber activists from different cities of Ukraine and around the world. The alliance was formed in the spring of 2016 from the merger of two groups of cyber activists FalconsFlame and Trinity, later the group of cyber activists RUH8 and individual cyber activists of the CyberHunt group joined the alliance. Hacktivists have united to oppose Russian aggression in Ukraine.

"Cyber Resistance" [280] is a team of hacktivists, which since 2014 cooperates with various power structures of Ukraine, as well as with volunteers of the international intelligence community "InformNapalm", the Center "Mirotvorets" and the Center of National Resistance.

The joint project "MRIYA" [281] between the cyber police and volunteers joined forces in the fight against the Russian occupiers in the media space. The "Dream" ecosystem currently includes:

— channel "StopRussia | MRIYA" is a community of caring Ukrainians who block and oppose Russian aggression on the Internet;

— bot "StopRussia | MRIYA", which receives information about fake resources, which are checked by moderators and sent to the Telegram channel for blocking;

— bot "StopFraud | MRIYA" combats online fraud. You can check a phone number, bank card or IBAN and see if anyone has reported related fraud;

— bot "Narodnyi mesnyk" — the official chatbot of Ukraine for reporting hostile actions on the territory of our state;

— "MRIYA Automatic" service contains services for the automatic ban of pro-Russian propaganda in social networks, such as "Instagram", "LinkedIn", "Twitter", "YouTube", "Telegram".

Charity fund "IT-Ukraine Volunteers" [282] was created for the development, communication, improvement of knowledge of IT specialists and help with their means. The foundation's mission is to develop the IT community and transfer funds to the specific needs of Ukrainians fighting for peace.

The Global Center for Cooperation in Cyberspace (GC3) [283] is an integration platform that develops meaningful cooperation between global and local creators of safe cyberspace.

Help from foreign IT organizations and hacktivists.

International IT partners actively support Ukraine on a volunteer basis, in particular such world leaders in software development, service provision and equipment manufacturing as: GOOGLE, ESET, Veeam, Cisco, Hewlett Packard Enterprise, TeamViewer, IMPREVA, Maxon, GFI Software, Fudo Security, Canon, Smiddle, Intel, Amazon Web Services (AWS), etc. A selection of such help, which is updated, can be found on the web resource [284].

There are various assistance programs launched by international partners. Separately, we should dwell on the US international assistance program "USAID" [285]. In recent years, USAID has

invested significant resources in strengthening Ukraine's ability to resist cyberattacks and eliminate their consequences. Since the beginning of the full-scale invasion, the assistance program in this area has been expanded to facilitate more effective countermeasures against cyberattacks on public communications networks and the recovery of information systems after such attacks, as well as ensuring uninterrupted voice and data transmission. At the moment, within the framework of the program in the direction of "cyber security", there are sub-programs: the project "Cyber security of critical infrastructure in Ukraine", the "Responsible and accountable governance in Ukraine" program, "Regional program for strengthening cyber security in energy".

A number of foreign hacktivist organizations, such as "Anonymous", "AgainstTheWest", "DDoSecrets", "NB65", "KelvinSec" (**Fig. 2.7.5**) and others, took the side of Ukraine. In particular, the international network of hacktivists "Anonymous" [286] constantly carries out cyberattacks on the information infrastructure of the Russian Federation. One of the most famous is the attack on February 26, when more than 50 DDoS attacks with a capacity of more than 1 terabyte were recorded on the information structures of the Russian Federation. In addition, "Anonymous" attacked various government websites of the Russian Federation, including the Kremlin, the State Duma, and the Ministry of Defence, significant and unprecedented disruptions were recorded on the portal of public services of the Russian Federation, TV channels, satellite receivers of the GNSS satellite navigation system were hacked, etc.

A fundamental element of ensuring Ukraine's cyber resilience in the face of Russian aggression was the provision, with the assistance of the Ministry of Digital Affairs of Ukraine, of the possibility of using the Starlink satellite radio communication network from Elon Musk's company from the end of February 2022, which became a reliable alternative to terrestrial cellular communication networks and ensured the uninterrupted functioning of control systems, including in an automated mode (that is, through cyberspace), in various aspects of the state's life, in particular in the field of defence.

We would also like to emphasize that the level of cyber security of Ukraine was significantly strengthened through the provision by partners of up-to-date information, in particular in electronic form and in real time, from those means of intelligence that are not yet available to the Defence Forces of Ukraine, which made it possible to significantly increase situational awareness and to ensure a timely and adequate response to threats of an attack by the enemy (for example, air defence measures or public notification).

However, it should be noted that, as evidenced by the above facts, even with such integration of efforts, the enemy in a number of cases carried out significant interference in the work of information and communication systems of Ukraine.

So, the phenomenon of Ukraine's fairly successful cyber resilience in the face of Russia's large-scale military aggression lies in the unique rapid synergy of efforts of Ukrainian and foreign, as well as state, private and volunteer cyberspace clusters aimed at cyber defence of Ukraine and ensuring its cyber security.

At the same time, the proper level of cyber security of Ukraine under the conditions of a military confrontation with a superior enemy should not be considered guaranteed, especially without the support of the international community.

2.7.6 STRATEGIC ASPECTS OF WARFARE IN CYBERSPACE

It is clear from the above that the cyber influence of the Russian Federation on Ukraine, as an integral component of modern military multi-domain conflicts, was carried out with the aim of achieving the goals of the so-called "special military operation" in two directions:

— support and strengthening of military operations with the use of kinetic weapons;

— causing the greatest possible damage to the cyber infrastructure of Ukraine (as a separate task) with negative consequences in various aspects of the state's life.

Due to the change in circumstances during the so-called "special military operation", the goals and strategies of both aggression in cyberspace and resistance to cyberaggression changed accordingly. We shall analyze how it happened and identify strategic aspects in the course of Russian cyber aggression.

1. Changing strategies of cyber aggression.

1.1. *Paradigm change and shift in emphasis of the Russian cyber-attack.*

Hoping to conduct their "blitzkrieg", not expecting significant resistance from the Ukrainian side, according to the classics of military art, the invaders made the main emphasis of cyber influence on the power of the main strike. Immediately after the beginning of the large-scale invasion, there was a massive launch of planned cyber-attacks in support of powerful information operations and destructive actions on the most important objects of the security and defence sector of Ukraine. At the same time, the vulnerabilities of certain information and communication systems of the aggressor were known for sure and in advance, so they knew that the probability their cyberattacks would achieve their goals was quite high.

After the "blitzkrieg" choked and the kinetic offensive capabilities were exhausted, a decline in the overall level of activity and cyber-offensive actions was noted. This is explained by the fact that known vulnerabilities of Ukraine's cyber systems have already been used by the aggressor, so there is a need to find new vulnerabilities in them, and, accordingly, to redistribute their cyber potential. In addition, with the decline in the mass and simultaneity of cyberattacks, Ukrainian cyber defenders have the opportunity to consistently respond to subsequent cyber incidents, plus partners and cyber volunteers have joined, as described above. This forced the aggressor to change the paradigm of the cyber warfare strategy. In general, such changes were the result of a change in the nature of the armed confrontation: the hot phase ended, and the war increasingly took on the signs of an ongoing conflict.

1.2. *Changing ways of influence.*

While at the first stages of a large-scale invasion it was possible to clearly trace the fact that cyber-attacks were carried out in support of kinetic warfare: destructive impact on software and information, active support of the Kremlin's propaganda campaign, disinformation, and intimidation of the population — with the aim of causing panic, officials — with the aim of suppressing determination and the will to make decisions, etc. Subsequently, Russian cybercriminals changed their strategy of cyber influence, and their main activity was focused on obtaining information —

cyberespionage, as well as searching for and fixing cyber vulnerabilities in order to use them further if necessary.

Why is it dangerous? When cyber influence is frankly destructive, its results, in particular: damage to information, failure of network equipment, changes in the software, etc., are visible almost immediately. And, depending on the importance of the information and communication object targeting by cyberattack, cybersecurity measures are implemented: identification, protection, detection, response, recovery [287]. When a covert cyberattack is carried out, for example, for the purpose of cyber espionage, or covertly obtaining remote access to the object, attention may not be paid immediately, and therefore at a certain moment it can lead to the worst consequences.

In particular, the cyber group InvisiMole (Foreign Intelligence Service of the Russian Federation) specializes in such actions [243]. Their main target is the electronic resources of high-ranking officials, diplomats, and other professionals who have access to the most sensitive information.

1.3. Changing the focus of influence according to the phases of the war.

In the special report by the Microsoft Threat Analysis Center "The Year of the Russian Hybrid War in Ukraine" [288], the entire period of the hybrid war was divided according to the change in the focus of cyber influence into three phases:

Phase 1: January 2022 – end of March 2022: cyber operations parallel with the direct preparation and conduct of a full-scale military invasion of Russia.

Phase 2: Late March 2022 – September 2022: the focus of cyber influence is on undermining Ukraine's external and internal support.

Phase 3: September 2022 – present: Russia combines kinetic operations with enhanced cyber operations.

Such periodization generally corresponds to characteristic features. The cyber-incidents presented in this study have systemic features characteristic of certain periods, but, in our opinion, not the entire set of cyber-incidents that took place has been analyzed.

1.4. Changing objects of cyber influence.

The main target of Russian cyberattacks in a hybrid aggression is predominantly civilian infrastructure, but the priorities of enemy hackers during a full-scale invasion have changed according to military needs. Although government structures have consistently remained key targets of cyberattacks, media and telecom were important targets at the beginning of the invasion, as the Russian authorities counted on a quick victory and hoped to be able to influence Ukrainians through mass media, particularly electronic media. Subsequently, enemy cyber-attacks, as well as the actions of the Russian army, shifted to the energy sector.

As stated in [251], the Russian Federation doctrinally considers the information space, including cyberspace, as a separate environment of "information conflict" in the military sphere. Therefore, in the course of cyber operations against Ukraine, the enemy's cyber actions, as a rule, alternated the direction of attacks between technical objects of the information infrastructure and defined target audiences. It is not difficult for the Russian Federation to do this, considering that information operations in cyberspace are carried out by the same special services (**Fig. 2.7.3**).

2. Strategic factors that influenced warfare in cyberspace.

Every month, Ukraine experiences thousands of cyberattacks, which makes it an ideal environment for testing new strategies, tactics, and tools of cyber warfare. However, since February 24, 2022, cyberattacks, given the various estimates of Russia's cyber potential, have been limited in scope and, apparently, have not achieved their overall goal. This development had two main reasons: the phenomenon of Ukrainian cyber resilience and shortcomings and miscalculations on the part of the aggressor.

Among the scientific works, special technical reports, and other publications available in the public domain, in particular [289–293] confirm the main strategic factors that led to the conditional "defeat" of Russia on the cyber front, and more precisely to the disruption of the achievement of the set objectives of the cyber offensive.

Weaknesses (factors) of the cyber aggressor, determined by significant shortcomings in the systems of assessment, strategic planning, and organization of cyber-attack, in particular the following:

1. Corruption, ideological bias and, as a result, incompetence of the national security institutions of the Russian Federation. Consequences: failure to achieve the necessary cyber capabilities; the impossibility of assessing the real state of one's cyber forces; ignoring cyber intelligence information, which became an additional factor in underestimating the state of Ukrainian forces and affected the decision-making process.

2. The course of action is doctrinally incorrectly defined. The Russian Federation informally declared war on the entire civilized world, therefore, in combination with a cyber offensive, it had to maintain a circular defence in cyberspace. Therefore, the use of the available cyber potential was not fully focused on a cyber-attack on Ukraine.

3. Anticipation of a quick victory led to incorrect planning and misallocation of available cyber resources.

4. Significant deficiencies in cross-domain coordination and interaction of units. As can be seen from the above analysis, the Russian troops tried to synchronize their activities in various ways — between the operational environments of the conduct of hostilities, services, geographical areas, forces and means, etc. Cyberspace is a special operating environment and requires a separate vertical and management principles to achieve effective synchronization at all levels, which was not the case.

5. Cyber troops of the Russian Federation were too few in number and had insufficient technical potential (set of tactics, techniques, methods) both to achieve the planned blitzkrieg and to further maintain a high tempo of combat confrontation.

The strengths (factors) of Ukraine's cyber resistance are as follows.

1. Before the start of the full-scale invasion, Ukrainian cyber structures had some experience in countering Russian cyber aggression. In particular, they knew the subjects of cyber-aggression, their tactics, and methods and, accordingly, had experience in countermeasures. This was also facilitated by partial integration into the international security cyber space: a number of joint projects

and programs with foreign partners were conducted, in particular cyber training and training, the conditions for which were set taking into account possible Russian cyber influence and simulation of real cyber-attacks.

2. The digital infrastructure of Ukraine as a whole was structurally stable. The decentralized topology of critical infrastructure objects networks allowed it to maintain operational efficiency after disruption of individual nodes or subnets. Some of the services were placed in cloud environments even before the beginning of the large-scale aggression.

3. A number of joint projects (services, channels, bots, etc.) jointly implemented by state institutions together with non-governmental organizations of Ukraine. A broad volunteer movement, individual IT specialists, and hacktivists of Ukraine acted as a single protective cyber front.

4. International assistance at all levels. Cooperation with foreign countries, companies, non-governmental organizations, assistance of various hacktivist groups. Assistance at all levels of the OSI model, starting from the provision of equipment, privileges in the use of messengers and various services, ending with the direct implementation of cyber-attacks on the information and communication systems of the Russian Federation.

Separately, we note that an important positive factor for Ukraine in the cyber struggle with the Russian Federation turned out to be the fact that the State Security and Defence Sector did not have deep digitalization, and management processes are only partially connected to the Internet. In addition, many processes of managing military forces and assets are still carried out autonomously (automated in local cyberspace or manually), since a significant part of Soviet weapons and military equipment is in service. Therefore, even with a more powerful cyber influence than it was, the Russian Federation would not be able to completely suppress the management, coordination, and combat use of Ukrainian forces (armies).

2.7.7 RECOMMENDATIONS REGARDING THE CYBER DEFENCE OF UKRAINE AS A COMPONENT OF ENSURING THE CYBER SECURITY OF THE STATE

According to the Law of Ukraine "On the Basic Principles of Ensuring Cyber Security of Ukraine" [294], cyber defence is a component of ensuring cyber security of Ukraine with the definition: *cyber defence* is a set of political, economic, social, military, scientific, scientific and technical, informational, legal, organizational and other measures, which are carried out in cyberspace and are aimed at ensuring the protection of the sovereignty and defence capability of the state, preventing the emergence of an armed conflict and repelling armed aggression.

Without going into the shortcomings of this definition (at least it is not clear how all defined measures can be implemented in cyberspace!), its essence indicates that cyber defence issues require the efforts of the entire state. The events in cyberspace and outside it during the large-scale war between the Russian Federation and Ukraine, which affected the content of the above research results, confirmed this. Therefore, such a reality means the fact of the implementation

of cyber defence of Ukraine in the phase of repelling armed aggression, and with *all the forces and means available to the state*, which achieved a relatively high effectiveness of cyber resistance (in other words, cyber defence of the state) in this phase of the fight against the enemy.

At the same time, it should be noted that the positive result of Ukraine's cyber defence was obtained not so much due to the clarity of the state organization of this process, but due to the self-organization of the entire cyber community of Ukraine (including state institutions) and international cyber solidarity. This indicates that the state mechanism for implementing cyber defence of Ukraine still remains imperfect, primarily at the level of the relevant regulatory and legal framework. Because of this, intrastate integration suffers, when there is cooperation between institutions and departments of Ukraine, but there is no unified vision of the development of the cyber defence system with the coverage of all departments, the delineation of their functions and tasks, the vertical leadership of cyber forces, in particular during martial law, and the powers of the relevant management bodies.

Thus, according to the Law of Ukraine "On the Basic Principles of Ensuring Cyber Security of Ukraine" [294], the National Cyber Security Coordination Center as a working body of the National Security and Defence Council of Ukraine coordinates and controls the activities of security and defence sector entities that ensure cyber security (therefore cyber defence as a component!).

In accordance with the same law, the Ministry of Defence of Ukraine, the General Staff of the Ukrainian Armed Forces, in accordance with their competence, carry out measures:

— on preparing the state to repel military aggression in cyberspace (cyber defence);

— carry out military cooperation with NATO and other subjects of the defence sphere to ensure the security of cyberspace and joint protection against cyber threats;

— implement measures to ensure cyber protection of critical information infrastructure in conditions of emergency and martial law.

We should also note that in accordance with the same law and the Law of Ukraine "On Intelligence" [295], the intelligence body of the Ministry of Defence of Ukraine (i.e., the Main Directorate of Intelligence) carries out *intelligence activities* in the military sphere, the *aspects of defence*, military construction, military-technical and cyber security. Other intelligence agencies in the system of the Ministry of Defence of Ukraine, in particular within the Ukrainian Armed Forces, *are not assigned tasks of intelligence activities regarding threats in cyberspace* by the Law of Ukraine "On Intelligence".

Meanwhile, the Law of Ukraine "On the Defence of Ukraine" [296] contains a provision that in the event of armed aggression against Ukraine, based on the relevant decision of the President of Ukraine, the Ukrainian Armed Forces initiate military operations, including conducting special operations (*reconnaissance*, informational and psychological, etc.) in *cyberspace*.

At the same time, as part of the General Staff of the Ukrainian Armed Forces, the Main Directorate of Radio-Electronic and Cyber Warfare [297] was created, one of the main tasks of which is the planning and coordination of actions of cyber defence of Ukraine, state authorities that are part of the security and defence sector.

Let us also emphasize that the Law of Ukraine "On the Defence of Ukraine" [296] contains a provision that, among other things, the Ukrainian Armed Forces carry out cyber defence (active cyber defence) measures to protect the sovereignty of the state and ensure its defence capability, prevent armed conflict and repel armed aggression

A similar provision is contained in the Law of Ukraine "On the State Service of Special Communications and Information Protection of Ukraine" [298] one of the main tasks of the State Special Communications Service of Ukraine is to create and ensure the functioning of a system of active countermeasures against aggression in cyberspace.

Thus, as can be seen, the legislation of Ukraine on cyber defence is contradictory, it does not clearly specify the management vertical, does not delimit the functions of management bodies, and does not define exactly how the model (mechanism) of ensuring the state's cyber defence should function, in particular during martial law.

Therefore, it is necessary to properly finalize the national legislation and define the organizational model for implementing state cyber defence as an integral component of the National Cyber Security System of Ukraine, including during martial law.

In connection with the above, in our opinion, the legislative provision [294] obliging the Ministry of Defence of Ukraine, the General Staff of the Ukrainian Armed Forces (in general, the Defence Forces) to "*implement measures to prepare **the state** to repel military aggression in cyberspace (cyber defence) … to implement measures to ensure cyber protection of critical information infrastructure* (of **the state**) under conditions of emergency and martial law", since it is organizationally difficult for a separate state body, and technically rather impossible. The state defence forces, in particular the cyber forces, which will be created, must be ready and carry out exclusively *military measures*:

a) in peacetime:

— cyberspace monitoring *in the interests of the defence of Ukraine*;

— protection of own cyberspace (information infrastructure of the military sphere);

b) in wartime (in case of and during military aggression against Ukraine):

— continuation of peacetime measures;

— *use of cyber and other weapons against sources of cyber aggression*, including with the right to engage additional capabilities of the national IT community.

Other subjects of life in Ukraine that do not belong to the State Defence Forces, including the non-state sector, must solve *cyber defence issues* independently exclusively through comprehensive measures of *cyber protection* of their own cyberspace (information infrastructure) under the coordination and methodical guidance, which according to the legislation ensures the formation and implementation of the state policy on *protection in the cyberspace of Ukraine*.

The overall *coordination* of cyber defence activities is carried out by the National Cyber Security Coordination Center under the National Security and Defence Council of Ukraine, which, among other things, should have the exclusive (emergency) option to attract international assistance on behalf of the state in the interests of ensuring Ukraine's cyber defence.

CONCLUSIONS

The above allows us to outline the following recommendation regarding cyber defence.

Recommendation 1. In order to systematize activities on cyber defence of the state as an element of improvement of the National Cyber Security System of Ukraine, initiate and introduce, in accordance with the above, the necessary changes to the Laws of Ukraine "On the Basic Principles of Ensuring Cyber Security of Ukraine" [294], "On Defence of Ukraine" [296], "About intelligence" [295], etc.

Further considering the current issue of cyber defence of the state, it is important to pay attention to a number of features that are quite characteristic in the initial period of cyber-attacks related to the Internet, which were caused by the active phase of the Russian-Ukrainian war (the period February – May 2022, **Fig. 2.7.2**), which proved the following:

1. *The objects of information activity with the implementation of functions in the Internet environment turned out to be the most vulnerable to cyber-attacks*. As a confirmation – the effective cyber actions of the international hacker group ANONYMOUS against the Internet resources of the Russian Federation, including the Internet resources of its security forces.

2. *Under the conditions of war, terrestrial cellular communication networks, as the basis of mobile communications, may be disrupted during hostilities*. So, in particular, the enemy's destruction of stationary antenna towers significantly reduced the possibilities of information exchange in the Internet environment.

3. *In wartime, an alternative to terrestrial cellular communication networks can be satellite (space) radio communication networks* (such as Starlink from Elon Musk's SpaceX company). At the same time, such a network is sensitive to intentional radio interference in places where the radio signal is received, both on Earth and on the satellite, which does not provide an absolute guarantee of Internet information exchange.

4. *Information platforms operating on the basis of the Internet can be locally disabled (blocked) at the request of political decisions*. Confirmation of this, in particular, is the technical shutdown for the Russian Federation of a number of working Internet platforms at the initiative (on the proposal) of the leading state bodies of Ukraine due to military aggression against it (SWIFT, PayPal, Visa, MasterCard services), or under the same conditions of war, forced blocking Roskomnadzor part of its own (internal) Internet space in the interests of preventing external socially significant information (online services Facebook, YouTube, Instagram, Google News, Telegram) within the territory of the Russian Federation. In total, this caused significant losses and trouble both to the aggressor state and directly to its population.

5. *Open Internet platforms operating on the territory of the state can be a valuable source of information for the enemy*. This is evidenced, in particular, by cases of video recording and comments by citizens about the results of hostilities with the posting of this material on social networks.

It follows from the above remarks: *under the conditions of war, cyberspace, which is based on the application of Internet technologies, is particularly vulnerable to various destabilizing factors*.

For this reason, the task of forming and using network environments of electronic information resources (EIR) that are technically not connected to the Internet (but they are also components of cyberspace!) remains a relevant task for practice since such EIR networks are inaccessible to well-known hackers.

The first mentioned applies to the military sphere, as such are, in particular, network environments of EIR (cyberspace) of military and weapons control systems, which can be both mutually integrated and autonomous. Therefore, *it would be a fundamental mistake to consider the enemy's cyberspace, in particular its armed forces and other power structures (as well as one's own cyberspace), only as a single Internet environment.*

Thus, the experience gained shows that *the cyberspace characteristic of the military sphere, as a rule, is a discontinuous EIR environment with a division into Internet EIR and EIR environments that are technically not connected to the Internet*. This format of the cyberspace of the military sphere determines the general specific field of information struggle in cyberspace and an important direction in the formation of the state's cyber defence tasks.

In connection with the above, there is the following recommendation.

Recommendation 2. First, in order to improve the theoretical base on cyber defence issues, a systematic and thoughtful approach to the formation of an appropriate legal framework not only for the implementation of cyber defence, but also to improve the entire information legislation of Ukraine, a clear, concrete definition of the concept of "*military cyberspace*" is needed ", as well as clarification of the concept of "*cyber defence*".

Secondly, the Law of Ukraine "On Cyber Forces" (being developed in accordance with the Decree of the President of Ukraine dated August 26, 2021, No. 446/2021 On the decision of the National Security and Defence Council of Ukraine dated May 14, 2021 "On urgent measures for the cyber defence of the state" [299], as well as on implementation of the Decree of the President of Ukraine dated February 1, 2022 No. 37/2022 On the Decision of the National Security and Defence Council of Ukraine dated December 30, 2021 "On the Plan for the Implementation of the Cybersecurity Strategy of Ukraine" [300]), it is necessary to focus on solving the tasks of cyber defence by cyber troops by conducting military operations in cyberspace of the military sphere in two directions – *actions in the Internet space and actions in the EIR space outside the Internet network*.

After the adoption of the updated legislative norms, it will be possible to create in Ukraine an improved (harmonious) mechanism for ensuring cyber defence (in all the necessary areas of implementation) as one of the most important components of the state's cyber security.

2.8 SOME ISSUES OF THE APPLICATION OF SPECIAL OPERATIONS FORCES IN MULTI-DOMAIN OPERATIONS

Dmytro Viter

ABSTRACT

The search for new, modern forms and ways of using military force in order to ensure the achievement of the strategic goals of the state both at the local and global levels, including the desire to gain dominance in the world geopolitical space, is carried out taking into account the capabilities of real and potential opponents to conduct all types of struggles. Acceptance of the position on the equality of the enemy's military power, or the superiority of its capabilities in comparison with the capabilities and capabilities of one's own troops (forces), has as a consequence the development of the desire for constant improvement of the forms and methods of conducting armed struggle. One of these modern forms is the planning and conducting of multi-domain operations, which are aimed at ensuring the realization of the global interests of the state by capturing, maintaining, and increasing the positions of dominance in the world geopolitical space, which is considered as an active strategic and operational environment. In fact, we are talking about a synthetic non-traditional environment for the use of troops (forces), which most clearly reveals the essence of hybrid warfare, since the main emphasis in modern warfare is shifting towards achieving the goals of the struggle by non-forceful, so-called "hybrid" means, namely, conducting informational, psychological, civil (including civil military) operations, etc. Under such conditions, Special Operations Forces play a leading role in achieving success in resolving the armed conflict by non-forceful means. At the same time, the rejection of the force method of resolving the armed struggle is not one of the main priorities of ensuring the interests of national security and defence of the state, which proves the full-scale military aggression of the Russian Federation against Ukraine.

One of the main features of the Special Operations Forces (SOF) is their ability to conduct and support traditional and non-traditional operations of all levels in various environments, ensuring the achievement of military and political goals, which is facilitated by the understanding of SOF as a multidisciplinary force that differs significantly in terms of forms and methods of application from regular troops (forces). In this context, an important task of the theory of special operations (SO) remains the definition and justification of the strategic usefulness of the use of special operations forces (SOF) in non-traditional environments.

KEYWORDS

Achievement of strategic goals, dominance, equality, superiority, improvement of forms and methods, capturing, maintaining, world geopolitical space, active strategic and operational environment, hybrid warfare, non-forceful means, informational and psychological operations, regular troops (forces), theory of special operations, non-traditional environments.

2.8.1 GENERAL ISSUES OF THE DEVELOPMENT OF THE THEORY OF SPECIAL OPERATIONS

The main focus of the SO theory is on the wide and active use of SO during the resolution of modern conflicts, which actually eliminates the possibility of using the armed forces as one of the main ways of ensuring national security, as a factor of deterrence. In this context, in the general, special and strategic theory of military operations, special operations are usually understood as open, covert and secret operations of an unconventional (unorthodox) nature, which are associated with a high degree of risk and are carried out in a hostile, politically unstable or vulnerable environment for achievement or support of important political and military goals in order to ensure national security and foreign policy priorities, cover the entire range of conflicts in peacetime and in a special period (war), using specific and unique methods of applying forces, tactical techniques, equipment and technical means under the conditions, which make it impossible or do not justify the use of conventional troops (forces) [301–303]. The essence of special operations is considered through the prism of extraordinary operations planned and carried out to achieve a certain effect, acquiring a decisive role in achieving strategic goals [304]. However, from the point of view of the SO theory, the emphasis on the fact that special operations are carried out mainly on the territory of the enemy, in conditions of political tension, in areas inaccessible to the means of destruction, in which the units of SO can perform a set of tasks according to the following priorities [305] is rather limited: sabotage and reconnaissance actions; special intelligence; countering the proliferation of weapons of mass destruction; countering terrorism; conducting irregular wars (including unconventional military operations); assistance to foreign states in ensuring their internal and external security; release of hostages; struggle with insurgent movements; provision of humanitarian assistance; information provision and support of hostilities; ensuring relations with civil administrations and the population; search and rescue operations; fight against illegal drug trafficking; fight against piracy; fighting crime at the national, regional and global levels, etc. The theory of SO changes the main emphasis in the understanding of special operations as the main, hybrid form of application of SO, as a way of combining traditional and irregular operations. This form is characterized by a high dynamic of changes, constantly adjusting to new tasks and the corresponding methods of their implementation, the operational and strategic environment, the goals to which special operations are directed, and covers the entire set of existing and potential aspects of conducting SO, which expand and consolidate depending on the complexity of differentiation (or its absence) of a set of strategic goals of the state and being determined by the process of leveling the boundaries of certain aspects in which such goals can be achieved, including taking into account the environment of ensuring specific national interests. Taking into account the modern trends in the development of the forms and methods of conducting armed struggle determines the need to resolve the issue related to the activation of the process of leveling clear boundaries that distinguish traditional (ordinary) operations from irregular and multi-domain operations.

At the same time, the irregular nature of modern wars is characterized by the obligatory inclusion in the sphere of special operations of non-traditional ways of waging war, namely: methods of counter-terrorist operations, a wide range of means of ensuring and supporting the system

of collective security, methods of psychological and information-psychological operations, methods of controlling "civilian affairs" in a single complex [306]. The modern practice of conducting special operations with the use of SOF is determined by the strategic usefulness during the counterattack of units of the armed forces of the Russian Federation. Special operations forces are used in indirect actions as open, covert and secret operations of an unconventional (unorthodox) nature, which are associated with a high degree of risk and are carried out in a hostile, politically unstable or vulnerable environment to achieve or support important political and military objectives in order to ensure priorities of national security and foreign policy of the state, covering the entire spectrum of armed conflict and using specific and unique methods of using forces, tactical techniques, equipment and technical means under conditions that make it impossible or do not justify the use of conventional troops (forces). Practice shows that resistance and opposition to the enemy in the Kharkiv, Kherson, and Zaporizhzhia regions diverts the attention of the forces and means of the Russian Federation from the performance of the main tasks, since priority is given to the active operational search, detection and destruction of regular and irregular subversive (terrorist) formations in the territory of the base or deployment of their own subdivisions This creates prerequisites for intensifying the actions of the troops (forces) of Ukraine. At the same time, the intensification of work with the population of the occupied territories, the dissemination of information about the successes of the Ukrainian Armed Forces through social networks of the Internet, etc. also create conditions for preventing the actions of the occupying forces from performing their main tasks both in the rear and on the front line. In this aspect, SOFs gain strategic importance in deterring and distracting significant enemy forces from performing their main tasks through the complex use of mechanisms and elements of diplomatic, informational, military, economic missions, and operations. The military component of the strategy for the application of SOF provides for the conduct of deterrence operations in the occupied territories in a single complex with the conduct of the main combat operations for the liberation of the occupied territory [307]. To date, various forms of diplomatic, informational, economic, or military pressure have been used in the Kherson, Zaporizhzhia, and Kharkiv regions by SOF to strengthen insurgent movements or resistance movements based on the coordinated efforts of the SOF, intelligence, SSU, SBGSU to ensure support for special operations of "unconventional wars", in particular, irregular ones. In this aspect, one of the main problems of conducting the SO remains the definition of strategic military-political and operational goals, which cover issues of financing, supply of weapons and ammunition to resistance forces, illegal armed formations, irregular groups operating on the territory of the enemy, ideological, political, informational psychological support of opposition political movements, part of the population, dissatisfied with the policies of the government of the aggressor state, etc.

The speed of operational response to changes in the combat situation, as a factor of victory, determines the need to create a situation in which the task of maximum losses in combat equipment and personnel of the enemy's troops (forces) is ensured, creating the psychological effect necessary for the development of success. It is clear that a well-thought-out and planned military operation in a specific operational situation can be more effective and lead to success faster than a military operation conducted using conventional methods of warfare, including special methods.

An example is the actions of special units of the Ukrainian Armed Forces in the Chernihiv, Kyiv, and Mykolaiv regions against the forward and rear units of the Armed Forces of the Russian Federation, as a result of which conditions were created under which the enemy was unable to realize its desire for decisive action, gradually lost the initiative, and was forced to withdraw part of its own forces to ensure the security of rear facilities and conduct an armed struggle in their own rear. At the same time, one of the main differences between the actions of SOF and the actions of other units of the Armed Forces is that the actions of forces and means in a specific SO are, as a rule, not related to the task of mastering and holding this or that area or object for a long time. The task of SOF within the framework of supporting military operations is to deliver a sudden strike and an immediate retreat, which characterizes the tactics of special forces, which successfully manifested itself at the initial stage of the armed aggression of the Russian Federation against Ukraine [308]. It should be noted that the development and calculation of a large number of options for conducting military operations in the conditions of modern war is carried out without strict reference to time and place, since taking into account the invariance of the situation in the rear of the enemy, the randomness of conditions and the multiplicity of existing connections in the infrastructure of the area of the combat mission is essential reduce the planning possibilities and detailing of each individual operation. Therefore, SOF missions depend on the volume and accuracy of intelligence data of all levels — from tactical to strategic. This data provides an opportunity to achieve key advantages during the planning and implementation of SO. Special operations forces, performing specific tasks, due to the application of the element of surprise and being on the ground, serve as a reliable source of intelligence for special services [303]. However, countering subversive units remains a problematic issue in this case since it is the dynamics of the movement of subversive formations when performing special tasks that require the development and application of not only traditional tactical techniques in the fight against them (for example, the formation of a continuous ring of encirclement with the determination of the probable directions of the breakthrough or departure of subversive formations and creating a significant superiority in forces and means in these directions), but also opposing the tactics of subversive formations to the corresponding subversive tactics of special units of the own armed forces [309]. The importance of this is due to the fact that the actions of special units, which use special means in the enemy's rear, radically reduce the enemy's ability to conduct hostilities with conventional means, due to the fact that the enemy actually loses the idea of the borders of the front and the rear, the flanks because the combat space acquires for the enemy of equivalent appearance.

Experience shows that the main trends in the development of forms and methods of application of SOF units during the planning and conduct of modern special operations (in particular, non-combat operations) are [310]:

— informational and psychological impact on the population and armed forces of the aggressor country and the region where the measures will be held;

— coverage within the framework of informational and psychological training of the district to carry out the tasks of a special operation of all strata of the population according to ethnic,

national, linguistic, cultural, religious composition with the involvement of informational and pro-paganda materials aimed at a specific population group along with the use of religious figures for informational and propaganda purposes, as well as creating conditions for access of the population and personnel of the armed forces to information sources (including provision of technical means of obtaining information, free access to the Internet, etc.);

– preparation of local military formations taking into account political, national, and national-ethnic, socio-cultural characteristics of the state and region to ensure their actions in conditions of social and political instability in the state and region;

– support of illegal armed formations, opposition radical movements, criminality to ensure the conditions for increasing social and political instability in the state and region.

The change in the forms and methods of armed struggle in modern conflicts determines a steady tendency to expand the sphere of interaction between SOF and military intelligence. The operational use of SOF, and the tasks they solve in a specific operational environment, require the expansion of operational cooperation with other units of the security and defence sector. One of the main issues in this context has been determined today – the ability of SOF to create new and optimize existing operational capabilities, which requires certain flexibility, analytical depth, innovativeness, and creative thinking. The practice of modern armed struggle shows that the operational interaction of SOF and intelligence is built within the framework of taking into account the difference between special and military operations [306]. On the other hand, the nature of the war in Ukraine obliged the inclusion of non-traditional methods of armed struggle in the sphere of military intelligence in the complex with the provision of military intelligence units. This expands the possibilities of using the innovative potential of the Security Forces on the basis of a cybernetic approach, which makes it possible to determine specific areas of operational interaction of the Security Forces and intelligence. It is about the generalization of measures that combine quick, accurate and effective actions of special forces and intelligence units, taking into account their combat potential and the achievement of the key foreign policy goals of the operation, which are carried out with the aim of weakening the enemy's actions [311].

In fact, the success of a modern operation (both military and special) depends not only on the correctly and rationally chosen method of action to achieve the set goals but also on the ability to effectively combine the entire available range of capabilities of general purpose troops (forces) and SOF, which provides the ability to determine optimal combination of various forms and methods of armed struggle in various operational environments and heterogeneous aspects of special operations. The latter emphasizes the fact that in the resolution of modern conflicts, one of the forms of achieving success is the planning and conducting of multi-domain operations, which aim to ensure the realization of the global interests of the state by capturing, maintaining, and increasing the positions of dominance in the world geopolitical space, which is considered as an active strategic and operating environment. In this context, an important task of the theory of special operations remains the definition and justification of the strategic usefulness of the use of SOF in non-traditional environments and the development of modern principles of strategic art. In particular,

an in-depth approach to the consideration of multi-domain operations changes the concept of a rapid global strike (inflicting strategic non-nuclear means of damage to the enemy's nuclear forces and means), leading to the consolidation of tactical units of the armed forces. In fact, it is about preserving the principle of symmetry: for example, the orientation of the Russian Armed Forces on the use of brigade combat groups and brigade tactical groups by divisions, corps, and armies, which are expected to be used during traditional and non-traditional operations in different environments, which are mainly considered in a single system conducting a military battle.

2.8.2 CONCEPTUALIZATION OF THE USE OF SPECIAL OPERATIONS FORCES IN MULTI-DOMAIN OPERATIONS

In the modern theory of military art, the concept of multi-domain operations replaces the concept of a rapid global strike (inflicting strategic non-nuclear means of damage to the enemy's nuclear forces and means), which is oriented towards the consolidation of tactical connections of the armed forces. Gradually, there are significant shifts in the traditional approach of the theory of military art to multidimensional battles in the direction of combining the principles of symmetry and asymmetric actions of the armed forces, which indicates a gradual transformation of the concept of multi-domain operations. The main reasons for the transformation of traditional approaches to planning military operations into multi-domain operations include [312]:

— theoretical substantiation and practical implementation of the idea of the combined capabilities of the combined forces, integrated in several aspects, which requires a departure from the traditional understanding of the battle as coordinated by time, place, and conditions of actions of units of troops (forces);

— the need for doctrinally determined coordinated and united efforts of the management bodies of all types and types of combined troops (forces), which should ensure victory in the war, and not in the battle and campaign, which significantly changes the value of operations to achieve military and political goals;

— high dynamics of the development of the operational environment and obtaining and maintaining an advantage over the enemy;

— obtaining and maintaining competitive advantages over the enemy outside the time parameters of armed conflicts.

Based on this, the special operation provides for the description of additional operating environments of SOF [70, 313]:

— a complex operational environment (an uncontrolled sphere of interests, characterized by instability and uncertainty, the use of force, non-linear influence);

— a high-risk and high-sensitivity environment (closed areas, the conduct of operations in which is associated with high personal and political risk, which involves the preferential conduct of secret and underground operations with the use of special tactics);

— an environment of irregular armed struggle (characterized by the presence of acts of political violence carried out by the enemy with the aim of changing the political structure of the state, government, politics, etc. with the use of insurgent movements, subversive activities, terrorism, which actually makes it impossible to conduct open military operations and requires the use of inconspicuous or inconspicuous forces).

The specified additional operational environments of SOF are directly related to the concept of multidimensional operations, which is aimed at providing the most complete picture of the combat space and reducing the time for decision-making in the conditions of a combat situation. As a result, it is possible to substantiate a comprehensive approach to the application of SOF in the conduct of multi-domain operations in order to minimize existing and potential threats to the strategic and operational environment, which borders on one of the main threats to the state, which is associated with the possibility of losing national control over the domestic political situation.

The generalized experience of using SOF during operations in Afghanistan, Iraq, Syria, and Libya was taken into account in the concept of multi-domain operations of the USA, which defines ways to increase the effectiveness of SOF units in military operations and combat actions [313, 314]. This concept offers new approaches to the organization of SOF in order to increase their combat capability and equipment. At the same time, the concept of multi-domain operations considers SOF units as the most demanded component of the armed forces, taking into account the trends in the development of forms and methods of conducting armed struggle and realizing the interests of the state in the modern conditions of the development of the military and political situation at the local, regional, and global levels, as well as the need to solve the problems of ensuring the national security.

The result of the development of the provisions of the concept of multi-domain operations and the principles of the development of SOF is the formation of new principles of conducting combat operations by interspecies and united groups in all operational environments, including information and cognitive ones. In accordance with these principles, the main directions of the implementation of the combat capabilities of the Armed Forces under the conditions of modern warfare are represented by the following conceptual provisions [313]:

— improving the system of advanced military presence, organizing the deployment of expeditionary forces and the procedure for using the potential of coalition allies, which is aimed at deterring, minimizing the possibility of the enemy conducting a hybrid war (the use of appropriate means by the enemy), inflicting a defeat on the enemy in the shortest possible time;

— ensuring the capacity for isolation (autonomous, semi-autonomous) actions by units that are part of interspecies groups of troops (forces);

— creation of "windows of opportunity" for the maneuver of groups of troops (forces) in the main areas by ensuring the rapid concentration of military and political efforts based on taking into account a set of favorable conditions, factors, weak points, which makes it possible to gain an advantage over the enemy in a complex operational environment and preserve the initiative.

This testifies to the relevance of the involvement of SOF in conducting and ensuring the comprehensive application of the reconnaissance-strike system of the troop grouping to inflict

irreversible losses on the enemy in all achievable operational environments. The Russian-Ukrainian war demonstrates that the role of intelligence-strike complexes will grow rapidly in future conflicts. A simpler reconnaissance-strike complex is a system of an artillery battery, artillery gunners, and a group of reconnaissance UASs (**Fig. 2.8.1**). The less time passes from the moment of target detection to the moment of fire damage, the more efficiently the system works. At the same time, in modern combat, the work of anti-aircraft and radio-electronic warfare also comes first, respectively, in the case when the enemy forms an echeloned air-defence system and suppresses the work of the reconnaissance-strike complex by means of radio-electronic warfare, then in this case problems begin. In this case, the intelligence-strike complex should be multi-level, i.e., the integrated provision of strike means involves the creation of a system of technical means (radar stations, artillery reconnaissance systems, satellite communication systems, etc.) and SOF in combination with tactical intelligence means. Such a system can be considered as a basic element of the implementation of a complex of outer space, cyberspace, and special means of military defence (in interaction with conventional means and forces) in a multi-domain space.
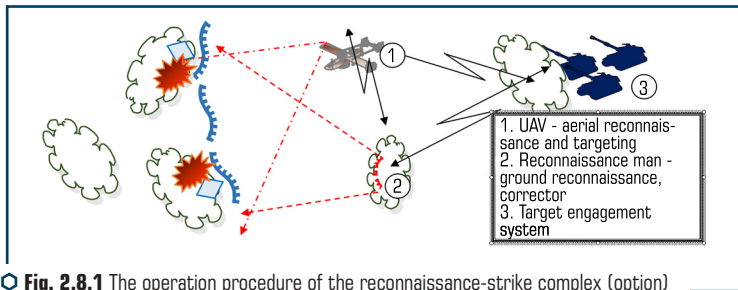
○ **Fig. 2.8.1** The operation procedure of the reconnaissance-strike complex (option)
Source: [315]

The given approach ensures the formation of new ways of using SOF during the planning and conducting of SOF, as well as the support of regular troops (forces) by units of SOF during military operations on TO, including the achievement of integrated goals of the complex of traditional and non-traditional operations. In particular, the areas of targeted application of SOF in multi-domain operations may include the goals of a single complex of the use of troops (forces) during operations or hostilities. Such goals are associated with the following priorities [70]:

1. General military long-range precision fires (LRPF), which are hidden and provided with echeloned air defence protection, are updated on strategic continental TO, creating a critical component of the confrontation, and covering air, space, and cyberspace. In addition, the LRPF provides for the advantage of the combined offensive potential of cyberspace, counter-space, and non-traditional methods of warfare.

2. Formation of advanced presence forces in the aspect of combined application of a complex of military units of permanent and variable composition, sets of means aimed at carrying out

missions, conducting reconnaissance, conducting fire, ensuring participation in the conduct of separate military operations, and supporting military operations.

3. Countermeasures against enemy SOFs and intelligence of the enemy, in particular in support zones, within the framework of interaction with counterintelligence means on TO, deployed field armies to ensure joint efforts in all aspects of combat operations and operations.

4. Development of non-standardized communication systems, which are formed from the network of human resources for the transmission of intelligence data on priority targets by SOF units to SOF coordination groups belonging to the sphere of management of field armies and corps.

5. Execution of tasks in deep fire zones (DFZ), both operational and strategic, that is, conducting operations in areas that are beyond the possible range of movement of traditional troops (forces), but in which joint fire actions can be used, SOF units are used, information influence and virtual capabilities will be implemented. At the same time, it is taken into account that ZHV are characterized by special limiting factors:

— remoteness that exceeds the limits of operational reach, or makes it impossible for traditional maneuver forces to penetrate into the ZHV;

— political prohibitions, in particular the presence of international borders, etc.;

— distribution by types of means that can be applied or allowed to conduct actions in each zone.

6. Countermeasures against enemy SOF units in the area of operational support of their troops (forces).

In view of the above, provision of a comprehensive approach to planning and application in multi-domain operations of SOF is carried out taking into account their role and place in unconventional wars, which are conducted with the aim of destabilizing the internal situation in the state by establishing control over governments, state administration bodies and the population in certain regions states, provide for the holding of SO with the involvement of opposition movements, terrorist and criminal organizations. As a rule, we are talking about SO, which are aimed at destabilizing, subversive activities, intelligence, information warfare, as well as the use of direct strikes (actions) to support traditional troops (forces), reduce the operational stability of the enemy, influence and control the terrain and the population of the state. In the latter case, it is about the achievement of the geopolitical goals of the state by using the potential of SOF to solve tasks related to the destructive impact on public and individual views, value orientations of the individual and society, disorientation of the population and disorganization of the process of socio-political development on the territory of the adversary states.

From the point of view of the SO theory, qualitative changes in the goals aimed at achieving the SOFs require significant transformations from traditional to non-traditional forms and ways of waging wars, since challenges and threats in the strategic and operational environment are dynamically changing, giving priority to new methods of influencing the enemy. In particular, informational and cognitive methods are more relevant, which in turn determine the need to reorient the forces and means of SOF to achieve informational and cognitive goals, which, unlike traditional approaches, do not have clear characteristics of the physical environment. It is the formation of a system

of non-traditional goals that has a direct impact on the conceptual justification of the use of SOF in multi-domain operations.

The introduction of a system of multi-domain objectives for SOF involves corresponding changes in the aspects and zones of influence, which also sometimes lose the completeness and conditional limitations of the physical environment, requiring the use of new methods of remote influence on the enemy. These are trends such as [313, 314]:

– expansion of the space for conducting hostilities and war environments;

– development of new forms of defence and defence measures;

– the growing importance of reconnaissance and diversionary actions in the enemy's rear, especially taking into account the growing depth of echeloning of troop groups (forces);

– intellectualization of wars, focused on the predominant use of high-precision and robotic weapons.

Another aspect is the development of new methods of remote influence on the enemy, i.e., the expansion of the space for conducting combat operations and war environments, the development of new forms of defence and defensive measures, the growing importance of reconnaissance and diversionary actions in the rear of the enemy (especially taking into account the increase in the depth of echeloning of troop groups (forces), the intellectualization of wars focused on the predominant use of high-precision and robotic weapons. In this case, the problematic issue is the implementation of the compensatory function that relies on SOF during the conduct of joint military and special operations by interspecies groups of troops (forces) in conditions of limited resource provision, which reduces the possibilities response to crisis situations. It is usually accepted that SOF should compensate for the lack of resources due to the involvement of units of allies, partners, irregular military formations of the country on the territory of which SOF is held, under the control of a loyal government. However, in certain situations related to due to the intensive growth of risks, the effective implementation of the compensatory function becomes impossible, therefore attention needs to be paid to the system of planning of SO and the joint use of troops (forces) and SOF in the defined operational area within the framework of the modernization of the system of comprehensive support, achieving a high level of operational interoperability of SOF with other units of the troops (forces), multinational formations, state and non-state organizations of various levels, including intergovernmental ones. As a result, the strategy of conducting military operations involves a combination of special operations as part of a traditional military campaign (operation) and as an independent, independent campaign of special actions or special operations limited by time parameters and a system of specific objectives.

The implementation of the compensatory function, which relies on SOF during joint military and special operations by inter-troop groups of forces in a situation of limited resource provision, which reduces the ability to respond to crisis situations, turns out to be a problematic issue of the given approach [316]. It is usually accepted that SOF should compensate for the lack of resources by attracting units of allies, partners, and irregular military formations of the country on whose territory the SCO is held, under the control of a loyal government. However, in certain situations associated with the intensive growth of risks, the effective implementation of the compensatory

function becomes impossible, therefore attention needs to be paid to the system of planning of military operations and the joint use of troops (forces) and military personnel on TO within the framework of the modernization of the system of comprehensive support, the achievement of a high level of operational interoperability of military personnel with other units of troops (forces), armed forces of other countries, multinational formations, state and non-state organizations of various levels, including intergovernmental ones. Achieving this should be ensured by an increased level of adaptability of SOF to situational changes on TO, in the strategic and operational environment. At the same time, the possibility of the development of an armed conflict or war is taken into account during the planning of the armed conflict, which requires the determination of invariants of the tactical and operational disposition of the armed forces during hostilities within the defined scenario models, as well as models characterized by a low degree of probability. The latter is important taking into account the high degree of uncertainty in the operational and strategic environment during the conduct of SO because the actions of SO in a new environment require non-standard decisions that are made and implemented in the shortest period of time. It is this that ensures the full realization of the universality of SOF as an exclusive means of immediate and effective response to risks and challenges to the security environment.

In fact, the theoretical and doctrinal justification of the use of SOF in multi-domain operations determines their priority, but not exclusive, importance in overcoming hybrid threats arising in one or another sphere or within the relevant clusters. At the same time, the strategic potential of SOF indicates the theoretical possibility of considering them as multi-domain forces acting at the intersection of interests or at the intersection of aspects. This is due to the growth of opportunities for technological and information influence, the use of special methods of point impact on the source of danger and gaining an advantage over the enemy. In this context, a steady trend towards theoretical understanding and conceptual consolidation of the principles of globally integrated multi-domain operations is being formed, which defines as the main priorities the development and substantiation of a modern structure of coordinated interaction of all forces and means of the Armed Forces, state and non-state organizations, one of the main elements of which is DFZ (including the rear area of the enemy) with the use of SOF. Diversification and complication of the aspects of struggle, first of all armed struggle, requires the universalization of SOF in order to take into account and minimize the negative impact on the effectiveness of the performance of tasks and the achievement of goals in difficult conditions. The universalization of SOF requires the adaptive use of traditional and non-traditional approaches, the integration of intellectual and combat capabilities of units capable of performing tasks and conducting SOF simultaneously in several areas.

CONCLUSIONS

Hybrid wars actively influence changes in the basic principles of planning and conducting military operations, the forms and methods of using military operations, determining the development

of a mixed approach to planning and conducting military operations aimed at achieving a balance of combat (direct or selective point strikes) and non-combat (indirect or special) methods and methods of influencing the enemy. The priority of using combat methods as main, and non-combat as auxiliary, and vice versa, changes, being determined by the objectives of SO. The selective use of force against the enemy's vital objects, critical infrastructure objects, as a result, becomes more prioritized and effective in comparison with mass strikes on the deployment locations of troop groups (forces), defence objects, etc. The success of a modern operation (both military and special) depends not only on the correctly and rationally chosen method of action to achieve the set goals, but also on the ability to effectively combine the entire available range of capabilities of general-purpose troops (forces) and SOF, which ensures the necessity and opportunities determination of the optimal combination of various forms and methods of armed struggle.

The analysis of the problems of substantiation in the theory of special operations of the use of SOF in multi-domain operations proved that in the theory of SO an understanding of SOF as multidisciplinary forces is formed, which makes it possible to expand the scope of theoretical justification of their use in multi-domain operations. This issue is considered in the context of the general tendency to the emergence of threats to national security in one or more aspects, when the use of armed forces alone loses its effectiveness, which is due to a high level of control or the achievement of an acceptable level of security in each sphere. Achieving this level requires special forces and means in each sphere, taking into account the complex nature of goals that ensure dominance or positive influence on a significant sphere in which national interests and strategic goals of foreign and domestic policy are achieved. In this context, **further research** into the development of hybrid forms and means of application of SOF is relevant.

CHAPTER 3

INFORMATIONAL, SOCIAL, HISTORICAL, AND LEGAL ASPECTS OF THE RUSSIAN-UKRAINIAN HYBRID WAR

3.1 CHANGE IN THE INFORMATION PARADIGM OF RUSSIA IN THE CONTEXT OF THE IMPLEMENTATION OF STRATEGIC COMMUNICATIONS

Iryna Izhutova, Volodymyr Shubin

ABSTRACT

During the year of Russia's full-scale invasion of Ukraine, the aggressor country changed the rhetoric of its information war more than once; only the adherence to long-established narratives persisted, which had taken root at least since 1991, and even earlier, as well as approaches to the dissemination of disinformation to reinforce its illegal actions.

The invading country restricted the access of its citizens to almost all social networks and mobile applications (messengers), leaving only Telegram channels available, which it actively uses to spread its propaganda. The subject of our research was the study of the change in Russia's information paradigm in the context of the implementation of strategic communications, in particular in the period from February 24, 2022, when the unconventional confrontation turned into a large-scale armed aggression against Ukraine. Until that turning point, the hybrid nature of information submission and message dissemination prevailed, but with the increase in the volume of purely military operations, a change in the information paradigm took place, saturation of messages with pre-prepared messages that were released according to a planned schedule. Our research is about exactly how the adversary uses Telegram channels to build its network of propaganda machines.

KEYWORDS

Invasion, aggressor country, information war, narratives, disinformation, restriction of access, social networks, mobile applications, propaganda, strategic communications, unconventional confrontation, network of propaganda machines.

The morning of February 24, 2022, was unexpected for many, even for those who considered themselves prepared for any development of events. Instead, Ukraine promptly reacted to the intensive Russian informational aggression and made a decision on "unified informational policy under the conditions of martial law" [317]. The document substantiates that "implementation of a unified information policy is a priority issue of national security, the provision of which is implemented by unifying all nationwide TV channels, the content of which consists mainly of information and/or information-analytical programs on a single information platform of strategic communication – 24-hour information marathon "The only news #UArazom" [317].

At the beginning, the marathon played its role and according to the comprehensive comparative study "How the war changed me and the country. the results of the year", "there was an increase in

trust in mass media, but the main feature of wartime is a sharp change in the channels of communication and obtaining information by citizens. And if trust in national and local media increased, the frequency of consumption of their news content – on the contrary – decreased: national television from 55 % to 43 %; local from 11 % to 7 %. The respondents note that at the beginning they watched more TV because it calmed them down, gave them an official assessment, but with the return to work there is no time left for a marathon, therefore, for analysis and obtaining information, people turn to messengers and channels, the share of consumption of which has increased from 11 % to 41 %" (**Fig. 3.1.1**) [318].

What sources do you use to get social and political news most often?
NO MORE THAN THREE ANSWERS

Source	02'23	11'21
National television	43	55
Groups and channels in messengers (Telegram, Viber)	41	11
Internet pages	36	47
Social media (Facebook, Twitter, Instagram)	36	35
YouTube	29	21
Friends or family	15	16
Radio	9	9
Local television	7	11
National newspapers, journals	3	6
Local newspapers, journals	2	6
Other	1	2
Difficult to answer	0	1

○ **Fig. 3.1.1** Confidence in mass media. Communication channels
Source: [318]

But, unfortunately, the single marathon did not and does not provide coverage and reach of all target audiences, in particular under the conditions of the destruction of TV and radio towers of Ukraine, power outages and those features that not all audiences are fans of television. In addition, since February 24, 2022, a large part of the audience has switched to social networks, which quickly respond to changes in the information space and all the events around; the texts in them are short, as a rule, they contain just facts, which cannot fail to interest readers who do not have much time to read long texts (or simply do not like to read a lot). "Over the last year, the number of users of social networks in Ukraine has increased – from 60 % of the population in 2021 to 76.6 % in July 2022. This is evidenced by the GlobalLogic study" [319].

One of the most popular messengers was Telegram, which offers a huge number of channels, but until 2022, it was popular among young people and was not very attractive to government institutions. Its phenomenon has a simple explanation:

"1. This is one of the most convenient ways to receive news about the current situation.

2. In the first days of the full-scale invasion, the vast majority of Ukrainians used the messenger for its main purpose – maintaining communication and contacts with relatives, friends, acquaintances, and colleagues.

3. Telegram served as one of the first applications to maintain contact with those who were forced to flee abroad" [320].

Russia took advantage of this phenomenon, spending colossal sums to integrate its texts into the media space of Ukraine.

"Telegram has become the main source of news for Ukrainians – 65.7 % of citizens receive information from it, according to data from a May survey of the OPORA network. Messenger is the main channel of information for people aged 18 to 39, which is about 11.9 million people.

The statistics of the use of the application also confirm its popularity. From February to April, Ukrainians increased their time in Telegram eightfold – from 4 to 31 minutes per day, according to Kantar data. In March, the web version of the messenger closed the top five most popular sites in Ukraine.

In the top 50 Telegram channels, the majority are news or represent state bodies: an average of 763,000 subscribers, and each post receives 288,000 views" (**Fig. 3.1.2**) [321].
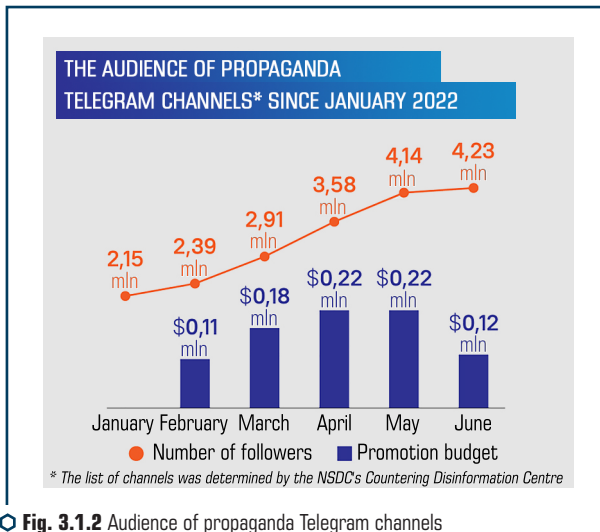
○ **Fig. 3.1.2** Audience of propaganda Telegram channels
Source: [321]

So, during the specified time, in the course of round-the-clock monitoring of the information space (which covers the period from February 20 to mid-November 2022), we investigated

Russian Telegram channels that "mimic" Ukrainian ones (they are so-called pseudo-Ukrainian) and have an audience of up to one million readers and more (Resident, Sheptun, Agent of the State Department, Nachshtab, ZeRada, MediaKiller, Legitymny, etc.), and purely Russian channels with the same audience of readers (Readovka, TASS, RIA Novosti, IZ.RU, Telegram channels of the Russian "military forces" and bloggers). Despite the repeated exposure of pseudo-Ukrainian channels, messages from them continue to be replicated subsequently by purely Ukrainian channels and sources of information. The messages in them are presented in Russian, but with the submission of receiving information from sources supposedly in the Office of the President of Ukraine or other "insider" sources close to the power structures, they are then distributed throughout the network of propaganda Telegram channels, from supposedly Ukrainian to clearly Russian ones.

Unfortunately, some messages, having passed through the propaganda media, enter the information space of Ukraine, losing the reference to the original Russian texts, which poses a danger for the formation of the Ukrainian national information space, public opinion. There is such a layer of readers who, after reading these messages, have an inspired feeling of so-called "betrayal" and mistrust of the Ukrainian authorities. And such a change in the behavior of the target audience – the population of Ukraine – is the goal of the information and psychological war that Russia is waging against Ukraine, actively integrating it into its military operations.

It is worth noting that in order to spread propaganda and disinformation during this war, Russia traditionally relies on five elements: official state communications (statements by the Kremlin or ministries, official messages on social networks, statements or quotes from Russian high-ranking officials), global state broadcasting (media, intended for foreign and domestic audiences funded by the state, foreign mass media funded by the Russian state, international Russian socio-cultural institutions), cultivation of proxy sources (pro-Russian Internet resources with a global reach, local mass media oriented to a certain language, deliberate dissemination of Russian propaganda, unintended spreaders of Russian propaganda, the spread of foreign propaganda), turning social networks into weapons (infiltrating internal discussions, constant campaigns to undermine trust in government institutions, inciting protests or civil insurrections), cyber-attacks (cyber disinformation) (computer hacking and dumping information, hijacking a site, cloning sites, forgeries, obstructing the work of official sources or mass media) [322].

"All of Russia's rhetorical distortions serve one purpose – to hide Russia's obvious attempts to erase the sovereign, independent state of Ukraine from the map and subjugate its people. Hidden in the lie are signs that point to the real neo-imperial ambitions of the Kremlin. Putin's July 2021 message declaring Russians and Ukrainians "one nation" and his calls for war in February 2022, filled with rewriting history and disinformation denying the statehood and sovereignty of Ukraine, made the world understand his true goals. These same lines are often repeated by Kremlin propaganda figures, such as Margarita Simonyan, who recently repeated the fabricated statement that Ukraine was created by Russia and owes Russia gifts. Putin's vision of realizing Peter I's imperial expansionist ambitions and "returning lost territories" and unvarnished comments by Kremlin officials reveal their true intentions. Kremlin officials said Moscow could also take action in response to

so-called "Russophobia" and non-existent "genocide against Russians" in places other than Ukraine, which it considers its historic lands. Kremlin experts have already suggested that Russia may need to "denazify" Kazakhstan, Moldova, and any other country that allegedly harbors "Russophobia". Leaving no doubt about his vision for the future, in a speech in January 2023, Putin stated: "The goal, as I have said many times, is primarily to protect people and to protect Russia itself from the threats that they are trying to create on our historical lands. We cannot allow this" [323].

According to the Doctrine of Information Security of Ukraine, which has already been canceled, but is a fairly effective well-structured document and the definition given in it is still relevant, "strategic communications is the coordinated and proper use of the communication capabilities of the state — public diplomacy, public relations, military connections, informational and psychological operations, measures aimed at promoting the goals of the state" [324].

This definition is not ideal and is a complete tracing of what existed in NATO at the time of initiating the process of building a strategic communications system in the state, but when we talk about strategic communications, we always mean working with target audiences. And this definition divides the whole process into these target audiences that need to be worked with. If we evaluate the content that Russia spreads against Ukraine, and follow the logic of the components of strategic communications, then it is worth emphasizing that all components are taken into account:

— public diplomacy — work for an international audience (scandals with the supply and sale of weapons on the black market, non-transparent distribution of weapons and military equipment, etc.);

— public relations — work, mainly with the internal audience (numerous corruption schemes);

— military relations with the public — work with the audience of the military (raising the issue of conflict between high-ranking officials);

— informational and psychological operations — influence on the population of Ukraine (constant pressure on readers' emotions, dissemination of frankly false information with the aim of changing behavior and forming the opinion that the enemy needs).

In addition, from the analysis of open sources, it is quite obvious and there is a clear picture that while preparing the Russian population for war, Russian propaganda at the end of 2021 significantly increased anti-Ukrainian rhetoric, directing it to increase contemptuous and hostile attitudes.

In particular, Russian propaganda denied the historical facts of the existence of the Ukrainian nation, discredited Ukrainian statehood, and formed the opinion that Ukrainians and Russians are one people. At the same time, narratives about the illegitimacy of the Ukrainian government after the Revolution of Dignity and the neo-Nazi nature of its actions with the support of Western special services were promoted.

An important direction of discrediting was theses about the geopolitical exploitation of Ukraine by the collective West. A narrative was being formed about the existence of an external threat to Russia from the side of NATO and the USA, which plan to use Ukraine as an aggressor against it and therefore "demonize peaceful Russia" with accusations of preparations for war.

In the context of statements about the oppression of the Russian-speaking minority and the violent displacement of everything Russian from Ukraine, a justification was formed for the potential

"forcing Ukraine to make peace" on Russia's terms. So, the propaganda of the Russian Federation spread theses about the need to resolve the Ukrainian issue in Donbas by military means.

Anti-Ukrainian hatred, which reached its peak in February 2022, intensified after the invasion with a patriotic "hangover". Propagandists en masse declared about the ultra-fast conquest of Kyiv and the inevitable defeat of the Ukrainian Armed Forces during the first three days:

– O. Lukashenko: "Ukraine will not fight with us – this war will last a maximum of three or four days. The CSTO showed us that by the time they turn around there and send troops, we will already be standing by the English Channel";

– M. Simonyan: "In a hot war, we will defeat Ukraine in two days! Well, what is there to defeat her, Lord? Well, let's suppress the fire points…";

– O. Skabeeva: "We will take Kyiv in two days, and then – the fall of the city";

– V. Solovyov: "If you think that we will stop at Ukraine, think three hundred times. Let me remind you that Ukraine is only an intermediate stage in ensuring the strategic security of the Russian Federation".

In the first days of the war, Russian propagandists reported on the numerous victories of the Russian army, the breakdown of the unipolar world under the hegemony of the United States, and Russia's rise to a leading position in geopolitics.

Subsequently, their speeches became less and less pathetic, and the lack of a quick victory was explained as follows: "in fact, Ukraine is a large European country, of course, it is not possible to capture such a territory quickly in a month of a «special operation»".

After the failed blitzkrieg attempt, the main direction of Russian propaganda was the interpretation of the goals and objectives of the so-called special military operation. It turned out that the declared goal of aggressive military expansion was "demilitarization" and "denazification" for the majority of Russians.

To this day, the final goals of the so-called SVO, which were transformed and added to as the situation at the front developed, have never been made public.

In March 2022, Russian propaganda replicated theses regarding the historical falsity of Ukrainian statehood and the country's inability to exist independently. The narrative about the need for a quick "peace on any terms" as a result of negotiations with the Russian Federation and partial compromises regarding the already occupied territories was advanced" [325].

In order to have a complete clear picture of what the Russian Federation was doing in the information space of Ukraine, it is worth paying attention to its message a few days before the start of large-scale armed aggression against Ukraine. In general, the entire information campaign of Russia against Ukraine during this period is represented in the form of separate information blocks. Each block consists of several stages (phases). They are periodically repeated, scrolling in a circle.

Having analyzed all the messages for the specified period of time, it can be stated that these so-called information blocks are launched in accordance with the problems that the population of Ukraine most often faces and that are of most interest to them, i.e. found and identified vulnerabilities of audiences, as well as within the existing main of Russian narratives about Ukraine, which were singled out by Ukrainian researchers:

– "a civil war is ongoing in Ukraine";

– "Ukraine is a state that does not exist";

– "Ukraine is a puppet of the West, which is trying to conquer Russia" [326].

Accordingly, it is very easy to manipulate the minds of citizens and create subversion within the state through the spread of panic, confusion, insecurity, and loss of trust.

This is confirmed by the fact that in February 2023, the American analytical center "Atlantic Council", which is engaged in research in the field of international relations and global security, published a report on Russian propaganda in the period from 2014 until the beginning of the full-scale invasion of the Russian army in Ukraine in February 2022; the report is devoted, in particular, to the main narratives that have been formed against Ukraine, and the main ones coincide with those proposed by Ukrainian scientists. In fact, these narratives were not formed just a few days before the invasion or a few months or years before February 2022: the process began much earlier, and what the world community saw was already the result and the messages that were spread within the pre-formed narratives, when users (audience) are simply used to receiving information in exactly this form and with such content. What is visualized now is just the tip of the iceberg that has been building up over a long period of time.

The authors of the study emphasize that "seventy days before the invasion (December 16, 2021 – February 24, 2022), we analyzed and structured more than ten thousand articles from fourteen pro-Kremlin mass media.

Among the main narratives we investigated were [327]:

– Russia seeks peace (2201 articles);

– Russia has a moral obligation to do something about security in the region (2,086 articles);

– Ukraine is aggressive (1,888 articles);

– The West creates tension in the region (1,729 articles);

– Ukraine is a puppet of the West (182 articles)" (**Fig. 3.1.3**).
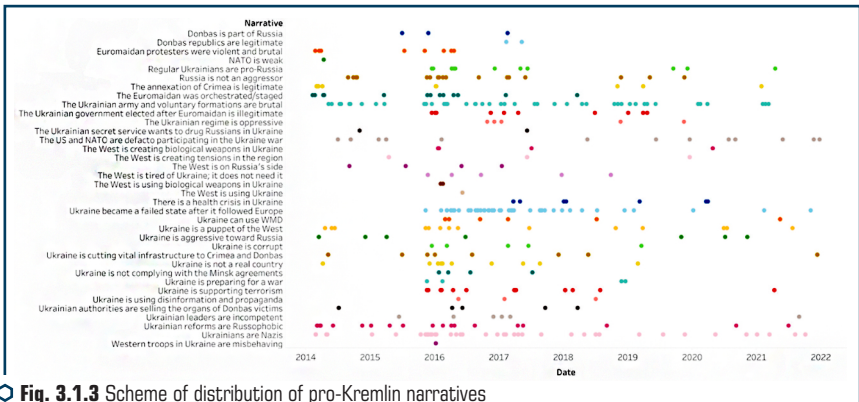
○ **Fig. 3.1.3** Scheme of distribution of pro-Kremlin narratives
Source: [327]

There are many such blocks: some are quite popular and often used, others are launched to strengthen the main ones. We identified four main topics of the mentioned blocks. These units include topics such as:

1) corruption;

2) the West is tired of Ukraine;

3) creating problems in Europe and the world through Ukraine;

4) intergovernmental conflicts.

Within the framework of the research, we are interested in the relationship between events in Ukraine, in particular in the areas of hostilities (changes in the situation at the front), in the world, and the emergence of each information block. We evaluate the mentioned processes according to the following indicators: triggers, peaks, slumps, and lulls.

We analyzed in detail the period up to and including July 1, 2022, a general overview of the topic was made until the month of November. The trends in the spread of messages are clearly visible:

1) to distract attention (switching it from one's own failures and defeats at the front: these are periods of failure in the Kyiv region, Kharkiv region, and Kherson region, shifting attention from internal problems to the issue of Ukraine);

2) canceling or reducing assistance from partner countries (discrediting Ukraine in their eyes, in particular, intensifying the promotion of this block immediately before making important decisions in favor of Ukraine or against their background);

3) undermining the countries of the world from the inside due to the supposed problems created by Ukraine due to problems with the supply of energy resources, grain supplies, etc.

4) sowing panic inside the country (within the Ukrainian Armed Forces, among military personnel, at the beginning this information block was not popular and was tested in parallel with other blocks. It is not interesting for the entire population of the country since not every average citizen knows the military leaders, instead servicemen are a vulnerable audience and painfully perceive messages about the existence of a supposedly power confrontation) due to the discrediting of the top military-political leadership and the formation of distrust in all actions of the authorities in Ukraine (**Fig. 3.1.4**).

The life cycle of information blocks at the beginning of the full-scale Russian invasion of Ukraine was insignificant; they changed more often and were broadcast sequentially; subsequently, sensing the topics that are relevant to the country and which are not, the sequence and duration of these information blocks changed.

After testing the appropriateness of dissemination, the topic of corruption remained dominant, as it is one of the main topics that concerns the population, which is the target audience of such information. The topic of corruption is revealed in the promotion of Ukraine's sale of arms on the "black arms market" and the lack of transparency in the process of accounting for arms deliveries from partners to Ukraine. In particular, this concerns corruption by high-ranking officials. This theme makes it possible to work with the maximum number of target audiences, achieving maximum reach. Especially since, as a rule, this topic is promoted without facts, without a clear indication of the source of information, and filled with conspiracy, mystery, and opacity.
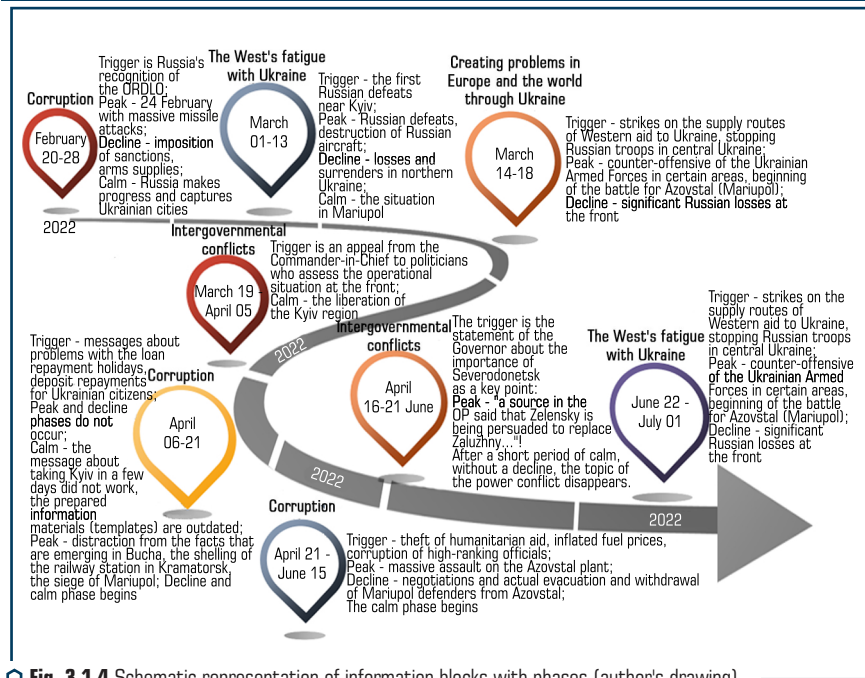
Fig. 3.1.4 Schematic representation of information blocks with phases (author's drawing)

In addition, over time, the interspersion of different topics in one information block is noted to divert attention from real events taking place in the state. Such "thematic interspersions" make it possible to check whether the launch of a new topic is appropriate in a certain period of time.

As already noted at the beginning of our research, the main problem of creating such a network of dissemination of propaganda information is dangerous from the point of view of the entry of messages into the information field of Ukraine with the loss of the original source and the taste of tradition-al (classical) "treason" — something that the target audience will definitely react to and consume.

It is noteworthy that in some information blocks, after the trigger stage, there is a lull stage, without a peak and a decline. The justification can be:

a) lack of interest in the stated topic;

b) the need to quickly switch the attention of the target audience;

c) "probing" the topic, whether it will be interesting with a gradual increase in the number of messages in the future.

What is interesting is the fact that some messages are repeated at intervals of one month or less with almost no change in the text but to remind the main narrative of the enemy. This, in par-ticular, happens in those periods when the texts prepared in advance run out, and it is necessary to fill the information space. At the beginning of a large-scale invasion, such a period ended in about

two weeks. There was complete silence in the information field, there was no powerful saturation of information, as there was a calculation for a blitzkrieg, which did not happen.

In connection with the official notifications of the Security Service of Ukraine about the exposure of the so-called propaganda Telegram channels, the compilation of a whole list of such channels, propaganda became more active and at the end of 2022, new channels began to be created, the quality of which content increased significantly, even channels in the Ukrainian language began to appear. In our opinion, such information resources are the most dangerous because information from them spreads very quickly, the very source of its creation is lost. Simple psychology works – a person believes in something mysterious, hidden, which is entrusted only to him from an unknown, anonymous source, or from supposedly relatives or acquaintances of those who make important decisions. And despite the numerous publications of lists of such channels, information from them continues to be actively disseminated. Sometimes new channels quote already exposed channels to demonstrate their actual affiliation.

CONCLUSIONS

Based on the conclusions we made while studying the changes in Russia's information paradigm in the context of the implementation of strategic communications, we can provide the following recommendations:

1) open response to such information blocks is not effective and looks more like an excuse;

2) it is more effective to demonstrate and spread one's own strong narrative without tying to the enemy's statements or repeating his narratives and messages;

3) greater work with the target audiences and their awareness will make it possible to avoid fanning unnecessary "betrayals" even from minor facts.

With regard to strategic communications, awareness of the mechanism of dissemination of such information is necessary for the construction of proactive communication and the formation of a sustainable society. In addition, taking into account the approaches of the enemy to form their respective actions aimed at ensuring national security.

3.2 ANALYSIS OF THE USE OF SOCIAL NETWORKS IN THE INTERESTS OF CONDUCTING AN INFORMATION OPERATION WHILE FORECASTING THE SPREAD OF THE ADVERSARY'S INFORMATION INFLUENCE

Oleksandr Voitko, Volodymyr Rakhimov

ABSTRACT

Modern information technologies and the unstoppable development of the Internet have created unhindered conditions for the development of communications throughout the world. So gradually a person in the physical space becomes a network user, and in the digital dimension becomes a cyberperson, which directly contributes to receiving information and remote communication without borders. The urgent need for communications, and especially for communication in today's innovative, informational world, is greater than ever before. A decisive role in solving these tasks is played by social networks that rapidly unite people, both by the fact of their common past and by different motives and interests. Initially, users are united in social networks to build and maintain business contacts. The great demand for social networks has influenced the growth of the number of networks of various orientations and increased user requirements for network services. Thus, social networks began to actively introduce online games, expand blogospheres, photo hosting, and other services and went from uniting people around the world to publicly sharing information, opinions, personal life stories, news, and feelings with each other [328]. Nowadays, for a large number of users, the network is not just a system for exchanging messages, but it serves as the user's self-expression in the network, providing the opportunity to fill the network with his/her own content in free mode, to blog, which can also be commented on by other members of the social network.

KEYWORDS

Modern information technologies, global communications, digital dimension, remote communication, social networks, business contacts, blogging.

3.2.1 THE ROLE AND PLACE OF SOCIAL NETWORKS IN THE PROCESS OF INFORMATION DISSEMINATION

Today, social networks have become an integral element of communication in society, without separating the personal and professional needs of a person. Social networks are a means of communication between the communicator and the consumer of information, they can act simultaneously as a platform for discussing problematic issues as a large social group, and as a service for correspondence of individual individuals. The content distributed through these networks

may be factual or manipulative in nature, which may cause unforeseen and unexpected consequences around us.

Social network theory views social relationships in terms of nodes and connections. Nodes are isolated actors in networks, and ties correspond to relationships between individuals or groups (actors) [329]. The study of social networks is an extremely important issue because it can provide significant amounts of information about the members of social groups and their relationships.

Despite the fact that various information has been disseminated in society before, recently, fake news and false, distorted information have gained momentum at a rapid pace, as social networks play an inevitable role in the faster spread of informational influences in societies. Nowadays, people spend hours on numerous social networking websites, participating in a variety of activities that help spread informational influences among us.

Considering information influence as an organized purposeful application of special information means and technologies to introduce destructive changes in the consciousness of an individual, social groups or population (correction of behavior), in the information and technical infrastructure of the object of influence and (or) the physical state of a person, it should be considered as a totality of information-technical and information-psychological influences [330].

Practically, information influence is carried out with the help of specially developed psychotechnology. The object of psychotechnology is the human psyche, which is considered as a dynamic system that provides management of human interaction with the environment [331]. These psycho technologies are based on a differentiated approach to the individual according to his psych type (in particular, informational), use psychological mechanisms of communication to achieve optimal results in managing people, that is, direct informational influence on defined target audiences in social networks.

In 2022, there were significant changes in the consumption of news in Ukraine, in particular, the consumption of TV, radio, press, and Internet sites (mostly TV) decreased significantly, and the news audience moved mainly to social networks (**Fig. 3.2.1**). At the same time, 49 % of Ukrainians use several types of media for news; if they use only one source, it is usually social networks [332].

At the same time, unlike registered mass media, filtering of destructive content (information influence) is insufficient in social networks, any news, especially "fake" news, can be quickly multiplied and spread before the information protection department or moderator conducts a detailed analysis. The number of social networks in which destructive information is published is constantly increasing. In this regard, there is a need to monitor and forecast the spread of destructive information in social networks for timely decision-making regarding neutralization and studying the information impact.

After the beginning of the full-scale invasion of the Russian Federation on the territory of Ukraine, the Ukrainian society constantly monitors the updates of the events on the front, official statements of the authorities and reports about the air alert. Before the war, users of social networks used, as a rule, 1–2 sources of news, but with the beginning of hostilities, they were forced to use from 3 to 5 sources – not only to get a more complete picture ("control the situation") but also to check the news on disinformation ("I compare news from different sites for disinformation").
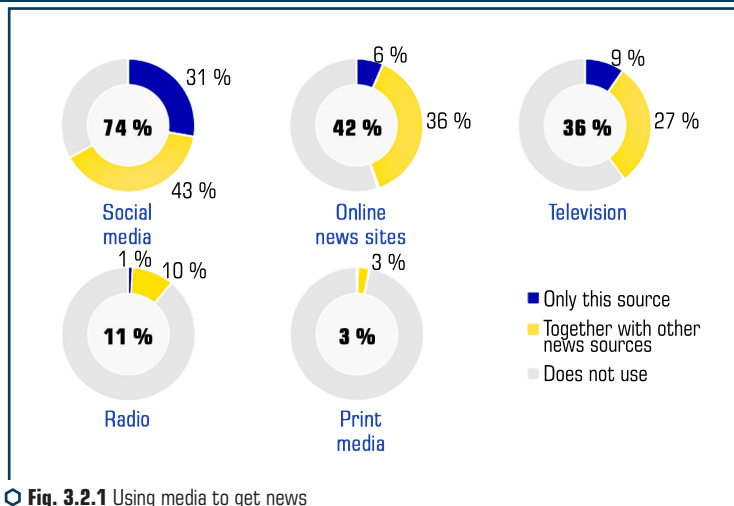
Fig. 3.2.1 Using media to get news
Source: [332]

The most noticeable are the differences in news consumption by age (**Fig. 3.2.2**). Thus, more than 92 % of users aged 18 to 39 consume news on social networks, as do more than 64 % of consumers aged 40 to 69. At the same time, older people prefer television (more than 78 % of users over 60 years old) and radio (more than 36 % of users over 60 years old). More than 60 % of users aged 30 to 59 use the Internet, excluding social networks, for news, and more than 20 % of users aged 60 and over use print media [333].

	18-29	30-39	40-49	50-59	60-69	70+
Social media	92.2 %	92.1 %	83.5 %	79.8 %	64.8 %	34.1 %
Television	51.0 %	62.6 %	58.2 %	72.2 %	78.0 %	83.7 %
Internet *(not including social media)*	64.3 %	74.2 %	68.5 %	63.7 %	54.6 %	32.1 %
Radio	20.7 %	25.9 %	23.5 %	27.3 %	36.9 %	39.9 %
Print media	10.5 %	13.7 %	8.1 %	15.7 %	23.8 %	26.1 %

Fig. 3.2.2 News consumption by age
Source: [333]

234

Summarizing the reasons for the attractiveness of social networks, we can highlight the following opportunities that they provide to users:

– receiving and collecting information from other users of the social network;

– verification of ideas through participation in interactions in the social network;

– social benefit from communications (self-identification, social identification, social acceptance);

– recreation, pastime.

When modeling social networks, the mutual influence of their users (agents), the dynamics of their opinions, etc., there is a need to take into account the factors (effects) that take place in real social networks [334]. In general, the following effects and properties may occur in real social networks, determined both by the characteristics and needs of agents (who exert an informational influence and those who are influenced), the nature of their interaction, and the properties of the social network itself:

– availability of users' own opinions;

– change of opinion under the influence of other agents of the social network;

– different significance of opinions (influence, trust) of some agents for other agents;

– different degree of users' susceptibility to influence (conformism, stability of opinions);

– the existence of indirect influence in the chain of social contacts.

Reduction of indirect influence with increasing "distance":

– existence of "opinion leaders" (agents with maximum "influence"), formalization of influence indices;

– the existence of a threshold of sensitivity to changing the opinion of others;

– localization of groups ("by interests", with close opinions);

– presence of specific social norms;

– taking into account the factors of "social correlation" (common to groups of agents);

– the existence of (as a rule, less significant) external factors of influence (advertising, marketing actions) and, accordingly, external agents (mass media, product manufacturers, etc.);

– the presence of stages – characteristic stages of the dynamics of the opinions of members of the social network (for example, the process of diffusion of innovations);

– avalanche-like effects (cascades), formalization of the conditions of their occurrence and propagation properties;

– influence of structural properties of social networks on the dynamics of opinions;

– activity (purposeful behavior) of users;

– the possibility of formation of groups, coalitions;

– incomplete or asymmetric awareness of agents;

– non-trivial mutual awareness (reflection) of agents;

– game interaction of agents;

– optimization of informational influences;

– information management in social networks.

These features have great practical application in the situation of analysis of real social networks, when it is necessary to analyze the network taking into account its structural features.

3.2.2 INFORMATION INFLUENCE IN SOCIAL NETWORK

Diffusion of informational influence in social networks is the process by which users of social networks receive information from other users that can influence their beliefs, behavior, and perception of the world. The main tools for spreading information influence in social networks are posts, comments, likes, reposts, and other ways of interaction between users. Some people and organizations use social media to spread fake news or promote their ideas. This can have a serious impact on public opinion and perception of reality. Various approaches are used to combat the spread of fake news and information influence on social media, including fact-checking, blocking unwanted sources of information, and promoting truthful news sources. It is important to remember that each social media user is responsible for what they post and share online. Critical thinking and checking sources of information can help avoid the influence of unreliable data and fake news.

In order to understand how information influence spreads in social networks, it is worth paying attention to several factors.

Algorithms of social networks. Most social networks use algorithms that determine what content should be shown to users in their news feed. These algorithms are usually based on the previous interaction of users with the content (likes, comments, reposts), as well as on the properties of the content itself (for example, the number of views or the time users spend on the content page). This means that popular content is more likely to appear in users' news feeds, increasing its potential impact. For example, Facebook uses the EdgeRank algorithm, which determines which messages will be shown in the user's news feed based on the level of interaction with certain content (likes, comments, etc.) [335]. This can affect which information spreads faster and to a larger audience.

Influential users. Some social media users have a large number of followers or "followers", which makes them influential. These users can spread information faster and more effectively, making their influence on public opinion much higher.

Viral content [336]. Some content has the property of "viral" advertising – that is, it begins to spread very quickly through social networks, with the help of reposts and similar methods of distribution. This type of content can have a significant impact on public opinion and behavior.

Public relations are a form of informational influence aimed at forming a positive image of a company or an individual, as well as increasing their popularity among the public [337].

Communities and groups. Most social networks have communities and groups where users can share information with like-minded people and receive information from them. These communities and groups may be based on common interests, political views, religious beliefs, and other factors. The informational influence in these communities can be significantly higher because users have more similar views and interests.

Manipulations. Some individuals and organizations may try to manipulate public opinion through social media. This can be done by spreading fake information, abusing social network algorithms, using bots, and other ways. These manipulations can have a significant impact on public opinion and lead to undesirable consequences.

Advertising and paid content. Many social networks have the possibility of paid advertising and other content. This can affect which information will be shown to a larger audience and will be shared more quickly.

Trends and virality. Information that goes viral or spreads as a trend can spread quickly on social media. This can be related to important events, hot topics, or emotional content that encourages users to interact and share.

In general, information influence in social networks depends on many factors that can interact with each other. This makes the dissemination of information in social networks a rather complex process that requires an understanding of the specifics of each social network and its audience.

At the same time, the main directions of ensuring Ukraine's information security are stability and interaction, for the achievement of which it is necessary to fulfill strategic goals and objectives. Strategic goal No. 1 defines countermeasures against disinformation and information operations (of the aggressor state) aimed at eliminating the independence of Ukraine, overthrowing the constitutional system, violating the sovereignty and territorial integrity of the state, promoting war, violence, cruelty, inciting national, inter-ethnic, racial, religious enmity and hatred, committing terrorist acts, encroachment on human rights and freedoms [338].

Achieving the specified goal will be carried out by performing a number of tasks, namely:

– creation of a system for early detection, forecasting, and prevention of hybrid threats, in particular, creation of a system for combating disinformation and information operations, aimed at prevention, as fast as possible detection and response of the state and society to information threats;

– introduction of effective mechanisms for detection, fixation, restriction of access (deletion) from the Ukrainian segment of the Internet, the placement of which is restricted or prohibited by law.

At the same time, one of the main tasks for achieving the goal of the information operation is the protection of the population, the personnel of the Ukrainian Armed Forces, and the objects of the information infrastructure of Ukraine from the information influence of the enemy.

At the same time, under the conditions of worldwide globalization and informatization of communication processes, the use of Internet capabilities for informational influence is a priority, more hidden and protected means. At the same time, the mass application of measures of informational influence through the Internet provides an opportunity to spread and "feed" already formed public opinions, which indirectly causes the so-called "contagion effect" in the target audience and encourages them to join the majority.

Informational influences can be limited (narrowly directed dissemination on the definition of the target audience) or have a global reach and represent a certain classification by content:

– propaganda or justification of war;

– propaganda or justification of terrorism and extremism;

– propaganda or justification of offenses;

– propaganda of racism;

– propaganda of national hatred;

– propaganda of religious hatred;

– desecration, insult to historical memory, symbols of military glory;

– desecration, insult of state symbols;

– an insult to the religious feelings of believers;

– promotion of destructive, non-traditional values and attitudes;

– justification of violence, cruelty;

– justification of deviant behavior;

– propaganda, justification of actions dangerous to human life;

– intentionally false information;

– slander;

– information containing information on methods of manufacturing something prohibited;

– advertisements for the purchase or sale of prohibited goods;

– sexually explicit content;

– sexually explicit content involving minors.

Thus, the study of information dissemination processes becomes an increasingly important task every year. This happens for several reasons: firstly, due to the importance of information as such in modern society, secondly, with the development of technological progress and in particular the improvement of means of communication between people (users), which now cover almost the entire globe, it has become important to understand how exactly this or that information is distributed. The analysis of these processes gives us the opportunity to predict the reactions of certain groups of people to this or that information, and therefore there is an opportunity to develop strategies that make it possible to effectively work with the target audience, for wider coverage, and also make it possible to predict the spread of informational influence and determine the limits of reaching the target audience.

The explosive growth of the use of social networks paved the way for the rapid spread of informational influence in society. It is very important to build mathematical models to study the spread of information influence in a social network among each user and the community as a whole.

3.3.3 ANALYSIS OF THE SPREAD OF INFORMATION BY THE EXAMPLE OF SIR - THE MODEL OF THE SPREAD OF THE EPIDEMIC

Network epidemics play a significant role in manipulating the consciousness of both specific target audiences and influence the change of public opinion of the population of the state as a whole. The latest trends after the COVID-19 pandemic prove that the world is slowly and gradually moving to a work-from-home strategy and directly affecting both educational processes and professional fields. This, in turn, makes it possible to predict an increase in the use of social networks among all age groups. More recently, most people have come to rely on social media platforms to

share and gather information based on the topics they are most interested in or attracted to. It also creates the possibility of a growing trend of informational influence through social networks.

Modeling the processes of the spread of information influence in social networks can help make an early prediction of the spread of information influence, and timely intervention can be carried out before destructive (harmful) information affects society.

In 1964, Hoffman and Newill developed a new concept for modeling the transmission of ideas in society based on the SIR mathematical model due to the great similarity between the two phenomena [339]. This model has previously been used to model disease transmission and epidemics in communities; in the introduction to their work, the authors stated that "the process already described does not take into account the almost infinite number of complexities that actually arise". Building on previous work, Daley and Kendall, in their letter titled "Epidemics and Rumors", proposed applying the previous idea to model the spread of rumors in communities [340]. With the development of societies and the emergence of modern technological means (transportation communications), new factors have appeared that further complicate the phenomenon of rumors and contribute to their widespread dissemination; this has prompted many researchers to think about developing a preliminary model to study the processes of information dissemination in social networks.

However, based on the results of these studies, it is impossible to answer the question of the speed of the spread of informational influence and obtain probabilistic estimates of audience coverage.

In itself, the processes of spreading information are quite similar to the processes of spreading epidemics. In fact, one can think of a unit of information as a virus that infects more and more people over time through their communication with each other. With a certain time, the infection reaches its maximum, thanks to communication with each other, the virus, in turn, also has a certain life span, a certain group of people has immunity, and so on.

The basic models of the epidemic include the SI and SIR models. The general terminology for these models is:

S – susceptible node – refers to nodes susceptible to infection (receiving information);

I – infected nodes – nodes that are infected and capable of spreading the disease (information effect) among susceptible;

R – recovered (resusceptible) nodes – nodes recovered after infection by receiving immunity or recovered as a result of injection (unfavorable to information or lost interest in information).

Mathematical models that use biological approaches to describe the process of spreading information influence are based on differential equations and the representation of the epidemic process as a change in the number of objects that are in one of several discrete states.

The SI model states that all susceptible nodes in the network will be infected [341]. It acts as a basic model that led to the development of other epidemic models.

The generalized structure of a social network based on the SI model can be represented by the expression:

$$N = S(t) + I(t),$$

where N is the total number of users in the social network; $S(t)$ is the number of users not familiar with destructive information; $I(t)$ is the number of users who positively perceived destructive information and contributed to its spread in the social network.

According to **Fig. 3.3.3**, the SI model states that every person in the state of receiving information remains under its influence forever, and loss of interest or the influence of other factors (acquiring immunity) is impossible, and β is a parameter that reflects the rate of information infection of favorable users or the probability of dissemination of information influence during communication between favorable users and those who distribute information.
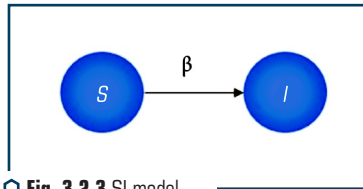
◯ **Fig. 3.2.3** SI model

The fact that the SI model does not take into account the fact that a certain number of users who have not previously been exposed to destructive information $S(t)$ will turn out to be immune to informational influence becomes obvious. In this case, taking into account the insensitivity of the user, the SI model is transformed into the SIR (SI Recovered) model.

As can be seen in **Fig. 3.3.4**, users in a non-susceptible state cannot transmit information to other susceptible network users. Let β be a parameter that reflects the speed of information contamination of favorable users or the probability of the spread of informational influence during communication between favorable users and those who spread information, and γ be a parameter that reflects the speed of recovery (loss of interest in information), which directly depends on the time of information impact.
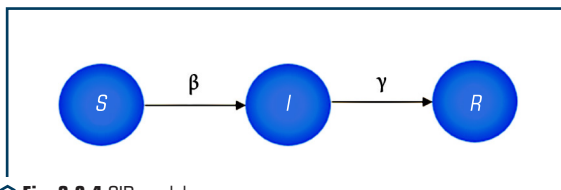
◯ **Fig. 3.2.4** SIR model

The model can then be represented as systems of differential equations [342]:

$$\begin{cases} \dfrac{dS}{dt} = -\beta SI; \\[2mm] \dfrac{dI}{dt} = \beta SI - \gamma I; \\[2mm] \dfrac{dR}{dt} = \gamma I. \end{cases}$$

The generalized structure of the social network based on the SIR model lies in the division of the entire array of users into three main groups and is considered using the expression:

$$N = S(t) + I(t) + R(t),$$

where N is the total number of users in the social network; $S(t)$ is the number of susceptible users who are not familiar with destructive information; $I(t)$ is the number of users who positively perceived destructive information and contributed to its spread in the social network (are under the influence of information); $R(t)$ is the number of users who are not influenced by information (have lost interest or are immune to destructive information).

At the same time, this model can be described as:

$$N = Const = S(t) + I(t) + R(t).$$

This statement makes it possible to investigate the information effect that occurs at a moment in time when the number of network users remains the same, however, if the spread of information occurs over a period of time, then there will be both an increase in the number of N due to new users and a decrease in N due to, for example, blocking or deleting accounts. In this model, before becoming immune to the destructive information $R(t)$, the user had to first be susceptible to $S(t)$ and positively perceive the destructive information (ie, receive the status "infected"), and then receive a refutation of this information. The main disadvantage of this model is that the user can be immune to destructive information from the very beginning, and the transition to the state of immunity cannot be guaranteed. This model does not predict the fact that in the future the object will again be able to go into a state of receptivity. In this regard, within the framework of intensive information countermeasures, the accuracy of this model decreases, but in real conditions this model can be effective, for example, when predicting information "throws" or the spread of "fakes" (spreading information influence), where users cannot to be invulnerable from the start.

At the same time, this drawback can be eliminated by transforming the SIR model into a SIRS (Susceptible-Infected-Recovered Susceptible) model, in which a previously non-susceptible user becomes susceptible after a while. Introducing an additional type of control object and taking into account new possible discrete states makes it possible to increase the accuracy of the mathematical model, however, in real conditions, the transition from one state to another and back cannot be

guaranteed. It is necessary to take into account that information countermeasures may not start working immediately, but only after a certain period of time. Under conditions of intense information resistance, the user of the social network can go from one state to another several times or not attach importance to the destructive information influence at all. These factors are not taken into account in the SIRS model, which reduces the scope of this model. The advantage of this model is the ease of implementation, however, in real conditions, the application of this model is limited at the stage of negative informational influence.

Considering mathematical models that use biological approaches to describe the process of spreading informational influence makes it possible to make the following statements.

During the distribution of information, users can change their initial attitude to the information that circulates in the network. Based on this, the transformation of individual states of users in a model during informational influence can contribute to the qualitative identification and study of a user or group of users (target audiences), whose attitude changes after each transmission of destructive information (informational influence). For example, if an individual's state changes from S to I, it means that the user has been exposed to information, and the value of the information attitude will change accordingly.

The SIR model clearly distinguishes all users in the social network into three categories and includes users who are receptive to receiving information and are not under the influence of information; users who positively perceived destructive information, changed their attitude and contribute to the dissemination of information, i.e. are under the influence of information; individuals who are unsusceptible and stop spreading information after receiving information several times, that is, they have a certain filter to information.

At the same time, when a certain high-profile informational event occurs in a social network, it is possible to monitor the trends of changes in the increase or decrease of users in a certain social group after the dissemination of information, which will be characterized by the rate of infection with user information – β. Also, it should be noted that those users who contributed to the active dissemination of information may change their values of attitude to information over time, namely, strengthen information influence (stimulation with new and relevant information), support information influence ("likes", "reposts") or to be in a neutral state after propagation. However, users who contributed to the spread of informational influence will later have a certain immunity after receiving information several times and focus their attention on new informational events or lose interest and simply forget forgotten old information. These users simply stop spreading information influence in the social network. Thus, users who spread information influence lose interest in information and stop spreading it with probability γ.

CONCLUSIONS

Therefore, the use of biological approaches in mathematical models describing the process of the spread of information influence makes it possible to identify characteristic features and obtain

a mathematical assessment of the spread of information influence. The SIR model most accurately describes the process of the spread of informational influence in social networks and can be used to predict the spread of informational influence in individual cases.

Further research into forecasting the spread of informational influence in social networks will contribute to the development of a method of forecasting the spread of informational threats in social networks, which includes mathematical models and methods of their application, and the development of software complexes to limit the availability of destructive informational influence on the Internet, as well as the development of practical recommendations regarding the creation of favorable conditions in the information environment during operations (combat operations).

3.3 MILITARIZATION OF THE YOUTH OF THE TEMPORARY OCCUPIED TERRITORIES OF THE DONETSK AND LUHANSK REGIONS AS A SYSTEMIC PHENOMENON

Olha Pashkova

ABSTRACT

After the occupation of certain areas of the Donetsk and Luhansk regions of Ukraine (hereinafter referred to as the ORDLO) in 2014, the efforts of the military and political leadership of the Russian Federation through the occupation administrations under their control began to be directed towards massive influence on the consciousness of the local population – patriotic education – through the creation of a dense information space without access to alternative sources and opportunities to avoid exposure. At the same time, the main object of influence (target audience) was local youth, in particular children of middle and high school age, who were considered as a future labor resource for staffing illegal armed formations and occupation administrations; mobilization resource in case of escalation of armed aggression against Ukraine. The general purpose of patriotic education was to create worldviews, to form a positive attitude towards "military service", to motivate them to serve as members of illegal armed forces, and to create prerequisites for making it impossible for local youth to reintegrate into Ukrainian society in the future.

The militarization of the youth of the temporarily occupied territories of the Donetsk and Luhansk regions began to acquire obvious systematicity, which was conditioned by the introduction of the so-called state-building processes. The creation of a "patriotic education system" in quasi-formations in Donbas was accompanied by the development of a corresponding "normative and legal framework", reformatting of the local educational sphere and extracurricular activities of student youth as the most favorable environment for the indoctrination of new "patriotic" ideologues, as well as the training of personnel in the field of patriotic education.

KEYWORDS

Temporarily occupied territories, Donbas, youth, minors, militarization, training, patriotic education, military service, legal framework.

3.3.1 REGULATORY AND LEGAL FRAMEWORK IN THE FIELD OF PATRIOTIC EDUCATION

The first documents related to patriotic (military-patriotic) education appeared in the temporarily occupied territories of Donbas almost simultaneously (July 2015). In general, in the period 2015–2021, the occupying administrations of the pseudo-republics developed a number of normative legal acts in this area: laws, concepts, programs, orders, methodological

recommendations, etc. The fundamental documents in the field of patriotic education of the youth of the ORDLO quasi-organizations were the "concept of patriotic education of children and young people studying in the Donetsk People's Republic" and the "Law of the Luhansk People's Republic on the system of patriotic education of citizens of the Luhansk People's Republic". Implementation of the provisions set forth in the specified documents began to be carried out through the relevant programs:

– "State target program «Patriotic education of the younger generation of the Luhansk People's Republic for 2016–2020»";

– "Program of patriotic education of children and youth of the Donetsk People's Republic";

– "Republican program of patriotic education of citizens of the Donetsk People's Republic for 2020–2022".

Separate documents defined approaches to the education of children and youth during educational activities (in secondary, vocational, and higher education institutions):

– "Order of the Ministry of Education and Science of the Donetsk People's Republic No. 763 "On Approval of Methodological Recommendations for Pedagogical Workers of Educational Institutions of Secondary Vocational Education on Raising the Level of Patriotic, Spiritual and Moral Education of Youth, Forming an Active Life Position" dated July 15, 2016";

– "The concept of educational work. The program of patriotic education of students at Donetsk National University for 2016–2020";

– "Law of the Luhansk People's Republic No. 243 "On Amendments to the Law of the Luhansk People's Republic "On Education" on Pupil Education" dated February 15, 2021".

A number of documents related to the provision of leisure time for local youth outside of school hours (activities of military-patriotic clubs, circles, sections): "Temporary order of activity of patriotic, military-patriotic, sports-patriotic youth and children's associations of the «DPR»", "Typical program of training of military trainees – patriotic clubs, circles, and associations of the «DPR»" etc.

Organizational aspects of youth militarization and determination of its effectiveness were separately considered, for example:

– "Resolution of the People's Council of the Luhansk People's Republic No. 701 "On Approval of the Authorized Executive Body of State Power Responsible for the Implementation of State Policy on Patriotic Education" dated July 2, 2017";

– "Order of the Ministry of Education and Science of the Luhansk People's Republic No. 670 "On Approval of the Regulations on the Coordinating Council on Patriotic Education of Children and Youth" dated October 3, 2017";

– "Resolution of the Council of Ministers of the Luhansk People's Republic No. 450/17 "On Approval of the Procedure for Using the System of Objective Criteria Acting as Generalized Evaluation Indicators of the Performance of the Patriotic Education System" dated July 18, 2017".

Thus, normative legal acts in the field of patriotic education contained general provisions, as well as defined subjects of "state regulation and management" in this field. The aforementioned documents defined military-patriotic education as one of the components of patriotic education.

3.3.2 MILITARIZATION OF INFORMATION SPACE

The armed conflict between Ukraine and the Russian Federation represents a "war of meaning", where images and visualization prevail [343]. The ideologues of the information and psychological front of the self-proclaimed new formations actively use the technology of visual influence, for which "republican" channels were formed on the technical base of TV channels of a number of ORDLO cities, in particular, "Luhansk 24", "Novorossiya TV", "Pervyy Respublikansky", etc. Thanks to artificially constructed manipulative technologies, the introduction of artificial analogies, the occupation administrations, through the content of the mass media controlled by them, formed in the minds of local youth the images of "own" and "strangers" through:

– construction of the "historical conditioning" of the proclamation of pseudo-republics;

– destruction of signs of illegality and legitimization of self-proclaimed authorities ("people's mayor", "people's governor", "people's self-defence", etc.) [343];

– discrediting the state authorities of Ukraine ("junta", "self-proclaimed Kyiv authorities", etc.);

– dehumanization of servicemen of military formations of Ukraine ("punishers", "Banderivtsi", "dills", "punitive operation", etc.);

– glorification of members of illegal armed formations ("heroes-commanders", "father", etc.).

At the same time, along with this, self-proclaimed occupation administrations and group leaders widely reproduced the image of a minor "defender of the fatherland" [344], especially during the first period of the armed conflict in Donbas.

A special place in the information space of ORDLO was given to the symbols of the Second World War [345], the continuation of the cultivation of the narratives of the "Great Patriotic War": the combat victory of Donbas, the images of the Soviet "liberator warrior", as well as child partisans, "sons of the regiments", etc. Appealing to a commemorative culture in which "Victory Day" plays a significant role, a specific information space was supposed to form in the minds of local youth the conviction about the modern armed conflict in Donbas as a "continuation of the war with fascism".

3.3.3 MILITARIZATION IN THE COURSE OF EDUCATIONAL ACTIVITIES

Aware of the important role of education in shaping the consciousness of the young generation, a special emphasis in planting a new ideology in the quasi-republics was placed on the creation of an educational environment that, on the one hand, was aimed at approaching the standards of the Soviet school, and on the other hand, at gradual integration into the education system of the Russian Federation.

Special classes had an overtly militaristic content – the so-called lessons of courage, the conduct of which was entrusted to representatives of illegal armed formations. The theoretical part of the lesson included a lecture on military-historical topics (especially on holidays established in Soviet times, and on days associated with the so-called state creation in ORDLO), based on

Soviet/Russian narratives, practically – a demonstration of small arms. Pupils who were active during classes were later encouraged to participate in extracurricular activities, in particular, in the work of "military-patriotic" clubs [346].

A more practical component, especially in the context of propaganda for military service among young men of conscription age, was included in the study of the subject "Initial military and medical-sanitary training". Its final stage involved conducting 3-day field training (on the basis of "military units", "military commissariats", defence-sports, recreational and "sports-patriotic" camps, etc.) in the immediate vicinity of the demarcation line.

In addition to promoting service in illegal ORDLO armed formations during the educational process in general educational institutions, the occupation administrations encouraged minors to enter classes with enhanced military training. In particular, the activities of the so-called cadet/Cossack classes on the basis of secondary education institutions gained significant momentum in the temporarily occupied territory of the Luhansk region where, as of the end of 2021, 62 such classes were functioning, in which more than 1,200 children studied [347]. Although the educational process in specialized classes was carried out according to the general education curriculum, it was characterized by a military organization with corresponding attributes. In the focus of attention of the occupation administrations were minors who planned to enter higher education institutions of a military and sports profile in the future, children from so-called Cossack families, as well as families of "military servicemen". In addition, the propaganda of military training also extended to orphans and children of members of illegal armed formations who died during hostilities. For this category of minors, the occupation administration opened "cadet" classes in local institutions of institutional care [346] and sent them to study at similar institutions on the territory of the Russian Federation. In particular, in 2020, the first recruitment of orphans from the so-called DPR to the specialized class named after Alexander Nevsky of the "Cadet Corps" boarding school of the Investigative Committee of the Russian Federation (Khimki, Moscow region) [348] was carried out.

3.3.4 MILITARIZATION IN THE COURSE OF EXTRACURRICULAR ACTIVITIES

Indoctrination of new ideologues was carried out by the occupation administrations not only through the education system but also during leisure time, in particular by mass involvement of ORDLO youth in extracurricular activities of a sports and defence nature: military-tactical, military-sports, physical culture-patriotic games ("Zorya", "Zirnytsia", "Race of heroes", etc.). For example, during 2017–2019, more than 14 students took part in the Zorya military-sports student games, the Future Warrior military-sports all-around championship among 10–11th graders, and the Zirnytsia physical culture-patriotic games in the so-called DPR thousand people aged 12 to 20 [349]. Individual events in the pseudo-republics had a purely military-historical character, continuing the cultivation of the narrative of the "Great Patriotic War" as a subject with significant

educational potential ("Hero's Street", "Race of Heroes", etc.). Thus, in 2019, 3,755 people were involved in the "Hero Street" action in the so-called DPR [349]. Minors of secondary school age from the temporarily occupied regions of Donbas were involved by the occupation administrations in similar activities on the territory of the Russian Federation. For example, in 2019 in the city of Bryanka, students of one of the secondary education institutions of the so-called LPR took part in the "Orlyatko" and "Zirnytsia" military sports games, timed to "Victory Day" [350].

At the same time, the occupation administrations of the so-called republics concentrated their efforts on involving the maximum number of local youths in systematic mass extracurricular activities of sports-defence and military-sports direction — "military-patriotic" organizations and paramilitary camps. In the period from 2014 to 2019, the number of "military-patriotic" clubs in the temporarily occupied territories of Donbas increased 3 times, and the number of their "students" — almost 4 times. At the same time, the so-called "patriotic education program" of the "DPR" planned to expand the network of such associations to 72 in 2020, 80 in 2021, and 90 in 2022 [349]. The number of club members was heterogeneous and depended on the size of the settlement — from several dozen to several hundred people. They accepted children of all social statuses, without gender restrictions. The admission of minors (ages 8–17) was determined both by the decision of parents or other relatives, by personal desire or the example of friends, and by encouragement from pedagogical staff of educational institutions. For example, at the end of 2016, the so-called Ministry of Education and Science "DPR" recommended secondary vocational education institutions to create "military-patriotic" clubs from among students and teaching staff and to develop relevant documentation (regulations, work plans, etc.). In particular, such clubs were created at the Donetsk Metallurgical Lyceum ("Russian Bear"), Shakhtar Pedagogical College ("Feat"), etc. The work program of the clubs was generally typical and had the goal of basic military training of minors, formation and strengthening of anti-Ukrainian sentiments, as well as motivation for further recruitment of illegal armed formations.

Although the activities of local clubs were aimed at fostering "republican patriotism" and forming children's readiness to protect them, the military-political leadership of the Russian Federation continued to fuel the ideology of "Russian world" through the creation of youth patriotic organizations based on the Russian analogue. Thus, in 2019, the so-called public organization "military-patriotic movement «Young Guard — Young Army»" was founded on the territory of ORDLO. The training program of "young soldiers" as a whole was similar to other "military-patriotic" organizations. Classes with minors were conducted mainly during the vacation period, 3–4 times a week, during the school period — mostly on weekends. In 2019, the "Youth Army" of the so-called LPR had about 400 minor participants, at the end of 2020 the number of local "Youth Army" was about 1,500 people [351], and as of the end of 2021 — more than 5,000 participants and 12 units from different cities temporarily occupied territory of Luhansk region [352].

The paramilitary camps (on the territory of ORDLO, TOT of the Autonomous Republic of Crimea and on the territory of the Russian Federation) attracted mainly active members of "military-patriotic" organizations, so-called cadets — students of "cadet/Cossack" classes of secondary education

institutions, children of former or active representatives of illegal armed formations. Their activity was characterized by the following features:

— military-style operation: organizational structure (companies, platoons); mutual relations in accordance with the requirements of the combined military statutes (subordination, subordination); accommodation (accommodation in military tents, barracks) and daily schedule (rising at 6 a.m.); wearing military uniforms and symbols; conducting daily classes, including with the use of combat weapons;

— practical orientation: implementation of basic military training (tactical, marching drill, fire, physical, medical);

— personnel support: local members of illegal armed formations of the ORDLO, citizens of the Russian Federation — members of private military companies, Cossack organizations, personnel officers of the armed forces of the Russian Federation [353].

3.3.5 TRAINING OF PERSONNEL IN THE FIELD OF PATRIOTIC EDUCATION

After the occupation of certain districts of Donetsk and Luhansk regions, the occupation administrations needed qualified teaching staff to carry out educational and non-educational activities, in particular, patriotic education of local youth within the framework of new ideological postulates. For example, in the so-called DPR, educational seminars for training (improvement of qualifications) in the field of patriotic education were organized annually: in 2017 — 3, in 2018 — 1, in 2019 — 4. At the same time, the occupation administration itself recognized the insufficient level of training of specialists in this field. In view of this, the pseudo-republic planned to increase the number of similar events: in 2020, up to 12 seminars, 2021 — 20, 2022 — 30, for which it was planned to allocate 134 thousand rubles [349]. A similar situation occurred with the teaching staff of educational institutions of all levels who headed local children's and youth organizations. Such persons of the "Ministry of Education" were involved in special events. Thus, the "patriotic education program" for 2020–2022 in the so-called DPR provided for the allocation of 300,000 rubles for the organization and holding of seminars and conferences for the leaders of "military-patriotic" clubs and groups. In addition to the so-called Ministry of Education and Science, other self-proclaimed authorities and illegal armed formations took care of patriotic education of local youth. On their initiative, children's military-patriotic clubs were created, paramilitary camps and other children's leisure activities were organized.

Thus, the patriotic (military-patriotic) education of the youth of the ORDLO was carried out at the expense of local workers in the educational sphere, who, in turn, were subject to retraining to carry out educational activities in the interests of the occupation regimes. Personnel training involved the organization of special events (seminars, conferences) both for teaching staff of educational institutions of all levels in general, and for leaders of "military-patriotic" clubs in particular. In addition, the implementation of patriotic education of local school youth relied on members of

illegal armed formations as leaders, instructors and mentors in children's military-patriotic clubs and paramilitary camps for minors.

CONCLUSIONS

After the "proclamation" of the so-called republics in 2014, the activities of the occupation administrations formed and managed by the Russian Federation in some areas of the Donetsk and Luhansk regions began to focus on intensive "state building". An important place in this process was occupied by the military-patriotic education of the youth of the temporarily occupied territories of Donetsk and Luhansk regions, which acquired a comprehensive character due to the militarization of the local information space, the "educational system" and leisure time, as well as due to systematic work on the training of relevant personnel. The patriotic upbringing of youth in ORDLO had several dimensions: the impossibility of further socialization and adaptation of the local population in Ukrainian society, maintaining loyalty to the occupation administrations and the military-political leadership of the Russian Federation, as well as the militarization of youth as an object of recruitment. At the same time, the children of representatives of the "power structures" were primarily considered as a future personnel resource for their recruitment.

Thus, the militarization of minors from the temporarily occupied territories of Donetsk and Luhansk regions can be considered a violation of the Law of Ukraine "On the Protection of Childhood", which prohibits the education of children for the purpose of using them in armed conflicts or violent actions aimed at overthrowing state power or violating territorial integrity and indicates about the intention of the military-political leadership of the Russian Federation and the occupation administrations controlled by it to recruit and use local youth in the armed conflict against Ukraine.

3.4 INFLUENCE OF THE RUSSIAN FEDERATION ON YOUTH IN THE EASTERN REGIONS OF UKRAINE

Ihor Pidopryhora

ABSTRACT

One of the aspects of the Russian Federation's hybrid aggression against Ukraine is changing the identity of the population of the temporarily occupied territories for its wider involvement in the armed struggle and creating the illusion of a civil war in Ukraine. The study of the influence of the Russian Federation on the youth of the temporarily occupied territories of Ukraine, outlined in this article, is caused by the need to forecast its possible consequences in the future, and will further contribute to the selection of effective ways of countering the enemy's activities in changing the identity of the population of the temporarily occupied territories.

KEYWORDS

Hybrid aggression, identity of the population, temporarily occupied territories, civil war, consequences, effective countermeasures.

3.4.1 THEORETICAL FOUNDATIONS OF MILITARY-PATRIOTIC EDUCATION

Throughout human history, land (territory) has been a value and a subject of dispute between opposing parties in armed conflicts. In the pre-information age, territories were conquered by force of arms. From the middle of the 20th century, the opinion of the population began to be used as a pretext for the occupation/annexation of the territory or the creation of prerequisites for such actions (legitimization) (an example can be the accession of the Sudetenland region of Czechoslovakia to the Third Reich). Therefore, information activity (influence) in certain regions for the purpose of changing the public opinion of the population began to gain relevance in recent decades. It can be argued that today the strategy of secession (annexation) of certain territories is based on the self-determination of the population (Kosovo can serve as an example). The technology of self-determination in the form of referendums was actively used by the leadership of the former USSR, and later by the Russian Federation, as a tool for the spread of separatism and the subsequent creation of "smoldering conflicts" from the beginning of the 90s of the 20th century.

The use of self-determination of the population is closely related to its identity – the awareness of one's belonging to something and on the basis of this difference from others. According to Ukrainian scientists, identity can have different dimensions (levels) – state (identifying oneself with the place of birth/origin, a certain state – the Motherland), regional (identifying oneself with a certain region of the state), ethnic, religious, class, etc. [354].

A feeling of patriotism is directly related to belonging to a certain territory (state, Motherland). According to Ukrainian scientists, patriotism is a valuable reflection in a person's consciousness of an attitude towards the Motherland, which is expressed in the awareness of one's belonging to the nation / state / Motherland and the combination of one's own well-being and future with its development and future (national identity and patriotic feelings), and social activity and purposeful activity for its benefit (patriotic activity). Patriotism is a socio-cultural value and acts as an important component of the formation and development of the nation [354]. The concept of patriotism is multifaceted in meaning, first of all it is respect for one's culture, language, history and experiencing a personal connection with one's Motherland. The personal experience of patriotic feelings is the basis of the conscious choice of citizens who defend the Motherland during wars [355]. Patriotism practically manifests itself in the patriotic activities of citizens to ensure national (state) interests, one of which is the armed defence of the Motherland [354].

The formation of a sense of patriotism is carried out through patriotic education, which is part of the national education system and is carried out at all levels – in the family, in the preschool education system, at school, in the higher education system. Also, patriotic education is carried out in the armed forces of the state. In particular, in Ukraine, in accordance with the current legislation, national-patriotic education is one of the priority directions of the state and society for the development of national consciousness based on public-state (national) values (identity, will, unity, dignity), the formation of citizens' sense of patriotism, respect to the Constitution and laws of Ukraine, social activity and responsibility for assigned state and public affairs, readiness to fulfill the duty to protect the independence and territorial integrity of Ukraine, and adherence to European values. National-patriotic education is an important means of civic education. National-patriotic education covers all spheres of society's life, primarily education and science, youth and family, security, and defence of Ukraine. The components of national-patriotic education are public-patriotic, military-patriotic, and spiritual-moral education [356, 357]. That is, the formation of a conscious attitude and readiness of citizens of the state for its armed defence in Ukraine is carried out through military and patriotic education.

In the context of the armed defence of the state (Motherland), patriotism is part of the moral and psychological state of the personnel of the armed forces and an important component of the military power of the state, and military-patriotic education is a means of implementing the idea of armed defence of the Motherland and preparing the armed forces and the population as a whole for armed defence, as well as an element of control of troops (forces) [358, 359]. And the methods of managing troops (forces), in addition to direct managerial influence (through normative requirements – laws, orders, combat tasks, etc.), influence through motives and needs (motivation, stimulation, change of working conditions and relations in the social environment), there is also influence through system of values (upbringing, education, including military-patriotic education). And the result of the management of troops (forces) is a high level of morale (moral and psychological state) of personnel, which is characterized by comprehensive readiness of both individual servicemen and troops (forces) as a whole to fulfill the tasks of armed defence of the state [354].

Military-patriotic education influences servicemen through symbolically mediated experience – military traditions, rituals, formation of stereotyped behavior, symbols and myths, dissemination of historical knowledge [360, 361].

Military traditions are specific stable forms of social relations in the armed forces in the form of order, rules, and norms of behavior of military personnel, related to the performance of combat tasks, organization of military service and everyday life. Military traditions are formed in the process of historical development of the armed forces and under the conditions of solving the tasks of armed defence of the state (Motherland) and are passed down from generation to generation. They are a special symbolic form of social communication and are manifested in customs (formed rules of behavior), actions (rituals), reflected in symbols and myths.

Rituals are formed methods of mass behavior of military personnel, which are reproduced over a long period of time, are fixed by custom or normative acts and are such that they are firmly embedded in the consciousness as voluntary and obligatory social actions. Through rituals, generally accepted in society moral and specific military attitudes penetrate into individual consciousness, turn into personal experiences and beliefs. Practically participating in rituals, servicemen absorb their content at an unconscious level through feeling, gradually uncritically involving it in their own experience. Military rituals contribute to the formation of servicemen's personal experience of belonging and attachment to the values of the state (Motherland), motivate the further choice of behavior models, help the identification of servicemen and their integration into a single organism thanks to powerful emotional and psychological experiences, unite units by emotional unification of individual feelings people and leveling based on this cultural (ethnic, religious, class and other) differences [360, 362].

The formation of stereotyped behavior is extremely important due to the fact that stereotypes dominate individual willpower because a stereotype is a form of social communication that is organized according to simplified (typical at the level of everyday life) schemes. Stereotypes assume uniformity of perception and a fixed order of people's actions; therefore, they make it possible to reduce the reaction time to the changing reality, speed up the process of cognition and avoid information overload. Social stereotypes include social labels, standards of mass culture, models of public opinion, typical patterns of everyday life (rules, norms, etc.) [360].

Military symbolism is a specific means of reflecting the social essence of the state's armed forces, its level of development, social qualities, and training of military personnel, as well as military traditions through a defined system of attributes (signs, sensual images). Military symbols include military uniforms, military ranks and insignia, military flags, military awards, military museums, monuments, memorials and historical objects, military bands.

State and military symbols belong to universal symbols. These symbols store important valuable information that is present in every person at a subconscious level. The collective unconscious preserves certain stereotypes that unconsciously affect the psyche and behavior of people. The information embedded in the symbols is explained to citizens and servicemen of the armed forces through the means of propaganda, carrying out the anchoring of values. Therefore, when the

image of the Motherland is formed as the image of a mother, it causes a desire to protect her as the most precious person in the world. Despite the fact that each person has his own image of a mother, at the deep level this symbol is stereotypical [360].

Under the conditions of war, deeds – exploits, and verbal attributes associated with them – honorary titles (heroes, knights of orders) that reflect belonging to a certain elite social group also become symbols. Such symbols increase the combat activity of military personnel, because they are usually perceived as a social value and are able to carry out emotional contagion – to encourage the desire to perform a significant deed (feat) and join an elite social group (heroes) [362]. Heroic images and examples of individual heroism popularize universal values. Such images on posters and in films call for urgent and adequate actions against the enemy, which destroys what is most dear to the heart of every person, for the selfless performance of military duty by servicemen, for heroic deeds during the performance of combat tasks, which is the basis of the state's defence capability and safety of citizens.

Myth refers to the presentation of information in a figurative and symbolic form. In contrast to the usual message of information, which is supported by specific facts and devoid of emotional color, in the myth the emphasis is on the appeal to emotions, which increases the effectiveness of the message almost twice. Myths are characterized by emotionality and a figurative and symbolic form of expression, as well as a kind of logic that establishes imaginary connections and consequences between various phenomena that displace logic and critical thinking. Thanks to this, the myth encourages uncritical assimilation of important information. At the same time, the myth is not fiction. Mythological images can be so fascinating that they contribute to the displacement in the consciousness of individuals of everything that does not correspond to them. It is such images that can push a person to patriotic activity [355].

Modern military mythology is built on strong, vivid symbols that evoke patriotic images that you want to join and associate with. Myths carry information about basic values, violations of which cause justified violence in response. Mythology is not a rational means of presenting information; therefore, it contains certain axioms that do not require explanation.

Each nation has its own historical memory that distinguishes it from other nations. Historical memory is a collective perception of the historical past, which lays the foundation of national identity. That is why historical knowledge becomes a powerful tool of constructive propaganda aimed at the consolidation of the nation. Historical knowledge is individual and collective persistent ideas about the past social reality, formed in the minds of people, recorded on information carriers, and perceived as true (considered real). What is important is that social representations that are considered real have real social consequences in the future. Therefore, historical knowledge, disseminated by means of mass communication and mass culture, becomes a powerful factor of influence on society. Also, historical knowledge is mythologized (myths are created based on it), which significantly increases the effectiveness of propaganda influence on the population. The use of historical knowledge allows purposeful formation of public opinion and manipulation of public consciousness. For this, with the help of specially selected information, knowledge is constructed

and consistently disseminated, which affects the emotional and volitional sphere of the population and gradually changes its model of understanding the world, which leads to a change in values, motives, and behavior [355]. Dissemination of historical knowledge in military-patriotic education also acts as a means of counterpropaganda against the enemy's destructive propaganda. Therefore, military-patriotic education is also a means of counteracting the negative informational and psychological influence of the enemy. All of the above is implemented in propaganda activities among the population of the state and military personnel of the armed forces and contributes to a positive attitude towards the Motherland and pride in belonging to the armed forces, forms a sense of patriotism, readiness to sacrifice one's life for the native land.

Thus, military-patriotic education is part of the state (national) ideology and the national system of patriotic education, an important direction of strategic communications, and is aimed at the formation of national identity through the formation of a sense of patriotism in the population of the state and members of the armed forces. In addition, directly in the armed forces, military-patriotic education acts as one of the tools for managing the troops (forces) and a means of countering the enemy's destructive propaganda. In the civilian sphere, it is realized through education, and in the armed forces – in the system of training and the system of providing troops (forces). Based on the idea of the state (Motherland) and implementing the idea of armed defence of the Motherland, military-patriotic education is part of the military power of the state and forms the readiness of the population and personnel of the armed forces for armed defence and self-sacrifice.

3.4.2 PREREQUISITES AND FACTORS INFLUENCING THE DEVELOPMENT OF THE SO-CALLED "MILITARY-PATRIOTIC EDUCATION" IN THE TEMPORARILY OCCUPIED TERRITORIES OF UKRAINE

The prerequisites that contributed to the emergence of the so-called "military-patriotic education" were the following:

1. Features of the "Soviet" period of development until 1991, which contributed to the formation of a special regional identity of the population of Donetsk and Luhansk regions, when the special place of Donbas as an important industrial center of the country formed a special vision of the population of its role. The consequence of this period is a feeling of nostalgia for the Soviet past, social standards of that period, which gave confidence in the future [363, 355]. Also at that time, the system of education of the population had a supranational character, unifying representatives of different peoples [365].

2. The presence of an ideological basis and the promotion of ideas for the development of separatist sentiments and separation from Ukraine, in particular, the promotion of the ideas of separatism and federalism, the creation and support of the activities of public and political organizations for the implementation of these ideas; falsification of the history of Ukraine for the purpose of ideological justification of pro-Russian separatism in the Autonomous Republic of Crimea, Donetsk

and Luhansk regions; active appeal to the Orthodox identity of the population and opposition to foreign Western values by representatives of the dominant religious denomination in the region (the Ukrainian Orthodox Church of the Moscow Patriarchate). This contributed to the multipolar identity of the population in the East of Ukraine – Soviet, Russian, religious, undefined [363, 366]. In addition, the cultivation of criminal consciousness among the population of the region contributed to the implementation and operation of a modified copy of the current Russian government model (which is based on totally corrupt political and social relations) in the temporarily occupied territories. Therefore, the temporarily occupied territories will continue to be marginalized.

3. The presence of population groups potentially ready to accept pro-Russian ideas. In particular, until 2014, the region was home to a significant number of ethnic Russians (38.2 % in Donetsk region and 39 % in Luhansk) and a Russian-speaking population, the majority of which was oriented towards Russian traditions and Soviet values [364].

4. Peculiarities of the policy of the Russian Federation in the post-Soviet space and directly in relation to Ukraine, in particular, the attitude towards Ukraine as a key element of the US/NATO anti-Russian policy towards the Russian Federation; efforts to keep Ukraine out of the European/ Euro-Atlantic security zone and in the sphere of Russian influence; efforts of the Russian Federation with the help of successes in local conflicts in the post-Soviet space to confirm claims to global leadership; preservation of the right to intervene in the internal affairs of sovereign states and to carry out force actions in the post-Soviet space in the long term; established Russian practice of freezing conflicts in the post-Soviet space in order to maintain its presence in key regions or to continue exerting influence on newly created states. All this, combined with the reluctance of the Russian Federation to bear responsibility for aggression before the world community, further contributed to the freezing of the conflict and the transformation of the temporarily occupied territories of Donetsk and Luhansk regions into a tool for destabilizing the internal situation in Ukraine [367–369].

5. Thanks to the dominance of the Russian Federation in the information space of the region, the following were successfully carried out: an information campaign to discredit the Ukrainian Euromaidan and the Revolution of Dignity in late 2013 – early 2014, discrediting the idea of Ukrainian statehood and stimulating separatism in the East of Ukraine, conducting informational and psychological operations against the Ukrainian Armed Forces.

6. Armed aggression of the Russian Federation against Ukraine, its occupation of the Autonomous Republic of Crimea, certain areas of the Donetsk and Luhansk regions.

Also important prerequisites were the presence of an extensive network of educational institutions in the region and the functioning of the Donetsk Higher Military-Political College during the Soviet period, which later became the material base of the so-called "military-patriotic education".

Separately, one should take into account the targeted covert influence of the Russian Federation on military-patriotic education in the Ukrainian Armed Forces in the period up to 2014 [365]. This, in combination with the rather low level of material and social support of military personnel, formed a negative attitude of a certain part of the residents of the region, who served in the Ukrainian Armed Forces, to the armed defence of the state.

Factors influencing the development of the so-called "military-patriotic education" in the temporarily occupied territories are the following:

1. The need to cover up aggression against the Russian Federation against Ukraine by distorting reality and creating the illusion of a civil war in Ukraine itself. In connection with this, there was a need to involve the population of the region in the armed struggle against Ukraine. Therefore, immediately after establishing control over the temporarily occupied territories, the Russian Federation began to create appropriate conditions for the involvement of the local population in hostilities as part of the terrorist organizations "DPR" and "LPR" in order to form false assessments and negative attitudes of other states and international institutions and the population of the Russian Federation itself to the events in Ukraine.

2. The creation of illegal armed formations in the temporarily occupied territories and the need to staff them with the local population [370]. In view of the insufficient support of the Russian Federation's actions by the local population in the spring of 2014, it was forced to use units of special operations forces, and in the summer of 2014 to introduce regular armed forces to stop the offensive of the Ukrainian Armed Forces. At the same time, the potentially insufficient number of the armed forces of the Russian Federation to ensure the occupation of significant territories of Ukraine, the lack of prepared mobilization resources and the large losses of Russian troops stimulated the use of material and ideological means by the Russian Federation to solve the problems of staffing the armed formations of the terrorist organizations "DPR" and "LPR".

3. Economic crisis in the temporarily occupied territories (decrease in the standard of living of the population, immersion of the population in the process of permanent provision of basic needs, lack of prospects for economic development, reduction of the level of science and education to the minimum necessary to ensure the activities of the terrorist organizations "DPR" and "LPR"), the inability of the Russian Federation to ensure the economic development of the temporarily occupied territories and a decent standard of living of the population. Therefore, the better financial position of the participants of the illegal armed formations of the terrorist organizations "DPR" and "LPR" became an economic prerequisite for their recruitment by the local population [371].

4. Creation in the temporarily occupied territories of mass media of terrorist organizations controlled by the Russian Federation (television, radio, printed propaganda), symbolic filling of the information field of the temporarily occupied territories (replacing symbols, creating the ideal of a "defender", creating a pantheon of "heroes", creating landmarks – forming the image of the enemy, the image of allies and the image of the victim), the use of the information vacuum effect became the basis for the informational support of armed aggression against Ukraine and the manipulation of the mood and behavior of the local population [372].

5. The Ukrainian authorities lack sufficient resources to relocate a large number of citizens from the temporarily occupied territories to other regions of the country and provide them with better living conditions.

Also, in view of the previously conducted theoretical understanding of military-patriotic education [373] and the nature of the activities of the Russian Federation in the temporarily occupied

territories of Ukraine, there is every reason to assert that the so-called "military-patriotic education" is part of informational and psychological operations to change the identity of the population temporarily of the occupied territories first to the local regional, and later to the Russian one.

CONCLUSIONS

Thus, it can be stated that as of the beginning of 2014, ideological, socio-political, and informational prerequisites were created, and since April 2014, real conditions for the implementation of the so-called "military-patriotic education" of the population of the temporarily occupied territories of Donetsk and Luhansk regions.

Elucidation of the essence of military-patriotic education, taking into account the peculiarities of military-patriotic education in the Ukrainian Armed Forces, analysis of the nature of the activities of the Russian Federation in the temporarily occupied territories of Ukraine make it possible to assert that the so-called "military-patriotic education" in the temporarily occupied territories is part of the informational and psychological operations of the Russian Federation against Ukraine. The ultimate goal of these operations is to change the identity of the population of the temporarily occupied territories (since 2014, a new generation of citizens has appeared in the temporarily occupied territories of Ukraine, who, being included in social life through local educational institutions, are brought up under the conditions of anti-Ukrainian propaganda and integration processes from the Russian Federation).

3.5 YOUTH AS A FUTURE OBJECT OF RECRUITMENT BY TERRORIST ORGANIZATIONS "DPR" AND "LPR"

Andrii Biliuha

ABSTRACT

The main direction of the hybrid war is the fight in the information space. In 2014, this environment reached its peak on the territory of Ukraine. The informational impact on the mass consciousness of the population of Donbas, especially at the early stage of the conflict, turned out to be so destructive and total that some theorists generally tend to identify the concepts of "hybrid war" and "information war". The role of television and social networks is really difficult to overestimate, but they are only channels for the transmission of meanings, means of psychological pressure, which are not limited to all the diversity of manifestations of hybrid war. In this context, it should be noted the impact on the consciousness of the young generation of the temporarily occupied territories of Donetsk and Luhansk regions. In conditions of complete isolation from the Ukrainian media, young people were under constant informational pressure from the occupation authorities, which continuously promoted anti-Ukrainian politics. As a result, children and teenagers of the occupied territories began the process of forming hatred for "everything Ukrainian", which in the future became one of the factors of their involvement in the terrorist units of "DPR" and "LPR".

KEYWORDS

Information space, mass consciousness, population of Donbas, hybrid war, information war, television and social networks, psychological pressure, temporarily occupied territories, anti-Ukrainian politics, formation of hatred, "DPR", "LPR".

The armed conflict in Donbas affected almost all Ukrainians. According to the Office of the UN High Commissioner for Human Rights, 34,766 victims were documented in 2014–2017: 10,225 people were killed, 24,541 were injured. During the entire period of the conflict, at least 2,505 civilians died, including 1,382 men, 837 women, 90 boys, and 47 girls. 298 civilians were also killed in the crash of flight MH17 on July 17, 2014, including 80 children [374].

The ideologues of the self-proclaimed republics of Donbas have well learned the historical lessons about the exceptional importance of propaganda, taking control not only of television but also of printed media. In 2014–2015, separatist newspapers such as "Donetsk Republic", "Novorossiya", "Enakievskii Rabochy", "Vechernyaya Makeevka", "Khartsyzskiy Rabochy" actively covered the events that the Russian Federation had already arrived, communism in Donbas soon will be "built". Such narratives were purposefully sent to all categories of the population in order to change people's opinion about the real state of affairs in the occupied territories.

Even a cursory look at the columns of the newspapers "Novorossiya", "Voice of the Republic", "Khartsyzskie vesti", "Donetska republika", and "Vechernyaya Makeevka" allows us to conclude that metaphors predominate among the titles of the articles. Thus, already by the titles of the publications you can see in which direction the formation of public opinion of the residents of the occupied territories is taking place. First, hatred of Ukraine is cultivated, and the political and economic mistakes of the Ukrainian leadership are interpreted as catastrophic. If you are only in the media space of the self-proclaimed republics, you get the impression that life in Ukraine will soon stop, so the question "How do you live there?" is completely sincere. Secondly, reverence for the Russian Federation is cultivated, "fraternal help" not only in the form of humanitarian assistance, but also in the form of the latest weapons is perceived as "manna from Heaven". Hatred of Ukraine is compensated by love of the Russian Federation. Thirdly, confidence in the rightness of one's own choice is persistently formed ("Ukraine will envy us") and the ability to protect it ("We're peaceful people, but..."). The population regularly receives information that there can be no turning back, the choice is final and irrevocable. On the other hand, the Ukrainian authorities did not refute these thoughts with their actions, but rather fueled them. As soon as some hope for the return of the occupied territories to the legal field of Ukraine was maturing in the public opinion, it faded over time due to the lack of real constructive actions of the authorities.

If the civil society manifested itself covertly in the Internet space, then the totalitarian society was formed demonstratively and purposefully – the population was simply "zombified" from the television screens and from the pages of newspapers. Socialization and resocialization of the individual took place precisely by totalitarian methods. And if the older generation only had to remember it, and such methods were for them natural forms of organizing life in society, then children and young people had to deal with it quite difficult. For example, in 2015, before the anniversary of the "republic", the Ministry of Education of the "DPR" sent out instructions about the need for students and schoolchildren to study the biography of Oleksandr Zakharchenko, the anthem of the republic, and its symbols. The participation of "DPR" fighters in school lessons became a regular occurrence, not only for seniors, but also for junior high school students [375].

It cannot be said that the management of educational institutions carried out all orders flawlessly. Teachers resisted the excessive politicization of life as much as possible, emphasizing the educational process. Nevertheless, in the previous years before the occupation, there were signs of life in democratic Ukraine, but the mental desire "to be the master of one's own destiny" is ineradicable among many Donbas residents. Living "bound by one goal and bound by one chain" turned out to be more convenient and easier, there was no need to make a choice, it will be made for you. The theses of "negative" ("I am nobody's slave") and "positive" freedom ("I am my own master"), described by the English philosopher Isaiah Berlin, did not work there. People became burdened with their freedom and deliberately gave it into the hands of the ruling elite. A "closed society" was formed in an open mode. This sense of closure was reinforced by the blockade, roadblocks, and isolation. The youth of the occupied territories had a choice according to two scenarios: to lead a passive apolitical lifestyle or to join the ranks of the "DPR" and "LPR" militants.

Militarization of education in the "DPR" and "LPR" also became a problem. The public organization "Young Guard — Youth Army" was created in Donetsk. Its work was aimed at increasing the prestige and authority of the military service among the population. Residents of "DPR" between the ages of 8 and 35 could become members of the "Unarmy" on a voluntary basis. Schoolchildren who were in the temporarily occupied territory of Donbas were increasingly sent to military and patriotic games in the Russian Federation. Thus, the team of one of the secondary education institutions of the temporarily occupied part of the Luhansk region took part in the All-Russian military-patriotic triathlon competition "Young Special Forces". For reaching the finals, the team was awarded with a diploma of the special purpose department "«Saturn» of the Russian Federal Police Service in the city of Moscow"; activists of the children's and youth organization "Young Guard" ("LPR") visited the capital of the Russian Federation [376]. In addition, high school students, after completing the initial military training courses, compiled standards on the territory of the "People's Militia of «LPR»" military training ground, got acquainted in detail with modern samples of weapons and military equipment. Teenagers of the middle and senior classes of the so-called "LPR" annually visited the defence and sports camp "Gvardeets", located in the Penza region of the Russian Federation [377]. The specified military-patriotic events were held on the territory of the Russian Federation in accordance with the State program "Patriotic Education of the Citizens of the Russian Federation for 2016–2020".

Education of the youth took place directly in children's camps on the territory of "LPR". These measures were systematic since 2014. For example, on the basis of the "Dream" health camp in the village of Velikiy Sukhodil, Krasnodon district, from June 29 to July 8, 2018, local authorities organized "patriotic" youth field meetings. About 700 people from the NGO "Military-Patriotic Cadet «Pereval»" (Perevalsk) and the NGO "Airborne Patriotic Sports Club «School of Courage»" (Sverdlovsk) participated in these meetings. According to the head of the School of Courage, Domrachev Vyacheslav, in 2014, his subordinates actively provided assistance to the militants of the "LPR" in the Sverdlovsk and Krasnodon districts of the Luhansk region. it is obvious that measures of this format (weapons handling, battle tactics, etc.) are aimed at zombification and psychological training of young people with their subsequent involvement in the ranks of the 2nd Army Corps of the "LPR" [378]. On the initiative of the representatives of the terrorist groups "DPR" and "LPR" in the city of Horlivka, Donetsk region, the joint tactical group "Recruit" organized military-patriotic competitions with representatives of the Russian Federation and the occupied territories of Donetsk and Luhansk regions in 2015. These activities have gained popularity among teenagers. Information is posted on social networks that children from the age of 12 took part in shooting with small arms: a PM pistol, a Kalashnikov assault rifle, and a grenade launcher [379]. At the end of the so-called "military-patriotic competition", children and teenagers were awarded certificates of successful completion of the event. This type of militarization had a negative impact on the consciousness of teenagers, who later directly participated in hostilities and sometimes did not realize that they were participating in the commission of war crimes. Thus, the independent German publication "Spiegel" published an article on November 10, 2015, about 15-year-old

Bohdan Kravchenko, a resident of the Luhansk region. When asked by a journalist if he had to kill people, the teenager answered that "he did not kill people but fascists, because there are no people on the other side of the front" [380].

The mentioned facts indicate that school-age children and teenagers probably took a direct part not only in hostilities but were also involved in patrolling, maintenance of military equipment, protection of military facilities, intelligence activities, performance of additional tasks in the ranks of terrorist units of the "DPR" and "LPR", etc.

Starting from 2014, the occupation administration of the Russian Federation used educational institutions of formal and informal education as an additional factor of influence on the youth, pursued a purposeful policy of destroying the national identity and militarizing the young generation. Such actions should be considered as a violation of the right to cultural and national identity, as well as Article 29 of the UN Convention on the Rights of the Child, in particular clause (c) fostering respect for cultural identity, language and national values and (d) preparing a child for a conscious life in a free society in the spirit of understanding, peace, tolerance [381]. In addition, the militarization of youth was actively carried out in educational institutions outside the school curriculum, namely in civilian educational institutions, higher military educational institutions, in particular on the territory of the Russian Federation (**Fig. 3.5.1**). Classes were mainly held with young people on formation training, fire training (shooting small arms), hand-to-hand combat, military heptathlon, throwing grenades, overcoming an obstacle course, the history of the Great Patriotic War, commemorating the fallen fighters of the "DPR" and "LPR", etc. The main efforts were focused on the maximum involvement of young people in the military cause, raising their interest in the defence of the "DPR" and "LPR".
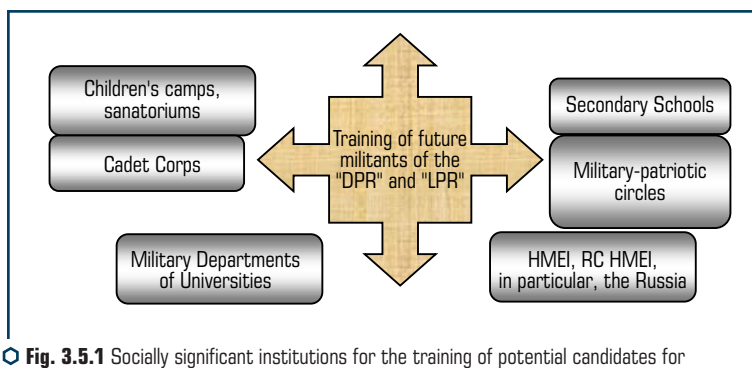
○ **Fig. 3.5.1** Socially significant institutions for the training of potential candidates for the ranks of terrorist groups "DPR" and "LPR"

The Russian Federation and the occupation administration of the occupied territories grossly violated and continue to violate the requirements of international humanitarian law in the temporarily occupied territories of Ukraine, in particular Article 51 of the Geneva Convention

"On the Protection of the Civilian Population in Time of War" [382], which prohibits all propaganda of voluntary entry into the army in the occupied territories. The same article of the Convention prohibits forcing residents of the occupied territory to serve in the armed or auxiliary forces of the occupying power. In addition, the UN General Assembly Resolution S-27/2 "A world conducive to life" provides a provision on the need to protect children from armed conflicts [383].

CONCLUSIONS

Thus, since 2014, the Russian Federation has begun the most active phase of the hybrid war against Ukraine. This, in turn, concerned ideological work among children and youth of the occupied territories of Donetsk and Luhansk regions. A purposeful mass process of zombification of the young generation with the sole purpose of hatred of Ukraine has begun. Youth, under the influence of propaganda, became the main conductor of separatist ideas, an integral part of illegal armed formations. The war in Donbas was not for territories but for people, particularly youth, as the main driving force of society in the future. The consciousness of the young generation is the most manipulative, and our main goal is to win the favor of young people, to convince them that they are Ukrainians and that it is more profitable for them to live in Ukraine than in criminal reservations not recognized by anyone. Of course, there is logic in these statements. The war was called a hybrid war for a reason. Russia conducted it with the help of proxy formations, under the guise of local militants, and without the support of a certain part of the population on the ground, it is unable to wage war in its current format.

3.6 MECHANISMS FOR COUNTERING THE USE OF HISTORICAL MYTHS BY THE RUSSIAN FEDERATION IN THE HYBRID WAR AGAINST UKRAINE

Vitalii Bidnyi, Valerii Hrytsiuk, Rostyslav Pyliavets, Volodymyr Kydon

ABSTRACT

The relevance of the research topic is determined by the need for a scientific analysis of historical mythology as a direction to improve the effectiveness of countering external informational threats. This necessity is caused by several factors. Under the current conditions of the Russian-Ukrainian confrontation, the information component becomes not only a supplement to force actions but also a dominant way to achieve the ultimate goal. Historical mythology is increasingly becoming an important component of information warfare due to its universality, high level of suggestion, and relatively low cost. In the context of Ukraine's national interests aimed at integration into pan-European and Euro-Atlantic structures, the problem of countering hybrid threats from the Russian Federation is of great importance. In the course of their implementation, the Russian special services actively use historical myths and fake structures similar to them. As a result, false ideas are created about the belonging of our state to the civilizational space of the "Russian world", "East Slavic trinity", "Russian-Ukrainian brotherhood", etc.

During the occupation of Crimea, the deployment of the armed conflict by the Russian Federation in the Donetsk and Luhansk regions, and especially with the beginning of the large-scale aggression of the Russian Federation, the scale of anti-Ukrainian propaganda increased significantly. At the same time, historical fakes, myths, falsifications, and manipulations are widely used. Therefore, the role of historical knowledge in establishing Ukrainian national and civic identity is growing even more [384]. An important role in educational activities is played by the restoration of the historical memory of Ukraine's long state traditions. Of particular importance is not only familiarization with the history of the heroic struggle of the Ukrainian people for state independence during its historical journey but also the education of the personnel of the Ukrainian Armed Forces on the examples of dedication and sacrifice of servicemen during the defence of our state under the conditions of the Russian-Ukrainian war.

Inadequate study of the given topic in domestic science against the background of massive use of historical myths and fakes directed against Ukraine by the Russian Federation in information operations, requires a comprehensive analysis of this problem.

KEYWORDS

External informational threats, Russian-Ukrainian confrontation, Ukraine's national interests, integration, Russian special services, false ideas, Russian world, occupation of Crimea, anti-Ukrainian propaganda, historical memory, state traditions, state independence.

3.6.1 THE RUSSIAN FEDERATION'S USE OF HISTORICAL MYTHS IN THE HYBRID WAR AGAINST UKRAINE

Historical mythology can be considered as a mega-historical phenomenon. Mythological representations take root in individual and collective consciousness, manifesting in the corresponding cognitive and behavioral stereotypes. The creation of myths is based on precedents in the past and is aimed at the expected future behavior of objects of manipulative influence. Today, ideology is transformed into mythology in the mass consciousness, and societies in transitional periods combine the mythology of both the past and the present. The mass consciousness largely operates with mythological categories, which under the conditions of war (including information war), become practically the only form of perception of reality, as a result of which a person begins to demonstrate more primitive forms of thinking and behavior.

A historical myth is an element of purposeful manipulative influence on mass consciousness, which is used to form certain mental and behavioral models of social groups. Its attributes are hidden imperativeness and universality of influence on different ethnic, social, and religious communities. For the most part, myths are artificial constructs. Myths are used by the Russian Federation as a powerful tool of informational aggression with the aim of falsifying historical events and creating false ideas about the socio-political reality that surrounds us. Such mythological constructions are practically insensitive to rational arguments and cannot be destroyed by the use of syllogisms [385].

Penetrating into the unconscious against the background of an emotional surge using the channel of human sensory perception, the mythologem awakens the archetype corresponding to the goal. Acting as a media virus, the mythologeme also helps fill the activated archetype with a mythological substrate. In this way, connections and relationships between elements are formed. Over time, they lead to the formation of a strong and at the same time elastic structure capable of influencing collective and individual consciousness and behavior in a given direction [386].

Currently, mythological macroforms in the form of mythological complexes (MCs), as well as quasi-mythological forms of fakes, are actively used. According to the structure of MC, it can be represented as a sphere, the core of which includes archaic myths common to most countries and civilizations; the layer closer to the core consists of myths that have imperative-traditional features for a specific ethno-social (national) community; the outer layer is formed from artificially created modern myths that fulfill a specific political order and have specific discrete political goals. The stability of such a construction is ensured by the presence of a general mythologeme, adapted for each level with the help of variable changes of a secondary nature.

Fake is an artificial cognitive construct used in contemporary political discourse. The main purpose of using fakes is to create a false social reality in objects of informational influence. In the case of mass use of fakes, significant time, media, and human resources are spent on "defaking". The main difference between any myth and a fake is that the former is always based on real events. The cornerstone of a political myth is its further interpretation.

Due to its high manipulative potential, historical myth is one of the most dangerous tools of external influence on socio-political structures, in relation to which informational aggression is carried out. Therefore, the neutralization of mythological influence becomes an essential element of the information struggle. For the purpose of countermeasures, standard approaches of a counter-mythological character are usually used, the basis of which is a symmetrical response. However, such actions can be calculated in advance by the enemy and be part of an information attack plan (using the resources of the object of influence for expansion) [387].

Long before the large-scale invasion of Ukraine in 2022 and even before the resolution of armed aggression against Ukraine in 2014, the Russian Federation launched a powerful, large-scale, and multidimensional hybrid war against our country. There is every reason to claim that it became visible to the "open eye" after the victory of the "Orange Revolution" in Ukraine in 2005 and was the Russian government's response to the defeat of its protégé and the determination of Ukraine's clear geopolitical course towards European integration. This hybrid war is still carried out using a wide range of means, among which an important place belongs to the information war — a systematic and powerful informational influence not only on Ukraine, but also on other countries and international organizations with the aim of obtaining certain strategic and political advantages [388, 389].

The informational and psychological influence exerted by Russian propaganda on Ukrainian society had the task of discrediting our national idea and undermining the worldview orientations of Ukrainians, imposing one's own values and ideas, in particular promoting the idea of "the Russian world", introducing the desired for Putin's the regime of destructive changes in the behavior of our fellow citizens. According to the plan of Russian pro-government strategists and political technologists, all this should inevitably lead to the creation of zones of instability, "controlled chaos" [388], social upheavals, mass anti-government actions and destabilization in all spheres of state activity and public life in Ukraine. Ultimately, the Kremlin sought a sharp weakening of the Ukrainian state, a collapse within the country, and the creation of conditions for its rapid and complete absorption by the Russian Federation [390].

Now the specified goal has been supplemented with more specific and urgent goals, namely: the destruction of the national unity of Ukrainians, the loss of confidence in our own strength and the support of our allies, the sowing of seeds of despair in our minds in the victory over the aggressor, the weakening of our spiritual, political and, most importantly, military resistance Russian invasion.

An important place in the complex of measures and means of the hybrid war of the Russian Federation directed against Ukraine belongs to historical myths. On the "main front of the war for the consciousness and worldview of the people, the propaganda machine of the Russian Federation — official (press, television and Internet media) and unofficial (troll and bot farms) — in the interests and at the behest of the powerful, resorts to methodical promotion, distribution and laying in mass and individual consciousness of people formed during the times of the USSR and newly created historical myths. Ensuring their inviolability, manipulation of facts, formation of the image of the enemy and demonization of Ukraine, aggressive attack by apologists of the imperial Russian Federation and the Soviet Union on the establishment of historical truth, on the publication and

defence of valid historical facts that disprove established Soviet-Russian myths are obvious, but not all, characteristic features of modern Russian hybrid politics on the «historical front»" [390].

Determining the nature of the historical myth and its danger, the famous historian O. Zinchenko notes: *"A myth is a distorted, sometimes simplified, and sometimes falsified vision of the past. And that's why myths are dangerous: when our knowledge of the past is filled with myths instead of facts, we lose our understanding of the nature of historical processes. Cause-and-effect relationships are broken by those myths. And we find ourselves in the trap of our own myth-distorted vision of the past. And over time, we lose the ability to adequately assess not only the cause-and-effect relationships between facts in the past, but also the nature of various processes in the present"* [391].

Imperial Russian, Soviet and modern Russian historical myths distort real history – individual historical events, phenomena and figures, political forces and entire societies, periods, and strata of history. And these myths as an effective tool (according to Kremlin propagandists) are actively exploited nowadays, in particular, to justify the so-called "special operation" of Russian troops.

The main historical myths created during the times of the tsarist and imperial Russian Federation concern the origin and "kinship of Eastern Slavs, Ukrainians, and Russians. So, for example, V. Putin rebroadcasts the old myth that Ukrainians, Belarusians, and Russians are a single people, while Ukrainians and Belarusians, as it were, never had their own statehood. The idea of the Russian people, which consists of Great Russians, Little Russians, and Belarusians, was "substantiated by Russian historians at the behest of the authorities (Empress Catherine II) at the end of the 18th century and developed at the beginning of the 19th century. This was done with the goal, first of all, to have more subjects, serfs, and manpower to conquer new lands.

According to another myth, Muscovite (and later the Russian Federation) is recognized as the heir of Kyivan Rus, and, apparently, the Russian people trace their origins to the Kyivan princes and the times of Kyivan Rus. This myth has an extremely long tradition – it was created as early as the second century. 17th century, however, it became established in the following two centuries. It should be noted that this myth was given life by individual Ukrainian intellectuals of that time, who actually formed the intellectual sphere of the Muscovite Empire. It has been proven that their actions were motivated by the desire to obtain a certain status and material reward from the Moscow rulers.

Many Russian and Soviet myths relate to the lives of famous historical figures. Thus, one of them says that Bohdan Khmelnytskyi made joining Muscovy and reuniting Muscovites and Ukrainians the meaning of his life. In fact, B. Khmelnytskyi sought to give legitimacy to the Cossack power and in the struggle with the Polish nobility was looking for a temporary protector. For a certain time, he became the Tsar of Moscow.

Among the ancient historical myths, one should pay attention to one more of them, which connects the name "Russia" with the name "Rus", emphasizing their alleged kinship. However, this myth is quite easily refuted, primarily by European maps created in the period from 15th to the beginning 18th century. The word "Russia" is missing from them, instead there is "Rus", which is localized not

where Muscovite is but where Ukrainian Galicia is. On the location of the territory of Ukraine at that time, there is the name "Ukraine", and where the territory of Russia is written — "Tataria", and later — "Moscow".

The idea of Russia's greatness and the need to revive the most powerful empire has become dominant in modern Russian ideology and politics. The aggression of the Russian Federation against Ukraine and the modern Russian-Ukrainian war are closely related to ideology and propaganda based on certain topics, including the topic of the Second World War. Thus, a large array of historical myths is associated with the events of the Second World War period. This is explained, first of all, by the growing over the past two decades, and even hypertrophied, attention of the state and society of the Russian Federation to the events of the past war in the context of the state policy of "privatizing" the victory over Nazi Germany and hyperbolizing the role of the USSR (recently we are not talking about the USSR, but about Russia, that is, there is a frank exchange of concepts) as the "only savior of the world from the fascist plague". Elevating the importance of "Victory in the Great Patriotic War", giving it a leading place among the main historical events and holidays, and even consolidating its status as one of the main "spiritual bonds of Russia" is aimed not only at preserving established historical myths in the minds of the population and consolidating society around modern Russian power, but also the satisfaction of the growing political, economic, and power ambitions of the ruling elite of Russia and Putin personally, the implementation of "geopolitical revenge" (the return of the positions lost with the collapse of the USSR), the restoration of the "greatness" and "special role" of Russia in the world historical process.

Significant efforts of the ideological and propaganda apparatus of Putin's Russian Federation were "thrown" into the creation of that version of the historical memory of the events of the Second World War, such a dominant memory that should unite the ideologically, socially, and nationally diverse population of the federation into a new post-Soviet unity — Russians of the restored empire [392].

At the same time, we should note that Russian propagandists impose a constructed version of historical memory not only on Russians but also on the communities of other countries, primarily the post-Soviet space, and to the greatest extent on the "Slavic brothers" — Ukrainians and Belarusians. As some Ukrainian analysts rightly point out, "Russia's manipulation of historical facts is part of the strategy to restore its status as a great power and world leader and plays a significant role in its ideological foundation" [393].

At one time, the USSR tried to construct a whole context of individual episodes, creating the Great Myth of the Great War [391]. Myth is based on an irrational image of the past, on belief in this image, and not on facts. The truth of this image cannot be verified. The Soviet myth of this war, filled with falsifications and taboos, bypassed whole pages and chapters of history.

Soviet myths about the events of the Second World War as a whole are not real, but a varnished, dosed, emasculated and invented story, constructed in the interests of the state, primarily of the highest political leadership, which was intended to emphasize the "power and greatness of the USSR", its "leading", a progressive role in world historical development, the advantages of

the socialist system and the Soviet way of life. Undoubtedly, they should be considered as a tool of propaganda, and more broadly — of ideological and informational and psychological struggle, of hybrid warfare in general.

The mythologeme of the Great Patriotic War has become a key element of modern Russian historical narrative and propaganda. According to Russian political technologists, since 2014, this problem has taken a prominent place in ideological confrontations between representatives of various political forces and on Ukrainian territory. Soviet myths continue to exert a tangible influence on the consciousness of some citizens of modern Ukraine.

At the same time, historical knowledge was, is, and will remain a tool for both the formation of people's social consciousness and its manipulation. History, or rather its appropriate preparation, can influence the course of events and predict the mood of society on various issues. Among the methods of manipulation of historical consciousness are, in particular, the spread of outdated stereotypes, direct falsification of facts, silencing of unfavorable information, bias in the interpretation of facts, hanging labels to compromise historical figures and many others. All this is characteristic of Russian propaganda. The manipulative potential of the Russian mass media is quite effective today. They use not only certain methods, but also whole genre forms that contain pseudo-events, mystifications, falsifications [394].

Ukraine and the Russian Federation parted ways on their historical paths. The Russian Federation is returning to the usual practices of the USSR of "accusing enemies" of their own sins. The language of hatred of today's Russian propaganda is borrowed from the vocabulary of that war — "fascists", "punishers", "Benderovtsi". The Totalitarian Myth of War kills again. Unpunished evil grows and multiplies [391].

3.6.2 MECHANISMS FOR COUNTERACTION TO HISTORICAL FALSIFICATIONS AND MANIPULATIONS BY THE RUSSIAN FEDERATION

The aggression of the Russian Federation against Ukraine, the occupation of Crimea, the armed conflict in the East of Ukraine, and the large-scale invasion were accompanied by a large-scale information campaign, which was demonstrated by total disinformation of the population and, in particular, the servicemen of the Ukrainian Armed Forces, and the large-scale use of fake information.

In the struggle for the state independence and territorial integrity of Ukraine, the formation of readiness for national resistance and the indomitability of the Ukrainian people, an important place is occupied by the state policy in the field of national and public identity, the components of which, in turn, are national-patriotic education, military-patriotic education, civic education [395]. Therefore, one of the main tasks for the leadership of the Ministry of Defence of Ukraine, the General Staff of the Ukrainian Armed Forces in working with personnel has become effective military-patriotic education, timely provision of servicemen with relevant information that affects their consciousness and behavior and forms high morale in them. psychological state.

In the Ukrainian Armed Forces, cultural institutions and units, officers' houses, museums, song and dance ensembles, military orchestras, libraries, museums are involved in order to satisfy the national and cultural interests of servicemen, the study of the history of Ukraine, the culture of the Ukrainian people, folk traditions, customs, and ceremonies. (rooms) of martial glory.

The Order of the General Staff of the Ukrainian Armed Forces No. 108 dated March 25, 2017, approved the "Instructions on the organization of national-patriotic training in the Ukrainian Armed Forces", according to which the main tasks are:

— training of personnel based on the ideals of Ukrainian statehood and the unity of Ukrainian lands, military traditions, examples of courage and heroism of Ukrainian soldiers during the liberation struggles and during the protection of the territorial integrity of the Ukrainian state;

— promotion and popularization of the traditions of the spiritual and cultural identity of the Ukrainian people, the Ukrainian language, the heroic struggle for independence, territorial integrity of Ukraine;

— education of servicemen's loyalty to the Military Oath, military traditions, and pride in belonging to the Ukrainian Armed Forces.

The basis of the system of national-patriotic training of the personnel of the Ukrainian Armed Forces is the idea of the development of Ukrainian statehood as a consolidating factor in the development of Ukrainian society and the Ukrainian political nation. An important role in educational activities is played by the restoration of the historical memory of Ukraine's long state traditions. The scientific institutions of the Ukrainian Armed Forces published the collection "Ukraine — Russia: questions and answers", which sets out the main myths and stereotypes imposed by Russian propaganda and relate to issues related to the modernity and history of Ukraine. The monograph "Military traditions in the Ukrainian Armed Forces", collections of informational and analytical materials "The First World War: events and facts", "The Second World War: events and facts", "Russia aggressive: lessons of history, important for us" was prepared, and many souvenirs for soldiers, information and propaganda leaflets and posters for servicemen and the population of Donetsk and Luhansk regions.

Ukrainian military-historical calendars for 2015, 2016, 2017, 2018, and 2019 were developed by scientists and historians with the aim of spreading military-historical knowledge and restoring the tradition of honoring Ukrainian soldiers. The calendar contains information about the events of the military history of Ukraine, outstanding Ukrainian military figures of different times, our contemporaries who steadfastly defend the independence of our state. In 2022, the publications "Destroying the historical myths of Russian propaganda: a collection of analytical materials" and "Communicative and propaganda component of informational and psychological countermeasures in the Ukrainian Armed Forces: educational and methodological manual" were published.

The causes of the Russian-Ukrainian war are largely based on the interpretation and reinterpretation of historical events. By changing values and ideals, distorting historical facts and distorting information, Russian propaganda managed to influence public consciousness and form anti-Ukrainian public opinion in the annexed Crimea and eastern Ukraine. In addition, as a result of

the destructive influence, dangerous separatist and pacifist sentiments appeared in other regions of Ukraine. Such trends have a negative impact on the formation of citizens, in particular, military personnel of the Ukrainian Armed Forces, a sense of patriotism and readiness to defend the Motherland from external aggression.

Since historical knowledge under the conditions of informational and semantic wars becomes strategic content, modern communication and propaganda technologies are used for its dissemination in the information society. For the effective use of historical knowledge in propaganda and counter-propaganda activities in the Ukrainian Armed Forces, it is necessary to determine the main forms and methods of activity.

In accordance with the normative legal acts regulating information and propaganda provision, as well as the definition of the essence of propaganda, which in a broad sense means activities related to the dissemination and clarification of political, philosophical, scientific, ethical, artistic ideas, teachings and views, knowledge, values and other information with the aim of forming a certain worldview, ideas and emotional mood and influencing people's behavior, information and propaganda activities in the Ukrainian Armed Forces can be defined as the purposeful activity of military management bodies, commanders, commanders (chiefs), officials members of structural divisions of moral and psychological support regarding the informational and meaningful influence on the consciousness of personnel, in particular with the use of historical knowledge, with the aim of strengthening their moral and psychological state, forming and spreading ideological beliefs, national values, sustainable motivation and readiness for armed protection of state sovereignty, territorial integrity of Ukraine, adequate understanding by military personnel of the socio-political situation, tasks assigned to the troops (forces), conditions and features of their implementation.

Antidote to the negative informational and psychological influence of the enemy in the Ukrainian Armed Forces is the activity of military management bodies, commanders, commanders (chiefs), officials of structural units of moral and psychological support regarding forecasting, timely detection, and the implementation of preventive and protective measures against negative informational and propaganda influence the enemy The antidote to the enemy's negative informational and psychological influence consists in the formation of an information flow in response to the enemy's propaganda with the aim of weakening it or completely eliminating the consequences of the negative influence. Under the conditions of the Russian-Ukrainian war, it is aimed at forming the ability of military personnel to avoid the destructive content of the enemy's propaganda, to expose its direction, to understand its forms, methods, and techniques. Mythologemes and fakes created by the enemy must be refuted with arguments.

In general, we can distinguish several types of information and propaganda activities using historical knowledge, which can take place in verbal (oral speech) and visual form, as well as in printed word and in audiovisual form (video, in which the display is combined with oral speech, text, sound effects, etc.).

Lectures on national-patriotic training take place in verbal form, which are largely based on historical knowledge; individual and collective conversations on historical topics; listening to

educational radio programs dedicated to defining dates, events and personalities in the history of the Ukrainian people and their army; listening to thematic audio materials using historical knowledge; briefings on topical issues of the historical past and recent history of Ukraine, as well as the Ukrainian army; speeches, discussions, conferences, round tables on the mentioned issues, etc.

Articles that consider historical issues are published in the form of the printed word; brochures and booklets dedicated to memorable dates in the history of the Ukrainian people and the Ukrainian army, prominent personalities, as well as the debunking of various historical myths of Russian propaganda can be printed; it is quite effective to use satirical printed publications (in verse or rhyming form) using historical knowledge, figures and events in propaganda and counter-propaganda activities.

In a visual form, the tools of spreading military-historical knowledge about significant events and legendary figures of Ukrainian military history in society can be: official pages of military units and state institutions, television, radio, outdoor advertising (billboards, city lights); advertising on transport (station premises, monitors in metro cars, light boxes and a moving information tape in trams, trolleybuses, minibuses); thematic exhibitions, social advertising in social networks, sets of posters for educational institutions. In addition, it is quite effective to use posters and leaflets, comics and satirical magazines using historical issues and appropriate images of the enemy.

This activity should include museum expositions dedicated to significant events of the historical past of the Ukrainian people and the Ukrainian army, as well as events and figures of recent history; monuments, memorial plaques, etc., dedicated to honoring significant historical events and figures; in addition, state and military symbols, awards always contain historical knowledge, because they are historically conditioned. These knowledge and values must be disseminated among the personnel of the Ukrainian Armed Forces.

In audiovisual form, historical knowledge can be used in online lectures on national-patriotic training, or in lectures with visual support (presentations, slides, thematic video materials, etc.); watching television programs dedicated to the historical issues of the Ukrainian people and the Ukrainian army; watching popular science programs or films dedicated to debunking the myths of Russian propaganda about the history of the Ukrainian people, the state and the Ukrainian army; viewing popular science films, feature films and TV series dedicated to legendary figures of the past and recent history of Ukraine, significant events of the past of the Ukrainian people and the Ukrainian army, memorable dates; watching concerts dedicated to memorable dates, etc. The use of historical knowledge in a combined form can be most effective under the condition of creating a high-quality information product.

The implementation of countermeasures against the enemy's negative information and psychological influence in the Ukrainian Armed Forces involves the use of both traditional methods that are usually used in internal communication work, as well as the use of the latest methods and means of working with target audiences.

The methods of internal communication work in the Ukrainian Armed Forces are understood as the basic rules, a set of methods of influence of subjects of military management on the personnel

of the troops (forces) and military collectives regarding the formation of a stable and controlled moral and psychological state, the necessary moral and combat qualities of the personnel of the troops (forces).

Methods of informational and promotional activities using historical knowledge can be classified as verbal, visual, and combined (audiovisual).

The main verbal, or verbal (*verbalis* – oral, verbal) methods include story, conversation, lecture, and discussion. They make it possible in a short period of time to inform servicemen of important information, pose a problem and outline ways to solve it. With the help of verbal methods, a sufficient level of historical knowledge and his own communication skills, an officer of the MWR can create vivid images of the past and present in the minds of servicemen, which activate imagination, memory, and patriotic feelings.

One of the simplest and at the same time the most common verbal methods is a story. The storytelling method involves an oral live, figurative, and sequential presentation of the material, which usually occurs in an explanatory or narrative form with the aim of encouraging listeners to create a certain image in their imagination. Therefore, this method is figuratively called "drawing with a word". It is actively used at all levels of education and in information-propaganda and counter-propaganda activities [396].

Narrative, as a method of information-propaganda and counter-propaganda activities using historical knowledge, must meet the following requirements:

– contain reliable facts;

– include a sufficient number of vivid and convincing examples, facts that prove the correctness of the given provisions;

– have a consistent and logical presentation of the material;

– be emotional;

– to teach in a simple and accessible language for military personnel;

– to express the personal assessment and attitude of the officer from MWR to historical events and reported facts.

An explanation is a verbal interpretation of the essential features of the historical events being studied. The explanation is based on logical thinking, so the use of this method requires an accurate and clear formulation of the essence of the question, as well as a consistent disclosure of cause-and-effect relationships associated with the historical event being studied. In this method, it is appropriate to use comparisons, analogies, vivid historical examples, etc.

In addition to the above, in order to increase efficiency, the leader of the lesson can use certain voice modulation techniques during the explanation, move through the audience, as well as correctly choose words that play a significant role in the explanation, etc. Thanks to these techniques, the explanation affects the emotional and sensory sphere of the listeners and is better remembered. To enhance the effect, it is advisable to use visual aids (maps, diagrams, models, tables, etc.). However, it is worth remembering that an excessive increase in explanation time causes fatigue and a decrease in the attention of listeners [397].

A conversation is a dialogic presentation of the material, when the leader of the lesson leads the listeners to understand certain historical events, facts, etc., by means of well-thought-out questions. With the help of dialogue, listeners can become aware of new historical knowledge for them or reproduce already known ones. A dialogic presentation of the material can be addressed to one military serviceman or to all participants of the class. The success of the conversation largely depends on the correct formulation of questions, which should be specific, clear, and meaningful. In some cases, during the conversation, you can ask alternative questions that require unambiguous answers, such as "yes" or "no". The conversation method can be used only if the servicemen have a certain level of knowledge on the issue being discussed.

A lecture (from the Latin lection— reading) is a logical, sequential presentation of material characterized by judgments, conclusions, and a summary. The lecture is intended for assimilation of theoretical material; therefore, the lecture method is aimed at informing the staff and transferring historical knowledge during classes on national-patriotic training through a monologic form of com-munication. In this regard, class leaders should use creative approaches when conducting them. After all, the lecture should form the interest of military personnel in the history of the Ukrainian people and the Ukrainian army, as well as promote the exchange of knowledge, experience, and feelings. For this, it is necessary to use certain techniques and methods of diversification and activation of the classical lecture method of conducting classes. They can be lecture-conversation, lecture-discussion, lecture with pre-planned mistakes, etc.

The essence of the *lecture-conversation* method is dialogue and direct contact between the in-structor and the military servicemen. This is a relatively simple form of active involvement of students during classes on national and patriotic training. The activity of military personnel during the class can be ensured by the puzzling technique, which consists in the questions of the leader of the class. Such questions should not be aimed at knowledge control, but at clarifying the opinions and level of awareness of servicemen regarding the topic of the lecture, as well as at updating their knowledge and tuning for careful perception of the content of the lecture. Questions are asked to all participants of the class, to which servicemen answer as they wish. In order to save time, the leader of the class should ask questions in such a way that it is possible to give an unambiguous answer. Taking into account the content of the answers, the leader of the lesson should plan his further actions.

Lecture-conversations can turn into a *lecture-discussion*, which involves an active exchange of ideas in the intervals between the logical sections of the lecture. The activity of the military service-men-listeners in the lesson enlivens the lesson and activates their cognitive activity and gives the opportunity to the leader of the lesson to manage the collective opinion of the group.

The basis of the listed methods of information-propaganda and counter-propaganda measures is the word of the class leader. Therefore, his communication skills are one of the main conditions for the effectiveness of information and propaganda and counter-propaganda measures.

Visual methods are illustration and demonstration (from the Latin *ilustratio* – image, visu-al explanation; *demonstratio* – show). The method of illustration involves a schematic repre-sentation, that is, the use of maps, diagrams, posters, reproductions, diagrams, drawings, etc.

The *demonstration* method involves the display of natural objects and phenomena, therefore, when carrying out information-propaganda and counter-propaganda activities using historical knowledge, depending on the purpose, you can use historical documents, photographs, posters, postcards, awards, uniforms, and other items. Usually, illustrative and demonstrative methods are used as auxiliary to verbal methods, because they help to "revive" verbal information. Demonstration materials supplement verbal information or become independent carriers of information. For example, during classes on national-patriotic training, it is appropriate to use all of the listed visual aids that will promote the interest of military servicemen-listeners, as well as visual and emotional perception of information. In addition to the above, illustrative and demonstrative methods can be used independently when conducting information and propaganda and counter-propaganda activities. For example, as a visual campaign, etc.

The *audiovisual* method is a modern combined method that combines the showing of a video sequence and listening. The audiovisual method occupies a special place in the implementation of information and propaganda activities in the Ukrainian Armed Forces because it contributes to the figurative and holistic perception of information and historical material. In addition, the audiovisual method provides a synthesis of the interpretation of historical knowledge, facts, events, phenomena with elements of art, because their display on the screen is done by artistic means. In addition, during the creation of video productions (movies, popular science films, video lectures, videos, etc.), various audio and video special effects are used, which are also enhanced by musical accompaniment. All these and other methods contribute to the increase of information and propaganda influence on the subconscious of the personnel of the Ukrainian Armed Forces. However, the effective use of the audiovisual method during informational and propaganda activities in the Ukrainian Armed Forces involves the provision of modern technical means and high-quality thematic audio and video production.

In addition to the traditional methods used in information and propaganda activities, it is necessary to dwell on purely propaganda methods that can be used to popularize the history of the Ukrainian people and its army, as well as to increase the level of patriotism among servicemen of the Ukrainian Armed Forces.

Propaganda aimed at popularizing the history of the Ukrainian people and its army is constructive in its essence. Such propaganda is aimed at forming a patriotic outlook among servicemen of the Ukrainian Armed Forces. Constructive propaganda is carried out in the interests of servicemen and the state. It does not pursue manipulative goals, on the contrary, it contributes to the formation and maintenance of feelings of self-respect, patriotism, and pride in servicemen for their country and belonging to the Ukrainian Armed Forces.

Special methods and approaches of informational and propaganda influence are used to realize this goal. The main feature of the methods of effective constructive propaganda is the absence of coercion, pressure, substitution of facts, fearmongering, etc. The impact of such propaganda occurs by stimulating interest, admiration, encouragement, and attractiveness in the target audience. Under such conditions, the target audience voluntarily perceives the ideas, meanings,

and values of constructive propaganda and begins to act accordingly. Therefore, modern constructive propaganda should be unobtrusive and attractive.

Method of *reframing*. These are speech techniques, with the help of which the perception and understanding of historical events and facts of figures in the target audience are quickly changed, which during the informational and semantic wars become the subject of distortions and manipulations. To refute distorted historical knowledge, you can use the method of logical refutation with the help of historical scientific knowledge. An example of the application of this method is the work of V. Brehunenko "War for Consciousness. Russian myths about Ukraine and its past". However, the choice of a logical method of refutation presupposes that the propagandist has a high level of historical knowledge. Therefore, in certain situations it is appropriate to use the reframing method.

Frame means scheme, template. That is, it is an emotional and mental pattern that determines the stereotypes of interpretation and understanding of a person. That is, frames, as semantic frameworks, or frameworks of social representations shape a person's vision of the world. Accordingly, the method of reframing is aimed at changing the emotional and mental pattern of the personnel of Ukraine in relation to certain historical events, facts, figures, etc., so as to go beyond the usual perception and see them in a new context, or from another side. This is very relevant in relation to many historical facts, figures and events, the interpretation of which during the times of the USSR was distorted and distorted.

There are several types of reframing. *Content (meaning) reframing* is aimed at changing the meaning of the content, while keeping the context the same. This method is expressed by the following formula: "It is actually not called X, but Y" [398]. That is, content reframing can be interpreted as renaming an event, veil, or person with the aim of giving a different meaning to its perception. This method is one of the most frequently used in information and propaganda activities and in information and semantic wars. After all, the way an event, a person, a fact is called changes its perception. For example, Russian propaganda, starting from March 2014, actively uses content reframing to present the Ukrainian Armed Forces as "punishers", the leadership of Ukraine as a "fascist junta", and mercenaries in the east of Ukraine as "militia". Therefore, it is necessary to adequately call historical facts and events by their proper names and to timely and accurately reframe all informational and propaganda criticisms towards Ukraine, its statehood, culture, national history, and traditions.

Reframing the context is aimed at changing the context in which the fact changes its meaning. This method is expressed by the following formula: "In this situation it is not X, but Y" [398]. For example, about a military defeat, you can say: "What happened is a defeat but considering the totality of all difficult circumstances and the courage of our boys, it can be considered our small victory". The method of context reframing makes it possible to present the same historical event, fact, or figure in both a good and a bad light. After all, if you change the context of the message, its interpretation and attitude of public perception to the content will also change.

Reframing as *"showing the other side"*. For example, when Russian propaganda begins to spread narratives about how well everyone lived in the Soviet Union with cheap sausage and free

medicine, it is necessary to remind about the scary aspects of life in the USSR: about the Gulag concentration camps, total repression, censorship, extermination of dissenters, etc.

Reframing with the help of turns "a", "but". This method is the simplest from a technical point of view. Its main principle is to compensate the disadvantage with dignity. For example: "We are not retreating but leveling the front line"; "This is not a defeat, but another lesson for us"; "This is not a problem, but a task that we need to solve"; "It's hard to study, but it will be easy in battle".

Reframing using an *"alternative question".* In order to encourage the target audience to perceive information, a situation, an event through the right frame, it is necessary to ask questions using the effect of contrast. This effect makes it possible to emphasize exactly what the target audience needs to pay attention to. You can ask a rhetorical question; the answer is not obvious.

Under the conditions of modern information and meaning wars, classic counterpropaganda, which is aimed at refuting the enemy's propaganda and minimizing the negative consequences of its influence, is undergoing certain changes. In addition to retaliatory actions, preemptive counterpropaganda is much more effective. The effect of prejudicial propaganda is based on neuropsychological studies, which prove that information heard for the first time is difficult to refute. The founder of the theory of frames, J. Lakoff, emphasizes that all objections to the introduced frame only strengthen it [399].

Therefore, it is necessary to avoid refutation, but at the same time to build a new frame. The method of "*building a new frame*" is implemented as follows. For example, when enemy propaganda makes accusations that destroy the positive image of the state leadership, the command of the Ukrainian Armed Forces, military personnel, etc. It is necessary to avoid direct answers to such criticisms, but to focus as much as possible on the positive things carried out by the state leadership, the military command, as well as on the achievements of the personnel. For example, if hostile mass media show footage of destroyed buildings and say that this is the work of the Ukrainian Armed Forces, then it is necessary to show as many examples as possible of how the Ukrainian Armed Forces are building and helping to restore the destroyed houses of civilians, etc. This is what the fight against the enemy's destructive frames is all about.

The method of "*anticipatory countermeasures*" consists in the fact that commanders (chiefs), officers from MWR are the first to inform the personnel about all significant events in the state, and about the course of the Russian-Ukrainian war. After all, it is difficult to change the attitude towards information perceived for the first time from other sources of information. In addition, this method must be used in the case of reporting facts, events, the perception of which negatively affects the moral and psychological state of servicemen. With advance notification of such information, it is possible to present it in a softer form and prevent an explosion of negative emotions, which will certainly occur when this information is disseminated by the mass media.

However, according to experts, a sufficient level of historical knowledge forms such a filter of perception that does not let contradictory information into the mind. Under such circumstances, the need to fight against every fake fact of the enemy disappears, since all sources of information are perceived as unreliable.

Information in public life poses serious challenges. Society must be informed through all possible means of communication about the true history of the state and people, real events that become history, refuting stereotypes and myths about Ukraine imposed by Soviet and Russian propaganda.

The use of military rituals, rites, and the formation of stereotypical behavior in servicemen allows influence through experience.

The concept of *tradition* (from the Latin *traditio* – to pass on) includes a set of stable rules, norms, values, forms of consciousness, social institutions, etc., which are preserved and constantly reproduced in the life of a certain people throughout history. Tradition acts as a mediator between the past and the present through the transmission of models, skills, ideals, etc. Transmission occurs through repeated repetition and duplication of traditional activities (customs), rituals, festive ceremonies, symbolic texts (mythology) and signs. In addition, tradition is a kind of historical consciousness, for which the historical past becomes a model for the present and the future.

National military traditions are the rules, customs, and norms of behavior of military personnel in peacetime and wartime, which were formed during the history of the Ukrainian army during everyday activities, training, and execution of combat tasks. Military traditions contain various elements, namely: principles and norms of behavior of military personnel; civil and moral qualities of soldiers; principles of military training and education; military rituals; system of military awards; military ethics; military heraldry and symbols; flag studies; uniformology; elements of military life and spiritual culture of life activities of troops; military music and songs; military vocabulary. The historical achievements of many generations of defenders of our Motherland are the backbone of military traditions. National military traditions were created and developed on the basis of the experience of the military formations of Kyivan Rus, Cossacks, Ukrainian state formations of 1917–1921, etc. Military traditions are constantly recreated and passed down from generation to generation of military personnel through military rituals.

Military rituals are a historically formed form of behavior of military personnel, which has been reproduced for a long time and has become part of consciousness as a voluntary, social, and obligatory action. Any ritual action is determined by its symbolic nature. Therefore, in military rituals, along with the word, signs and symbols are used, which act as substitutes for real objects, processes, and phenomena. Such symbolically mediated activity is aimed at forming patriotic thoughts, feelings, ideas, moods, and instructions in military personnel.

Military rituals perform the function of preserving military tradition, unite the past and future of the armed forces, older and younger generations of servicemen, integrate the ethnic distinctions of individuals into a highly developed military-professional community. Military rituals preserve the best military achievements that ensured physical survival and self-preservation of Ukrainian soldiers who lived throughout history in conditions of almost continuous hostilities. Practically participating in the rituals, young servicemen absorb their multifaceted meaning at an unconscious level, through feelings, gradually internalizing this meaning in their own experience. At the same time, each new generation of military personnel does not simply perceive and assimilate military rituals

in a ready-made form but makes its own interpretation and choice. Military rituals contribute to the formation of servicemen's personal experience of belonging and attachment to military traditions and values, culture, and history of Ukraine in general. Accordingly, it is practically impossible to carry out full-fledged training and education of military personnel without taking into account the powerful potential of rituals in the military sphere.

A significant number of military rituals are associated with the phenomenon of war. That is why they crystallize people's ideas about war, military duty, as well as about a number of moral, emotional, and social-psychological phenomena, such as patriotism, heroism, sacrifice, courage, etc. They reflect significant military-historical experience and are supplemented by new experience of modern wars. Thanks to this ability, military rituals contribute to the achievement of a state of coherence and are a factor in uniting servicemen into a single combat body for the common goal of ensuring victory over the enemy during war and the implementation of combat training tasks in peacetime.

The complex of rituals, which are reproduced by military personnel with a certain periodicity, forms a general semantic context, a common atmosphere in military teams and gently and imperceptibly immerses the personnel in the realm of saturated images of military history, mythology, culture, which are internalized in the consciousness of military personnel through traditions and rituals.

Prospective ways of countering Russian informational aggression can be conditionally divided into two main parts.

Within the framework of the first, countermeasures are carried out through the complex use of counter-mythological methods, both with the use of anti-myths and demythologizing. Based on the above, it is considered expedient to carry out measures to neutralize mythological influences in a complex manner in two main directions: demythologizing and using myths to destroy one's own kind.

The second is an activity aimed at complicating the application and ultimately destroying the mechanism of external mythological influence.

During the planning and implementation of measures aimed at countering the destructive informational influences of the Russian Federation, it is considered promising to use:

— the method of myth analysis, built on the basis of research into Soviet mythology. Its application is aimed at revealing the structural and scenario features of myth-constructs traditionally used by Russian propagandists, with the aim of forecasting further options for the development of the hostile myth-environment;

— archaic myths as an effective tool for destroying modern Russian myth-constructs, which was demonstrated in practice by Western allies of Ukraine;

— technologies of adaptation to modern conditions of well-known religious myths with a powerful suggestion (within the framework of the Russian-Ukrainian confrontation to the example of the use of the myth of "David and Goliath", etc.);

— "reverse analogy" technologies. Its essence is the exposure of the dual approaches of Russian politics through the use of mythological analogies to discredit a certain Russian myth-object of influence.

CONCLUSIONS

The military leadership, commanders at all levels should more actively use the potential of Ukrainian history as a basis for the formation and preservation of national identity, and with the truth of historical facts, debunk Russian historical interpretations that are imposed on Ukrainians. Historical knowledge will be a guarantee of the spiritual sovereignty of Ukrainians and the independence of Ukraine.

Today, history, like science, plays the role of an effective weapon. With the help of history, an attractive image of Ukrainian society should be formed, which will contribute to the integration of the inhabitants of the territories affected by military actions. The true, not distorted history of the Ukrainian people and the Ukrainian army will best help preserve and shape the national identity of Ukrainians.

3.7 STRATEGICALLY DIRECTED MIGRATION AS AN INSTRUMENT OF RUSSIA'S HYBRID WARFARE AGAINST UKRAINE

Maryna Semenkova

ABSTRACT

Strategically directed migration is one of the types of hybrid warfare and is included in many modern concepts of the so-called "New Wars". The goals of directing the population from or to a specific country are generally resolves into strengthening or weakening the positions of certain countries and regions, depending on the goals of the political actor that resorts to the techniques of such displacement. Using the example of the aggression of the Russian Federation against Ukraine we can analyze the use of population movement techniques and find out what purposes they can be used.

Based only on open sources, it is difficult to understand whether the actions of the Russian Federation to relocate the population were the result of a policy and, if so, with what goals the Russian leadership resorted to it. Therefore, we will adhere to the "fit-for-purpose approach". Within the framework of the mentioned approach, the goals of the international actor are evaluated from the point of view of its behavior, that is, from the point of view of analyzing the consequences of the its actions, but from the declared intentions. Therefore, the consequences that did take place were determined by the international policy actor as a political goal.

KEYWORDS

Strategically directed migration, hybrid warfare, "New Wars" concept, population movement, international policy.

When studying the strategically directed of migration by the Russian Federation and the purposeful use of migration processes for its political purposes, we must first of all turn to the period preceding the events of 2014. Even before the beginning of the aggression the Russian Federation made efforts to create prerequisites for strengthening its own positions in the future conflict. In particular, the social base for the annexation of the Crimean Peninsula was being created with the help of migration processes, conditions were being created for the destabilization of the socio-political situation in Ukraine and, at the same time, demographic and socio-economic problems in Russia itself were being solved.

Long before the beginning of the hybrid conflict, Russia considered the intensification of migration contacts as a factor in strengthening transnational ties in the territory of the former USSR. The main direction of migration processes was the Russian Federation itself, in particular its

European part. This, in turn, was considered by the leadership of the Russian Federation as a factor of dominance in the region [400].

At the same time, such migration was essentially only labor migration. Citizens of Ukraine mostly stayed in the Russian Federation temporarily, returning to Ukraine after solving their financial issues and not considering moving to Russia for permanent residence. However, the political leadership of Russia, seeing a threat to its own national security as a result of the depopulation of vast regions of Western Siberia and the Far East, took measures to increase the country's population, including through migration. The President of the Russian Federation, Putin, putting forward the task of ensuring migration flows to the country at the level of 300 thousand people per year, emphasized that this must be achieved primarily by attracting compatriots living abroad to permanent residence in the Russian Federation [401].

On June 22, 2006, Putin signed Decree No. 637 "On Measures to Facilitate the Voluntary Resettlement of Compatriots Living Abroad in the Russian Federation", which approved the State Program for 2006–2012. The program provided the favorable conditions for resettlement, the payment of settling allowance, assistance with employment and purchasing or obtaining housing, accelerated procedure for obtaining Russian citizenship, etc. Organizational work was carried out by the Federal Migration Service of Russia, for which its representative offices were opened abroad [402]. In particular, in Ukraine, FMS specialists worked in Kyiv, Kharkiv, Odesa, Lviv, and Simferopol.

However, resettlement under the Program was not carried out to Russia in general, but to specific regions, mostly to remote, depressed regions with difficult climatic conditions and unattractive from a socio-economic point of view, where depopulation was observed, or there was a shortage of representatives of certain professions (doctors, engineers, etc.). Participation in the Program was denied to persons who did not have proper qualifications and had outstanding criminal records. The economically inactive citizens (pensioners, students, persons with disabilities) could only apply to the program as members of families of immigrants.

Geographical and other restrictions, as noted by analysts, were the main reason for the weakness of the migration flow [401]. Instead of the planned 50,000 in 2007, 100,000 in 2008, and 150,000 in 2009, the total number of resettlements permits issued by the Federal Migration Service during the 5 years of the Program implementation (2006–2012) was 79,900 (for 166,600 people). The share of applications from Ukraine was only 7.2 %.

On September 14, 2012, Presidential Decree No. 1289 "On the Implementation of the State Program to Prevent the Voluntary Resettlement of Compatriots Living Abroad to the Russian Federation" was signed, approving a new edition of the Program, expanded and supplemented [403]. However, despite additional preferences for immigrants, their flow did not increase significantly. There was no talk of 300,000 people per year at all.

However, the situation changed after the start of the Russian-Ukrainian war. While in 2013, 34.7 thousand immigrated to Russia within the framework of the Program, then in 2014 – 106 thousand, of which 39.2 % were citizens of Ukraine, in 2015 – 183 thousand (60.4 % –

from Ukraine). 90 % of Ukrainians applied for participation in the Program while already on the territory of the Russian Federation.

The Program itself was promptly adapted to allow Ukrainians to participate in it. In 2016, the number of people arriving under the Program decreased by 16 % compared to the previous year, but Ukrainians accounted for more than half of them. In general, about 1 million people left Ukraine and returned to the Russian Federation in 2014–2015 alone [401]. However, this number includes not only those citizens who moved under the resettlement program.

If resettlement according to the indicated Program pursued the main goal of stopping the depopulation of certain regions of Russia, which can also be considered as a strengthening of its own military capabilities, then already in the context of the launched armed aggression of the Russian Federation against Ukraine, its goals regarding the transfer of the population can be reduced to the following:

1. Ensuring the loyalty of the population in the temporarily occupied territories.

2. Provision of formal grounds for military presence, in particular for full-scale aggression.

3. Strengthening own military capabilities and reducing Ukraine's military capabilities.

Loyalty of the local population is an important factor in capturing and holding territory. If the technologies of external informational and psychological influence on the population are not effective enough, political actors may resort to the eviction of certain groups of the population and/or the settlement of the territory by other groups.

For this purpose, the Russian Federation resorted to various measures, including:

— forcing Ukrainians primarily families with children to leave their permanent place of residence in the temporarily occupied territories due to the threat to life and health under the conditions of the armed conflict;

— resettlement of the own population to temporarily occupied territories, in particular representatives of law enforcement agencies, citizens who were supposed to replace management positions in local self-government bodies, etc., and their family members;

— stimulating the movement of young and middle-aged people to the Russian Federation.

— complicating, and most often — actually making it impossible from the spring of 2020, the procedure for crossing entry-exit checkpoints temporarily occupied territories of Donetsk and Lugansk regions.

In particular, in order to prepare for the annexation of Crimea, the Black Sea Fleet of the Russian Navy served as a tool for moving its own population to Crimea for permanent residence. Among tens of thousands of servicemen and members of their families there were many who tried to get there to serve in order to stay in Crimea for permanent residence. In this way Russia created a social base in Crimea for future annexation [404].

After the annexation, in order to further strengthen the social base and legitimize the annexation, about 200,000 Russians, mainly military personnel and representatives of the security forces, as well as family members, were resettled on the peninsula. Approximately 170,000 Ukrainians left Crimea after its illegal annexation.

Before the start of the full-scale armed aggression in February 2022, there were 1.3 million officially registered internally displaced persons from the East of Ukraine. Most of them opposed to the pro-Russian government and could constitute its internal opposition. However, they were forced to leave due to the threat to life and health, as well as the unwillingness to live under the occupation. A significant part of Ukrainians also left the unoccupied territories of Donetsk and Luhansk regions, mostly due to the uncertainty of their future and the future of their children in these territories.

The overwhelming majority of those who left were active young and middle-aged people who had enough resources and energy to settle in a new place. Families with children also left the region en masse. As a result of the conflict in Ukraine, in all studied regions, the share of elderly and disabled people among internally displaced persons turned out to be smaller than within Ukraine, and the share of children under the age of 18 was 29 % [405]. Quite often pensioners and persons with disabilities only registered in the controlled territory in order to receive pensions and material assistance, but actually continued to live in the temporarily occupied territories. On the other hand, approximately 10 % of displaced persons were not registered as internally displaced persons at all. Thus, the actual share of young and middle-aged people among those who left temporarily uncontrolled territories is even higher than the official one. Accordingly, the number of Ukrainians of reproductive age in the temporarily occupied territories objectively decreased. In a situation of prolonged occupation, this should lead to the decrease of the population of Ukrainian origin. In turn, this will create conditions for the gradual replacement of the population of the temporarily occupied territories by citizens of Russia with related political implications.

Here it should be pointed out the importance of regular movements of Ukrainian citizens between the temporarily occupied territories of Ukraine and other territories of Ukraine. Between 2016 and 2019, more than 30,000 people and 5,000 vehicles crossed checkpoints every day. A total of about 20 % of all residents of certain regions of the Donetsk and Luhansk regions (OR-DLO) regularly traveled to the territory controlled by Ukraine. Such active migration from/to the temporarily occupied territory was explained by the need to visit relatives, look after property, solve social and household issues, commute to the place of study and place of work. A significant proportion of travelers were recipients of social benefits and pensions. For example, until March 2020, most pensioners crossed the demarcation line once every two months in order to undergo identification at Oschadbank, through which payments were made.

Such active migration was an important step on the way to the successful reintegration of the temporarily occupied territories. After all, the duration of interaction, the frequency and depth of contacts are among the key factors contributing to optimal reintegration, as well as integration into the social and cultural environment. It should be said that in our case it is not about integration, but rather about preventing disintegration and preserving socio-cultural ties, not their formation. However, this does not reduce the importance of regular migration movements for the purpose of comprehensive and full-fledged reintegration of the ORDLO. Thanks to periodic episodes of entry and exit, connections were maintained between residents of the temporarily uncontrolled territory

and other territories of Ukraine, the residents of the temporarily occupied territories were aware of the fact that Ukraine cares for them and fulfills its financial and social obligations, they felt the difference between the living conditions in Ukraine and in the temporarily occupied territories in the context of advantages and opportunities.

However, the displacement factor lost its importance with the beginning of the introduction of restrictions in connection with the increase in the incidence of covid, and was later transformed by the leadership of quasi-state states, and essentially the Russian Federation, into a factor of disintegration and isolation, into a factor of increasing the socio-cultural distance between the residents of Ukraine and its temporarily occupied territories. After all, it was from the temporarily occupied territories that restrictions were introduced, which reduced the number of crossings by more than twenty times [406].

At the same time, there were practically no restrictions on crossing the borders between the temporarily occupied territories of Ukraine and the Russian Federation. As already mentioned, only in the period of 2014–2015, about 1 million people left the temporarily occupied territories for the Russian Federation and continued to maintain contact with their previous place of residence.

The process of passporting of citizens of Ukraine and their acquisition of citizenship of the Russian Federation should be addressed separately. "Passportization" can be considered a creeping migration. Without changing their place of residence, people become citizens of another state.

In the temporarily occupied territories of Ukraine, Russian authorities created conditions under which Ukrainians were forced to obtain passports of self-proclaimed republics or passports of the Russian Federation. In their absence, people had extremely limited access to social and administrative services, they could not get a job, etc.

On April 29, 2019, Putin issued Decree No. 187 "On simplifying the procedure for obtaining Russian citizenship for certain categories of foreign citizens and stateless persons". In particular, the list of these categories included residents of the temporarily occupied regions of Donetsk and Luhansk regions [407]. On May 30, 2022, changes were made to the above decree. The number of categories of persons was increased, the procedure for obtaining was simplified.

There are no reliable statistics on the number of Ukrainian citizens who have received Russian citizenship live in the temporarily occupied territories or moved to the territory of the Russian Federation. But it is believed that since 2014, 1.3 million Ukrainian citizens have received Russian citizenship (not including residents of Crimea).

The following can be cited as the purposes of "passportization":

1. The Russian Federation's attempt to legitimize its presence in the temporarily occupied territories.

2. Creation of a "legal basis" for the open use of armed forces against Ukraine. According to Article 7 point 2.2 of the federal law "On Security", the Russian leadership tried and is trying to create a so-called political reality for "protecting the rights and legitimate interests of Russian citizens living abroad" [408]. The protection of Russian citizens living abroad is also prescribed in paragraph 22 of the military doctrine of the Russian Federation [409].

3. Using it with a propaganda purpose, as a demonstration of support from the residents of the community.

4. The use of "passortization" by the political leadership of the Russian Federation to obtain additional votes in the elections.

5. Use as an additional factor in changing the balance of military capabilities.

Thanks to the direction of population flows from Ukraine, Russia managed to solve its internal problems and, accordingly, strengthen its military capabilities. According to the Concept of State Migration Policy, it was planned to increase the population of the Russian Federation to 145 million people (from 142 million) [410]. This goal was achieved as a result of providing people with Russian citizenship in the annexed Crimea and in the temporarily occupied regions of Ukraine.

To stimulate the movement of the population, favorable conditions were created for those Ukrainians who agreed to move to a permanent place of residence in the regions of the Far East, Siberia, etc. The Russian Federation is resorting to populating these regions because their depopulation is threatened by probable expansion from China.

From the point of view of military capabilities, the number of the population, primarily young and middle-aged, is of particular importance for conducting a conventional warfare. Special programs were implemented to attract young people. In particular, among them is the decision of the Government of the Russian Federation No. 434, which prescribes a simplified procedure for the admission of citizens of Ukraine from the temporarily occupied territories to higher educational institutions of the Russian Federation, the provision of additional places for this purpose funded by the government, which was issued already after the start of the full-scale invasion, namely March 21, 2022 [411].

Regarding the dynamics of population movement after February 24, 2022, there are no reliable data yet, because the borders between the Russian Federation and the temporarily occupied territories of Ukraine are not controlled by the Ukrainian State Border Service. However, approximately 2.8 million Ukrainians crossed the border from the Russian Federation; they are mostly residents of the temporarily occupied territories of Ukraine. In particular, Russia began evacuating the population from the ORDLO even before the start of its full-scale aggression, explaining the evacuation of the population by the existence of a threat of an attack on these territories by Ukraine. After February 24, the Russian Federation repeatedly carried out organized transfer of persons from temporarily occupied territories, primarily children, to its territory.

Despite the fact that with the beginning of full-scale aggression, the Russian Federation resorts to military actions, it continues to make efforts to relocate the population, considering this as one of the factors for achieving the goals of the war. In particular, programs to encourage voluntary resettlement of Ukrainians to the Russian Federation as well as social and economic support programs for immigrants continue working, and "passportization" of the population continues.

At the same time, mass media and social networks are conducting campaigns to discredit the efforts of other countries in the world to support refugees from Ukraine, emphasizing that the conditions of stay of refugees from Ukraine in the Russian Federation are the best.

CONCLUSIONS

The migration of citizens abroad in itself poses a threat to the national security of Ukraine and is a factor of the socio-economic development deterioration, thereby reducing the country's ability to resist the aggressive policy of the Russian Federation. Unfortunately, the longer people stay abroad, the less likely they are to return. The departure of citizens also takes place towards the Russian Federation, mostly from territories that are temporarily occupied. This process is not only difficult for Ukraine to influence, but almost impossible to control.

We must recognize the fact that it is very difficult to influence the migration processes that take place in the temporarily occupied territories. Moreover, it is difficult for countries that believe in the values of democracy and freedom, like Ukraine is to oppose the process of mass migration from the country, especially during a full-scale aggression when issues of safety for the lives and health of citizens come to the fore.

A condition for reducing the number of people leaving for the Russian Federation is the creation of the best possible conditions for internal resettlement. It should be pointed out that Ukraine, despite all the difficulties associated with the war, did and is doing everything possible to evacuate the population from the war zones, provide them with housing, food, basic necessities, and living expenses, provide them with social services, etc. Both relevant state institutions and volunteer organizations are involved in helping internally displaced persons. Significant funds from the state budget are allocated for financial and socio-economic support of internally displaced persons, especially the most vulnerable categories.

The internal movement of people from the war zone to a safe part of the territory of Ukraine in order to prevent them from leaving the Russian Federation is a better alternative than their departure to other countries. However, as of now, 4.2 million Ukrainians have left abroad since the beginning of the full-scale aggression of the Russian Federation [412]. About 50 % of them are children under the age of 18. The departure of this age group has a particularly negative impact on the demographic dimension of the country's national security. One of the reasons for such an outflow of schoolchildren and students is the lack of opportunity to receive full-fledged educational services. Very often, where there is no urgent need for this, academic process in civilian educational institutions of Ukraine is carried out in a distance format. A simple transition to the classroom system should ensure an increase in the return of children and youth to Ukraine both from the Russian Federation and from other countries.

Those citizens of Ukraine who, for one reason or another, will not return home, can become a guarantee of maintaining socio-cultural ties, thanks to which Ukraine will be able to strengthen its political influence abroad, including in the Russian Federation. In fact, Ukraine's every possible support for its citizens who have found themselves in the territory of the Russian Federation or in temporarily uncontrolled territories can turn them into the same soft power, thanks to which it will be possible to oppose the hybrid strategies of the Russian Federation in relation to our country.

3.8 LEGAL ASPECTS OF COUNTERING A HYBRID WARFARE

Oleksandr Kotliarenko, Liudmyla Prypolova

ABSTRACT

Under the conditions of constant changes in the security environment and the ongoing armed aggression of the Russian Federation against Ukraine, the state must proactively and flexibly respond to changes in the world and national "agenda". The transition to the so-called "strategies of limited actions", hybrid methods of conflict resolution, the growing role of national stability of the state causes landscape changes in approaches to the functioning of the system of ensuring national security and defence of the state, stimulates the rejection of previous ones and the development of new regulatory and legal standards in the sphere of defence of Ukraine. Under such circumstances, the creation of an effective and flexible system of legal coordinates is one of the priorities for the development of the capabilities of the Ukrainian Armed Forces and other military formations formed in accordance with the laws of Ukraine (hereinafter referred to as security and defence forces).

In addition, the situation related to the introduction of martial law in Ukraine provoked the appearance of a whole array of changes and the adoption of new legal acts, which, under the conditions of the existence of a special period until February 24, 2022, were not so noticeable to the subjects of rule-making that "to be noticed" earlier.

KEYWORDS

Security environment, strategies of limited actions, hybrid methods of conflict resolution, national stability, ensuring national security and defence, regulatory and legal standards, military formations, martial law.

3.8.1 UKRAINE'S MILITARY-LEGAL REFLECTION ON THE ARMED AGGRESSION OF THE RUSSIAN FEDERATION

We shall briefly recall the conditions and circumstances under which changes in the legislation in the field of defence took place in the course of veiled armed aggression. Thus, it all started with the illegal occupation of the Autonomous Republic of Crimea and the city of Sevastopol by the Russian Federation in 2014, on March 1, 2014, the Federation Council of the Federal Assembly of the Russian Federation gave its consent to the use of the Armed Forces of the Russian Federation on the territory of Ukraine, on March 17, 2014, the Verkhovna Rada of the Autonomous Republic of Crimea was dissolved by resolution of the Verkhovna Rada of Ukraine, declared Crimea

an independent state. From the point of view of regulatory and legal support for responding to the situation that has developed, a number of legislative amendments were adopted in Ukraine:

– Decree of the President of Ukraine dated March 17, 2014, No. 303 "On partial mobilization". On the basis of this, the implementation of partial mobilization activities was started with the practical conscription of conscripts and the supply of vehicles;

– On March 13, 2014, the Verkhovna Rada of Ukraine adopted the Law of Ukraine "On the National Guard of Ukraine", which determined that the National Guard of Ukraine is a military formation with law enforcement functions, which is part of the system of the Ministry of Internal Affairs of Ukraine. The National Guard of Ukraine participates, in accordance with the law, in cooperation with the Ukrainian Armed Forces in repelling armed aggression against Ukraine and liquidating the armed conflict through the conduct of military (combat) operations, as well as in the performance of territorial defence tasks;

– subsequently, the events of April 2014 were marked by the proclamation of the creation of the "Donetsk People's Republic" (April 7, 2014) and the "Luhansk People's Republic" (April 27, 2014). Therefore, by the Decree of the President of Ukraine dated April 14, 2014, No. 405, the decision of the National Security and Defence Council of Ukraine "On urgent measures to overcome the terrorist threat and preserve the territorial integrity of Ukraine" was implemented, and a large-scale anti-terrorist operation was launched in the Donetsk and Luhansk regions with the involvement of Ukrainian Armed Forces;

– since the legislation in the field of defence was not ready for the conditions of armed aggression, it underwent significant changes to adapt to the situation. Yes, it is worth mentioning the adoption of the Law of Ukraine "On Amendments to the Laws of Ukraine" on combating terrorism on June 5, 2014, which made certain changes to the Laws of Ukraine "On Combating Terrorism", "On the Ukrainian Armed Forces" and others. The aforementioned law improved the procedure for engaging and using the forces and means of the Ukrainian Armed Forces, the State Border Service of Ukraine, the State Service for Special Communications and Information Protection of Ukraine, and the State Security Office of Ukraine in anti-terrorist operations;

– on December 25, 2014, the Law of Ukraine "On Amendments to the Law of Ukraine «On the National Security and Defence Council of Ukraine»" regarding improvement of coordination and control in the field of national security and defence was adopted. This Law significantly expanded the competence of the National Security Council, in particular with regard to making decisions on urgent measures to resolve crisis situations;

– in order to adapt to the new crisis situation and overcome it, strategic planning documents were adopted in the field of ensuring national security and defence, such as: National Security Strategy of Ukraine, Military Doctrine of Ukraine, Concept of Development of the Security and Defence Sector of Ukraine, Strategic Defence Bulletin of Ukraine, State the program for the development of the Ukrainian Armed Forces for the period until 2020, the Cyber Security Strategy of Ukraine and others;

– already in May 2015, the new version of the Law of Ukraine "On the Legal Regime of Martial Law" was adopted;

– the Law of Ukraine "On Amendments to Certain Laws of Ukraine Regarding Special Operations Forces of the Ukrainian Armed Forces" dated July 7, 2016, No. 1437-VIII created a separate type of forces in the structure of the Ukrainian Armed Forces – Special Operations Forces;

– the adoption of the Law of Ukraine "On the National Security of Ukraine" dated June 21, 2018, No. 2469-VIII, which established the irreversibility of the process of transformation of the Ukrainian Armed Forces in accordance with NATO standards, can be considered a powerful factor for the legal response to manifestations of armed aggression by the Russian Federation.

One of the first such regulatory acts, which showed a reaction to the full-scale invasion, was the Law of Ukraine "On Approval of the Decree of the President of Ukraine «On the Introduction of a State of Emergency in Certain Regions of Ukraine»" dated February 23, 2022 [413]. In addition, the Parliament of Ukraine additionally reacted to the arbitrary act of the Russian Federation on the declaration of independence of the "LPR" and "DPR" in the form of the Resolution of the Verkhovna Rada of Ukraine "On the Statement of the Verkhovna Rada of Ukraine in connection with the recognition by the Russian Federation of the independence of illegal self-proclaimed entities in the temporarily occupied territories of certain districts of the Donetsk and Luhansk regions of Ukraine" No. 2093-IX dated February 22, 2022 [414].

In addition to the above statement, the Parliament of Ukraine, due to the full-scale invasion of Ukraine by the Russian invasion, adopted Resolution No. 2141-IX of March 24, 2022 "On the Address of the Verkhovna Rada of Ukraine to the United Nations, the European Commission, the European Parliament, other international organizations and their parliamentary assemblies, the parliaments and governments of the member states of the European Union and NATO, the parliaments and governments of the democratic states of the world regarding the need to take additional joint measures in order to stop the aggression of the Russian Federation against Ukraine and prevent the spread of this aggression to other countries in Europe" [415]. In the said appeal, the Ukrainian parliament describes the aggressive actions of the aggressor state and appeals to international institutions regarding the need to urgently take decisive steps to support Ukraine and protect the civilian population. In addition, on April 14, 2022, the Verkhovna Rada of Ukraine adopted the Resolution "On the Statement of the Verkhovna Rada of Ukraine "On the Russian Federation's Perpetration of Genocide in Ukraine", in which it recognized with reason the actions committed by the Armed Forces of the Russian Federation and its political and military leadership during the last phase of the armed aggression of the Russian Federation against of Ukraine, which began on February 24, 2022, with the genocide of the Ukrainian people [416].

In addition to the addresses and statements of the Parliament of Ukraine, the speeches and addresses of the President of Ukraine (at the meeting of the European Council on March 25, 2022 [417] and the meeting of the UN Security Council on April 5, 2022 [418]) deserve attention, which in their content are quite critical with direct a claim to the established order of activity of security organizations, which today is unable to provide effective means of countering hybrid conflicts.

As already mentioned earlier, the development of events on the territory of Ukraine since February 24, 2022, led to the adoption of a number of acts of appropriate response. Thus, on the

first day of the state of emergency, from 05:30 on February 24, 2022, martial law was introduced for a period of 30 days (Decree of the President of Ukraine "On the introduction of martial law in Ukraine" No. 64/2022 of February 24, 2022), which was extended from 05:30 on March 26, 2022 for a period of 30 days (according to the Decree of the President of Ukraine "On extending the period of martial law in Ukraine" No. 133/2022 dated March 14, 2022), and then again this period was extended for 30 days in April (by the Decree of the President of Ukraine "On extending the period of martial law in Ukraine" No. 259/2022 of April 18, 2022), for 90 days in May (by the Decree of the President of Ukraine "On the extension of the period of martial law in Ukraine" No. 341/ 2022 dated May 17, 2022), August (by the Decree of the President of Ukraine "On the extension of martial law in Ukraine" No. 573/2022 dated August 12, 2022), which were approved by the relevant laws of Ukraine and will probably be extended in the future.

Together with the introduction of martial law, decrees of the President of Ukraine were issued regarding the use of the Ukrainian Armed Forces and general mobilization. Such is the Decree of the President of Ukraine "On General Mobilization" No. 65 of February 24, 2022, which was approved by the Law of Ukraine No. 2105-IX of March 3, 2022. From May 25, the general mobilization was also extended for 90 days by the relevant Decree of the President of Ukraine "On extending the period of general mobilization" No. 342 dated May 17, 2022, and approved by the relevant Law of Ukraine. Similarly, from August 23, by Decree of the President of Ukraine No. 574 of August 12, 2022, general mobilization was also extended for 90 days.

It is worth noting that the President of Ukraine issued two decrees with the same title: "On the use of the Ukrainian Armed Forces and other military formations", one of them dated 24.02.2022 No. 66/2022 [419], approved by the Law of Ukraine dated 03.03.2022 No. 2106-IX, another dated February 24, 2022 No. 71/2022 [419] was not submitted to the Verkhovna Rada of Ukraine for consideration and was published on March 11, 2022. The analysis of the content of the two decrees shows that both were issued in connection with the armed aggression of the Russian Federation against Ukraine, in accordance with the second part of Article 102, points 1, 17, 19 of the first part of Article 106 of the Constitution of Ukraine, the Law of Ukraine "On the Defence of Ukraine" and duplicative provisions of paragraphs 1 and 2 regarding the decision to "apply" the Ukrainian Armed Forces, other military formations formed in accordance with the laws of Ukraine, to repel armed aggression against Ukraine and the instruction to state authorities and military administration bodies to "take measures" to repel armed aggression against Ukraine.

To implement the possibility of creating the Headquarters of the Supreme Commander-in-Chief in accordance with Article 8 of the Law of Ukraine "On the Defence of Ukraine", on February 24, 2022, the President of Ukraine also issued Decree of the President of Ukraine No. 72 [420] on its creation as a higher collegial body of military leadership of the state's defence. According to the text of the Decree, the Headquarters was created in connection with the armed aggression of the Russian Federation against Ukraine, which threatens its state independence and territorial integrity, to ensure the strategic leadership of the Ukrainian Armed Forces, other military formations, and law enforcement agencies.

It is important to note that the Law of Ukraine "On the basic principles of forced removal confiscation in Ukraine of objects of property rights of the Russian Federation and its residents" dated March 3, 2022, on the basis of legal acts on the introduction of martial law, provisions of the IV Hague Convention on the Laws and Customs of War on Land and its annex (Provisions on the Laws and customs of war on land dated October 18, 1907), defined the Russian Federation as an aggressor state that carries out armed aggression against Ukraine (in accordance with the decision of the Verkhovna Rada of Ukraine, guided by UN General Assembly Resolution 3314 "Definition of aggression" dated December 14, 1974) [421].

In April 2022, the Law of Ukraine "On Ensuring the Rights and Freedoms of Citizens and the Legal Regime in the Temporarily Occupied Territory of Ukraine" [422] was adopted, which defined some concepts (the territory of Ukraine temporarily occupied by the Russian Federation, humanitarian corridor, deoccupation, armed formations of the Russian Federation, the line of contact and others) as well as the peculiarities of the activities of state bodies, local self-government bodies, enterprises, institutions, and organizations in such a regime. Along with this, on the basis of the adoption of the Law of Ukraine "On Amendments to Certain Laws of Ukraine Regarding the Regulation of the Legal Regime in the Temporarily Occupied Territory of Ukraine" dated April 21, 2022, No. 2217-IX) [423], the Law of Ukraine "On Peculiarities of State Policy with ensuring the state sovereignty of Ukraine in the temporarily occupied territories in the Donetsk and Luhansk regions".

In order to protect social relations during martial law from offenses in the sphere of security and defence, a significant number of changes were made to the Criminal Code of Ukraine, among which we can single out:

1. The Law of Ukraine "On Amendments to the Criminal Code of Ukraine on Strengthening Liability for Looting" [424] dated March 3, 2022.

2. In the updated edition, Articles 111 (Treason) and 113 (Sabotage) were set forth, which provided for the punishment for the specified crimes under martial law with a maximum penalty of imprisonment for a term of fifteen years or life imprisonment, with mandatory confiscation of all property [425].

3. A novel for Ukrainian criminal law was a new crime related to the recognition and support of the actions of the aggressor state.

4. The Law of Ukraine "On Amendments to Certain Legislative Acts of Ukraine on Strengthening Criminal Liability for the Production and Distribution of Prohibited Information Products" [426] was adopted, according to which criminal liability is provided for insulting the honor and dignity of a serviceman, threatening a serviceman (Article 435-1) and justification, recognition as legitimate, denial of armed aggression of the Russian Federation against Ukraine, glorification of its participants (Article 436-2).

5. The Law of Ukraine "On Amendments to the Criminal Code of Ukraine and other legislative acts of Ukraine regarding the determination of circumstances that exclude the criminal illegality of an act and provide immunity under the conditions of martial law" adopted an article that excludes the criminal illegality of an act.

By a similar analogy regarding the need to take combat immunity into account, changes were made to the Statute of the Internal Service of the Ukrainian Armed Forces (Article 26) and the Disciplinary Statute of the Ukrainian Armed Forces (Article 5 Part 3) [427].

6. Law of Ukraine "On Amendments to the Criminal and Criminal Procedural Codes of Ukraine on Improving Liability for Collaborative Activities and Features of the Application of Preventive Measures for Crimes Against the Basics of National and Public Security" No. 2198-IX of April 14, 2022, Article 1112 introduces liability for assistance to the aggressor state, which is often now called collaborative [428].

Significant for cooperation with international judicial organizations is the adoption of the Law of Ukraine "On Amendments to the Criminal Procedure Code of Ukraine and other legislative acts of Ukraine regarding cooperation with the International Criminal Court" [429], by which the Criminal Procedure Code of Ukraine was supplemented with a new Chapter IX "Peculiarities of cooperation with the International criminal court". In particular, the following are established: the scope and procedure of cooperation with the International Criminal Court, the transfer of criminal proceedings within the framework of cooperation with the International Criminal Court, the fulfillment of the International Criminal Court's request for assistance, ensuring the preservation of evidence, the temporary transfer of a person to the International Criminal Court for procedural actions, the implementation of the decisions of the International Criminal Court and other issues related to cooperation with the International Criminal Court.

On March 24, the Law of Ukraine "On Amendments to Certain Legislative Acts of Ukraine Regarding Regulation of Issues Related to Prisoners of War in a Special Period" was adopted to regulate issues related to the handling, placement, maintenance, and other necessary actions of prisoners of war [430].

In May 2022, the Law of Ukraine "On Amendments to the Law of Ukraine "On the Basics of National Resistance" on Enabling Territorial Defence to Perform Tasks in the Areas of Military (Combat) Actions" [431] allowed the involvement of the Territorial Defence Forces of the Ukrainian Armed Forces and volunteer the formation of territorial communities outside the defined territorial defence zone.

Historically significant for the further development and recovery of Ukraine is the event associated with the granting of the status of a candidate country for EU accession in June 2022. On the eve of this event, on June 17, 2022, the Committee on the Integration of Ukraine into the European Union at a meeting considered the draft Resolution No. 7471 on the Appeal of the Verkhovna Rada of Ukraine to the member states of the European Union and EU institutions regarding support for granting Ukraine the status of a candidate country for EU accession [432]. The committee decided to recommend that the Verkhovna Rada of Ukraine adopt the draft of this resolution as a basis and as a whole.

Along with the active process of joining Ukraine to the EU, confident steps have been taken in the direction of the post-war recovery of our country. Thus, on July 4–5, 2022, at the International Conference on the Recovery of Ukraine (URC2022) in Lugano, Switzerland, jointly organized

by the governments of Switzerland and Ukraine, our country presented its Recovery Plan. During the conference, a number of current proposals for the restoration of Ukraine and the contribution that international partners can make to this process were considered. The signatories also confirmed their support for Ukraine on its path to recovery at the initial stage and in the long-term European perspective of our country as a candidate for the EU [433].

In addition, we can observe the general world practice related to updating and adapting legislation to ensure an effective post-war period in Ukraine. Yes, it is known that the EU is developing legislation that would allow the confiscation of sanctioned Russian assets and their use for the post-war reconstruction of Ukraine. The president of the European Commission, Ursula von der Leyen, announced this at a July briefing in Strasbourg. The development of legislation for the legal confiscation of Russian assets in the European Union was also confirmed by the President of the European Parliament, Roberta Metsola. It also became known that the head of the British Foreign Ministry, Liz Truss, supports the idea of confiscating frozen Russian assets and transferring them to victims of Russia's war in Ukraine. And in Canada, amendments to the law on special economic measures came into force, which provides for the possibility of confiscation of assets that have come under sanctions due to the war with Russia, and their use in support of Ukraine [434].

3.8.2 ANALYSIS OF LEGAL REGULATIONS REGARDING THE PROCEDURE FOR DECLARING WAR

Discussions about the expediency and relevance of "declaring a state of war" began as early as 2014. The Russian Federation wanted to disguise its (couple of) military groups as the population of the eastern regions and resorted to manipulating statements about "non-declaration of a state of war by Ukraine" [435].

It will be recalled that war became an element of international law at the beginning of the 20th century, when the concept of "declaration of war" was introduced by the Second Hague Convention in 1907 [436], according to which war is a state between two or a group of states whose armed forces fight to establish rules for the other party in case of victory. Another important document was the Bryan-Kellogg Pact, signed in 1928 [437]. The document stated that war would henceforth not be used to settle "disputes or conflicts of any nature or origin and what may arise from them". As a result, in many cases, the country did not declare war on the other side, but simply attacked. Only the terrible consequences of the Second World War forced humanity to write in the UN Charter of 1945 [438] the inadmissibility of resolving conflicts between states by armed means.

According to the definition of aggression adopted by the 29th session of the UN General Assembly in 1974 [439], the declaration of war is not an act of self-defence for the aggressor and cannot be considered a fact that turns an illegal war into a legitimate one (according to Article 51 of the UN Charter [438]). The start of a war without its declaration is a circumstance that burdens and increases the responsibility of the aggressor.

Ukrainian legislation clearly defines the term "armed aggression": the use of armed force against Ukraine by another state or a group of states. Armed aggression against Ukraine is considered any of the following actions, in particular:

– invasion or attack by the armed forces of another state or group of states on the territory of Ukraine, as well as occupation or annexation of part of the territory of Ukraine;

– dispatch by another state or on its behalf of armed groups of regular or irregular forces, which commit acts of use of armed force against Ukraine, which are of such a serious nature that it is equivalent to the actions listed in paragraphs five to seven of this article, including significant participation of a third country in such actions;

– the actions of another state (states), which allows its territory, which it placed at the disposal of a third state, to be used by this third state (states) to carry out the actions specified in paragraphs five to eight of this article [296].

The bold for that time comments of expert criminologist G. Malyar, who currently holds the position of Deputy Minister of Defence of Ukraine, that the consequence of an erroneous official legal assessment of armed aggression was the bringing to criminal responsibility of thousands of people with false qualifications for criminal acts, and exactly – as for terrorist crimes. In turn, the so-called "LPR" and "DPR" are not terrorist organizations, but paramilitary formations not provided for by law, under responsible command, which conduct combat operations and control part of the territory of Ukraine with direct assistance from the Russian Federation [440].

In general, the declaration of a state of war is a category of international law and means a legal, diplomatic procedure in international politics, which consists in an official, in accordance with the established procedure, notification by one state to another about the end of peace between them and the transition to a state of war. One of the features of the introduction of a state of war is that, according to the Hague Convention of 1907 [436] (Ukraine is a party to it), hostilities between states must not begin without a prior and unambiguous warning in the form of a motivated declaration of war or in the form of an ultimatum with a conditional declaration of war The declaration of war takes place: by addressing the highest authorities to their own people; by appealing to the people or government of the enemy state; by addressing the world community. It is necessary to immediately inform neutral states about the state of war.

Historian and international journalist E. Braylyan notes that the declaration of war is accompanied by the severing of diplomatic relations and the introduction of martial law, which Ukraine did on February 24, 2022, in response to the full-scale aggression of the Russian Federation. "This time, Moscow did not disguise itself as a proxy force, but used regular units of the Russian armed forces, the Russian Guard and other groups. Legal confirmation of the status of war has already taken place" [435].

Thus, the declaration of war, even if it is not accompanied by actual military actions, means the beginning of a legal state of war (the address of the President of the Russian Federation to his citizens, disguised as the pretext of starting a "liberation special operation", in fact, can be considered as a conditional declaration of war on Ukraine). While an act of aggression is in any case the

implementation of active (illegal) actions (which can be carried out even without declaring war), the list of which is defined in the 1974 UN General Assembly Resolution.

A declaration of a state of war is a documented act confirming the fact of war with another country. According to the national legislation of Ukraine, the state of war in itself is not a special legal regime compared to a state of war or a state of emergency, and its declaration does not create special rights and obligations for the relevant subjects at the domestic level. Ganna Malyar repeatedly drew attention to the fact that "it is not necessary to pass a law or a decree that would specifically confirm that there is a war, the war is recognized as a de facto war", that is, legal confirmation of the fact does not create the fact itself, but only certifies it [441].

Therefore, since 2014, the updated constitutional norm regarding the declaration of a state of war has been in effect, but the provisions of Article 4 of the Law of Ukraine "On the Defence of Ukraine" (which establish the decision-making mechanism by the President of Ukraine with the aim of repelling armed aggression against Ukraine) are currently not brought into line with the Constitution of Ukraine. The analysis of the content of the norms of the article indicates an inextricable combination of the decision of the head of state on mobilization, on the introduction of martial law, on the use of the Ukrainian Armed Forces and other military formations with the submission by the President of Ukraine of a submission to the Verkhovna Rada of Ukraine on the declaration of a state of war, and the date and time of the end of the state of war directly connected with the end of wartime [442].

3.8.3 PROSPECTS OF HOLDING THE RUSSIAN FEDERATION ACCOUNTABLE FOR THE CONSEQUENCES OF ARMED AGGRESSION AGAINST UKRAINE

The full-scale armed aggression of the Russian Federation, which began on February 24, 2022, took place simultaneously with the commission of a large number of war crimes. Ukraine, with the consolidated support of many states, strives to bring the guilty to justice in accordance with IHL norms. At the same time, since Ukraine has not ratified the Rome Statute, relevant experts are continuing to search for possible solutions to such a situation.

International criminal law defines the following four categories of international crimes: war crimes, crimes against humanity, genocide and acts of aggression. Those guilty of these crimes are brought to justice at the national level and in international courts and tribunals.

There are several options for prosecuting war crimes:

1. National judiciary of Ukraine.

2. The International Criminal Court in The Hague, to which Ukraine granted jurisdiction to investigate war crimes and crimes against humanity on its territory in 2014. He is charged with war crimes, crimes against humanity and genocide.

3. Application of the principle of international law by states that have ratified the Rome Statute of the ICC.

4. Criminal cases can be considered not only by Ukrainian national courts or international courts, but also by courts of other countries, based on the principle of citizenship of the victims.

5. Creation of a Special (hybrid) tribunal with the possibility, stipulated in its statute, of conducting trials in the absence of the suspect and passing judgments against senior officials and representatives of the military leadership of the Russian Federation in absentia.

Thus, the International Criminal Court is an important mechanism for investigating Russia's war crimes in Ukraine. The Association of Lawyers of Ukraine, together with the Ukrainian Helsinki Human Rights Union, the ZMINA Human Rights Center, the Regional Center for Human Rights, and the Crimean Human Rights House, are continuing an information campaign on the importance of ratifying the Rome Statute of the International Criminal Court. Representatives of the named organizations note that despite the fact that Ukraine has not ratified the Rome Statute, in 2014 and 2015 Ukraine used the mechanisms of recognizing the jurisdiction of the ICC and submitted applications for the recognition of jurisdiction over war crimes committed on the territory of Ukraine and human rights violations. On their basis, the Office of the Prosecutor of the International Criminal Court began a preliminary study of the situation in Ukraine, and based on the results of the preliminary investigation, the conclusions of the Office of the Prosecutor of the International Criminal Court regarding the situation in Ukraine were already provided. According to the Rome Statute of the ICC, if a state submits such applications, it accepts the jurisdiction of the ICC and undertakes to cooperate and comply with any orders and decisions (Article 12 of the Rome Statute) [443].

The initiative to create a petition regarding the activities of the Special Tribunal to punish those guilty of aggression against Ukraine was shown by the former Prime Ministers of Great Britain, scientists, lawyers, and political figures. The essence of the petition is a proposal to create a judicial body that will deal with prosecution for aggression against Ukraine in addition to the already existing investigation of the ICC on war crimes and crimes against humanity in Ukraine. At the same time, experts note that although the UN International Criminal Court may investigate war crimes, Ukraine and the Russian Federation are not parties to the Rome Statute. Even if not Ukraine, but the UN Security Council transfers the investigation to the aforementioned court, the Russian Federation can use its right of veto and block this transfer. The same reason for the low probability of the creation of a special tribunal for Ukraine by the UN Security Council. However, a special tribunal is possible in a mixed form (it can be created in the jurisdiction of Ukraine as an injured party and receive authority under Ukraine's agreement with the UN General Assembly or together with the founding states [444]. Even if one relies only on the ICC, it cannot cover the entire array of committed international crimes, because according to its policy it concentrates attention exclusively on management positions.

D. Koval and M. Soldatenko claim that there is a particular difficulty in the likelihood of the ICC investigating the crime of aggression compared to the investigation of crimes against humanity and war crimes, since the ICC is authorized to investigate only aggression committed by citizens of a country that is a party to the charter against a country that is a party to the charter. As the only possible option, they see the initiation of ICC cases by a decision of the UN Security Council, although the Russian Federation will, of course, use its right of veto to transfer the investigation. At the same time,

as the authors note, on February 28, the prosecutor of the International Criminal Court Karim Khan announced his intention to ask the so-called Pre-Trial Chamber of the International Criminal Court to authorize an investigation into the events in Ukraine for crimes against humanity and war crimes. In March 2022, 39 member states of the Rome Statute supported it and asked the ICC to investigate crimes committed in Ukraine. Based on this, representatives of the ISS urgently left for Ukraine to investigate and collect evidence. Reflecting on the possible option of creating a tribunal for Ukraine, examples from the history of their creation (Nuremberg, Tokyo, Hague) were mentioned with the indication that for Ukraine an option of creating a tribunal by an international coalition is possible [445].

Lawyer A. Bukvych also convincingly argues for the need to ratify the Rome Statute, despite trying to justify the impossibility of ratifying the Rome Statute with ghostly myths and political discussions. In addition, the author says that the ICC does not have the powers of national courts, that is, it does not replace national judicial bodies and does not exclude their jurisdiction. After the investigative procedure, the ICC has the right to bring to justice only the officials of the aggressor state, i.e., the persons who caused human rights violations by their orders. The author concludes that in today's conditions, only the decisions of the ICC can become another effective mechanism for the political responsibility of the Russian Federation [446].

It is worth noting that in order to continue the fight through legal means and to bring the Russian Federation to justice for arbitrary actions on the territory of Ukraine, a significant number of public organizations took the initiative and joined in documenting the facts of violations of IHL [447].

In addition, according to Oleksandr Merezhko, head of the Committee on Foreign Policy and Interparliamentary Cooperation of the Verkhovna Rada of Ukraine, the Verkhovna Rada will work on changes to the legislation that will create all the necessary tools for the effective investigation of Russia's crimes against Ukraine. Relevant specialists discussed the procedure for interaction with international judicial institutions, that is, national and international judicial mechanisms for bringing to justice persons involved in the commission of war crimes, crimes against humanity, acts of genocide and crimes of aggression [448].

Summarizing the state of affairs in general regarding bringing the Russian Federation to justice, we can single out the following important steps:

– the UN International Court of Justice satisfied Ukraine's demand to stop the Russian military invasion of Ukraine; scheduled hearings in the case under the Convention on the Prevention and Punishment of the Crime of Genocide;

– the European Court of Human Rights adopted the decision of the European Court of Human Rights on the application of temporary (precautionary) measures from March 1, 2022;

– the ICC decided to initiate an investigation into war crimes, crimes against humanity and genocide and transfer the situation in Ukraine to the ICC through a joint statement of 39 states that are parties to the Rome Statute. On February 25, 2022, ICC Prosecutor Karim Khan stated [445] that his office can exercise jurisdiction and investigate any act of genocide, crime against humanity, or war crime committed within Ukraine. If the ICC recognizes war crimes committed by Russian troops, those involved in them may be detained in any country that recognizes

the jurisdiction of this court. 42 countries have already applied to the International Court of Justice in The Hague, the investigation of war crimes at the international level has begun, the application of these countries allowed to simplify and speed up the procedure for Ukraine [449];

— the UN General Assembly adopted the resolution "Aggression against Ukraine" and "Humanitarian consequences of aggression against Ukraine" (dated March 2, 2022), which condemned the invasion of Ukraine and demanded that Russia immediately stop the war and withdraw all its troops from the territory of Ukraine, as well as the existence of grave humanitarian consequences of the military actions of the Russian Federation against Ukraine is ascertained;

— adoption of the Declaration on the establishment of a Special Criminal Tribunal (Minister of Foreign Affairs of Ukraine Dmytro Kuleba, together with leading national and international experts in international law, agreed to sign the declaration on the establishment of a Special (hybrid) tribunal on March 4, 2022, to prosecute persons guilty of the crime of aggression against of Ukraine [445, 447]);

— PACE adopted two resolutions ("Consequences of the Russian aggression: the role and reaction of the Council of Europe" and on bringing to justice those guilty of international crimes committed during the aggression of the Russian Federation [450]);

— the UN Human Rights Council created an independent international commission of inquiry into Ukraine for a period of one year at the request of Ukraine and its allies, including the European Union, Great Britain, and the United States. Russia opposed the investigation. The team will interview witnesses and collect forensic materials for the upcoming trial. The Independent International Commission of Inquiry into Ukraine is an independent international committee established by the UN Human Rights Council on March 4, 2022, with a mandate to investigate violations of human rights and IHL during the war [451];

— the investigation of war crimes in Ukraine at the national level is carried out by the Office of the Prosecutor General and subordinate prosecutors' offices, the State Bureau of Investigation (a special investigative department was created);

— implementation of the process of recording war crimes (the Office of the Prosecutor General has created a single platform for collecting such facts at the link warcrimes.gov.ua. (evidence can also be submitted using a special chatbot of the State Intelligence Service Tribunal.ua, it can be sent directly to the chief prosecutor of the International Criminal Court in The Hague to Karim Khan at otp.informationdesk@icc-cpi.int);

— on January 19, 2023, the deputies of the European Parliament voted for a resolution demanding the prosecution of the highest political and military command of the Russian Federation and Belarus for the crime of aggression against Ukraine [452].

CONCLUSIONS

With the beginning of the full-scale armed aggression of the Russian Federation against Ukraine, the mentioned issue became especially relevant, because the head of state used the entire

set of powers granted to him by the Constitution of Ukraine, with the aim of protecting state sovereignty and restoring the territorial integrity of Ukraine, in addition to submitting to the Verkhovna Rada of Ukraine a petition to declare a state of war.

The legal system of Ukraine was forced to urgently adapt to purposeful systemic activity aimed at ensuring the goals and objectives of national security in the military sphere during ATO, OOS, and especially during martial law in 2022. The period, which began its countdown from the second half of February 2022, was marked by an aggressive manifestation and frank intention of the Russian Federation to occupy an even larger part of the territory of Ukraine. Such events provoked a hyper-accelerated adaptation and response of the relevant norms of national legislation, which primarily related to the sphere of security and defence.

We can summarize the presence of problematic issues in the settlement of the procedure for declaring a state of war, namely in the following:

– the grounds (conditions) for filing a motion to declare a state of war and conclude peace;

– a clear definition of the moment of the beginning and end of the period of the state of war and wartime;

– the time frame within which the President of Ukraine must submit to the Verkhovna Rada of Ukraine a submission on the declaration of a state of war, as well as the form and content of this submission;

– a list of measures that must be taken in the state and outside its borders after declaring a state of war;

– lack of definition of the term "threat of attack on Ukraine", etc.

In general, Ukraine has taken the first steps to create a mechanism for bringing to international responsibility those guilty of crimes committed by the Russian Federation against Ukraine. Despite the lack of ratification of the Rome Statute, according to experts, the most likely way is the option of creating a special tribunal based on an agreement between several countries. At the same time, taking into account the unprecedented situation for our country, the topic of bringing the aggressor to justice will become promising for the further development of the relevant legislation of Ukraine, the actualization of scientific research related to the specified topic.

CONCLUSIONS

Nina Andriianova, Valerii Hordiichuk, Anatolii Pavlikovskyi

Russian aggression against Ukraine contains all the signs of hybridity: along with the massive use of kinetic weapons, political, economic, informational, and other means of achieving the aggressive goal are widely used.

Among other things, social networks and mass media became the tools of Russia's hybrid aggression; youth as an object of recruitment; historical myths generated by the Soviet and Russian political systems, controlled migration, imperfection of international law, etc.

Therefore, the hybrid Russian-Ukrainian war is a new type of war, which is characterized by an increase in the number of operational environments and areas of combat operations. In addition to the traditional operational domains of physical space – land, sea, air, space, the war continues in the operational domains of virtual space – cybernetic and cognitive.

One of the features of hybrid wars is their long-term nature, which requires a preventive and long-term policy of countermeasures organized at the state level. Other distinctive features of a hybrid war are its lack of formal declaration and difficult to predict long-term consequences.

For Ukraine, the task is not only to adapt its military policy to the long era of hybrid wars, but also to introduce military-political mechanisms that would not allow a hybrid war to develop into a large-scale one.

The experience of resisting large-scale Russian aggression has shown that *the national resilience system* in Ukraine exists and operates but needs improvement. The monograph presents foreign and domestic approaches to understanding sustainability, analyzes the evolution of approaches to ensuring sustainability in NATO, the EU, and leading countries, and provides their experience in governing in the direction of ensuring sustainability.

The basic requirements for ensuring stability in NATO are unwavering to be fulfilled by all member states of the alliance, but the national stability systems of the member countries have differences and peculiarities, there is no universal model for ensuring national stability, because the threats, challenges and levels of their danger are different for everyone, so mechanisms and practices that are effective for some may not meet the needs of others.

The range of components that can be used to improve the effectiveness of the national sustainability system should be expanded. Taking into account the experience of the Russian-Ukrainian war, in addition to everything else, the national resilience system should foresee (take into account) the peculiarities of providing (receiving) *foreign military assistance, logistical support, national resistance*, etc.

The largest supplier of *military assistance* to Ukraine is the USA. In 2022, the US delivered an unprecedented scale of aid, mostly modern weapons worth more than USD 18 billion. In many

positions, primarily shells, the scale of supply exceeds the production capacity of the American in-dustry at the moment. This is much more than what Ukraine had on February 24, 2022, in reserves and weapons in most positions, so such assistance is invaluable.

The initiation of monthly high-level diplomatic meetings in the "Ramstein" format, as a result of which 53 countries agreed to provide military assistance to Ukraine, became important in the coordination, systematization, and prompt response to Ukraine's military needs in confronting Rus-sian armed aggression. As a result of the meetings, the Donor Coordination Center, the Ukraine Defence Contact Group, the International Fund for Ukraine were created, and important decisions were made regarding the provision of military assistance to ensure Ukraine's defence needs.

In 2022, the total amount of military assistance to Ukraine from world powers amounted to more than EUR 93 billion. International partners provide Ukraine with both Soviet-style anti-aircraft and the most modern anti-aircraft used by NATO troops. Such OVT in sufficient quantity is able to turn the tide of the war and allow Ukraine to regain the occupied territories. Taking into account the quantitative advantage in numbers, the number of OVT of the Russian Federation, the difference in the ultimate reach of the means of destruction to achieve at least parity in this war, the amount of OVT delivered is extremely insufficient and is happening slowly.

The improvement of the effective system of *logistic support* of the Ukrainian Armed Forces will be capable of planning and managing the processes of logistic support of the troops (forces) both in peacetime and in conditions of martial law, as well as being compatible with the NATO system. It should be noted that the application of the NATO LOGFAS program will increase the efficiency of interaction between Ukraine and partners, as well as speed up the logistics process and the process of managing the aid that Ukraine receives.

The system of national resistance is the tool that also helped mobilize the will, energy, and courage of the entire Ukrainian society in an organized way to repel the aggressor, and the devel-oped territorial defence in Ukraine became one of the key elements of the asymmetric resistance to the external aggression of the Russian Federation.

In the interest of ensuring national stability, Ukraine needs to solve a number of problems, in particular, improving legal support in the field of national security and state administration; regula-tion of interaction between the authorities, state institutions, business, civil society; involvement and establishment of effective coordination in synergy of all structures that can be involved in ensuring sustainability. Certain approaches to improving the national resilience system of Ukraine are proposed in the work.

The effectiveness of countermeasures in hybrid warfare depends on the reality of the pro-jected scenarios. When conducting defence planning and defining scenarios for countering hybrid war, modern methods are needed, which use a significantly larger number of parameters of the military-political situation, external and internal factors, integration of military and non-military tools based on new management principles. It is also necessary to develop *non-standard forms of confrontation*, including *asymmetric actions*, changes in the defence planning system, and the use of specific tools during modern military conflicts.

To take into account all the features, it is advisable to supplement the scenarios of combating hybrid wars with a *multi-domain operation* (MDO) of an interspecies grouping of troops, which is conducted simultaneously in physical operational environments and virtual dimensions. Such an operation is considered as a variant of the strategy of countering the prevailing enemy.

Based on the results of the analysis of the current state of implementation and technologies of the concepts of multi-domain operations in the leading countries of the world, the following conclusions can be drawn:

– modern challenges and threats to the national security of Ukraine require the military and political leadership of our country to respond quickly and effectively to all changes taking place in the world, and the primary issue in this direction is the development and implementation of the own MDO concept for the Defence Forces of Ukraine;

– taking into account the full-scale war with the Russian Federation, the chosen military-political course for Euro-Atlantic integration, the rapid equipping of the Defence Forces of Ukraine with weapons and military equipment from NATO member states, the main vector of the development of military technologies for the Ukrainian Armed Forces is the development of its own unified *Joint All-Domain Command and Control System* (JADC2), which in the future can be integrated into similar systems of the North Atlantic Alliance;

– the technical basis of JADC2 should be modern technologies of *Army Command, Control, Communications, Computers, Cyber, Intelligence, Surveillance and Reconnaissance* (C5ISR).

Summarizing the results of the *subdomain analysis* of possible ways of countering Russia's armed aggression against Ukraine in a hybrid war, the following conclusions can be drawn:

– in order to defeat the enemy on land, the Defence Forces of Ukraine need to take the initiative, accumulate the necessary resources faster than the enemy and go to offensive actions (conducting counter-offensive operations) simultaneously or gradually along the entire front line;

– the available means of air and fire support for actions on land, the means of air defence are quite effective, but their number is also limited, which will probably encourage the military-political leadership of the state to choose the second proposed or other (unannounced) course of action, the essence of which will consist in the successive defeat of the enemy; significant increase of domestic capabilities in terms of fire, aviation support and anti-aircraft defence is currently possible only under the condition of consistent support from partner and allied countries;

– after the completion of the counteroffensive operation, there will be a need to move to defensive or stabilization actions, which will also require the involvement of significant forces, means, and resources in order to demonstrate the aggressor's readiness to retaliate decisively in the event of further attempts to resume military actions against our state.

The analysis of the struggle in the air domain showed that the actions of the Russian Aerospace Forces in Ukraine are characterized by a concentration on long-range missile strikes on Ukrainian military and civilian objects in order to weaken the capabilities, suppress the resistance of the Ukrainian population and punish the country for its chosen pro-Western course of development. For many years, the Russian Federation has been developing C4ISR-type systems to ensure the high

intensity of missile and air strikes. These systems were integrated into the all-Russian systems of "reconnaissance strike complexes", which were designed for the coordinated use of high-precision long-range weapons in integration with intelligence data in real time. To identify targets in a complex operational environment, the Russian military widely uses integrated aerial platforms, including unmanned aerial systems.

The experience of combating *the air enemy* during a large-scale invasion of Russian troops, despite the scale, shows that it can be effectively combated if the air defence system of the troops is created taking into account their strengths and weaknesses. It is advisable to strive to build an air defence system based mainly on maneuverable forces and means. Changing the positions of anti-aircraft systems at least once every one or two hours will dramatically reduce the probability of their damage. It is necessary to carry out a sufficient amount of operational masking measures, which will not only make it possible to hide the objects of the attack, but also, in the case of an air attack, will significantly reduce the accuracy of aiming at the target or lead to a false one.

The analysis of the experience of the use of the Air Force of the Ukrainian Armed Forces in the ongoing Russian-Ukrainian war proves the need to improve the existing structure of military formations and military command bodies, the use of modern weapons and military equipment, and the search for effective ways of their use. Implementation of the concepts of "combat operations in a single information space" and "multi-domain operation (battle)" will allow the Ukrainian Armed Forces to conduct joint actions at a qualitatively new level as part of united groups of diverse, disparate forces.

According to the conclusions of the analysis of the use of Russian forces in *military operations in the Black and Azov Seas*, it can be concluded that the enemy's dominance at sea and, accordingly, the enemy's possible attack from the south-western direction on the central part of Ukraine was thwarted thanks to the effective management of forces and the successful use of coastal missile and unmanned aircraft complexes, intelligence means, modern information support systems, other forces and means, grouping of heterogeneous forces of the Navy of the Ukrainian Armed Forces together with other components of the Defence Forces of Ukraine. These actions created favorable conditions at sea for the start of an offensive operation by Ukrainian forces to liberate Crimea.

In further actions at sea, the aim of the enemy's actions may be to assist the troops operating in the south of Ukraine in the areas adjacent to the Black and Azov Seas, to hold the southern regions of the Kherson, Zaporizhzhia, and Donetsk regions and to prevent the restoration of control by the Defence Forces of Ukraine over Crimea, as well as ensuring the sea evacuation of troops (forces) and material resources from the Crimea to the ports of the Russian Federation in the eastern part of the Black Sea.

To ensure success in the fight against the aggressor, the goal of the strategy of the Defence Forces of Ukraine to counter the enemy at sea should be to create such conditions in the designated sea areas, under which the Russian Federation will not be able to effectively resist the offensive of our troops on land and will be forced to evacuate troops (forces) from Crimea, including the

Black Sea Fleet. To achieve this goal, it is necessary to provide for the performance of a number of relevant tasks in military operations at sea.

An important condition for the success of the implementation of the proposed strategy of combating the enemy at sea is the creation and effective use of means of combat at sea received from partners and maritime robotic systems created in Ukraine, the use of which ensures an asymmetric impact on the enemy and the effectiveness of priority tasks, in particular regarding the destruction of surface and underwater long-range sea-based cruise missile carriers.

Special operations. The success of a modern operation (both military and special) depends not only on the correctly and rationally chosen method of action to achieve the set goals, but also on the ability to effectively combine the entire available range of capabilities of general-purpose troops (forces) and SFO, which ensures the necessity and opportunities determination of the optimal combination of various forms and methods of armed struggle.

The analysis of the problems of substantiation in the theory of special operations of the use of SFO in multi-domain operations proved that in the theory of SFO an understanding of SFO as multidisciplinary forces is formed, which makes it possible to expand the scope of theoretical justification of their use in multi-domain operations. This issue is considered in the context of the general tendency to the emergence of threats to national security in one or more spheres, when the use of armed forces alone loses its effectiveness, which is due to a high level of control or the achievement of an acceptable level of security in each sphere.

Aggression in *cyberspace* has become an integral part of hybrid warfare. Using an empirical approach using open sources of information, the monograph analyzed and systematized: the chronology and statistics of Russian cyber aggression; systemic features of the use of kinetic weapons and acts of cyber aggression of the Russian Federation in synergy; the most significant cyber incidents at security and defence sector facilities; subjects of cyber aggression and their main tactics (methods, techniques); peculiarities of cyber resilience of Ukraine; strategic aspects and factors influencing the course of cyber confrontation. According to the obtained results, the general nature of the cyber confrontation during the hybrid Russian-Ukrainian war of the 21st century was assessed, and certain recommendations were made for improving the cyber defence of Ukraine as a component of ensuring the cyber security of the state.

Thus, the current work collects the results of research into the essence of modern war of the hybrid type; concepts and strategies for countering an enemy with superior resources; peculiarities of the organization of national resistance; military-technical aid and financial assistance to Ukraine; experience of using troops (forces) in different operational environments (domains) and dimensions; approaches to building a system of sustainability; certain problems of the post-war development of Ukraine, etc. The results of these studies made it possible to determine the ways of increasing national stability and to provide certain recommendations for countermeasures in hybrid warfare.

INSTEAD OF EPILOGUE.
CURRENT PROBLEMS OF POST-WAR DEFENCE
DEVELOPMENT OF UKRAINE

Mykhailo Lobko, Radion Tymoshenko, Anatolii Pavlikovskyi

Armed aggression of the Russian Federation against Ukraine continues. Russian aggression, carried out with the use of hybrid methods on such a scale, is carried out for the first time in recent history.

The consequences of this aggression are terrible – tens of thousands of dead, wounded, injured and several million displaced people. In various industries, about 30–40 % of production facilities, critical infrastructure facilities, a significant amount of housing, roads, bridges, etc., were destroyed.

Our state and its Armed Forces are making great efforts to defeat the enemy and liberate the temporarily occupied territories. It is worth noting that with the victory Ukraine will face large-scale and difficult tasks of post-war reconstruction of everything destroyed by the war.

The key driver of Ukraine's post-war recovery should be the construction of an economic system resistant to global threats, which will function according to innovative principles on the basis of a new modern infrastructure.

The war confirmed that one of the main areas that the state should provide is the area of defence. Determining directions for solving the problem of post-war development of the defence sphere, ensuring the achievement of the necessary level of the state's defence capability, combat capability of the defence forces and determines the purpose of this publication.

A number of works by domestic scientists, specialists and experts are devoted to the problems of ensuring the defence of the state under the conditions of its hybrid nature. They include such authors as V. Badrak, V. Horovenko, I. Velma, I. Rusnak, V. Telelym, V. Tyutyunnyk, and others. The authors covered various aspects of the problems of defence reform in Ukraine, development of the Ukrainian Armed Forces, etc.

It should be noted that in Ukraine, after the armed aggression of the Russian Federation in 2014, a defence reform was introduced.

Decree of the President of Ukraine dated 13.05.2014 No. 468/2014 On the decision of the National Security and Defence Council of Ukraine dated April 28, 2014 "On measures to increase the efficiency of planning in the security and defence sector" [453] and approved by the order of the Cabinet of Ministers of Ukraine dated February 25, 2015 year No. 139 "Plan of measures for carrying out a comprehensive review of the security and defence sector of Ukraine" a comprehensive review of the security and defence sector of Ukraine was conducted [454].

The defence reform in Ukraine was defined and implemented by the decision of the National Security and Defence Council of Ukraine dated May 20, 2016 "On the Strategic Defence Bulletin of Ukraine" put into effect by the Decree of the President of Ukraine [455].

The implementation of the defence reform in Ukraine was determined by the peculiarity and complexity of the military-political, military-strategic, and economic situation that arose as a result of the armed aggression of the Russian Federation against Ukraine, the occupation of part of the sovereign territory of Ukraine – the Autonomous Republic of Crimea and the city of Sevastopol, as well as the resolved and supported Kremlin armed conflict in the East of our country.

In addition, during the comprehensive review of the security and defence sector, the state of military security of the state, as well as the acquired experience of the participation of the Ukrainian Armed Forces in the anti-terrorist operation, a number of problems of the functioning of the defence forces under the conditions of the resolved armed conflict in the Russian Federation and potential threats that required the implementation of a set of measures to eliminate them.

Developed based on the results of a defence review, as a component of a comprehensive review of the security and defence sector, the Strategic Defence Bulletin of Ukraine identified ways to overcome the identified problems and achieve the goals of defence reform, in particular, to increase the capabilities of the defence forces to a level that would enable the fulfillment of the tasks of state defence and recovery its territorial integrity, active participation in the implementation of the Common Security and Defence Policy of the European Union and active cooperation with NATO to achieve the criteria necessary for full membership in the North Atlantic Treaty Organization.

The goal of the defence reform in Ukraine was defined as the acquisition and maintenance by the defence forces of the necessary level of combat readiness and the ability to perform state defence tasks (defence capabilities), effective response to emerging military threats and military-political challenges to national security, increasing the level of operational interoperability of the Ukrainian Armed Forces and other military formations with units of the armed forces of NATO and EU member states to perform joint tasks in international operations to maintain peace and security.

Achieving the defined goal of the defence reform was supposed to be carried out in accordance with the priority of the following strategic goals [455]:

– joint leadership of the defence forces, carried out in accordance with the principles and standards adopted by NATO member states;

– effective policy, systems of planning and management of resources in the defence sector using modern Euro-Atlantic approaches;

– operational (combat, special) capabilities of the defence forces, necessary for guaranteed repulsion of armed aggression, defence of the state, maintenance of peace and international security;

– a unified logistics system and a medical support system capable of providing support to all components of the defence forces;

– professionalization of the defence forces and creation of the necessary military reserve.

For each strategic goal, the expected result was determined. To achieve it, appropriate operational goals were formed with the determination of expected results and the establishment of integral indicators that allow assessing the degree of achievement of strategic goals. The operational goals specified the defined directions and results of achieving each strategic goal and detailed the guidelines for the implementation of the defined defence reform measures.

The implementation of the defence reform was based on the goals defined in the National Security Strategy of Ukraine [456]. Management of the defence reform and control over the implementation of its practical measures was planned to be carried out on the basis of the program-target method and taking into account the priority of the goals defined in the Strategic Bulletin.

The expected result of the defence reform was determined to be the creation of effective, mobile, equipped with modern weapons, military, and special equipment defence forces of the model of 2020, capable of guaranteeing the defence of the state and adequately and flexibly responding to military threats, based on the principles and standards adopted by NATO member states national security of Ukraine, rationally using the existing potential (capabilities) and resources of the state.

For the implementation of the defence reform in the Ministry of Defence of Ukraine, an Action Plan for the implementation of the defence reform in 2016–2020 (hereinafter referred to as the Action Plan) (Defence Reform Roadmap) was developed and approved by the Minister of Defence of Ukraine [457].

The purpose of the Action Plan for the implementation of the defence reform in 2016–2020 was aimed at ensuring the achievement of the goal of the defence reform.

The action plan included specific tasks and content of measures, responsible performers, deadlines, expected results for the respective years and effective (indicative) indicators of their achievement.

The measures of the Action Plan were aimed at achieving the defined strategic and operational goals of the defence reform.

This approach made it possible to purposefully organize and carry out the planned measures and ensure the fulfillment of the tasks and achieve the defined strategic and operational goals of the defence reform.

To implement the measures of the Action Plan, appropriate working bodies were formed, the organizational structure of which is shown in **Fig. 4**.

The implementation of the above-mentioned reform made it possible to achieve the required level of the state's defence capability and the capabilities of the Ukrainian Armed Forces and other components of the defence forces to fulfill the tasks of the state's defence.

Unfortunately, we have to state that despite the long time, many of the planned measures could not be implemented in full. In addition to objective reasons, organizational and methodical mistakes were made in the implementation (continuation) of the defence reform. The main one was the violation of the principle, the essence of which is that no organization can qualitatively reform itself. For example, during the reformation of the military administration bodies of the Ukrainian Armed Forces, heads of the structural divisions that were to be reformed were appointed to head the working bodies for carrying out the actions of the Action Plan.

It is clear that some of these leaders had their own personal views and ideas about the results of the reform. As a result, despite the involvement of specialists, experts, and volunteers in the events, often the changes were carried out formally and ended only with the change of the sign.

```
┌─────────────────────────────────┐
│   President of Ukraine           │
├─────────────────────────────────┤
│   NSDC of Ukraine                │
└─────────────────────────────────┘
        │
┌───────────────┐
│     CMU        │
├────────────────────────────────┐
│   Interagency commission        │
└────────────────────────────────┘
        │
┌───────────────┐          ┌──────────────┐
│     MOD        │──────────│ GS of the AFU│
├────────────────────────┐ └──────────────┘
│   Reform Committee      │        │
└────────────────────────┘ ┌──────────────────┐
        │                  │  WG of MCCB       │
        │                  │  of the Branches  │
        │                  │  and Services of  │
        │                  │  the Armed Forces │
┌─────────────────────────┐└──────────────────┘
│   Subcommittees          │
│   (by area of activity)  │
│   of the MoD, AFU        │
└─────────────────────────┘
        │
┌─────────────────────────┐
│   Working groups         │
└─────────────────────────┘
        │
┌─────────────────────────┐
│ Specialists, experts, volunteers │
└─────────────────────────┘
```
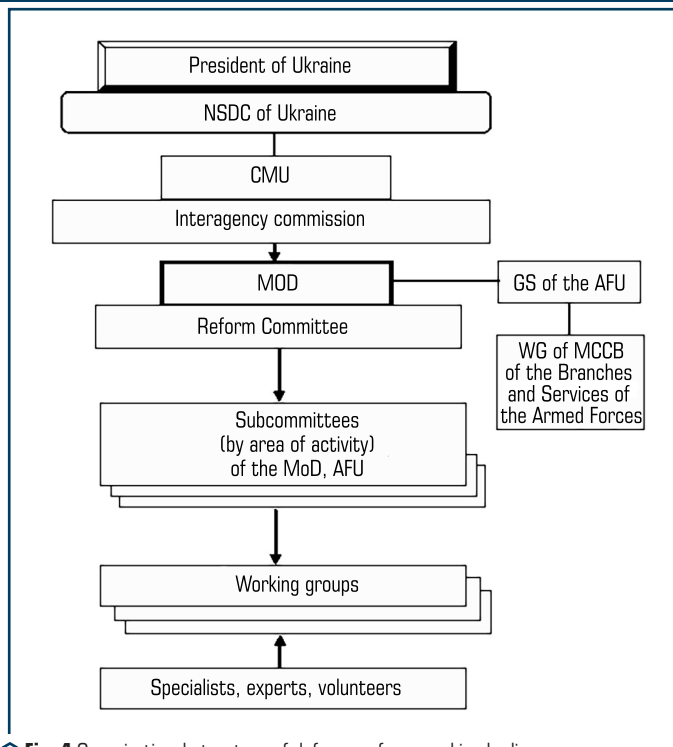
○ **Fig. 4** Organizational structure of defence reform working bodies

The insufficient level of training of the personnel of the working bodies turned out to be a serious obstacle in the implementation of defence reform measures. A significant part of them had a low level of knowledge of the principles and standards by which NATO military structure functions.

In addition, it was not possible to eliminate paranoia in Ukrainian defence legislation.

The creation of a system of unified leadership of defence forces and military management in the Ukrainian Armed Forces, as well as strategic communications, has not been completed.

The low level of equipping the defence forces with the latest weapons and military (special) equipment and the inconsistency of the capabilities of the domestic defence-industrial complex with their needs have not been eliminated. As a result, the operational (combat, special) capabilities of the defence forces for effective response to military threats turned out to be insufficient.

The creation of an automated system of operational (combat) control, communication, intelligence, and surveillance has not been completed.

The ability to effectively respond to destructive informational influence, negative propaganda, and the growing number of threats in cyberspace remained low.

It was not possible to complete the creation of the system of territorial defence and the resistance movement, as well as the formation of the necessary prepared military reserve.

Indestructible stocks of material and technical means were at a critically low level. The existing military infrastructure did not meet the needs of the defence forces.

The creation of effective unified logistics, capable of supporting the use of all components of the defence forces, has not been completed, and there is no automated logistics management system.

The creation of a system of medical support for the Ukrainian Armed Forces and other components of the defence forces, capable of effectively and rationally using medical resources within the framework of the unified medical environment of the state, requires further completion.

It is necessary to overcome chronic state underfunding of defence needs.

Other mistakes and miscalculations were made, which negatively affected the final result of the defence reform. Together, this led to a slippage in the dynamics of reforms, an incomplete implementation of the planned measures, and often to stomping on the spot.

In 2019, there was a change of government in Ukraine and a new cycle of defence planning began. It was characteristic of the new cycle of defence planning that the new government did not reject the work of its "predecessors", but began to implement its development, taking into account the new realities of the military-political, military-strategic situation that has developed in the world, the region, and the national space.

In particular, it was noted that during 2016–2020 the key tasks of the defence reform were fulfilled, namely:

— democratic civilian control over the defence forces has been strengthened;

— the foundations of a new system of unified leadership of defence forces and military management in the Ukrainian Armed Forces were laid in accordance with the principles adopted by NATO;

— planning for the development of the capabilities of the defence forces and state defence planning was introduced;

— the creation of new systems of logistics, medical support and support (operational support) of the troops (forces) of the Ukrainian Armed Forces has been started;

— new doctrines on the training and application of the Ukrainian Armed Forces were developed, collective and individual training standards were introduced based on the principles and standards of NATO and the standards adopted by the member states of the Alliance;

— the personnel management system has been improved; conditions have been created for gender equality in the defence forces.

The initiation of a new cycle of defence planning was based on the developed provisions of domestic legislation and the approved National Security Strategy of Ukraine [166] and the newly developed Military Security Strategy of Ukraine [458].

Our study showed that the updated National Security Strategy of Ukraine is based on new basic principles:

— deterrence — which consists in the development of defence and security capabilities to prevent armed aggression against Ukraine;

– stability – the ability of society and the state to quickly adapt to changes in the security environment and maintain sustainable functioning, in particular by minimizing external and internal vulnerabilities;

– interaction – development of strategic relations with key foreign partners, primarily with the European Union and NATO and their member states, the United States of America, pragmatic cooperation with other states and international organizations based on the national interests of Ukraine.

The Military Security Strategy of Ukraine defines the principles of military security and preparation of Ukraine for defence as one of the fundamental conditions for realizing the right of the Ukrainian people to self-determination, preserving the state of Ukraine and ensuring its sustainable development based on the highest values of democracy, the rule of law, freedom, dignity, security and prosperity of citizens of all nationalities and the protection of the sovereignty and territorial integrity of Ukraine, which is based on the comprehensive defence of Ukraine. The issue of comprehensive defence is highlighted for the first time as a counterweight to Russia's superiority in economic, resource, military, demographic, and other important potentials.

The document states that comprehensive defence of Ukraine involves maintaining a certain balance and synergy of military and non-military means to ensure Ukraine's military security and defence.

It was also established that at the national level, the Russian Federation remains a military adversary of Ukraine, which carries out armed aggression against Ukraine.

A new cycle of defence planning in Ukraine began with the issuance by the President of Ukraine of Decree No. 225 of May 16, 2019 [459]. The decree established, among other things, the conduct of a defence inspection.

During the defence review:

– an assessment of the state and prospects for the development of the security environment was carried out and a description of the future security environment until 2030 was developed for the first time;

– a list of possible scenarios for the occurrence and development of crisis situations of a military nature was formed, as well as the division of responsibility for organizing planning, responding to threats and during the performance of assigned tasks between the components of the security forces and the defence forces was carried out;

– a unified list (catalogue) of the capabilities of the Ministry of Defence of Ukraine, the Ukrainian Armed Forces and other components of the defence forces was formed;

– the priority directions of the development of weapons and military (special) equipment, which ensure the creation of the necessary capabilities for the Ukrainian Armed Forces to perform tasks in a multidimensional space, have been worked out;

– a perspective model of the defence organization of Ukraine was developed.

According to the results of the defence review, the Strategic Defence Bulletin of Ukraine was developed, which determined the main directions of the implementation of the military policy of Ukraine, strategic goals and expected results of the development of the defence forces.

The specified document was approved by the decision of the National Security and Defence Council of Ukraine and put into effect by the decree of the President of Ukraine.

The updated strategic goals for the development of the defence forces in this document became [460]:

– strategic goal 1 – effective defence management and a system of unified leadership of defence forces and military management in the Ukrainian Armed Forces, carried out on the basis of democratic civilian control, other NATO principles and standards;

– strategic goal 2 – professional and motivated personnel of the defence forces, prepared military reserve, supported by effective and transparent systems of personnel management, military education and science, health care and social protection;

– strategic goal 3 – modern weapons and military (special) equipment, which ensures the fulfillment of tasks by the Ukrainian Armed Forces, other components of the defence forces, in particular together with the relevant structures of NATO member states;

– strategic goal 4 – developed military infrastructure, unified logistics and sufficient stockpiles of material resources, an effective system of medical support that meet the needs of the Ukrainian Armed Forces, other components of the defence forces to repel armed aggression against Ukraine;

– strategic goal 5 – integrated operational (combat and special) capabilities of the defence forces, which ensure deterrence, stability and repulsion of armed aggression against Ukraine, countering hybrid threats.

It was assumed that the specified strategic goals of the development of the defence forces would be realized by carrying out a number of tasks for each of them.

At the same time, the analysis of the organization of the implementation of the specified tasks showed that the state did not develop specific mechanisms for their implementation in order to achieve the specified strategic goals. The organization and implementation of the specified tasks relied only on the managers and employees of the structural divisions of the Ministry of Defence and the military management bodies of the Ukrainian Armed Forces with the participation of specified executive authorities and other state bodies. Therefore, tasks and development measures of the Ukrainian Armed Forces and other components of the defence forces were not carried out systematically.

It should be noted that a significant contribution to the organization and implementation of the specified tasks was made by scientists, scientific and pedagogical workers of the National Defence University of Ukraine. They provided scientific support for the organizational activities of the Ministry of Defence of Ukraine, developed the necessary methods and algorithms for these activities, and directly participated in the development of specific defence and other types of strategic planning documents.

Unfortunately, we have to state that despite the efforts made, many of the planned measures could not be implemented in full due to the beginning of the full-scale invasion of the Russian Federation on the territory of our state. In addition, the consequences of the armed aggression of the Russian Federation will require significant efforts, resources, and time to restore both the country and the defence of the state.

In addition, the experience of repelling a full-scale invasion of the Russian Federation and the liberation of temporarily occupied territories revealed a number of legal, organizational, and logistical problems that require additional systematic measures to solve them.

Therefore, the military and political leadership faced the task of further development of the defence sector in general and the defence forces in particular, for the victorious conclusion of hostilities, further ensuring the military security of the state and guaranteed repulsion of a possible repeated armed aggression of the Russian Federation in all its forms.

Solving these tasks requires improvement of the system of defence management at the state, regional, and local levels and the military management of the defence forces, clarification of the legislation and regulatory framework, reconstruction of the defence-industrial complex and its transformation into the defence sector of the national economy, transition from strategic defence planning to strategic planning in the field of defence, restoration of military infrastructure, military-technical policy, order of staffing, training and methods of use of defence forces, formation of new groups of troops (forces), relocation of their deployment points to the northern, eastern, and southern regions of the state, changes in composition and organizational structure of the Ukrainian Armed Forces, the formation of a system of joint logistics of the defence forces and the creation of the necessary operational reserves of material and technical means, improvement of the direction of training and education of personnel and other important problems.

The identified transformations, as shown by the assessments and forecasts of domestic and foreign experts, will have to be carried out over a long period of time with the use of significant state and investment resources. This also applies to the problems of restoring the defence of the state.

In order to further solve the problems of the recovery of our country, the President of Ukraine issued a decree on "Questions of the National Council on the Recovery of Ukraine from the Consequences of the War" [460].

The aforementioned decree defines the formation of the National Council for the Recovery of Ukraine from the Consequences of the War (hereinafter – the National Council). The Regulations on the National Council provide that the National Council is a consultative and advisory body under the President of Ukraine. The National Council, in accordance with the tasks assigned to it, ensures the development and submission to the President of Ukraine of agreed proposals on the issues of reconstruction of Ukraine in the post-war period in key areas.

The main tasks of the National Council are primarily to develop a plan of measures for the post-war reconstruction and development of Ukraine (hereinafter referred to as the Plan), which, in particular, will provide for the restoration and development of transport, medical, social, communal, industrial infrastructure and housing, energy, communications, military infrastructure, and the military-industrial complex, structural modernization and restart of the economy, measures to overcome unemployment, support families with children, vulnerable sections of the population, people who found themselves in difficult life circumstances as a result of the war, restoration and preservation of cultural heritage objects.

To fulfill the assigned tasks, the National Council is formed from the co-chairs of the Council, the secretary, and other members of the Council. Co-chairs of the National Council are the Chairman of the Verkhovna Rada of Ukraine (with consent), the Prime Minister of Ukraine and the Head of the Office of the President of Ukraine.

The National Council includes the specified co-chairs, the First Vice-Prime Minister of Ukraine, the Secretary of the National Council, Vice-Prime Ministers of Ukraine, Ministers, including and the Minister of Defence of Ukraine, the Secretary of the National Security and Defence Council of Ukraine, the Chairman of the National Bank of Ukraine (with consent) and the respective Chairmen of the Committees of the Verkhovna Rada of Ukraine (with consent).

For the proper work of the National Council and the preparation of professional proposals arising from its tasks, working groups are formed under it. Among others, a working group on the modernization and development of the security and defence sphere is being formed.

The National Council makes decisions on issues within its jurisdiction. The decision of the National Council is adopted by the majority of the members of the Council present at its meeting. In the case of an equal distribution of votes, the vote of the chairperson at the meeting is decisive.

According to the results of the meeting of the National Council, a protocol is drawn up, which is signed by the co-chairman of the Council, who presided over the corresponding meeting, and the secretary of the Council.

In accordance with the decree of the President of Ukraine, the National Council prepared a draft plan for the recovery of Ukraine from the consequences of the war (hereinafter referred to as the Recovery Plan) [461, 462]. The Government and the Office of the President of Ukraine presented the mentioned Recovery Plan on July 4, 2022, in the Swiss city of Lugano, during the large-scale International Conference on the Recovery of Ukraine. The implementation of this Recovery Plan is calculated for 10 years from 2022 to 2032 and will cost $ 750 billion.

Ukraine's recovery plan is aimed at accelerating sustainable economic growth.

The specified Recovery Plan of Ukraine provides for three key stages:

1. Restore here and now what is possible and what is critical for people's lives (this work is already underway and financed from the budget of Ukraine).

2. Rapid infrastructure restoration.

3. Long-term transformation (it applies to all spheres, starting from education, medicine and ending with the green transition and the new military-industrial complex).

As part of the Recovery Plan, 15 national programs have been identified to achieve key results. These programs largely correspond to the basic needs of the country in both the war and post-war periods.

One of them is the national defence and security strengthening program worth USD 50 billion.

Each of the national programs is implemented through relevant projects. The national defence and security strengthening program includes the following projects:

— State targeted scientific and technical program for the development of the aviation industry for 2021–2030;

– State target defence program for the implementation of projects for the implementation of scientific research and development, development of new technologies in the interests of the security and defence sector of Ukraine;

– State target defence program for the development of missile weapons; State target program for reforming and developing the defence-industrial complex;

– State targeted defence programs for the development of weapons by direction (radar systems, armored vehicles, ammunition, and special chemicals, etc.);

– Defence Accelerator/Incubation Program (Diia Tech & Defence);

– Formation of the Defence Technologies Agency.

Projects may have relevant directions in which measures for their implementation are specified.

Therefore, Ukraine faced a complex and large-scale task of implementing the plan to recover Ukraine from the consequences of the war.

At the same time, a cursory study of the content of the National Program for Strengthening Defence and Security shows that the identified projects and areas of implementation of the specified program cover mainly the problems of equipping the Ukrainian Armed Forces and other components of the defence forces with weapons and military equipment.

Of course, after the end of hostilities, there will be a need to continue and consolidate certain changes. Today's practice shows that the scale of these changes will cover state, regional, local, and in the defence forces – strategic, operational, and tactical levels.

Thus, the scale of military operations, the increase in the range and volume of defence tasks led to significant changes in the defence forces management system. Some military command bodies have lost their functionality, such as the Joint Operations Command. Instead, a number of new military management bodies with other management functions were formed to perform the tasks of managing the troops (forces) that arose.

There are also other important tasks regarding the further development of the defence forces. In particular, we are talking about the need for further acquisition of NATO standards by the Ukrainian Armed Forces.

Together, this increases the scale and volume of tasks related to the successful completion of repelling armed aggression, ensuring the preparation of defence in the post-war period, deterring armed aggression, and repelling it in the event of a renewal.

Thus, the review of the scope of the tasks of reforming and developing the defence forces, acquiring the necessary level of defence capability of Ukraine under the conditions of continued repulsion of full-scale armed aggression of the Russian Federation, the assessment of the military-political, military-strategic situation that has developed and the forecast of the prospects for their development in the post-war period show that certain transformations in the field of defence should be carried out in the form of defence reform. This will determine the main direction of transformations in the field of defence.

The defence reform should be understood as a complex of deep systemic transformations carried out in the field of defence, the defence forces with the expenditure of specified resources

in the established terms by the highest military and political leadership of the state in order to implement military policy to ensure a sufficient level of military security and defence.

The strategic goal of the defence reform in Ukraine should be to define the implementation of the state military policy, the restoration and development of the defence sector, the acquisition of the state's defence capability, the combat capability of the defence forces to a level that will ensure deterrence and reliable protection of its national interests in the event of encroachments on them with the use of military force by the Russian Federation or another foreign state and the implementation of the state's strategic course regarding integration into the European and Euro-Atlantic space.

The defence reform should provide for significant changes to the entire defence system of the state, as well as the defence forces and ensuring a new quality of their condition and functioning. It should unite the implementation of defined programs, projects and directions, synchronize the work of various working bodies that implement them.

The implementation of the system of defence reform measures in Ukraine should cover the activities of all branches of the executive power and other state bodies, all spheres of the state's vital activities, which are legally related to the provision of (facilitative) defence.

In order to achieve the goal of defence reform in Ukraine for a certain period, the following main directions should be established, taking into account the provisions of national legislation and domestic and foreign experience:

– the defence reform should ensure the implementation of the military policy of Ukraine and should be aimed at ensuring the military security and defence of Ukraine in the new conditions of the military-political, military-strategic situation;

– the defence of Ukraine must be planned according to the provisions of the comprehensive defence of Ukraine, provide for the use of all the potential of the state and society and the use of all forms and methods of armed struggle with the implementation of preventive, asymmetric actions, persistent resistance in compliance with the norms and principles of international humanitarian law;

– acquisition by the central bodies of executive power and other state bodies of the necessary institutional capabilities for timely and organized mobilization, meeting the needs of the defence of the state, defence forces and protection of its territory from possible repeated aggression and effective management of defence resources;

– development of the capabilities of the defence forces to the level necessary to contain the armed aggression of the Russian Federation against Ukraine and guarantee its repulse;

– continuation of the implementation in the defence forces of advanced military experience, principles, and standards of NATO member states with further integration into the Euro-Atlantic security structures.

A significant volume of tasks in all spheres of the state's vital activities, a long period of time for their implementation, the need for a rational distribution of allocated defence resources, the involvement of all branches of the executive power and other state bodies in their implementation determine the need for a defence reform in stages.

The first stage should be carried out during the repulse of a full-scale invasion of the enemy and the liberation of temporarily occupied territories, that is, during wartime. At this stage, it is expedient to carry out measures aimed at acquiring the minimum necessary capabilities for the defence forces, which will ensure the defeat of the aggressor groups, restore the territorial integrity of our state, and create the necessary conditions for conducting peace negotiations on the terms of Ukraine.

In July 2022, a review of the capabilities of the defence forces was launched in Ukraine to address these measures. Capability review is a defence planning exercise. It is organized in the form of a separate project using a program-project approach.

Incidentally, it should be noted that the review of the capabilities of the defence forces is being conducted for the first time within the cycle of defence planning, taking into account the complex conditions of the state's defence that have developed.

The result of the review of the capabilities of the defence forces should mainly be the development of proposals for clarifying the priorities and tasks of the implementation of state policy in the military sphere, the strategic goals of the development of the defence forces, the criteria for their achievement, the system of military management, the composition and structure of the Ukrainian Armed Forces and other components of the defence forces.

Therefore, the review of capabilities can be considered one of the important measures of the first stage of the defence reform.

The second stage, as shown by the forecasts of the development of the military-political, military-strategic situation and identified threats in the military sphere, should be carried out in a partially reconstruction period after the end of military (combat) operations. Preliminary calculations show that this period can reach up to two years. At this stage, it is necessary to carry out priority measures to restore the defence along the state border of Ukraine with the Russian Federation (line of demarcation of the parties) in order to form the necessary groups of troops (forces) with the capabilities that should ensure the repulsion of possible first blows of the enemy in the event of attempts to resume the attack on our state.

At the third stage, the rest of the defined measures of the defence reform should be carried out, which should ensure the fulfillment of the established tasks and the achievement of its defined goal.

Its organization is of great importance in ensuring the effective implementation of the defence reform.

The defence reform is carried out by the decision of the highest military and political leadership of the state.

The President of Ukraine considers the proposals of the National Council and approves the decision of the National Security and Defence Council of Ukraine regarding defence reform.

The National Security and Defence Council of Ukraine initiates the defence reform, determines the organizational principles and procedure for its implementation, makes decisions and monitors the progress of the main measures. Considers and approves the results of the implementation of

state programs, projects, and specified directions, and subsequently submits them to the President of Ukraine for implementation by relevant acts.

The Cabinet of Ministers of Ukraine provides resources, organizes, monitors and pre-approves the results of defence reform measures, projects of developed state programs, projects in specific directions and other documents.

The leading role in the implementation of defence reform measures should belong to the Ministry of Defence of Ukraine.

It is the Ministry of Defence of Ukraine, in our opinion, that needs to be developed and submitted by the working group for the development of the national defence and security strengthening program to the National Council on the initiation of defence reform.

In addition to those specified in the specified national program, it is proposed to include the project of the State Targeted Defence Program for the Development of the Defence Forces with the projects and directions of their development defined in it. Such projects (directions) of development, for example, should be defined as: planning the capabilities of the defence forces in accordance with specified defence tasks; determination of the prospective composition and structure of the Ukrainian Armed Forces; clarification of the updated system of strategic leadership and military management of the Ukrainian Armed Forces and other components of the defence forces, and others.

Certain ministries, other central bodies of executive power, state bodies participate in the planning and implementation of defence reform measures. Their activities are directed by the Ministry of Defence of Ukraine.

The key body in the specified organizational structure should be the coordination committee. The coordination committee ensures coordination and promotion of interaction in the activities of working groups on the implementation of defence reform measures. The coordination committee also analyzes and monitors the state and effectiveness of the implementation of defence reform measures and adjusts proposals developed by working groups taking into account the state's financial and material capabilities.

An important place in the implementation of the defence reform should belong to its preparation. In order to increase the effectiveness of the preparation of the defence reform in the current conditions, it is necessary, according to the authors, to determine the issues regarding its organization in the organizational order of the Ministry of Defence of Ukraine.

It is necessary to prepare and achieve the implementation of a program of special training of management and personnel of all levels for the implementation and management of changes during the reform. This will allow the leaders and staff of the working bodies to be equipped with the necessary knowledge of NATO principles and standards, the methodology of implementing changes, will ensure uniform approaches and understanding of these changes, and unite the participants into a single group of like-minded people regarding the understanding of the importance and necessity of defence reform.

The basis of successful change management is a high professional level and full understanding of the final model of the organization of the defence system of the state and the Armed

Forces of Ukraine, both by the leadership of change management and the entire personnel of the defence forces.

During the implementation of the defence reform, effective defence management should be implemented in the field of defence, based on the principles of democratic civilian control, other Euro-Atlantic principles and standards, innovative solutions and modern business practices, program and project management of defence resources, improved processes for determining and meeting the needs of the defence of Ukraine.

CONCLUSIONS

1. The analysis of the results of the defence reform of 2016–2020 showed that Ukraine faces the need to solve important problems related to ensuring military security and defence in new internal and external conditions related to the repulsion of full-scale armed aggression of the Russian Federation and the constant threat of renewed invasion of the post-war period.

2. Taking into account the wide range, significant number of tasks and the long time required to implement the specified measures, the presence of the threat of renewed invasion in the post-war period, the need for a significant amount of resources and their rational use, it is advisable to implement the national program for strengthening defence and security in the form of defence reform.

In connection with the above, the defence reform should be carried out in stages.

3. Taking into account the highlighted problems, the defence reform should be aimed at the implementation of the military policy of Ukraine and meet the current needs of the defence, ensure an increase in the level of the state's defence capability, strengthening the capabilities of the defence forces, and their readiness to perform tasks as assigned.

4. Defence reform should be based on NATO principles and standards.

5. For the organized implementation of defence reform measures, it is necessary to form appropriate working bodies and conduct high-quality training of their managers and personnel. It is also necessary to develop (specify) mechanisms and methods for its implementation.

6. The defence reform must ensure the implementation of the planned measures of the national program for strengthening defence and security and the proposed State target defence program for the development of the defence forces with defined projects and directions of their development, which must ensure the achievement of the specified goals of the specified defence reform.

REFERENCES

1. Zaluzhnyi, V., Zabrodskyi, M. (2022). Perspektyvy zabezpechennia voiennoi kampanii 2023 roku: ukrainskyi pohliad. Available at: https://www.ukrinform.ua/rubric-ato/3566162-ak-zabezpeciti-voennu-kampaniu-u-2023-roci-ukrainskij-poglad.html Last accessed: 14.11.2022

2. Novichkov, N. A., Fediushko, D. I. (2021). Boevoe primenenie bespilotnykh apparatov v Nagornom Karabakhe. Moscow: Status, 124.

3. Ivashchenko, A. M. (2021). Predicting the development of hybrid conflicts based on Big Data. Collection of Scientific Works of the Center for Military and Strategic Research of the National Defence University of Ukraine, 3 (73), 42—47. doi: https://doi.org/10.33099/2304-2745/2021-3-73/42-47

4. Syrotenko, A. M., Semenenko, V. M., Ivashchenko, A. M.; Syrotenko, A. M. (Ed.) (2020). Voienni aspekty protydii hibrydnii ahresii: dosvid Ukrain. Kyiv: NUOU im. Ivana Cherniakhovskoho, 176.

5. Military Aspects of Countering Hybrid Aggression: Ukrainian Experience. Technical Report SAS-161 (2021). Paris: NATO Science and Technology Organization, 300.

6. Bartosh, A. A. (2021). Hybrydnaia voina. Moscow: KNORUS, 306.

7. Gerasimov, V. V. (2013). Tcennost nauki v predvidenii. Voenno-promyshlennyi kurer, 8, 1—6.

8. Gerasimov, V. V. (2019). Razvitie voennoi strategii v sovremennykh usloviiakh. Zadachi voennoi nauki. Vestnik Akademii voennykh nauk, 2 (67), 6—11.

9. Orenstein, M. A. (2019). The Land sin Between Russia vs the West and the New Politics of Hybrid War. Oxford: Univercity Press, 248.

10. Salnikova, O., Sivokha, I., Ivashchenko, A. (2019). Strategic communication in the modern hybrid warfare. Social Development and Security, 9 (5), 133—142. doi: https://doi.org/10.33445/sds.2019.9.5.9

11. Kokoshin, A. A. (2018). Voprosy prikladnoi teorii voiny. Moscow: Dom Vysshei shkoly ekonomiki, 227.

12. Xiangsui, W., Liang, Q. (2016). Unrestricted Warfare. Changjiang Literature Press, 500.

13. Nemeth, W. J. (2002). Future war and Chechnya: A case for hybrid warfare. Monterey. Available at: https://core.ac.uk/download/pdf/36699567.pdf Last accessed: 7.06.2023

14. Mattis, J. N., Hoffman, F. (2005). Future warfare: The rise of hybrid warfare. U.S. Naval Institute Proceedings. Available at: https://www.usni.org/magazines/proceedings/2005/november/future-warfare-rise-hybrid-wars Last accessed: 07.06.2023

15. Hoffman, F. (2009). Hybrid warfare and challenges. Joint Force Quarterly, 52, 34—39.

16. Gerasimov, V. (2016). The value of science is in the foresight: New challenges demand rethinking the forms and methods of carrying out combat operations. Military Review, 23—29.

17. Chekinov, S. G., Bogdanov, S. A. (2013). The nature and content of a new-generation war. Military Thought, 4, 12–23. Available at: https://www.usni.org/sites/default/files/inline-files/Chekinov-Bogdanov%20Miltary%20Thought%202013.pdf Last accessed: 07.06.2023

18. Kofman, M. (2020). Russia's armed force under Gerasimov, the man without a doctrine. Riddle. Available at: https://ridl.io/russia-s-armed-forces-under-gerasimov-the-man-without-a-doctrine/ Last accessed: 07.06.2023

19. Galeotti, M.; Pikulicka-Wilczewska, A., Sakwa, R. (Eds.) (2016). "Hybrid war" and "little green men": How it works, and how it doesn't. Ukraine and Russia: People, politics, propaganda and perspectives, 149–156. Available at: https://www.e-ir.info/publication/ukraine-and-russia-people-politics-propaganda-and-perspectives/ Last accessed: 07.06.2023

20. Rácz, A. (2015). Russia's hybrid war in Ukraine: Breaking the enemy's ability to resist. FIIA Report 43, Finnish Institute of International Affairs, 104. Available at: https://www.fiia.fi/wp-content/uploads/2017/01/fiiareport43.pdf Last accessed: 07.06.2023

21. Chivvis, C. S. (2017). Understanding Russian 'hybrid warfare' and what can be done about it. Testimony presented before the U.S. House of Representatives Armed Services Committee. Published by the RAND Corporation. Available at: https://www.rand.org/content/dam/rand/pubs/testimonies/CT400/CT468/RAND_CT468.pdf Last accessed: 07.06.2023

22. Sæther, T. (2023). War of Broken Fraternity: Competing Explanations for the Outbreak of War in Ukraine in 2014. The Journal of Slavic Military Studies, 36 (1), 34–42. doi: https://doi.org/10.1080/13518046.2023.2201114

23. Multinational Capability Development Campaign (MCDC) Countering Hybrid Warfare Project (2017). Understanding hybrid warfare, 16–18. Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/647776/dar_mcdc_hybrid_warfare.pdf Last accessed: 07.06.2023

24. Bukkvoll, T. (2016). Russian special operations forces in Crimea and Donbas. Parameters, 46 (2), 13–21. doi: https://doi.org/10.55540/0031-1723.2917

25. Jonsson, O., Seely, R. (2015). Russian full-spectrum conflict: An appraisal after Ukraine. The Journal of Slavic Military Studies, 28 (1), 4–11. doi: https://doi.org/10.1080/13518046.2015.998118

26. Perry, B. (2015). Non-linear warfare in Ukraine: The critical role of information operations and special operations. Small Wars Journal. Available at: https://smallwarsjournal.com/jrnl/art/non-linear-warfare-in-ukraine-the-critical-role-of-information-operations-and-special-opera Last accessed: 07.06.2023

27. Shekhovtsov, A.; Wilson, A. (Ed.) (2015). The spectre of Ukrainian "fascism": Information wars, political manipulation, and reality. What Does Ukraine Think. European Council on Foreign Relations, 80–87. Available at: https://shron2.chtyvo.org.ua/Zbirnyk_statei/What_Does_Ukraine_Think7__en.pdf?PHPSESSID=us24gt02bqr50tpvurteggc1t4 Last accessed: 07.06.2023

28. Skachko, V., Skatsjko, V. (2014). Ravnovesie ili neopredelennost? RIA Novosti Ukraina. Available at: https://rian.com.ua/analytics/20140219/340199958.html Last accessed: 07.06.2023

29. Kopatko, E. (2014). Referendum v Krymu – khoroshii urok dlia vlastei v Kieve RIA Novosti Ukraina. Available at: https://rian.com.ua/analytics/20140317/341201712.html Last accessed: 07.06.2023

30. Nikolaev, I. (2014). Strategiia i taktika "Pravogo sektora". RIA Novosti Ukraine. Available at: https://rian.com.ua/analytics/20140305/340524862.html

31. Kulyk, V. (2016). National identity in Ukraine: Impact of Euromaidan and the war. Europe-Asia Studies, 68 (4), 588–608. doi: https://doi.org/10.1080/09668136.2016.1174980

32. Kuzio, T. (2019). Old wine in a new bottle: Russia's modernization of traditional Soviet information warfare and active policies against Ukraine and Ukrainians. The Journal of Slavic Military Studies, 32 (4), 485–506. doi: https://doi.org/10.1080/13518046.2019.1684002

33. McIntosh, S. E. (2015). Kyiv, international institutions, and the Russian people: Three aspects of Russia's current information campaign in Ukraine. The Journal of Slavic Military Studies, 28 (2), 299–306. doi: https://doi.org/10.1080/13518046.2015.1030263

34. Osflaten, A. (2021). Russian strategic culture after the Cold War: The primacy of conventional force. Journal of Military and Strategic Studies, 20 (2), 110–132.

35. Renz, B. (2016). Russia and 'hybrid warfare'. Contemporary Politics, 22 (3), 283–300. doi: https://doi.org/10.1080/13569775.2016.1201316

36. Rudenko, A. (2021). "Roztiahnuty na shpahat, vid Krymu do Chernihova". Yak Rosiia zaliakuvala Ukrainu v 2014 rotsi? Radio Svoboda. Available at: https://www.radiosvoboda.org/a/general-nazarov-pro-te-yak-zdaly-krym/31150303.html Last accessed: 07.06.2023

37. Rudenko, A. (2021). "Vy z hluzdu zikhaly?" Yak Ukraina hotuvalasia do viiny z Rosiieiu? Radio Svoboda. Available at: https://www.radiosvoboda.org/a/ukrayina-rosija-vijna-krym/31142217.html Last accessed: 07.06.2023

38. Sutyagin, I. (2015). Russian forces in Ukraine. Briefing paper 4. Royal United Services Institute for Defence and Security Studies. Available at: https://rusi.org/explore-our-research/publications/briefing-papers/russian-forces-ukraine Last accessed: 07.06.2023

39. Watling, J., Reynolds, N. (2023). Meatgrinder: Russian Tactics in the Second Year of Its Invasion of Ukraine. RUSI Special Report. Royal United Services Institute for Defence and Security Studies. Available at: https://rusi.org/explore-our-research/publications/special-resources/meatgrinder-russian-tactics-second-year-its-invasion-ukraine Last accessed: 07.06.2023

40. Conflict in Ukraine's east: A visual explainer (2022). International Crisis Group. Available at: https://www.crisisgroup.org/content/conflict-ukraines-donbas-visual-explainer Last accessed: 07.06.2023

41. Käihkö, I. (2021). A conventional war: Escalation in the war in Donbas, Ukraine. The Journal of Slavic Military Studies, 34 (1), 24–49. doi: https://doi.org/10.1080/13518046.2021.1923984

42. Steury, D. P.; Bischof, G., Karner, S., Ruggenthaler, P. (Eds.) (2009). The CIA and Strategic Warning: The 1968 Soviet-Led Invasion of Czechoslovakia. The Prague Spring and the Warsaw Pact Invasion of Czechoslovakia in 1968. Rowman & Littlefield. Available at: https://www.cia.gov/readingroom/docs/2009-09-01.pdf Last accessed: 07.06.2023

43. Watling, J., Reynolds, N. (2022). The plot to destroy Ukraine. RUSI Special Report. Royal United Services Institute for Defence and Security Studies. Available at: https://rusi.org/explore-our-research/publications/special-resources/plot-destroy-ukraine Last accessed: 07.06.2023

44. Zabrodskyi, M., Watling, J., Danylyuk, O. V., Reynolds, N. (2022). Preliminary lessons in conventional warfighting from Russia's invasion of Ukraine. RUSI Special Report. Royal United Services Institute for Defence and Security Studies. Available at: https://rusi.org/explore-our-research/publications/special-resources/preliminary-lessons-conventional-warfighting-russias-invasion-ukraine-february-july-2022 Last accessed: 07.06.2023

45. Watling, J., Danylyuk, O. V., Reynolds, N. (2023). Preliminary lessons from Russia's unconventional operations during the Russo-Ukrainian War. RUSI Special Report. Royal United Services Institute for Defence and Security Studies. Available at: https://rusi.org/explore-our-research/publications/special-resources/preliminary-lessons-russias-unconventional-operations-during-russo-ukrainian-war-february-2022 Last accessed: 07.06.2023

46. Tanriverdi, H., Munzinger, H., Rojkov, A. (2023). Putins Krieg im Netz (podcast). Spiegel Original. Available at: https://www.spiegel.de/ausland/putins-krieg-im-netz-podcast-blackout-folge-1-a-74a874e5-e259-4ab0-90b5-0e896f456a15

47. Helmus, T., Bodine-Baron, E., Radin, A., Magnuson, M., Mendelsohn, J., Marcellino, W. et al. (2018). Russian Social Media Influence: Understanding Russian Propaganda in Eastern Europe. RAND Corporation, 148. https://doi.org/10.7249/rr2237

48. Tidy, J. (2022). Ukrainian power grid "lucky" to withstand Russian cyber-attack. BBC. Available at: https://www.bbc.com/news/technology-61085480

49. Mueller, G. B., Jensen, B., Valeriano, B., Maness, R. C., Macias, J. M. (2023). Cyber operations during the Russo-Ukrainian War: From strange patterns to alternative futures. Center for Strategic & International Studies. Available at: https://www.csis.org/analysis/cyber-operations-during-russo-ukrainian-war Last accessed: 07.06.2023

50. Schectman, J., Bing, C., Pearson, J. (2022). Ukrainian cyber resistance group targets Russian power grid, railways. Reuters. Available at: https://www.reuters.com/technology/ukrainian-cyber-resistance-group-targets-russian-power-grid-railways-2022-03-01/

51. Tidy, J. (2023). Meet the hacker armies on Ukraine's cyber front line. BBC. Available at: https://www.bbc.com/news/technology-65250356

52. Nickerson, R. S. (1998). Confirmation bias: A ubiquitous phenomenon in many guises. Review of General Psychology, 2 (2), 175–220. https://doi.org/10.1037//1089-2680.2.2.175

53. Muradov, I. (2019). The Donbas conflict as a form of hybrid warfare: A neoclassical realist analysis. [PhD thesis, Middle East Technical University]. Available at: https://open.metu.edu.tr/handle/11511/45129

54. Matveeva, A. (2018). Through times of trouble: Conflict in southeastern Ukraine explained from within. Lanham, Boulder, New York, London: Lexington Books, 337.

55. De Benedictis, K. (2021). Russian 'hybrid warfare' and the annexation of Crimea: The modern application of Soviet political warfare. Bloomsbury Publishing, 280.

56. Rid, T. (2020). Active measures: The secret history of disinformation and political warfare-Farrar, Straus and Giroux, 528.

57. Kuzio, T. (2017). Putin's war against Ukraine: Revolution, nationalism, and crime. CreateSpace/University of Toronto, 474.

58. The US Army in Multi-Domain Operations 2028. TRADOC Pamphlet 525-3-1 (2018). US Army Training and Doctrine Command (TRADOC). Fort Eustis VA, US Army. Available at: https://adminpubs.tradoc.army.mil/pamphlets/TP525-3-1.pdf

59. Army Unified Network Plan 2021 (2021). Enabling multi-domain operations. U.S. Army, 18.

60. Retter, L., Hernandez, Z., Caves, B., Hughes, M., Knack, A. (2021). Global Mobility: Future Force Design 2040. Research Reports A1309-1. RAND Corporation, 79. doi: https://doi.org/10.7249/rra1309-1

61. Gady, F-S., Stronell, A. (2020). Cyber Capabilities and MDO in Future High-Intensity Warfare in 2030. Cyber Threats and NATO 2030: Horizon Scanning and Analysis. Tallin: NATO CCD-COE, 151–176.

62. Army Futures Command Concept for Maneuver in Multi-Domain Operations 2028. AFC Pam 71-20-1. U.S. Army Futures Command Futures and Concepts Center, 90.

63. Army Installations Strategy Supporting the Army in Multiple Domains (2020). US Army, 21. Available at: https://armypubs.army.mil/epubs/DR_pubs/DR_a/ARN32810-SD_07_STRATE-GY_NOTE_2020-01-000-WEB-1.pdf Last accessed: 18.04.2023

64. Army Multi-Domain Transformation: Ready to Win in Competition and Conflict (2016). Chief of Staff Paper No.1 Unclassified Version Headquarters. Department of the Army, 39.

65. Army Doctrine Publication ADP 3-0, Operations (2019). Headquarters Department of the Army Washington, 102.

66. Field Manual FM 3-0 Operations (2022). Headquarters Department of the Army DC. Washington, 280. Available at: https://irp.fas.org/doddir/army/fm3-0.pdf

67. GIS "ARTA" automated command and control system. Available at: www.gisarta.org Last accessed: 01.02.2023

68. Ukrainian Military Performance and Outlook (2022). US Congressional Research Service. In Focus 12150. Available at: https://www.everycrsreport.com/files/2022-11-03_IF-12150_275b6f8fc17485ebaf1c9306c5f9d07fb4058d20.pdf

69. Field Manual 3-0 Operations (2022). Headquarters Department of the Army. Washington, 280. Available at: https://irp.fas.org/doddir/army/fm3-0.pdf

70. The U.S. Army in Multi-Domain Operations 2028 (2018). TRADOC Pamphlet 525-3-1, 100. Available at: https://adminpubs.tradoc.army.mil/pamphlets/TP525-3-1.pdf Last accessed: 01.02.2023

71. The 2022 National Defence Strategy of the United States of America (2022). National Defence Strategy, 80. Available at: https://media.defence.gov/2022/Oct/27/2003103845/-1/-1/1/2022-NATIONAL-DEFENSE-STRATEGY-NPR-MDR.PDF Last accessed: 01.02.2023

72. Judson, J. (2022). US Army adopts new multidomain operations doctrine. DefenceNews. Available at: https://www.defencenews.com/land/2022/10/10/us-army-adopts-new-multi-domain-operations-doctrine/ Last accessed: 01.02.2023

73. Guidance. Multi-Domain Integration (2022). Available at: https://www.gov.uk/guidance/multi-domain-integration Last accessed: 01.02.2023

74. Dinsdale, R. (2021). Multi-Domain Integration Demystified. Available at: https://stratcommand.blog.gov.uk/2021/10/11/multi-domain-integration-demystified/ Last accessed: 01.02.2023

75. Decision of the National Security and Defence Council made on August 20, 2021 and approved the Strategic Defence Bulletin of Ukraine (2021). Decree No. 473/2021. 17.09.2021. Available at: https://www.president.gov.ua/en/news/glava-derzhavi-zatverdiv-strategich-nij-oboronnij-byuleten-uk-70713 Last accessed: 01.02.2023

76. Hoehn, J. R. (2022). Joint All-Domain Command and Control: Background and Issues for Congress. Congressional Research Service. Available at: https://sgp.fas.org/crs/natsec/R46725.pdf Last accessed: 01.02.2023

77. Summary of the Joint All-domain Command & Control (JADC2) strategy (2022). Department of Defence, 12. Available at: https://media.defence.gov/2022/mar/17/2002958406/-1/-1/1/summary-of-the-joint-all-domain-command-and-control-strategy.pdf Last accessed: 01.02.2023

78. DoD Announces Release of JADC2 Implementation Plan (2022). US Department of Defence. Available at: https://www.defence.gov/News/Releases/Release/Article/2970094/dod-an-nounces-release-of-jadc2-implementation-plan/ Last accessed: 01.02.2023

79. Science & Technology Trends 2020–2040 (2020). NATO Science & Technology Organization, 160. Available at: https://www.nato.int/nato_static_fl2014/assets/pdf/2020/4/pdf/190422-ST_Tech_Trends_Report_2020-2040.pdf Last accessed: 01.02.2023

80. Palavenis, D. (2022). Options for Small NATO Countries to Prepare for Multi-Domain Operations. Small Wars Journal. Available at: https://smallwarsjournal.com/jrnl/art/op-tions-small-nato-countries-prepare-multi-domain-operations Last accessed: 01.02.2023

81. Leonkov, A. (2020). Vse infoputi k pobede vedut v Natcionalnyi tcentr upravleniia oboro-noi. Zvezda. Available at: https://zvezdaweekly.ru/news/20208172016-kGYTT.html Last accessed: 01.02.2023

82. Melnyk, T. (2022). IT-khaos na sluzhbi ZSU. Sotni tysiach viiskovykh korystuiutsia ri-znym softom, yakyi rozrobyly volontery. Chy nebezpechna taka detsentralizatsiia. Forbes. Available at: https://forbes.ua/innovations/it-khaos-na-sluzhbi-zsu-sotni-tisyach-viyskov-ikh-koristuyutsya-riznim-softom-yakiy-rozrobili-volonteri-chi-nebezpechna-taka-detsentral-izatsiya-14112022-9700?fbclid=IwAR3cqQrC5jUBFYebSK6eHzMkOUgkngQ_Km6inxX1ck-T2LsiOAGrKYSOlhXg Last accessed: 01.02.2023

83. Systema upravlinnia "Dzvin-AS" stala na ozbroiennia Ukrainy (2022). Militarnyi. Available at: https://mil.in.ua/uk/news/systema-upravlinnya-dzvin-as-stala-na-ozbroyennya-ukrayiny/ Last accessed: 01.02.2023

84. Uriad ukhvalyv rishennia shchodo zaprovadzhennia systemy Delta v Sylakh oborony (2023). Uriadovyi portal. Available at: https://www.kmu.gov.ua/news/uriad-ukhvalyv-rishennia-shchodo-zaprovadzhennia-systemy-delta-v-sylakh-oborony Last accessed: 01.02.2023

85. Pro vnesennia zmin do Konstytutsii Ukrainy (shchodo stratehichnoho kursu derzhavy na nabuttia povnopravnoho chlenstva Ukrainy v Yevropeiskomu Soiuzi ta v Orhanizatsii Pivnichnoatlantychnoho dohovoru) (2019). Zakon Ukrainy No. 2680-VIII. 07.02.2019. Available at: https://zakon.rada.gov.ua/laws/show/2680-19#Text Last accessed: 25.12.2022

86. Oboronna dopomoha Ukraini: vyklyky y perspektyvy cherez zatiazhnu viinu (2022). Chas "Ch". Available at: https://chasche.com/108699-oboronna-dopomoga-ukrayini-vyklyky-j-perspektyvy-cherez-zatyazhnu-vijnu.html Last accessed: 12.02.2023

87. International Fund for Ukraine (2023). Ministry of Defence. Available at: https://www.gov.uk/guidance/international-fund-for-ukraine-ifu Last accessed: 12.02.2023

88. Yevropeiskyi fond myru: Rada pohodylasia zbilshyty obsiah finansuvannia na 2 miliardy yevro u 2023 rotsi (2022). Predstavnytstvo Yevropeiskoho Soiuzu v Ukraini. Available at: https://www.eeas.europa.eu/delegations/ukraine/європейський-фонд-миру-рада-погодилася-збільшити-обсяг-фінансування-на-2-мільярди-євро-у-2023-році_uk?s=232 Last accessed: 12.01.2023

89. Ukraina otrymala dorozhniu kartu vstupu v systemu Mekhanizmu tsyvilnoho zakhystu YeS (2022). Uriadovyi portal. Available at: https://www.kmu.gov.ua/news/ukraina-otrymala-dorozhnu-kartu-vstupu-v-systemu-mekhanizmu-tsyvilnoho-zakhystu-ies Last accessed: 12.01.2023

90. Na bazi "Ramshtain" vidbulasia zustrich ministriv oborony ponad 40 krain: pidsumky perehovoriv (2022). Fokus. Available at: https://focus.ua/uk/voennye-novosti/513450-na-baze-ramshtayn-proshla-vstrecha-ministrov-oborony-bolee-40-stran-itogi-peregovorov Last accessed: 18.11.2022

91. "Ramshtain-2": u Pentahoni zaiavyly pro druhe zasidannia kontaktnoi hrupy z oborony Ukrainy (2022). Radio svoboda. Available at: https://www.radiosvoboda.org/a/news-ramshtayn-2-u-pentahoni-zayavyly-pro-druhe-zasidannya-kontaktnoyi-hrupy-z-oborony-ukrainy/31861239.html Last accessed: 18.11.2022

92. Rezultaty "Ramshtain-3": ZSU otrymaiut vid Velykobrytanii 20 samokhidok M109, – Volles (2022). Fokus. Available at: https://focus.ua/uk/voennye-novosti/519265-rezultaty-ramshtayn-3-vsu-poluchat-ot-velikobritanii-20-samohodok-m109-uolles Last accessed: 18.11.2022

93. Zbroia dlia sushi, moria ta neba: ministr oborony pidbyv pidsumky "Ramshtaina" (2022). Fokus. Available at: https://focus.ua/uk/voennye-novosti/522883-oruzhie-dlya-sushi-morya-i-neba-ministr-oborony-podvel-itogi-ramshtayna Last accessed: 18.11.2022

94. Zustrich iz velykymy druziamy: Reznikov pidbyv pidsumky "Ramshtain-5" (2022). Fokus. Available at: https://focus.ua/uk/voennye-novosti/528847-vstrecha-s-bolshimi-druzyami-resnikov-podvel-itogi-ramshtayn-5 Last accessed: 14.02.2023

95. Pidsumky "Ramshtain-5": yaku novu tekhniku poobitsialy Ukraini na zustrichi u Nimechchyni (2022). Fokus. Available at: https://focus.ua/uk/voennye-novosti/528656-itogi-ramshtayn-5-ka-kuyu-novuyu-tehniku-poobeshchali-ukraine-na-vstreche-v-germanii Last accessed: 18.11.2022

96. Ukraine Support Tracker Data. Available at: https://www.ifw-kiel.de/topics/war-against-ukraine/ukraine-support-tracker/ Last accessed: 18.11.2022

97. Government support to Ukraine: Military aid, € billion (2023). Available at: https://app.23de-grees.io/view/KJpesgWQv1CmxoMr-bar-stacked-horizontal-figure-5_scv Last accessed: 18.11.2022

98. The Military Balance 2022 (2022). Available at: https://www.iiss.org/publications/the-mili-tary-balance/the-military-balance-2022 Last accessed: 18.02.2022

99. Winfrey, M. (2023). Ukraine Seeks Weapons to Beat Back Russia: Here's What It's Got. Bloomberg. Available at: https://www.bloomberg.com/news/articles/2023-01-15/ukraine-seeks-weapons-to-beat-back-russia-here-s-what-it-s-got?srnd=premium-europe Last accessed: 20.01.2023

100. Memorandum pro harantii bezpeky u zv'iazku z pryiednanniam Ukrainy do Dohovoru pro neroz-povsiudzhennia yadernoi zbroi (1994). Memorandum No. 998_158. 05.12.1994. Available at: https://zakon.rada.gov.ua/laws/show/998_158#Text Last accessed: 20.01.2023

101. 400 milioniv dolariv dodatkovoi viiskovoi dopomohy SShA Ukraini. U.S. Embassy in Ukraine. Available at: https://ua.usembassy.gov/uk/additional-u-s-military-assistance-for-ukraine/ Last accessed: 18.02.2023

102. Immediate release (2022). Fact Sheet on U.S. Security Assistance to Ukraine. Available at: https://media.defence.gov/2022/oct/18/2003098052/-1/-1/1/ukraine-fact-sheet-oct-14.pdf Last accessed: 18.02.2023

103. U YeS shukaiut shliakhy dlia finansovoi dopomohy Ukraini – €5 miliardiv shchomisiatsia (2022). Multymediina platforma inomovlennia Ukrainy "Ukrinform". Available at: https://www.ukrin-form.ua/rubric-economy/3498244-u-es-sukaut-slahi-dla-finansovoi-dopomogi-ukraini-5-mi-lardiv-somisaca.html Last accessed: 18.11.2022

104. Finansuvannia derzhavnoho biudzhetu Ukrainy z pochatku povnomasshtabnoi viiny (2023). Ministerstvo finansiv Ukrainy. Available at: https://mof.gov.ua/uk/news/ukraines_state_bud-get_financing_since_the_beginning_of_the_full-scale_war-3435

105. Osnovna informatsiia. Ministerstvo finansiv Ukrainy. Available at: https://mof.gov.ua/uk/over-view-340 Last accessed: 27.02.2023

106. UK injects $100m into Ukraine's economy as Canadian and Dutch Prime Ministers are wel-comed to Downing Street (2022). Available at: https://www.gov.uk/government/news/uk-in-jects-100m-into-ukraines-economy-as-canadian-and-dutch-prime-ministers-are-welcomed-to-downing-street Last accessed: 18.11.2022

107. PM to say to G7 leaders: We must keep up our resolve on Ukraine (2022). Gov.UK. Available at: https://www.gov.uk/government/news/pm-to-say-to-g7-leaders-we-must-keep-up-our-resolve-on-ukraine Last accessed: 18.11.2022

108. Russland-Ukraine-News live: Atomenergiebehörde sorgt sich um Tschernobyl. Spiegel. Available at: https://www.spiegel.de/ausland/russland-ukraine-news-am-dienstag-russland-bietet-neue-feuerpause-an-a-c4f19926-e9f8-4eff-bb0d-c063e5cdf20d Last accessed: 27.09.2022

109. Canada's response to the Russian invasion of Ukraine (2022). GAC. Canada, Global Affairs. Available at: https://www.international.gc.ca/world-monde/issues_development-enjeux_developpement/response_conflict-reponse_conflits/crisis-crises/ukraine.aspx?lang=eng Last accessed: 18.11.2022

110. Minfin: Ukraina otrymala 1 mlrd kanadskykh dolariv vid Kanady (2022). Uriadovyi portal. Available at: https://www.kmu.gov.ua/news/minfin-ukrayina-otrimala-1-mlrd-kanadskih-dolariv-vid-kanadi Last accessed: 27.09.2022

111. Rīga approves 500,000 euro assistance to Ukraine (2022). Available at: https://eng.lsm.lv/article/politics/politics/riga-approves-500000-euro-assistance-to-ukraine.a445224/ Last accessed: 18.11.2022

112. Latvia to send 1.2 million euros to Ukrainian army (2022). Available at: https://eng.lsm.lv/article/society/defence/latvia-to-send-12-million-euros-to-ukrainian-army.a445919/ Last accessed: 18.11.2022

113. Lithuania to send €4 million medical, military assistance to Ukraine (2022). Available at: https://www.lrt.lt/en/news-in-english/19/1628536/lithuania-to-send-eur4-million-medical-military-assistance-to-ukraine Last accessed: 27.09.2022

114. Minfin: Niderlandy nadadut Ukraini kredyt na sumu do 200 mln yevro na pilhovykh umovakh (2022). Uriadovyi portal. Available at: https://www.kmu.gov.ua/news/minfin-niderlandi-nadadut-ukrayini-kredit-na-sumu-do-200-mln-yevro-na-pilgovih-umovah Last accessed: 18.02.2023

115. Wie Deutschland die Ukraine unterstützt. Available at: https://www.zdf.de Last accessed: 18.11.2022

116. Korean Government's Decision Regarding Situation in Ukraine (2022). Ministry of foreign affairs. Available at: https://www.mofa.go.kr/eng/brd/m_5676/view.do?seq=322003 Last accessed: 27.09.2022

117. Communiqué of Narodowy Bank Polski. Available at: https://www.nbp.pl/homen.aspx?f=/srodeken.htm Last accessed: 18.11.2022

118. Slovenija zaprla zračni prostor za Ruse. Available at: https://www.siol.net Last accessed: 27.09.2022

119. Ukraina otrymala hrant vid SShA u rozmiri $1,3 mlrd (2022). Ministerstvo finansiv Ukrainy. Available at: https://www.mof.gov.ua/uk/news/ukraina_otrimala_grant_vid_ssha_u_rozmiri_13_mlrd-3502 Last accessed: 27.09.2022

120. US Congress gives final approval to $13.6bn Ukraine aid bill. Available at: https://www.aljazeera.com/news/2022/3/11/us-congress-gives-final-approval-to-13-6b-ukraine-aid-budget Last accessed: 27.09.2022

121. Jeffries, H. S. (2022). H.R.2471 – 117th Congress (2021–2022): Consolidated Appropriations Act. Available at: https://www.congress.gov Last accessed: 27.09.2022

122. France announces 300 mln euros in aid for Ukraine-Xinhua. Available at: https://english.news.cn/20220226/db6b74338bd1401393a59de84012494b/c.html Last accessed: 27.09.2022

123. Japan to provide $200min aid to Ukraine (2022). LB.ua news portal. Available at: https://en.lb.ua/news/2022/02/28/9490_japan_provide_200m_aid.html Last accessed: 27.09.2022

124. Ukraina otrymaie hrant v 1 mlrd yevro vid Nimechchyny (2022). Ministerstvo finansiv Ukrainy. Available at: https://mof.gov.ua/uk/news/ukraina_otrimaie_grant_v_1_mlrd_ievro_vid_nimechchini-3496 Last accessed: 27.09.2022

125. Kanada vydiliaie pryblyzno $7,6 mln na heneratory dlia Ukrainy (2022). Available at: https://gordonua.com/ukr/news/money/kanada-vidiljaje-blizko-7-6-mln-na-generatori-dlja-ukrajini-1638040.html Last accessed: 27.03.2023

126. Ukraina otrymala vid Kanady 500 mln kanadskykh dolariv (2022). Ministerstvo finansiv Ukrainy. Available at: https://mof.gov.ua/uk/news/ukraine_received_cad_500_million_from_canada-3771 Last accessed: 27.03.2023

127. Uriad Ukrainy otrymaie vid Kredytnoi ustanovy dlia vidbudovy (KfW) 7,4 mln yevro dlia pilhovoho kredytuvannia malykh ta serednikh pidpryiemstv. Uriadovyi portal. Available at: https://www.kmu.gov.ua/news/uryad-ukrayini-otrimaye-vid-kreditnoyi-ustanovi-dlya-vidbudovi-kfw-74-mln-yevro-dlya-pilgovogo-kredituvannya-malih-ta-serednih-pidpriyemstv

128. Yevropeiskyi bank rekonstruktsii ta rozvytku spriamuie kredyt na pidtrymku likvidnosti AT "Ukrzaliznytsia". Uriadovyi portal. Available at: https://www.kmu.gov.ua/news/yevropejskij-bank-rekonstrukciyi-ta-rozvitku-spryamuye-kredit-na-pidtrimku-likvidnosti-ukrzaliznicya Last accessed: 27.09.2022

129. Bennett, V. (2022). YeBRR posyliuie enerhetychnu bezpeku Ukrainy kredytom do €300 mln dlia "Naftohazu". European Bank for Reconstruction and Development. Available at: https://www.ebrd.com/ebrd-bolsters-ukraines-energy-security-with-up-to-300mln-for-naftogaz Last accessed: 27.09.2022

130. Ahrokholdynh MKhP Kosiuka otrymaie vid YeBRR 24 miliony yevro na pidtrymku likvidnosti (2022). Biznes Tsenzor. Available at: https://biz.censor.net/n3349309 Last accessed: 27.09.2022

131. Press corner. European Commission – European Commission. Available at: https://ec.europa.eu/commission/presscorner/home/e%20n Last accessed: 27.09.2022

132. Ukraina otrymaie vid YeS dopomohu na 330 mln yevro dlia pidtrymky naselennia ta ekonomiky v umovakh viiny (2022). Yevrointehratsiinyi portal. Available at: https://eu-ua.kmu.gov.ua/node/4630 Last accessed: 27.09.2022

133. European Commission proposes first €1 billion tranche of the new macro-financial assistance for Ukraine (2022). An official website of the European Union. Available at: https://ec.europa.eu/commission/presscorner/detail/e%20n/ip_22_4264 Last accessed: 27.09.2022

134. Ukraine Flash Appeal (2022). OCHA. Available at: https://www.reliefweb. Last accessed: 18.11.2022

135. Peseckyte, G. (2022). One million refugees left Ukraine, UN raises $1.5 billion. Available at: https://www.euractiv.com/section/europe-s-east/news/one-million-refugees-left-ukraine-un-raises-1-5-billion/ Last accessed: 27.09.2022

136. Kyryliuk, T. (2022). YeS vydilyv 50 milioniv yevro na vidnovlennia Kyivshchyny. Available at: https://www.dw.com/uk/es-vidiliv-50-miljoniv-evro-na-vidnovlenna-kiivsini/a-64111201?maca=ukr-rss-ukrnet-ukr-all-3816-xml Last accessed: 27.02.2023

137. Mariupols Stadtverwaltung spricht von 1207 zivilen Opfern in neun Tagen (2022). Russland-Ukraine-News. Available at: https://www.spiegel.de/ausland/russland-ukraine-news-am-mittwoch-fitch-stuft-russland-weiter-ab-zahlungsausfall-droht-unmittelbar-a-2c842f49-4395-4000-a445-2b666ccea05e Last accessed: 27.09.2022

138. U G7 vedut pidhotovku paketu dopomohy dlia Ukrainy v rozmiri 15 miliardiv yevro – The Washington Post (2022). Analitychnyi portal "Slovo i dilo". Available at: https://www.slovoidilo.ua/2022/05/19/novyna/svit/g7-vedut-pidhotovku-paketu-dopomohy-ukrayiny-rozmiri-15-milyardiv-yevro-the-washington-post Last accessed: 27.09.2022

139. Ukraina otrymala 424,6 mln yevro vid Velykobrytanii (2022). Ministerstvo finansiv Ukrainy. Available at: https://mof.gov.ua/uk/news/ukraina_otrimala_4246_mln_ievro_vid_velikobritanii-3503 Last accessed: 27.09.2022

140. Ukraina otrymala vid Kredytnoi ustanovy dlia vidbudovy (KfW) 150 mln yevro dlia finansuvannia sotsialnykh vydatkiv (2022). Ministerstvo finansiv Ukrainy. Available at: https://www.kmu.gov.ua/news/ukrayina-otrimala-vid-kreditnoyi-ustanovi-dlya-vidbudovi-kfw-150-mln-yevro-dlya-finansuvannya-socialnih-vidatkiv Last accessed: 27.09.2022

141. Repko, M. (2023). Ohliad proiektu derzhavnoho biudzhetu na 2023 rik (pershe chytannia). Tsentr ekonomichnoi stratehii. Available at: https://ces.org.ua/state-budget-draft-2023/ Last accessed: 27.03.2023

142. Derzhavna sluzhba statystyky Ukrainy. Available at: https://www.ukrstat.gov.ua Last accessed: 27.09.2022

143. KfW nadast 32,5 mln yevro kredytnykh koshtiv na modernizatsiiu merezhi elektroperedachi NEK "Ukrenerho" (2022). Ministerstvo finansiv Ukrainy. Available at: https://www.mof.gov.ua/uk/news/kfw_will_provide_eur_325_million_loan_for_the_modernization_of_the_electricity_transmission_network_of_npc_ukrenergo-3767 Last accessed: 27.02.2023

144. Abramova, Yu. (2022). "Ukrenerho" otrymaie 372 mln yevro na remont poshkodzhenykh rosiiskymy raketamy enerhoobiektiv – YeBRR. Available at: https://tsn.ua/ato/ukrenergo-otrimaye-372-mln-yevro-na-remont-poshkodzhenih-rosiyskimi-raketami-energoob-yektiv-yebrr-2208268.html Last accessed: 27.02.2023

145. Derzhavnyi borh ta harantovanyi derzhavoiu borh. Ministerstvo finansiv Ukrainy. Available at: https://mof.gov.ua/uk/derzhavnij-borg-ta-garantovanij-derzhavju-borg Last accessed: 27.02.2023

146. Poiasniuvalna zapyska do proektu Zakonu Ukrainy "Pro Derzhavnyi biudzhet Ukrainy na 2023 rik" (2022). Available at: https://itd.rada.gov.ua/billInfo/Bills/pubFile/1527959 Last accessed: 27.02.2023

147. Pro zatverdzhennia Poriadku lohistychnoho zabezpechennia syl oborony pid chas vykonannia zavdan z oborony derzhavy, zakhystu yii suverenitetu, terytorialnoi tsilisnosti ta nedotor-kannosti (2018). Postanova Kabinetu Ministriv Ukrainy No. 1208. 27.12.2018. Available at: https://zakon.rada.gov.ua/laws/show/1208-2018-%D0%BF#Text Last accessed: 21.10.2022

148. Shulman, O. (2020). Lohistychne planuvannia NATO ta suchasni vyklyky. Available at: https://armyinform.com.ua/2020/02/27/logistychne-planuvannya-nato-ta-suchasni-vyklyky Last accessed: 13.09.2022

149. NATO dozvolylo ZSU vykorystovuvaty systemu LOGFAS – shcho tse? Ukrainian Military Pages. Available at: https://www.ukrmilitary.com/2019/08/logfas.html Last accessed: 21.10.2022

150. Reznikov, O. (2022). Ramshtain i NATO rozshyriat pidtrymku Ukrainy. Available at: https://www.facebook.com/reznikovoleksii/posts/525216946281328 Last accessed: 17.11.2022

151. Ukraina zaprovadyla systemu obliku y kontroliu lohistyky NATO – Minoborony (2022). Available at: https://bykvu.com/ua/bukvy/ukraina-zaprovadyla-systemu-obliku-i-kontroliu-lohistyky-na-to-minoborony Last accessed: 21.10.2022

152. Dlia pokrashchennia lohistyky ZSU vprovadzhuiut natovsku prohramu Logfas (2022). Available at: https://www.ukrinform.ua/rubric-ato/3630151-dla-pokrasenna-logistiki-zsu-vprovad-zuut-nativsku-programu-logfas.html Last accessed: 10.12.2022

153. Konstytutsiia Ukrainy (1996). Zakon Ukrainy No. 254k/96-VR. 28.06.1996. Available at: https://zakon.rada.gov.ua/laws/show//254к/96-вр#Text Last accessed: 10.11.2022

154. Pro osnovy natsionalnoho sprotyvu (2021). Zakon Ukrainy No. 1702-IX. 16.07.2021. Available at: https://zakon.rada.gov.ua/laws/show/1702-20#Text Last accessed: 10.02.2023

155. Lobko, M. M. (2018). Terytorialna oborona Ukrainy yak faktor posylennia oboronozdatnosti derzhavy. Nauka i oborona, 2, 29–40. doi: https://doi.org/10.33099/2618-1614-2018-3-2-29-39

156. Pro zatverdzhennia Polozhennia pro dobrovolchi formuvannia terytorialnykh hromad (2021). Postanova Kabinetu Ministriv Ukrainy No. 1449. 29.12.2021. Available at: https://zakon.rada.gov.ua/laws/show/1449-2021-%D0%BF#Text Last accessed: 10.11.2022

157. Pro zvilnennia komandyriv ta rozformuvannia dobrovolchykh formuvan mista Kyieva (2022). Nakaz Komanduvacha Syl TrO No. 327. 04.11.2022.

158. Pro zatverdzhennia Poriadku zastosuvannia chlenamy dobrovolchykh formuvan terytorialnykh hromad osobystoi myslyvskoi zbroi, striletskoi zbroi, inshykh vydiv ozbroiennia ta boiepry-pasiv do nykh pid chas vykonannia zavdan terytorialnoi oborony (2021). Postanova Kabinetu Ministriv Ukrainy No. 1448 29.12.2021. Available at: https://zakon.rada.gov.ua/laws/show/1448-2021-%D0%BF#Text Last accessed: 10.11.2022

159. Reznikova, O. O. (2022). Natsionalna stiikist v umovakh minlyvoho bezpekovoho seredovyshcha. Kyiv: NISD, 455.

160. Pyrozhkov, S. I. (2022). Vstup. Natsionalna stiikist Ukrainy: stratehiia vidpovidi na vyklyky ta vyperedzhennia hibrydnykh zahroz: natsionalna dopovid. Kyiv: NAN Ukrainy, 552. doi: https://doi.org/10.53317/978-966-02-9908-5

161. Bruneau, M., Reinhorn, A. (2004). Seismic Resilience of Communities — Conceptualization and Operationalization. Performance-based Seismic Design Concepts and Implementation. Bled. Available at: https://www.eng.buffalo.edu/~bruneau/Bruneau-Reinhorn_Bled_Final.pdf Last accessed: 03.11.2022

162. Bonanno, G. (2005). Resilience in the face of potential trauma. Current Directions in Psychological Science, 14 (3), 135–138. doi: https://doi.org/10.1111/j.0963-7214.2005.00347.x

163. Cacioppo, J. T., Reis, H. T., Zautra, A. J. (2011). Social resilience: The value of social fitness with an application to the military. American Psychologist, 66 (1), 43–51. doi: https://doi.org/10.1037/a0021419

164. Barnett, M. D. (2004). Congress must recognize the need for psychological resilience in an age of terrorism. Families, Systems, & Health, 22 (1), 64–66. doi: https://doi.org/10.1037/1091-7527.22.1.64

165. Pyrozhkov, S. I. (2022). National Stability of Ukraine: Security Strategy. Ukrainian Geographical Journal, 2 (118), 3–10. doi: https://doi.org/10.15407/ugz2022.02.003

166. Pro Stratehiiu natsionalnoi bezpeky Ukrainy (2020). Ukaz Prezydenta Ukrainy No. 392/2020. 14.09.2020. Available at: https://www.president.gov.ua/documents/3922020-35037 Last accessed: 22.11.22

167. Pro zaprovadzhennia natsionalnoi systemy stiikosti. Kontseptsiia zabezpechennia natsionalnoi systemy stiikosti (2021). Ukaz Prezydenta Ukrainy No. 479/2021. 27.09.2021. Available at: https://zakon.rada.gov.ua/laws/show/479/2021#Text Last accessed: 03.03.2023

168. Blinov, A. (2023). Chy pokhytnuv enerhetychnyi teror finansovu stabilnist? Ekonomichna pravda. Available at: https://www.epravda.com.ua/columns/2023/04/17/699171/ Last accessed: 30.05.2023

169. Lukashchuk, L. (2023). Reforma systemy ekstrenoi medychnoi dopomohy: analiz i potochni rezultaty. Available at: https://medplatforma.com.ua/article/1937-sistema-ekstreno-medichno-dopomogi-v-ukran Last accessed: 30.05.2023

170. Pyrozhkov, S. I. et al. (Eds.) (2022). Natsionalna stiikist Ukrainy: stratehiia vidpovidi na vyklyky ta vyperedzhennia hibrydnykh zahroz: natsionalna dopovid. Kyiv: NAN Ukrainy, 552. doi: https://doi.org/10.53317/978-966-02-9908-5

171. Dopomoha NATO dlia Ukrainy perevyshchyla €100 miliardiv — Stoltenberh. Available at: https://www.ukrinform.ua/rubric-ato/3676254-dopomoga-nato-ta-kraincleniv-dla-ukraini-perevisila-100-milardiv-stoltenberg.html Last accessed: 03.03.2023

172. Stratehichna kontseptsiia NATO — 2022 (2022). Ukhvalena hlavamy derzhav i uriadiv na Madrydskomu samiti NATO 29 chervnia 2022 roku, 13. Available at: https://www.nato.int/

nato_static_fl2014/assets/pdf/2022/6/pdf/290622-strategic-concept-ukr.pdf Last accessed: 03.05.2023

173. Roepke, W.-D., Thankey, H. (2019). Стійкість: перша лінія оборони. Available at: https://www.nato.int/docu/review/uk/articles/2019/02/27/stjkst-persha-lnya-oboroni/index.html Last accessed: 03.03.2023

174. Commitment to enhance resilience (2016). Available at: https://www.nato.int/cps/en/natohq/official_texts_133180.htm?selectedLocale=en Last accessed: 03.03.2023

175. Warsaw Summit Communiqué. Issued by the Heads of State and Government participating in the meeting of the North Atlantic Council in Warsaw 8-9 July 2016 (2016). Available at: https://www.nato.int/cps/en/natohq/official_texts_133169.htm?selectedLocale=uk Last accessed: 03.03.2023

176. Resilience, civil preparedness and Article 3 (2023). NATO. Available at: https://www.nato.int/cps/en/natohq/topics_132722.htm?selectedLocale=en Last accessed: 03.03.2023

177. Shelest, H. (2021). Kontseptsiia stiikosti NATO ta Ukraina. Available at: https://www.academia.edu/67860339/КОНЦЕПЦІЯ_СТІЙКОСТІ_НАТО_ТА_УКРАЇНА Last accessed: 03.03.2023

178. Brussels Summit Declaration (2018). NATO. Available at: https://www.nato.int/cps/uk/natohq/official_texts_156624.htm?selectedLocale=uk Last accessed: 03.03.2023

179. Komiunike Briusselskoho samitu (2021). NATO. Available at: https://www.nato.int/cps/uk/natohq/news_185000.htm?selectedLocale=uk Last accessed: 03.03.2023

180. Strengthened Resilience Commitment (2021). NATO. Available at: https://www.nato.int/cps/en/natohq/official_texts_185340.htm?selectedLocale=uk Last accessed: 03.03.2023

181. Viiskovo-Morski Syly vzialy uchast u navchanniakh "Neporushna stiikist — 2021" (2021). Available at: https://armyinform.com.ua/2021/09/17/vijskovo-morski-syly-vzyaly-uchast-u-navchannyah-neporushna-stijkist-2021/ Last accessed: 03.03.2023

182. Resilience Review Paper. Experts of the PROTECT program (Promoting Reforms Objectives through Technical Expertise and Capacity Transfer) (2022). Implemented by Alinea International in Ukraine as well as experts of the Government Office, 77.

183. Rouet, G., Pascariu, G. C. (Eds.) (2019). Resilience and the EU's Eastern Neighbourhood Countries: From Theoretical Concepts to a Normative Agenda. Cham, 598. doi: https://doi.org/10.1007/978-3-030-25606-7

184. Reznik, O. S. (2022). Hromadianska identychnist ta terytorialna zghurtovanist yak sotsialni pokaznyky natsionalnoi stiikosti. Natsionalna stiikist Ukrainy: stratehiia vidpovidi na vyklyky ta vyperedzhennia hibrydnykh zahroz: natsionalna dopovid. Kyiv: NAN Ukrainy, 552. doi: https://doi.org/10.53317/978-966-02-9908-5

185. Stehnii, O. H. (2022). Ekolohichnyi vymir natsionalnoi stiikosti: suspilni nastroi ta potreby. Natsionalna stiikist Ukrainy: stratehiia vidpovidi na vyklyky ta vyperedzhennia hibrydnykh zahroz: natsionalna dopovid. Kyiv: NAN Ukrainy, 552. doi: https://doi.org/10.53317/978-966-02-9908-5

186. Voienno-istorychnyi opys rosiisko-ukrainskoi viiny (liutyi — berezen 2022 roku) (2022). Kyiv: HSh ZSU, 114.

187. Russian Army operates around 170 battalion tactical groups – defence chief (2021). TASS. Available at: https://tass.com/defence/1324461 Last accessed: 10.02.2023

188. Batalionna taktychna hrupa. Available at: https://uk.wikipedia.org/wiki/Батальйонна_тактич-на_група Last accessed: 10.02.2023

189. Neadekvatna orhanizatsiia nazemnykh viisk Rosii, yak odna z prychyn yikhnikh nevdach u vi-ini z Ukrainoiu – chastyna 1 (2022). Available at: https://defence-ua.com/army_and_war/neadekvatna_organizatsija_nazemnih_vijsk_rosiji_jak_odna_z_prichin_jihnih_nevdach_u_vi-jni_z_ukrajinoju_chastina_1-7879.html Last accessed: 10.02.2023

190. Davydov, I., Tarhonskyi, V., Openko, P., Myroniuk, M. (2022). The role and place of the separate material and technical supply brigade in the system of material and technical supply of the Armed Forces of the Russian Federation. Naukovi Pratsi Derzhavnoho Naukovo-Dos-lidnoho Instytutu Vyprobuvan i Sertyfikatsii Ozbroiennia Ta Viiskovoi Tekhniky, 12 (3), 25–33. doi: https://doi.org/10.37701/dndivsovt.13.2022.03

191. RF ne vdaietsia vyrishyty problemy zabezpechennia okupatsiinykh pidrozdiliv (2022). Available at: https://mind.ua/news/20242170-rf-ne-vdaetsya-virishiti-problemi-zabezpechennya-okup-acijnih-pidrozdiliv Last accessed: 10.02.2023

192. Zabuly pro lohistyku. Chomu armiia Rosii zaznaie porazky – CNN (2022). Available at: https://nv.ua/ukr/world/geopolitics/rosiyski-viyskovi-ne-otrimuyut-ozbroyennya-cherez-problemi-lo-gistiki-cnn-50233759.html Last accessed: 10.02.2023

193. Tymchasovyi boiovyi statut mekhanizovanykh viisk Sukhoputnykh viisk Zbroinykh Syl Ukrainy. Chastyna 1 (bryhada) (2021). Nakaz komanduvacha Sukhoputnykh viisk Zbroinykh Syl Ukrainy 09 bereznia 2021 roku No. 152. БП 3-(01,04)11(55).01, 111.

194. Tymchasovyi boiovyi statut tankovykh viisk Sukhoputnykh viisk Zbroinykh Syl Ukrainy. Chas-tyna 1 (bryhada) (2021). Nakaz komanduvacha Sukhoputnykh viisk Zbroinykh Syl Ukrainy 09 bereznia 2021 roku No. 153. Berezen 2021. BP 3-(02)11(55).01, 110.

195. Field Manual 3-96. Brigade Combat Team (2021). Headquarters Department of the Army Washington. Available at: https://armypubs.army.mil/epubs/DR_pubs/DR_a/ARN31505-FM_3-96-000-WEB-1.pdf Last accessed: 12.03.2023

196. Cranny-Evans, S. (2022). The Role of Artillery in a War Between Russia and Ukraine. Avail-able at: https://rusi.org/explore-our-research/publications/commentary/role-artillery-war-be-tween-russia-and-ukraine Last accessed: 27.03.2023

197. Operational information regarding the #russian_invasionon 24:00, March 5 (2022). Ministry of Defence of Ukraine. Available at: https://www.kmu.gov.ua/en/news/operativna-informaci-ya-stanom-na-2400-05032022-shchodo-rosijskogo-vtorgnennya Last accessed: 27.03.2023

198. ATP 3-94.2. Deep Operations (2016). Headquarters Department of the Army. Washington. Available at: https://irp.fas.org/doddir/army/atp3-94-2.pdf

199. Tarasov, V. M., Tymoshenko, R. I., Zahorka, O. M. (2015). Rozviduvalno-udarni, rozviduval-no-vohnevi kompleksy (pryntsypy pobudovy, otsinka efektyvnosti boiovoho zastosuvannia). Kyiv: NUOU.

200. Prymirenko, V., Shevtsov, R., Open'ko, P. (2022). Long-Range Assets Effectivity Dependence on the Method of Their Employment. Advances in Military Technology, 17 (2), 281–291. doi: https://doi.org/10.3849/aimt.01559

201. Melnyk, T. (2022). Zhaliucha "Kropyva". Yak ukrainske prohramne zabezpechennia dlia artylerystiv vplyvaie na perebih viiny. Zhurnal Forbes Ukraine. Available at: https://forbes.ua/innovations/zhalyucha-kropiva-yak-ukrainske-programne-zabezpechennya-dlya-artileristiv-vplivae-na-khid-viyni-22072022-7054 Last accessed: 27.03.2023

202. Boston, S., Massicot, D. (2017). The Russian Way of Warfare. Rand Corporation. Available at: https://www.rand.org/pubs/perspectives/PE231.html Last accessed: 27.03.2023

203. Boiovyi statut Sukhoputnykh viisk (2020). Armiiska aviatsiia Sukhoputnykh viisk Zbroinykh Syl Ukrainy, zatverdzhenyi nakazom komanduvacha Sukhoputnykh viisk Zbroinykh Syl Ukrainy vid 21 hrudnia 2020 roku No. 990, boiova publikatsiia komandyram vertolitnykh chastyn (pidrozdiliv) z poriadku pidhotovky ta vedennia boiovykh dii, BP 3(7)-12(01).01, 129.

204. Allied Tactical Publication ATP-49 Vol. 2 (2000). Use of helicopters in land operations, 240. Available at: https://www.navedu.navy.mi.th/stg/databasestory/data/laukniyom/ship-active/big-country-ship/United-States/ATP/atp49c2.pdf Last accessed: 21.12.2023

205. Osoblyvosti pidhotovky ta zastosuvannia uhrupovan Zbroinykh Syl Ukrainy v antyterorystychnii opratsii ta operatsii ob'iednanykh syl (2021). Kyiv: NUOU.

206. Boiovyi dosvid zastosuvannia armiiskoi aviatsii v khodi vidbyttia zbroinoi ahresii (liutyi – serpen 2022 roku) (2022). Viiskova navchalno-metodychna publikatsiia orhanam viiskovoho upravlinnia, komandyram vertolitnykh chastyn (pidrozdiliv) Komanduvannia Sukhoputnykh viisk.

207. Field Manual 3-04. Army Aviation (2015). Headquarters Department of the Army. Washington, 130. Available at: https://irp.fas.org/doddir/army/fm3-04.pdf Last accessed: 12.03.2023

208. Pidhotovka ta vykonannia zavdan viiskovymy chastynamy ta pidrozdilamy Sukhoputnykh viisk Zbroinykh Syl Ukrainy za dosvidom rosiisko-ukrainskoi viiny (2022). Kyiv: NUOU.

209. Institute for the Study of War/ Russian Offensive Campaign. Available at: https://www.understandingwar.org

210. Institute for the Study of War/ Ukraine Conflict Updates. Available at: https://www.understandingwar.org/backgrounder/ukraine-conflict-updates

211. Metodychni rekomendatsii pidrozdilam shchodo borotby z bezpilotnymy litalnymy aparatamy iranskoho vyrobnytstva "Shahed-136" ("Heran-2"). Available at: https://sprotyvg7.com.ua/lesson/rekomendacii-pidrozdilam-shhodo-borotbi-z-bezpilotnimi-litalnimi-aparatami-kamikadze-shahed-136-geran-2

212. Boiovyi statut Sukhoputnykh viisk (2021). Viiska protypovitrianoi oborony Sukhoputnykh viisk Zbroinykh Syl Ukrainy.

213. Volodymyr, H., Korshets, O., Korolyuk, N. (2020). Assessment of Possible Mechanisms of Achievement by Russian Federation of Political Aims in Ukraine With the Use of Conceptions of Strategic Paralysis and Operations on Basis of Effects. Scientific Works of Kharkiv National Air Force University, 1 (63), 113–123. doi: https://doi.org/10.30748/zhups.2020.63.15

214. Horbenko, V., Korshets, O. (2022). A Strategic Air Operation as one of the possible instruments in a hybrid war between the Russian Federation against Ukraine. Social Development and Security, 12 (2), 14–30. doi: https://doi.org/10.33445/sds.2022.12.2.2

215. Thiele, R. D. (2018). Chasing the Centre of Gravity in the Age of Accelerations. ISPSW Strategy Series: Focus on Defence and International Security, 550. Available at: https://www.ispsw.com/wp-content/uploads/2018/05/550_Thiele.pdf Last accessed: 20.01.2023

216. Fadok, D. S., Boyd, J., Warden, J. (1995). Air Power's Quest for Strategic Paralysis. School of Advanced Airpower Studies, 59. Available at: https://apps.dtic.mil/dtic/tr/fulltext/u2/a291621.pdf Last accessed: 20.01.2023

217. Zabrodskyi, M., Watling, J., Danylyuk, O., Reynolds, N. (2022). Preliminary Lessons in Conventional Warfighting from Russians Invasion of Ukraine February-July 2022. Royal United Services Institute for Defence and Security Studies, 67. Available at: https://rusi.org/explore-our-research/publications/special-resources/preliminary-lessons-conventional-warfighting-russias-invasion-ukraine-february-july-2022 Last accessed: 20.01.2023

218. Drozdov, S. S., Tiurin, V. V., Korshets, O. A., Horbenko, V. M. (2019). Operational environment analysis and likely scenarios of employment of the Air Forces of the Ukrainian Armed Forces. Science and Defence, 3, 25–30. doi: https://doi.org/10.33099/2618-1614-2019-8-3-25-30

219. Oleschuk, M., Korshets, O., Horbenko, V. (2022). Views Regarding Directions of Development of the Air Forces of the Ukrainian Armed Forces Taking Into Account the Experience of the Russian-Ukrainian War. Air Power of Ukraine, 1 (1 (2)), 6–13. doi: https://doi.org/10.33099/2786-7714-2022-1-1(2)-6-13

220. Maibutnie bezpekove seredovyshche 2030: stratehichne peredbachennia (poperednii opys) (2019). Kyiv: MOU, 53.

221. Viiskovo-Morski Syly Zbroinykh Syl Ukrainy: Doktryna vid 19 sichnia 2021 roku. VKP 7(3)-00(13).01 (2019). Instytut VMS Natsionalnoho universytetu "Odeska morska akademiia" spilno z komanduvanniam VMS ZSU, 86.

222. Stratehiia Viiskovo-Morskykh Syl Zbroinykh Syl Ukrainy 2035 (2018). Kyiv: KVMS ZSU, 22.

223. Osnovy morskoi stratehii derzhavy (2021). Kyiv: NUOU, 160.

224. European Union Maritime Security Strategy (2014). Brussels: Council of EU, 16. Available at: https://data.consilium.europa.eu/doc/document/ST%2011205%202014%20INIT/EN/pdf Last accessed: 01.02.2023

225. Alliance Maritime Strategy (2011). Brussels: NATO. Available at: https://www.nato.int/cps/en/natohq/official_texts_75615.htm Last accessed: 21.12.2023

226. Neizhpapa, O. L., Tarasov, A. A., Yakymiak, S. V. (2021). Problem issues and prospects for development of the Navy of the Ukrainian Armed Forces. Science and Defence, 3, 36–40. doi: https://doi.org/10.33099/2618-1614-2021-16-3-36-40

227. Rusnak, I., Bydniy, V., Segeda, S., Yakymiak, S. et al. (2017). The White Book of the Anti-terrorist Operation in the East of Ukraine in 2014–2016. Kyiv: MOD of Ukraine, National De-

fence University of Ukraine, 162. Available at: https://nuou.org.ua/assets/journals/bila_knyga/white-book-ato.pdf

228. Yakymiak, S. V. (2022). Viina na mori 2022: uroky z dosvidu, problemy ta perspektyvy. Kyiv: Natsionalnyi universytet oborony Ukrainy, 340.

229. Yakymiak, S. (2021). Hybrid warfare in the Black Sea: lessons learned and training improvement. Current issues of military specialists training in the security and defence sector under conditions of hybrid threats. Warszawa: Wydawnictwo Instytutu Bezpieczeństwa i Rozwoju Międzynarodowego, 396–405.

230. Yakymiak, S. V. (2020). Issues of counteracting the hybrid influence of the enemy at sea and ways to solve them. Science and Defence, 2, 31–36. doi: https://doi.org/10.33099/2618-1614-2020-11-2-31-36

231. Yakymiak, S. (2023). Hybrid and war Actions of the Russian federation at Sea. National Security and the Future, 24 (1), 67–81. doi: https://doi.org/10.37458/nstf.24.1.7

232. Bohdanovych, V. Yu., Syrotenko, A. M., Shchypanskyi, P. V., Yakymiak, S. V. et al. (2020). Voienni aspekty protydii "hibrydnii" ahresii: dosvid Ukrainy. Kyiv: NUOU, 176. Available at: https://nuou.org.ua/assets/monography/mono_gibr_viin.pdf

233. Yakymiak, S. V. (2022). Syly oborony Ukrainy u vidsichi zbroinii ahresii rf na mori. Ukrainske viisko: suchasnist ta istorychna retrospektyva. Kyiv: NUOU, 97–98.

234. Yakymiak, S. V. (2022). Dosvid viiny na mori: osnovni uroky ta shliakhy vprovadzhennia. Dosvid voiennykh dii na mori v umovakh rosiisko-ukrainskoi viiny. Udoskonalennia systemy vyvchennia i vprovadzhennia dosvidu. Kyiv: NUOU, 21–35.

235. Yakymiak, S. V. (2023). Robotyzovani systemy (kompleksy) u rosiisko-ukrainskii viini na mori: dosvid zastosuvannia ta perspektyvy rozvytku. Zbroiarnia: istoriia rozvytku ozbroiennia ta viiskovoi tekhniky. Lviv: NASV, 116–118.

236. Yakymiak, S. V. (2022). Syly oborony Ukrainy u vidsichi zbroinii ahresii rf na mori. Ukrainske viisk: suchasnist ta istorychna retrospektyva. Kyiv: NUOU, 97–98.

237. Rosiiska polityka u Chornomorskomu rehioni: zahrozy i vyklyky dlia Ukrainy. Analitychna dopovid (2020). Kyiv: Natsionalnyi instytut stratehichnykh doslidzhen, 18. Available at: https://niss.gov.ua/sites/default/files/2020-06/black-sea-analytics-ukraine-2306.pdf

238. Yakymiak, S. V.; Soliar, I. Ya. (Ed.) (2021). Zabezpechennia natsionalnoi bezpeky Ukrainy na mori (kinets XX – pochatok XXI stolit): problemni pytannia ta shliakhy yikh rozv'iazannia. Voienno-politychni interesy Ukrainy v iierarkhii suspilnykh priorytetiv (kinets XX – pochatok XXI stolit). Lviv: Instytut ukrainoznavstva im. I. Krypiakevycha NAN Ukrainy, 336.

239. Klymenko, A. (2020). Scenarios of sea wars for 2020: Russian Hybression in the Black Sea. Black Sea Security. Analytical journal, 1.

240. Hodges, B. (2021). Black Sea … or Black Hole? Center for European Policy Analysis. Available at: https://cepa.org/article/the-black-sea-or-a-black-hole/

241. Flanagan, S. J., Binnendijk, A., Chindea, I. A., Costello, K., Kirkwood, G., Massicot, D., Reach, C. (2020). Russia, NATO, and Black Sea Security Strategy. Santa-Monica: RAND Corporation, 195.

242. Voroiskii, F. S. (2006). Informatika. Entciklopedicheskii slovar-spravochnik: Vvedenie v sovre-mennye informatcionnye i telekommunikatcionnye tekhnologii v terminakh i faktakh. Moscow: FIZMATLIT, 768.

243. Russia's Cyber Tactics: Lessons Learned 2022 – analitychnyi zvit Derzhspetszv'iazku pro rik povnomasshtabnoi kiberviiny rosii proty Ukrainy. Derzhavna sluzhba spetsialnoho zv'iazku ta zakhystu informatsii Ukrainy. Available at: https://cip.gov.ua/ua/news/russia-s-cyber-tactics-lessons-learned-in-2022-ssscip-analytical-report-on-the-year-of-russia-s-full-scale-cyber-war-against-ukraine Last accessed: 12.04.2023

244. Fog of War. How the Ukraine Conflict Transformed the Cyber Threat Landscape (2023). Google Publishing, 48. Available at: https://services.google.com/fh/files/blogs/google_fog_of_war_research_report.pdf

245. Pshetachnyk, Ya., Tarpova, S. (2022). Doslidnytska sluzhba Yevropeiskoho parlamentu) Viina Rosii proty Ukrainy. European Parliament. Available at: https://www.europarl.europa.eu/RegData/etudes/BRIE/2022/733549/EPRS_BRI(2022)733549_XL.pdf Last accessed: 18.01.2023

246. An overview of Russia's cyberattack activity in Ukraine (2022). Special Report: Ukraine. Microsoft Publishing, 20.

247. Hotovnist Ukrainy do novykh vyklykiv. Kiberbezpeka i zv'iazok (2023). Derzhavna sluzhba spetsialnoho zv'iazku ta zakhystu informatsii Ukrainy. Available at: https://cip.gov.ua/ua/news/gotovnist-ukrayini-do-novikh-viklikiv-kiberbezpeka-i-zv-yazok Last accessed: 29.03.2023

248. Boiko, I. (2022). V efiri "Ukraina 24" pokazaly feikove povidomlennia Zelenskoho pro "kapitu-liatsiiu", prezydent yoho sprostuvav. Available at: https://www.unian.ua/society/v-efiri-ukraji-na-24-pokazali-feykove-povidomlennya-zelenskogo-pro-kapitulyaciyu-prezident-yogo-sprostu-vav-novini-ukrajini-11746198.html Last accessed: 21.01.2023

249. Severity Levels for Security Issues. Available at: https://www.atlassian.com/trust/security/security-severity-levels Last accessed: 05.04.2023

250. Kiberataky, artyleriia, propahanda. zahalnyi ohliad vymiriv rosiiskoi ahresii (2023). Derzhavna sluzhba spetsialnoho zv'iazku ta zakhystu informatsii Ukrainy. Available at: https://cip.gov.ua/ua/news/kiberataki-artileriya-propaganda-zagalnii-oglyad-vimiriv-rosiiskoyi-agresiyi Last accessed: 12.04.2023

251. Kiberataky, artyleriia, propahanda. zahalnyi ohliad vymiriv rosiiskoi ahresii (2023). Rada ekonomichnoi bezpeky Ukrainy. Available at: https://reb.org.ua/reporting/kiberataki-artileri-ya-propaganda-zagalnii-oglyad-vimiriv-rosiiskoyi-agresiyi-6yvkk2 Last accessed: 06.03.2023

252. Pearson, J., Satter, R., Bing, C., Schectman, J. (2022). Exclusive: U.S. spy agency probes sabotage of satellite internet during Russian invasion. Reuters. Available at: https://www.reuters.com/world/europe/exclusive-us-spy-agency-probes-sabotage-satellite-internet-during-russian-2022-03-11/ Last accessed: 21.12.2022

253. Guerrero-Saade, J. A. (2022). Acid Rain. A Modem Wiper Rains Down on Europe. Available at: https://www.sentinelone.com/labs/acidrain-a-modem-wiper-rains-down-on-europe/ Last accessed: 21.12.2023

254. KA-SAT Network cyber attack overview (2022). Viasat. Available at: https://news.viasat.com/blog/corporate/ka-sat-network-cyber-attack-overview Last accessed: 21.12.2023

255. Zaproshennia pryiednatysia do DDoS-ataky rosiiskoi kiber-komandy zlovmysnykiv. Xaknet_Team. Available at: https://t.me/xaknet_team/215 Last accessed: 22.12.2022

256. Xaknet — #Kremlin Proxy Given Specific Instructions to Hack #Kropyva & #DDoS Telegram (2022). Cybershafarat. Available at: https://cybershafarat.com/2022/10/31/xaknet-kremlin-proxy-given-specific-instructions-to-hack-kropyva-ddos-telegram/ Last accessed: 22.12.2022

257. Kiberataka na derzhavni orhanizatsii Ukrainy z vykorystanniam temy "Azovstali" ta shkidlyvoi prohramy Cobalt Strike Beacon (CERT-UA#4490) (2022). CERT-UA. Available at: https://cert.gov.ua/article/39708 Last accessed: 23.12.2023

258. Kiberataka na derzhavni orhanizatsii Ukrainy z vykorystanniam shkidlyvoi prohramy Cobalt Strike Beacon (CERT-UA#4227) (2022). CERT-UA. Available at: https://cert.gov.ua/article/38155 Last accessed: 23.12.2023

259. Kiberataka na derzhavni orhanizatsii Ukrainy z vykorystanniam shkidlyvoi prohramy Cobalt Strike Beacon ta eksploitiv do vrazlyvostei CVE-2021-40444 i CVE-2022-30190 (CERT-UA#4753) (2022). CERT-UA. Available at: https://cert.gov.ua/article/40559 Last accessed: 23.12.2023

260. Shcho take systema Delta, na yaku vzhe poliuie Rosiia ta poklaly oko u derzhdepi SShA (2023). Inshe.tv. Available at: https://inshe.tv/tehnologii-2/2023-02-08/739006/ Last accessed: 24.12.2023

261. Vorozha propahanda atakuie IT-systemu sytuatsiinoi obiznanosti ZSU (2022). Ministerstvo oborony Ukrainy: ofitsiina storinka Facebook. Available at: https://www.facebook.com/MinistryofDefence.UA/posts/pfbid02fjiCupvsbT1N3Vvwu8ZwwPupCEv57WPKv8fVpt9P9qtoVsC7L442PTvCpejaLnrYl Last accessed: 24.12.2023

262. Systema sytuatsiinoi obiznanosti Delta. Ministerstvo oborony Ukrainy. Available at: https://delta.mil.gov.ua/ Last accessed: 26.12.2023

263. U 2022 rotsi Gamaredon zdiisnyv 74 kiberataky na Ukrainu (2023). Derzhavna sluzhba spetsialnoho zv'iazku ta zakhystu informatsii Ukrainy. Available at: https://cip.gov.ua/ua/news/gamaredon-carried-out-74-cyberattacks-against-ukraine-in-2022 Last accessed: 26.12.2023

264. Dark Covenant 2.0: Cybercrime, the Russian State, and the War in Ukraine (2023). Cyber threat analysis: Russia: Recorded Future By Insikt Group Publishing, 27. Available at: https://go.recordedfuture.com/hubfs/reports/cta-2023-0131.pdf Last accessed: 13.04.2023

265. Dark Covenant: Connections Between the Russian State and Criminal Actors (2021). Cyber threat analysis: Russia. Recorded Future By Insikt Group Publishing, 23. Available at: https://go.recordedfuture.com/hubfs/reports/cta-2021-0909.pdf Last accessed: 13.04.2023

266. Pro Stratehiiu kiberbezpeky Ukrainy (2017). Ukaz Prezydenta Ukrainy No. 447/2021. 26.08.2017. Available at: https://www.president.gov.ua/documents/4472021-40013 Last accessed: 14.04.2023

267. U mezhakh misiatsia kiberbezpeky v YeS Derzhspetszviazku podilytsia ukrainskym dosvidom kiberstiikosti z yevropeiskymy partneramy (2022). Derzhavna sluzhba spetsialnoho zv'iazku

ta zakhystu informatsii Ukrainy. Available at: https://cip.gov.ua/ua/events/u-mezhakh-mi-syacya-kiberbezpeki-v-yes-derzhspeczv-yazku-podilitsya-ukrayinskim-dosvidom-kiberstiiko-sti-z-yevropeiskimi-partnerami Last accessed: 14.04.2023

268. Beecroft, N. (2022). Evaluating the International Support to Ukrainian Cyber Defence. Carnegie Endowment. Available at: https://carnegieendowment.org/2022/11/03/evaluating-international-support-to-ukrainian-cyber-defence-pub-88322 Last accessed: 15.04.2023

269. Permanent Structured Cooperation (PESCO). Available at: https://www.pesco.europa.eu/ Last accessed: 17.04.2023

270. CGI Federal Cyber Threat Analysis Center. Available at: https://www.cgi.com/us/en-us/media/brochure/cgi-federal-cyber-threat-analysis-center Last accessed: 17.04.2023

271. The NATO Cooperative Cyber Defence Centre of Excellence. Available at: https://ccdcoe.org/ Last accessed: 17.04.2023

272. Exercise cyber coalition 2020. Supreme Headquarters Allied Powers Europe. Available at: https://shape.nato.int/news-archive/2020/exercise-cyber-coalition-2020 Last accessed: 17.04.2023

273. Coalition Warrior Interoperability exercise. Available at: https://www.act.nato.int/federated-interoperability Last accessed: 17.04.2023

274. Protection of critical information infrastructure trained at cybersecurity exercise of the Lithuanian Armed Forces Amber Mist 2019. Ministry of National Defence (Republic of Lithuania). Available at: https://kam.lt/en/protection-of-critical-information-infrastructure-trained-at-cybersecurity-exercise-of-the-lithuanian-armed-forces-amber-mist-2019/ Last accessed: 17.04.2023

275. Locked Shields. The NATO Cooperative Cyber Defence Centre of Excellence. Available at: https://ccdcoe.org/exercises/locked-shields/ Last accessed: 18.04.2023

276. Army innovation. Defence cyber marvel. Available at: https://www.army.mod.uk/our-future/innovation/defence-cyber-marvel/ Last accessed: 18.04.2023

277. It Army Of Ukraine. Available at: https://itarmy.com.ua/ Last accessed: 21.04.2023

278. Volonterskyi khab Derzhspetszv'iazku. Derzhavna sluzhba spetsialnoho zv'iazku ta zakhystu informatsii Ukrainy. Available at: https://hub.cip.gov.ua/ua/home Last accessed: 12.03.2023

279. Ukrainskyi kiberalians. Facebook. Available at: https://www.facebook.com/UkrainianCyberAlliance Last accessed: 12.03.2023

280. Kiber Sprotyv. Telegram. Available at: https://t.me/s/cyberResistanceUA Last accessed: 12.03.2023

281. Platforma MRIYA synerhiia Kiberpolitsii Ukrainy ta volonteriv u protydii rosiiskym okupantam u media-prostori. Available at: https://mriya.social/ Last accessed: 12.03.2023

282. Blahodiinyi fond "IT-Ukraine Volunteers". Available at: https://it-ukraine.fund/ Last accessed: 12.03.2023

283. Global Cyber Cooperative Center (GC3) Available at: https://gc3.digital/ Last accessed: 12.03.2023

284. Yak IT-partnery pidtrymuiut Ukrainu (dobirka, shcho onovliuietsia). Wise IT. Available at: https://wiseit.com.ua/it-partnery-pidtrymuyut-ukrayinu/ Last accessed: 12.03.2023

285. Kiberbezpeka. USAID. Available at: https://www.usaid.gov/uk/ukraine/fact-sheets/aug-05-2022-cybersecurity Last accessed: 13.03.2023

286. Russian state TV channels have been hacked by #Anonymous to broadcast the truth about what happens in #Ukraine. Anonymous TV. Available at: https://twitter.com/YourAnonTV Last accessed: 13.03.2023

287. Pro zatverdzhennia Polozhennia pro orhanizatsiino-tekhnichnu model kiberzakhystu (2021). Postanova Kabinetu Ministriv Ukrainy No. 1426. 29.12.2021. Available at: https://zakon.rada.gov.ua/laws/show/1426-2021-%D0%BF#Text Last accessed: 02.04.2023

288. A year of Russian hybrid warfare in Ukraine (2023). Microsoft Threat Intelligence: Microsoft Publishing, 18. Available at: https://www.microsoft.com/en-us/security/business/security-insider/wp-content/uploads/2023/03/A-year-of-Russian-hybrid-warfare-in-Ukraine_MS-Threat-Intelligence-1.pdf Last accessed: 13.04.2023

289. Weber, V. (2022). Financial Incentives May Explain the Perceived Lack of Ransomware in Russia's Latest Assault on Ukraine. Council on Foreign Relations. Available at: https://www.cfr.org/blog/financial-incentives-may-explain-perceived-lack-ransomware-russias-latest-assault-ukraine

290. Timeline. CyberPeace Institute. Available at: https://cyberconflicts.cyberpeaceinstitute.org/threats/timeline Last accessed: 13.10.2022

291. Pearson, J., Satter, R. (2022). Analysis: Russian Ransomware Attacks on Ukraine. Muted by Leaks, Insurance Woes. Reuters. Available at: https://www.reuters.com/technology/russian-ransomware-attacks-ukraine-muted-by-leaks-insurance-woes-2022-03-01/

292. Kostyuk, N., Gartzke, E. (2022). Why Cyber Dogs Have Yet to Bark Loudly in Russia's Invasion of Ukraine. Texas National Security Review, 5 (3), 113–126. doi: https://doi.org/10.26153/tsw/42073

293. Bateman, J. (2022). Russia's Wartime Cyber Operations in Ukraine: Military Impacts, Influences, and Implications. Carnegie Endowment. Available at: https://carnegieendowment.org/2022/12/16/russia-s-wartime-cyber-operations-in-ukraine-military-impacts-influences-and-implications-pub-88657

294. Pro osnovni zasady zabezpechennia kiberbezpeky Ukrainy (2017). Zakon Ukrainy No. 2163-VIII. 05.10.2017. Available at: https://zakon.rada.gov.ua/laws/show/2163-19#Text Last accessed: 03.02.2023

295. Pro rozvidku (2020). Zakon Ukrainy No. 912-IX. 17.09.2020. Available at: https://zakon.rada.gov.ua/laws/show/912-20#Text Last accessed: 03.02.2023

296. Pro oboronu Ukrainy (1991). Zakon Ukrainy No. 1932-XII. 06.12.1991. Available at: https://zakon.rada.gov.ua/laws/show/1932-12. Last accessed: 20.05.2022

297. Holovne upravlinnia radioelektronnoi ta kiberborotby. Ministerstvo oborony Ukrainy. Available at: https://www.mil.gov.ua/ministry/struktura-generalnogo-shtabu/golovne-upravlinnya-radioelektronnoi-ta-kiberborotbi.html Last accessed: 04.02.2023

298. Pro Derzhavnu sluzhbu spetsialnoho zv'iazku ta zakhystu informatsii Ukrainy (2006). Zakon Ukrainy No. 3475-IV. 23.02.2006. Available at: https://zakon.rada.gov.ua/laws/show/3475-15#Text Last accessed: 01.02.2023

299. Pro nevidkladni zakhody z kiberoborony derzhavy (2017). Ukaz Prezydenta Ukrainy No. 446/2021. 26.08.2017. Available at: https://zakon.rada.gov.ua/laws/show/n0053525-21#Text Last accessed: 14.04.2023

300. Pro Plan realizatsii Stratehii kiberbezpeky Ukrainy (2022). Ukaz Prezydenta Ukrainy No. 37/2022. 01.02.2022. Available at: https://zakon.rada.gov.ua/laws/show/n0087525-21#n16 Last accessed: 14.04.2023

301. Searle, T. (2017). Outside the Box: A New General Theory of Special Operations. Florida: MacDill Air Force Base: JSOU Press, 80.

302. McCabeand, P., Lieber, P. (Eds.) (2017). Special Operations Theory. Florida: MacDill Air Force Base: JSOU Press, 188.

303. Yarger, H. R. (2013). 21st Century SOF: Toward an American Theory of Special Operations. Florida: Mac Dill Air Force Base: JSOU Press, 102. doi: https://doi.org/10.21236/ada591817

304. Rubright, R. (2017). A Unified Theory for Special Operations. Florida: MacDill Air Force Base: JSOU Press, 82.

305. 5Joint Publication 3-05.1, Joint Special Operations Task Force Operations (2007). Joint Chiefs of Staff, 401. Available at: https://irp.fas.org/doddir/dod/jp3_05_01.pdf Last accessed: 13.04.2023

306. McRaven, W. H. (1993). The Theory of Special Operations. Monterey: Naval Postgraduate School, 604.

307. Deterrence Operations. Joint Operating Concept, Version 2.0. (2006). Office of Primary Responsibility, 80.

308. Joint and National Intelligence Support to Military Operations (2017). Joint Publication 2-01. Joint Chiefs of Staff, 220

309. Joint Special Operations University SOF-Power Workshop A Way Forward for Special Operations Theory and Strategic Art (2011). Florida: Pinewood Campus: MacDill AFB, 49.

310. Radvani, J. (Ed.) (1990). Psychological Operations and Political Warfarein Long-Term Strategic Planning. New York: Praeger.

311. Spulak, R. G. (2019). Innovate or Die: Innovation and Technology for Special Operations. Florida: HurlburtField: JSOU Press, 80.

312. Townsend, S. (2019). Accelerating Multi-Domain Operations: Evolution of an Idea. Shaping NATO for Multi-Domain Operations of the Future: Joint Air & Space Power Conference 2019. Kalkar: The Joint Air Power Competence Centre von-Seydlitz-Kaserne, 7–12.

313. GTA 31-03-003, Special Forces Detachment Mission Planning Guide (2020). Headquarters, Department of the Army, 186.

314. Army Multi-Domain Transformation Ready to Winin Competition and Conflict Chief of Staff Paper No. 1 Unclassified (2021). Version Headquarters. Department of the Army, 39.

315. Tsevelov, O., Viter, D. (2022). Ukrainsko-rosiiska viina: kholodna vesna 2022. Kyiv: NUOU, 104.

316. Alexander, J. B. (2006). The Changing Nature of Warfare, the Factors Mediating Future Conflict, and Implications for SOF. Florida: Hurlburt Field: JSOU Press, 48.

317. Shchodo realizatsii yedynoi informatsiinoi polityky v umovakh voiennoho stanu (2022). Ukaz Prezydenta Ukrainy No. 152/2022. 19.03.2022. Available at: https://zakon.rada.gov.ua/laws/show/n0004525-22#Text Last accessed: 20.10.2022

318. Kompleksne doslidzhennia: yak viina zminyla mene ta krainu. pidsumky roku (2023). Available at: https://ratinggroup.ua/research/ukraine/kompleksne_dosl_dzhennya_yak_v_yna_zm_nila_mene_ta_kra_nu_p_dsumki_roku.html Last accessed: 20.10.2022

319. Zhyla, N. (2022). Naipopuliarnishi sotsmerezhi v Ukraini pid chas viiny — doslidzhennia GlobalLogic. Available at: https://mezha.media/2022/08/06/naypopuliarnishi-sotsmerezhi-v-ukraini-pid-chas-viyny-doslidzhennia-global-logic/ Last accessed: 12.03.2023

320. Skrypin, V. (2022). Fenomen Telegram v Ukraini — z pochatku viiny chas korystuvannia mesendzherom zbilshyvsia u 8 raziv. Available at: https://itc.ua/ua/novini/fenomen-telegram-v-ukrayini-z-pochatku-vijni-chas-koristuvannya-mesendzherom-zbilshivsya-u-8-raziv/ Last accessed: 20.10.2022

321. Krasnomovets, P. (2022). Infoterorysty. Prorosiiski Telegram-kanaly v Ukraini maiut uzhe 4,2 mln chytachiv, a vytratyly na zrostannia lyshe $850 000. Yak tak vyishlo? Available at: https://forbes.ua/inside/kanali-propagandi-prorosiyski-telegram-kanali-virosli-do-42-mln-chitachiv-u-skilki-obkhoditsya-ikh-prosuvannya-27062022-6835?utm_source=Telegram&utm_medium=post Last accessed: 12.03.2023

322. GEC Special Report: Russia's Pillars of Disinformation and Propaganda. 2020. Available at: https://www.state.gov/russias-pillars-of-disinformation-and-propaganda-report/ Last accessed: 20.10.2022

323. Disinformation Roulette: The Kremlin's Year of Lies to Justify an Unjustifiable War (2023). Available at: https://www.state.gov/disarming-disinformation/disinformation-roulette-the-kremlins-year-of-lies-to-justify-an-unjustifiable-war/ Last accessed: 12.03.2023

324. Doktryna informatsiinoi bezpeky Ukrainy (2017). Ukaz Prezydenta Ukrainy No. 47/2017. 25.02.2017. Available at: https://www.president.gov.ua/documents/472017-21374 Last accessed: 20.10.2022

325. Yak zminiuietsia antyukrainska rytoryka rf (2022). Available at: https://cpd.gov.ua/main/yak-zminyuyetsya-antyukrayinska-rytoryka-rf/ Last accessed: 12.03.2023

326. Pocheptsov, H. H. (2019). Kohnytyvnie voini v sotsmedya, massovoi kulture y massovikh kommunykatsyiakh. Kharkiv: Folyo, 314.

327. Narrative Warfare. How the Kremlin and Russian new soutlets justified a war of aggression against Ukraine. Available at: https://www.atlanticcouncil.org/in-depth-research-reports/report/narrative-warfare/ Last accessed: 12.03.2023

328. McIntyre, K. E. (2014). The evolution of social media from 1969 to 2013. A change in competition and a trend toward complementary, niche sites. The Journal of Social Media in Society, 3, 5–25.

329. Sotsialni merezhi: poniattia, istoriia vynyknennia. Available at: https://zounb.zp.ua/resourse/zaporizkyy-kray/zaporizhzhya-bibliotechne/fahova-osvita/socialni-merezhi-piv#q1 Last accessed: 15.02.2023

330. Zharkov, Ya. M. et al.; Skulysha, Ye. D. (Ed.) (2012). Istoriia informatsiino-psykholohichnoho protyborstva. Kyiv: Nauk.-vyd. viddil NA SB Ukrainy, 212.

331. Tolubko, V. B. (2003). Informatsiina borotba (kontseptualni, teoretychni, tekhnolohichni aspekty). Kyiv: NAOU, 320.

332. Ukrainski media, stavlennia ta dovira u 2022 r. (2022). Available at: https://internews.in.ua/wp-content/uploads/2022/11/Ukrainski-media-stavlennia-ta-dovira-2022.pdf Last accessed: 15.02.2023

333. Mediaspozhyvannia ukraintsiv v umovakh povnomasshtabnoi viiny (2022). Available at: https://pdf.usaid.gov/pdf_docs/PA00ZDSK.pdf Last accessed: 15.02.2023

334. Gubanov, D. A., Novikov, D. A., Chkhartishvili, A. G. (2010). Sotcialnye seti: modeli informatcionnogo vliianiia, upravleniia i protivoborstva. Moskva: Izdatelstvo fiziko-matematicheskoi literatury, 228.

335. Yak Facebook vyznachaie, shcho pokazuvaty u vashii strichtsi novyn (2018). Available at: https://my.rv.ua/hotnews/yak-facebook-viznachaye-shho-pokazuvati-u-vashiy-strichtsi-novin/ Last accessed: 15.02.2023

336. Korzh, N. (2022). Shcho take viralnist ta yak vykorystovuvaty viralnyi kontent? 28.01.2022. Admixer Academy. Available at: https://blog.admixer.academy/ua/shcho-take-viralnist-i-yak-vykorystovuvaty-viralnyy-kontent/ Last accessed: 15.02.2023

337. Yevtukhova, S. M. (2015). Pablik rileishnz. Kherson: Vydavnytstvo KhDU, 150.

338. Pro Stratehiiu informatsiinoi bezpeky (2021). Ukaz Prezydenta Ukrainy No. 685/2021. 15.10.2021. Available at: https://www.president.gov.ua/documents/6852021-41069 Last accessed: 15.02.2023

339. Goffman, W., Newill, V. A. (1964). Generalization of Epidemic Theory: An Application to the Transmission of Ideas. Nature, 204 (4955), 225–228. doi: https://doi.org/10.1038/204225a0

340. Daley, D. J., Kendall, D. G. (1964). Epidemics and Rumours. Nature, 204 (4963), 1118. doi: https://doi.org/10.1038/2041118a0

341. Govindankutty, S., Gopalan, S. P. (2022). SEDIS – A Rumor Propagation Model for Social Networks by Incorporating the Human Nature of Selection. Systems, 11 (1), 12. doi: https://doi.org/10.3390/systems11010012

342. Kermack, W. O., McKendrick, A. G. (1927). A contribution to the mathematical theory of epidemics. Proceedings of the Royal Society of London. Series A, Containing Papers of a Mathematical and Physical Character, 115 (772), 700–721. doi: https://doi.org/10.1098/rspa.1927.0118

343. Krotiuka, V. A. (Ed.) (2021). Viiny informatsiinoi epokhy: mizhdystsyplinarnyi dyskurs. Kharkiv: FOP Fedorko M. Yu., 558.

344. Burov, S., Lazarenko, O., Ianova, G., Nekrasova, A., Shcherbachenko, V. (2016). Involvement of children in armed formations during the military conflict in Donbas. Warsaw, 12. Available at: https://library.khpg.org/files/docs/1474993631.pdf

345. Maievskyi, O. (2020). Formuvannia informatsiinoho prostoru v tak zvanykh "DNR" ta "LNR" metodamy ekspluatatsii vizualnykh obraziv Druhoi svitovoi viiny. Informatsiia i pravo, 2 (33), 132–140. doi: https://doi.org/10.37750/2616-6798.2020.2(33).208106

346. Okkupatsyia RF podrastaiushcheho pokolenyia v ORDLO. Chast 1. Mylytaryzatsyia. Available at: https://lb.ua/blog/pavel_lisianskiy/491073_okkupatsiya_rf_podrastayushchego.html Last accessed: 27.02.2023

347. Kraina-ahresor zdiisniuie militaryzatsiiu ditei na tymchasovo okupovanykh terytoriiakh Donetskoi ta Luhanskoi oblasti. Available at: https://armyinform.com.ua/2022/04/19/krayina-agresor-zdijsnyuye-militaryzacziyu-ditej-na-tymchasovo-okupovanyh-terytoriyah-doneczkoyi-ta-luganskoyi-oblastej-lyudmyla-denisova/

348. Kadety iz Donbassa. Zachem deti pogibshikh voennosluzhashchikh DNR poluchaiut obrazovanie pri Sledkome RF (2021). Available at: http://webcache.googleusercontent.com/search?q=cache:QaJwkcDeliMJ:https://e-news.su/v-novorossii/393206-kadety-iz-donbassa-zachem-deti-pogibshih-voennosluzhaschih-dnr-poluchajut-obrazovanie-pri-sledkome-rf.html&hl=uk&gl=ua&strip=1&vwsrc=0 Last accessed: 27.02.2023

349. Pro zatverdzhennia respublikanskoi prohramy patriotychnoho vykhovannia hromadian donetskoi narodnoi respubliky na 2020–2022 roky (2020). Postanova donetskoi narodnoi respubliky No. 22-3. 30.04.2020.

350. Movchan, S., Sulialina, M., Halai, A. (2020). Osvitnie pole na tymchasovo okupovanykh terytoriiakh Ukrainy (2014–2019 rr.). Kyiv, 60.

351. "Molodaia gvardiia – Iunarmiia" naschityvaet bolee 1,5 tys. uchastnikov – Narodnaia militciia (2020). Available at: https://lug-info.com/news/molodaya-gvardiya-yunarmiya-naschityvaet-bolee-15-tys-uchastnikov-narodnaya-militsiya-63208 Last accessed: 27.02.2023

352. "Molodaia gvardiia" Donbassa (2022). Available at: http://webcache.googleusercontent.com/search?q=cache:K9uG4lu-CQYJ:https://armystandard.ru/news/2022218913-FzApU.html&hl=uk&gl=ua&strip=1&vwsrc=0 Last accessed: 27.02.2023

353. Pashkova, O. (2023). Voienizovani tabory dlia nepovnolitnikh na tymchasovo okupovanykh terytoriiakh Donetskoi i Luhanskoi oblastei: orhanizatsiinyi i zmistovyi aspekty roboty. Ukrainskyi istorychnyi zhurnal, 1 (561), 20–35.

354. Krymets, L. V., Palchyk, S. I. (2023). Aksiolohichni aspekty patriotyzmu v konteksti sotsialnoho upravlinnia. Kyiv, 250.

355. Kholokh, O. I., Maraiev, V. R., Topalskyi, V. L. et al.; Ahaieva, N. A. (Ed.) (2019). Vykorystannia istorychnykh znan v yakosti instrumentu propahandy u viinakh i voiennykh konfliktakh. Kyiv: FOP Maslakov, 157.

356. Stratehiia natsionalno-patriotychnoho vykhovannia (2019). Zatverdzhena Ukazom Prezydenta Ukrainy No. 286/2019. 18.05.2019.

357. Aleshchenko, V. I., Baranivskyi, V. F., Kobzar, A. O., Krymets, L. V.; Baranivskyi, V. F. (Ed.) (2014). Aktualni pytannia ideolohii ta ideolohichnoi roboty v ukrainskomu viisku. Kyiv: Zoloti vorota, 232.

358. Smolianiuk, V. F. (2001). Viiskova mohutnist suchasnoi ukrainskoi derzhavy (politolohichnyi analiz). Kyiv, 26.

359. Instruktsiia z otsiniuvannia moralno-psykholohichnoho stanu osobovoho skladu Zbroinykh Syl Ukrainy (2017). Zatverdzhena nakazom Heneralnoho shtabu Zbroinykh Syl Ukrainy No. 153. 21.04.2017.

360. Kholokh, O. I. et al.; Ahaiev, N. A. (Ed.) (2017). Informatsiino-propahandystske zabezpechennia viisk (syl) v umovakh voienno-politychnoho konfliktu. Kyiv: NDTs HP ZS Ukrainy, 185.

361. Afanasev, A. O., Lunyk, O. O., Maraeva, V. V. et al.; Yahupov, V. V. (Ed.) (2007). Viiskovo-patriotychne vykhovannia u Zbroinykh Sylakh Ukrainy. Kyiv: NAOU, 176.

362. Romanyshyn, A. M., Boiko, O. V., Bohorodytskyi, D. N. et al. (2015). Psykholohiia boiu: diialnist komandyra pidrozdilu shchodo pidtrymannia moralno-psykholohichnoho stanu osobovoho skladu v khodi boiovykh dii. Lviv: NASV, 322.

363. Berezovets, T., Kravchenko, V., Karakuts, A., Dobroier, O. (2016). Dva roky z pochatku ATO ta hibrydnoi viiny RF proty Ukrainy: Proval putinskoho blits-kryhu. Chastyna 2. Kyiv, 75.

364. Bila knyha antyterorystychnoi operatsii na Ckhodi Ukrainy (2014–2016) (2017). Kyiv: NUOU imeni Ivana Cherniakhovskoho, 250.

365. Pashkova, O. O. (2021). Viiskovo-patriotychne vykhovannia kursantiv vyshchykh viiskovykh navchalnykh zakladiv Ukrainy (1991–2019). Kyiv, 312.

366. Yaremchuk, V. (2017). Ukraine in counteraction of newest religious and informational expansion of Russian Orthodox Church. Naukovi zapysky IPiEND im. I.F. Kurasa NAN Ukrainy, 5–6 (79–80), 127–145.

367. Bielieskov, M. M. (2021). Suchasnyi rosiiskyi sposib vedennia viiny: teoretychni osnovy i praktychne napovnennia: analitychna dopovid. Kyiv: Natsionalnyi instytut stratehichnykh doslidzhen, 29.

368. Horielov, V., Klymenko, V., Derikot, O., Kydon, V. (2021). "Frozen" Conflicts in Russian Geopolitics: History and Reality for Ukraine (1991–2020). Military Historical Bulletin, 40 (2), 99–110. doi: https://doi.org/10.33099/2707-1383-2021-40-2-99-110

369. Bila knyha 2021. Sluzhba zovnishnoi rozvidky Ukrainy (2021). Kyiv, 74.

370. Iashin, I., Shorina, O. (2015). Nezavisimyi ekspertnyi doklad "Putin. Voina". Moscow, 66.

371. Hirnyk, A. M. (2018). Zhyttia na tymchasovo okupovanykh terytoriiakh: yak yoho bachat meshkantsi Donetskoi ta Luhanskoi oblastei. Ukrainske suspilstvo v umovakh viiny: vyklyky sohodennia ta perspektyvy myrotvorennia. Mariupol, 218–222.

372. Pidopryhora, I. (2018). Efekt informatsiinoho vakuumu yak chynnyk vplyvu na orhanizatsiiu informatsiino-propahandystskoho zabezpechennia Viiskovo-Morskykh Syl Zbroinykh Syl Ukrainy u liutomu–berezni 2014 roku. Viiskovo-istorychnyi merydian, 1 (19), 64–78.

373. Pidopryhora, I., Pashkova, O. (2021). Theoretical foundations of military-patriotic education. Filosofsko-sotsiolohichni ta psykholoho-pedahohichni problemy pidhotovky viiskovoho profesionala u hlobalizovanomu sviti. Kyiv, 200–204.

374. Dodonova, V. I., Dodonov, R. O. (2018). Monolohy pro Donbas. Vybrani pratsi z problematyky skhidnoukrainskoho konfliktu. Kyiv Vyd. Ruslan Khalikov, 6.

375. Zaitcev, V., Donetc, S., Sopkin, D. (2016). Chemu uchat detei v shkolakh okupirovannogo Donetcka: taiga, krasnye galstuki i "zakharovtcy". Available at: https://ukraine.segodnya.ua/regions/donetsk/chemu-uchat-detey-v-shkolah-okkupirovannogo-donecka-682804.html Last accessed: 30.10.2022

376. Informatciino-analitichne doslidzhennia "Osvitne pole na timchasovo okupovanikh teritoriiakh Ukraini" (2019). Kyiv, 10.

377. Razvitie vzaimodeistviia obrazovatelnykh organizatcii i voenno-patrioticheskikh obedinenii s voinskimi chastiami (2017). Moscow, 71. Available at: http://school-zaozernoe.ru/files/shef-stvo_voinskikh_chastey.pdf Last accessed: 09.11.2022

378. Martinetc, S. (2018). Novoe "pushechnoe miaso": v "LNR" gotoviat budushchikh boevikov v detskikh lageriakh. Available at: https://ukraine.segodnya.ua/regions/donetsk/novoe-pushech-noe-myaso-v-lnr-gotovyat-budushchih-boevikov-v-detskih-lageryah-1152228.html Last accessed: 08.11.2022

379. V Gorlovke okupanty sozdali iz shkolnitc shturmovoi otriad putleriugenda (foto i video) (2015). Available at: https://crime-ua.com/node/12433 Last accessed: 11.11.2022

380. Bidder, B, (2015). Spiegel. Oft riechte ich Blut und vergluhtes Metall. Available at: https://www.spiegel.de/politik/ausland/separatisten-rekrutieren-teenager-soldaten-in-der-ukraine-a-1062103.html Last accessed: 12.11.2022

381. UN Convention on the Rights of the child. Article 29 (1998). Available at: https://www.ohchr.org/en/instruments-mechanisms/instruments/convention-rights-child Last accessed: 26.10.2022

382. Zhenevskaia konventciia ot 12 avgusta 1949 goda o zashchite grazhdanskogo naseleniia vo vremia voiny (1949). Available at: https://www.un.org/ru/documents/decl_conv/conventions/geneva_civilian_33.shtml Last accessed: 01.11.2022

383. Resolution adopted by the General Assembly. S-27/2. A world fit for children. Available at: https://digitallibrary.un.org/record/464538

384. Pro zaboronu propagandi rosiiskogo natcistskogo totalitarnogo rezhimu, zbroinoi agresii Rosiis-koi Federatcii iak derzhavi-terorista proti Ukraini, simvoliki voennogo vtorgnennia rosiiskogo nat-cistskogo totalitarnogo rezhimu v Ukrainu (2022). Zakon Ukraini No. 2265-IX. 22.05.2022. Available at: https://zakon.rada.gov.ua/laws/show/2265-20#Text Last accessed: 01.02.2023

385. Slova ta viiny: Ukraina v borotbi z Kremlivskoiu propahandoiu (2017). Kyiv: KIS, 132.

386. Shvartc, F., Livraga, Kh. A. Mifologizatciia istorii. Mif kak sviashchennaia istoriia chelovechest-va. Kulturnaia assotciatciia Novyi Akropol. Available at: http://www.newacropolis.org.ua/the-ses/659abe22-0d5e-4937-bce4-6445f635af85

387. Pocheptsov, H. (2016). Smysly i viiny: Ukraina i Rosiia v informatsiinykh i smyslovykh viinakh. Kyiv: Vydavnychyi dim "Kyievo-Mohylianska akademiia", 316.

388. Horbulin, V. P. (Ed.) (2017). Svitova hibrydna viina: ukrainskyi front. Kyiv: NISD, 496.

389. Furman, I. I., Sydorov, S. V., Pyliavets, R. I., Hrytsiuk, V. M. et al. (2019). Zbroina ahre-siia Rosiiskoi Federatsii proty Ukrainy ta provedennia Antyterorystychnoi operatsii (2014–2018). Kyiv: TsP "Komprynt", 30.

390. Shevchuk, V., Furman, I., Pyliavets, R. (2020). The Ukrainian Dimension of the Second World War: Scientific Discourse. Military Historical Bulletin, 36 (2), 8–36. doi: https://doi.org/10.33099/2707-1383-2020-36-2-8-36

391. Zinchenko, O.; Zinchenka, O., V'iatrovych, V., Maiorov, M. (Eds.) (2016). Viina mifam. Viina i mif. Nevidoma Druha svitova. Kharkiv "Knyzhkovyi Klub "Klub simeinoho dozvillia", 7.

392. Shtokvysh O. Viina pam'iatei. Obraz Velykoi peremohy yak instrument manipuliatsii istorychnoiu svidomistiu. Available at: https://old.uinp.gov.ua/publication/viina-pam-yatei-obraz-velikoi-peremogi-yak-instrument-manipulyatsii-istorichnoyu-svidomi Last accessed: 01.02.2023

393. Ukrainskyi vymir Druhoi Svitovoi viiny: tsyfry ta fakty (2017). Resursnyi tsentr HURT. Available at: https://gurt.org.ua/articles/32309/ Last accessed: 01.02.2023

394. Zashkilniak, L. (2014). Radianski istorychni mify v suchasnii ukrainskii istoriohrafii: "stare vyno v novykh mikhakh". Svitlo y tini ukrainskoi radianskoi istoriohrafii. Kyiv, 17–31. Available at: https://clio.lnu.edu.ua/wp-content/uploads/2014/12/Радянські-історичні-міфи-в-сучасній-українській-історіографії.pdf Last accessed: 01.02.2023

395. Pro osnovni zasady derzhavnoi polityky u sferi utverdzhennia ukrainskoi natsionalnoi ta hromadianskoi identychnosti (2022). Zakon Ukrainy No. 2834-IX. 13.12.2022. Available at: https://zakon.rada.gov.ua/laws/show/2834-20#Text Last accessed: 01.02.2023

396. Uchomusutnistpoiasnenniayakmetodunavchannia?Pidru4niki.Availableat:https://pidruchniki.com/pedagogika/u_chomu_sutnist_poyasnennya_metodu_navchannya Last accessed: 01.02.2023

397. Metody navchannia. Slovesni metody navchannia. Virtualna shkola profesiinoho stanovlennia molodoho pedahoha. Available at: http://teacher.ed-sp.net/index.php?option=com_content&view=article&id=15:2012-01-17-11-21-03&catid=1:2011-09-13-21-50-27&Itemid=2 Last accessed: 01.02.2023

398. Zelenin, V. (2015). Po toi bikpravdy: NLP yak zbroia informatsiino-propahandystskoi viiny. Vol. 1. NLP XX stolittia. Kyiv: Vyd-vo "Liuta sprava", 384.

399. Pocheptsov, H. (2017). Vid pokemoniv do hibrydnykh viin: novi komunikatyvni tekhnolohii XXI stolittia. Kyiv: Vydavnychyi dim "Kyievo-Mohylianska akademiia, 260.

400. Kasianova, M. M. (2018). Mihratsiia hromadian Ukrainy do Bilorusi, Moldovy ta Rosii v umovakh postbipoliarnoi transformatsii mizhnarodnoi systemy. Chernivtsi, 748.

401. Malynovska, O. O. (2018). Mihratsiina polityka: hlobalnyi kontekst ta ukrainski realii. Kyiv: NISD, 471. Available at: https://niss.gov.ua/sites/default/files/2019-05/Migration_Politic_Print-fin-3178a.pdf

402. O merakh po okazanii sodeistviia dobrovolnomu pereseleniiu v Rossiiskuiu Federatciiu sootechestvennikov, prozhivaiushchikh za rubezhom (2006). Ukaz Prezidenta Rossiiskoi Federatcii No. 637. 22.06.2006. Available at: https://base.garant.ru/189653/

403. O realizatcii Gosudarstvennoi programmy po okazanii sodeistviia dobrovolnomu pereseleniiu v Rossiiskuiu Federatciiu sootechestvennikov, prozhivaiushchikh za rubezhom (2012). Ukaz Prezidenta Rossiiskoi Federatcii ot No. 1289. 14.09.2012. Available at: https://base.garant.ru/70227698/ Last accessed: 06.12.2022

404. Melnik, I. (2010). Gaz v obmin na flot? Ni, gaz v obmin na Krim. Available at: http://texty.org.ua/articles/21837/Gaz_v_obmin_na_flot_Ni_gaz-21837/ Last accessed: 30.11.2022

405. Natsionalna systema monitorynhu sytuatsii z vnutrishno peremishchenymy osobamy. Mizhnarodna orhanizatsiia z mihratsii, 37. Available at: http://iom.org.ua/sites/default/files/iom_nms_cumulative_report_ukr.pdf Last accessed: 30.01.2020

406. Ofitsiinyi veb-sait Derzhavnoi Prykordonnoi Sluzhby Ukrainy. Available at: https://dpsu.gov.ua/ Last accessed: 18.04.2022

407. Ob otdelnykh kategoriiakh inostrannykh grazhdan i litc bez grazhdanstva, imeiushchikh pravo obratitsia s zaiavleniiami o prieme v grazhdanstvo Rossiiskoi Federatcii v uproshchennom poriadke (2019). Ukaz Prezidenta RF No. 187. 29.04.2019. Available at: https://base.garant.ru/products/ipo/prime/doc/72136792/ Last accessed: 06.12.2022

408. O bezopasnosti (2010). Federalnyi zakon No. 390-FZ. 28.12.2010. Available at: https://rg.ru/2010/12/29/bezopasnost-dok.html Last accessed: 06.12.2022

409. Voennaia doktrina Rossiiskoi Federatcii (2014). Available at: https://rg.ru/2014/12/30/doktrina-dok.html Last accessed: 06.12.2022

410. Ob utverzhdenii Kontceptcii demograficheskoi politiki Rossiiskoi Federatcii na period do 2025 goda (2007). Ukaz Prezidenta RF No. 1351. 09.10.2007. Available at: http://www.consultant.ru/document/cons_doc_LAW_71673/7a46cb13de731db3333fcd77a-4f7887e468287e3/ Last accessed: 06.12.2022

411. Ob utverzhdenii osobennostei priema na obuchenie po obrazovatelnym programmam vysshego obrazovaniia, imeiushchim gosudarstvennuiu akkreditatciiu, programmam podgotovki nauchnykh i nauchno-pedagogicheskikh kadrov v aspiranture (adiunkture) v 2022 godu (2022). Postanovlenie Pravitelstva RF No. 434. 21.03.2022. Available at: https://base.garant.ru/403804968/ Last accessed: 06.12.2022

412. Fakty i tsyfry. Mizhnarodna orhanizatsiia z mihratsii v Ukraini. Available at: https://ukraine.iom.int/uk/dani-ta-resursy Last accessed: 30.11.2022

413. Pro zatverdzhennia Ukazu Prezydenta Ukrainy "Pro vvedennia nadzvychainoho stanu v okremykh rehionakh Ukrainy" (2022). Zakon Ukrainy No. 2101-IX. 23.02.2022. Available at: https://zakon.rada.gov.ua/laws/show/2101-IX#Text. Last accessed: 14.04.2022

414. Pro Zaiavu Verkhovnoi Rady Ukrainy u zv'iazku z vyznanniam Rosiiskoiu Federatsiieiu nezalezhnosti nezakonnykh samoproholoshenykh utvoren na tymchasovo okupovanykh terytoriiakh okremykh raioniv Donetskoi ta Luhanskoi oblastei Ukrainy (2022). Postanova Verkhovnoi Rady Ukrainy No. 2093-IX. 22.02.2022. Available at: https://zakon.rada.gov.ua/laws/show/2093-IX#Text Last accessed: 20.03.2022

415. Pro Zvernennia Verkhovnoi Rady Ukrainy do Orhanizatsii Ob'iednanykh Natsii, Yevropeiskoi Komisii, Yevropeiskoho Parlamentu, inshykh mizhnarodnykh orhanizatsii ta yikh parlamentskykh asamblei, parlamentiv ta uriadiv derzhav-chleniv Yevropeiskoho Soiuzu ta NATO, parlamentiv ta uriadiv demokratychnykh derzhav svitu shchodo neobkhidnosti vzhyttia dodatkovykh spilnykh zakhodiv z metoiu prypynennia ahresii Rosiiskoi Federatsii proty Ukrainy ta

zapobihannia poshyrenniu tsiiei ahresii na inshi krainy v Yevropi (2022). Postanova Verkhovnoi Rady Ukrainy No. 2141-IX. 24.03.2022. Available at: https://zakon.rada.gov.ua/laws/show/2141-IX#top Last accessed: 20.03.2022

416. Pro Zaiavu Verkhovnoi Rady Ukrainy Pro vchynennia Rosiiskoiu Federatsiieiu henotsydu v Ukraini (2022). Postanova Verkhovnoi Rady Ukrainy No. 2188-IX. 14.04.2022. Available at: https://zakon.rada.gov.ua/laws/show/2188-IX#Text Last accessed: 20.04.2022

417. Promova Prezydenta Ukrainy Volodymyra Zelenskoho na zasidanni Yevropeiskoi rady 25.03.2022. Available at: https://www.president.gov.ua/news/promova-prezydenta-ukrayini-volodimira-zelenskogo-na-zasidan-73809 Last accessed: 25.04.2022

418. Vystup Prezydenta Ukrainy na zasidanni Rady Bezpeky OON (2022). Available at: https://www.president.gov.ua/news/vistup-prezidenta-ukrayini-na-zasidanni-radi-bezpeki-oon-74121 Last accessed: 25.04.2022

419. Pro vykorystannia Zbroinykh Syl Ukrainy ta inshykh viiskovykh formuvan (2022). Ukaz Prezydenta Ukrainy No. 66/2022. 24.02.2022. Available at: https://zakon.rada.gov.ua/laws/show/66/2022 Last accessed: 25.04.2022

420. Pro utvorennia Stavky Verkhovnoho Holovnokomanduvacha (2022). Ukaz Prezydenta Ukrainy No. 72 24.02.2022. Available at: https://zakon.rada.gov.ua/laws/show/66/2022/print Last accessed: 10.03.2022

421. Pro osnovni zasady prymusovoho vyluchennia v Ukraini ob'iektiv prava vlasnosti Rosiiskoi Federatsii ta yii rezydentiv (2022). Zakon Ukrainy No. 2116-IX. 03.03.2022. Available at: https://zakon.rada.gov.ua/laws/show/2116-IX#top/ Last accessed: 20.03.2022

422. Pro zabezpechennia prav i svobod hromadian ta pravovyi rezhym na tymchasovo okupovanii terytorii Ukrainy (2014). Zakon Ukrainy No. 1207-VII. 15.04.2014. Available at: https://zakon.rada.gov.ua/laws/show/1207-18#Text Last accessed: 20.05.2022

423. Pro vnesennia zmin do deiakykh zakoniv Ukrainy shchodo rehuliuvannia pravovoho rezhymu na tymchasovo okupovanii terytorii Ukrainy (2022). Zakon Ukrainy No. 2217-IX. 21.04.2022. Available at: https://zakon.rada.gov.ua/laws/show/2217-20#n173 Last accessed: 20.06.2022

424. Pro vnesennia zmin do Kryminalnoho kodeksu Ukrainy shchodo posylennia vidpovidalnosti za maroderstvo (2022). Zakon Ukrainy No. 2117-IX. 03.03.2022. Available at: https://zakon.rada.gov.ua/laws/show/2117-IX#Text Last accessed: 20.05.2022

425. Pro vnesennia zmin do Kryminalnoho kodeksu Ukrainy shchodo posylennia vidpovidalnosti za zlochyny proty osnov natsionalnoi bezpeky Ukrainy v umovakh dii rezhymu voiennoho stanu (2022). Zakon Ukrainy No. 2113-IX. 03.03.2022. Available at: https://zakon.rada.gov.ua/laws/show/2113-IX#Text Last accessed: 20.05.2022

426. Pro vnesennia zmin do deiakykh zakonodavchykh aktiv Ukrainy shchodo posylennia kryminalnoi vidpovidalnosti za vyhotovlennia ta poshyrennia zaboronenoi informatsiinoi produktsii (2022). Zakon Ukrainy No. 2110-IX. 03.03.2022. Available at: https://zakon.rada.gov.ua/laws/show/2110-IX#Text Last accessed: 20.04.2022

427. Pro vnesennia zmin do Kryminalnoho kodeksu Ukrainy ta inshykh zakonodavchykh aktiv Ukrainy shchodo vyznachennia obstavyn, shcho vykliuchaiut kryminalnu protypravnist diiannia ta zabezpechuiut boiovyi imunitet v umovakh dii voiennoho stanu (2022). Zakon Ukrainy No. 2124-IX. 15.03.2022. Available at: https://zakon.rada.gov.ua/laws/show/2124-IX#Text Last accessed: 20.04.2022

428. Pro vnesennia zmin do Kryminalnoho ta Kryminalnoho protsesualnoho kodeksiv Ukrainy shchodo udoskonalennia vidpovidalnosti za kolaboratsiinu diialnist ta osoblyvostei zastosuvannia zapobizhnykh zakhodiv za vchynennia zlochyniv proty osnov natsionalnoi ta hromadskoi bezpeky (2022). Zakon Ukrainy No. 2198-IX. 14.04.2022. Available at: https://zakon.rada.gov.ua/laws/show/2198-IX#Text Last accessed: 20.05.2022

429. Pro vnesennia zmin do Kryminalnoho protsesualnoho kodeksu Ukrainy ta inshykh zakonodavchykh aktiv Ukrainy shchodo spivrobitnytstva z Mizhnarodnym kryminalnym sudom (2022). Zakon Ukrainy No. 2236-IX. 03.05.2022. Available at: https://zakon.rada.gov.ua/laws/show/2236-IX#Text Last accessed: 20.05.2022

430. Pro vnesennia zmin do deiakykh zakonodavchykh aktiv Ukrainy shchodo vporiadkuvannia pytan, pov'iazanykh iz viiskovopolonenymy v osoblyvyi period (2022). Zakon Ukrainy No. 2158-IX. 24.03.2022. Available at: https://zakon.rada.gov.ua/laws/show/2158-20#Text Last accessed: 20.03.2023

431. Pro vnesennia zmin do Zakonu Ukrainy "Pro osnovy natsionalnoho sprotyvu" shchodo nadannia mozhlyvosti terytorialnii oboroni vykonuvaty zavdannia v raionakh vedennia voiennykh (boiovykh) dii (2022). Zakon Ukrainy No. 2237-IX. 03.05.2022. Available at: https://zakon.rada.gov.ua/laws/show/2237-IX#Text Last accessed: 20.06.2022

432. Komitet rekomenduie Verkhovnii Rady ukhvalyty postanovu shchodo pidtrymky nadannia Ukraini statusu krainy-kandydata na vstup do YeS (2022). Available at: https://comeuroint.rada.gov.ua/news/main_news/73759.html Last accessed: 20.06.2022

433. Moshenets O. Vidnovlennia Ukrainy – proiekt, shcho ob'iednaie demokratychnyi svit Zastupnyk holovy Komitetu z pytan antykoruptsiinoi polityky (2022). Available at: https://www.rada.gov.ua/news/razom/225077.html Last accessed: 25.06.2022

434. YeS rozrobliaie yurydychnu osnovu konfiskatsii aktyviv RF na koryst Ukrainy (2022). Yevropeiska pravda. Available at: https://www.eurointegration.com.ua/news/2022/07/6/7142694/ Last accessed: 30.06.2022

435. Betsa-Bilousenko, O. (2022). Chy povynna bula Ukraina "ofitsiino oholosyty viinu" Rosii? Mediasapiens. Available at: https://ms.detector.media/manipulyatsii/post/29569/2022-05-27-chy-povynna-bula-ukraina-ofitsiyno-ogolosyty-viynu-rosii/ Last accessed: 30.06.2022

436. Konventciia o zakonakh i obychaiakh sukhoputnoi voiny, 18 oktiabria 1907 goda (1907). Dogovor s prilozheniem: Polozhenie o zakonakh i obychaiakh sukhoputnoi voiny. Available at: https://www.icrc.org/ru/doc/resources/documents/misc/hague-convention-iv-181007.htm Last accessed: 25.07.2022

437. Dohovir pro zaboronu viiny yak zasobu natsionalnoi polityky (Pakt Briana-Kelloha) vid 27 lypnia 1928 roku (1928). Mizhnarodnyi dokument No. 995_647. 27.07.1928. Available at: https://zakon.rada.gov.ua/laws/show/995_647 Last accessed: 25.07.2022

438. Statut Orhanizatsii Ob'iednanykh Natsii i Statut Mizhnarodnoho Sudu (1945). Orhanizatsiia Ob'iednanykh Natsii. Available at: https://unic.un.org/aroundworld/unics/common/documents/publications/uncharter/UN%20Charter_Ukrainian.pdf

439. Opredelenie agressii (1974). Rezoliutciia Generalnoi Assamblei OON 3314 (XXIX). 14.12.1974. Available at: https://zakononline.com.ua/documents/show/169633___169633 Last accessed: 25.05.2022

440. Maliar, H. (2022). Teroryzm chy viina. Ukrainska pravda. Available at: https://www.pravda.com.ua/columns/2014/06/16/7029138 Last accessed: 20.06.2022

441. Maliar, H. (2022). Dlia pidtverdzhennia faktu viiny ne potribni spetsialnyi zakon chy ukaz. Ukrinform. Available at: https://www.ukrinform.ua/rubric-ato/3435428-dla-pidtverdzenna-faktu-vijni-ne-potribni-specialnij-zakon-ci-ukaz-malar.html Last accessed: 20.08.2022

442. Ostapenko, A. (2022). Deiaki pytannia pravovoho rehuliuvannia oholoshennia stanu viiny. Yevropeiskyi vybir Ukrainy, rozvytok nauky ta natsionalna bezpeka v realiiakh masshtabnoi viiskovoi ahresii ta hlobalnykh vyklykiv KhKhI stolittia. Vol. 1. Odesa: Vydavnychyi dim "Helvetyka", 370–373.

443. Mizhnarodnyi kryminalnyi sud — vazhlyvyi mekhanizm rozsliduvannia voiennykh zlochyniv rosii v Ukraini (2022). Yurydychna hazeta. Available at: https://yur-gazeta.com/golovna/mizhnarodniy-kriminalniy-sud--vazhliviy-mehanizm-rozsliduvannya-voennih-zlochiniv-rosiyi-v-ukrayini.html Last accessed: 20.08.2022

444. Vozmozhen li spetctribunal po Ukraine i budet li u Putina immunitet? (2022). Available at: https://www.bbc.com/russian/features-60813662 Last accessed: 23.07.2022

445. Koval, D., Soldatenko, M. (2022). Trybunal ne tilky dlia Putina: yak realno pokaraty elitu RF za ahresiiu proty Ukrainy. Yevropeiska pravda. Available at: https://www.eurointegration.com.ua/articles/2022/03/5/7135297/ Last accessed: 23.05.2022

446. Bukvych, A. (2022). Ratyfikatsiia Rymskoho statutu daie dlia Ukrainy bilshe mekhanizmiv dlia rozsliduvannia voiennykh zlochyniv i pokarannia za nykh. Available at: https://yur-gazeta.com/dumka-eksperta/ratifikaciya-rimskogo-statutu-dae-dlya-ukrayini-bilshe-mehanizmiv-dlya-rozsliduvannya-voennih-zlochi.html Last accessed: 23.06.2022

447. "Trybunal dlia Putina" staie vse blyzhchym (2022). Available at: https://helsinki.org.ua/articles/trybunal-dlia-putina-staie-vse-blyzhchym/ Last accessed: 17.08.2022

448. Merezhko, O. (2022). Parlament rozhliane shliakhy vdoskonalennia mekhanizmiv rozsliduvannia zlochyniv RF. 13.04.2022. Available at: https://sluga-narodu.com/oleksandr-merezhko-parlament-hotuvatyme-zminy-do-kpk-iaki-dozvoliat-efektyvno-rozsliduvaty-voienni-zlochyny-rf/ Last accessed: 10.05.2022

449. Maliuska, D. (2022). Cherez viinu v Ukraini 42 krainy zvernulysia do Haahy: mizhnarodne rozsliduvannia pochalos. Available at: https://armyinform.com.ua/2022/04/11/cherez-vijnu-v-ukrayini-42-krayiny-zvernulysya-do-gaagy-mizhnarodne-rozsliduvannya-pochalos/ Last accessed: 10.07.2022

450. PARIe pidtrymala stvorennia mizhnarodnoho trybunalu dlia rozsliduvannia ahresii RF v Ukraini: ukhvaleno rezoliutsiiu (2022). Available at: https://sluga-narodu.com/parye-pid-trymala-stvorennia-mizhnarodnoho-trybunalu-dlia-rozsliduvannia-ahresii-rf-v-ukraini-ukh-valyleno-rezoliutsiiu/ Last accessed: 22.07.2022

451. OON nazvala ekspertiv dlia rozsliduvannia voiennykh zlochyniv v Ukraini (2022). Yurydychna hazeta online. Available at: https://yur-gazeta.com/golovna/oon-nazvala-ekspertiv-dlya-rozsl-iduvannya-voennih-zlochiniv-v-ukrayini.html Last accessed: 22.04.2022

452. Rybachok, A. (2023). Stvorennia trybunalu shchodo vtorhnennia rf v Ukrainu: znovu "za-sudzhennia" chy realni dii YeS. Available at: https://www.juscutum.com/news/stvorennya-tri-bunalu-shchodo-vtorgnennya-rf-v-ukrayinu Last accessed: 15.02.2023

453. Pro zakhody shchodo pidvyshchennia efektyvnosti planuvannia v sektori bezpeky i oborony (2014). Ukaz Prezydenta Ukrainy No. 468/2014. 13.05.2014 Available at: https://zakon.rada.gov.ua/laws/show/n0007525-14#Text Last accessed: 25.02.2023

454. Pro Plan zakhodiv z provedennia kompleksnoho ohliadu sektoru bezpeky i oborony Ukrainy (2015). Rozporiadzhennia Kabinetu Ministriv Ukrainy No. 139-p. 25.02.2015. Available at: https://www.kmu.gov.ua/npas/247983129 Last accessed: 25.02.2023

455. Pro Stratehichnyi oboronnyi biuleten Ukrainy (2016). Ukaz Prezydenta Ukrainy No. 240/2016. 06.07.2016. Available at: https://www.president.gov.ua/documents/2402016-20137 Last accessed: 25.02.2023)

456. Pro rishennia Rady natsionalnoi bezpeky i oborony Ukrainy vid 6 travnia 2015 roku "Pro Stratehiiu natsionalnoi bezpeky Ukrainy" (2015). Ukaz Prezydenta Ukrainy No. 287/2015. 26.05.2015. Available at: https://www.president.gov.ua/documents/2872015-19070 Last accessed: 11.02.2023

457. Plan dii shchodo vprovadzhennia oboronnoi reformy u 2016—2020 rokakh (2016). Available at: https://www.mil.gov.ua/content/tenders/Plan_2208.pdf Last accessed: 25.02.2023

458. Pro Stratehiiu voiennoi bezpeky Ukrainy (2021). Ukaz Prezydenta Ukrainy No. 121/2021. 25.03.2021. Available at: https://www.president.gov.ua/documents/1212021-37661 Last accessed: 11.02.2023

459. Pro rishennia Rady natsionalnoi bezpeky i oborony Ukrainy vid 16 travnia 2019 roku "Pro orhanizatsiiu planuvannia v sektori bezpeky i oborony Ukrainy" (2019). Ukaz Prezydenta Ukrainy No. 225. 16.05.2019. Available at: https://www.president.gov.ua/documents/2252019-26835 Last accessed: 11.02.2023

460. Pytannia Natsionalnoi rady z vidnovlennia Ukrainy vid naslidkiv viiny (2022). Ukaz Prezydenta Ukrainy No. 266/2022. 21.04.2022. Available at: https://www.president.gov.ua/documents/2662022-42225 Last accessed: 11.02.2023

461. Opryliudneno dlia komentuvannia proekty rozdiliv planu zakhodiv z pisliavoiennoho vidnovlennia ta rozvytku Ukrainy (2022). Available at: https://www.kmu.gov.ua/news/opryliudneno-dlia-ko-mentuvannia-rozdily-planu-vidnovlennia-ukrainy Last accessed: 11.02.2023

462. Natsionalna rada z vidnovlennia Ukrainy vid naslidkiv viiny. Robochi hrupy (2022). Uriadovyi portal. Available at: https://www.kmu.gov.ua/diyalnist/nacionalna-rada-z-vidnovlennya-ukray-ini-vid-naslidkiv-vijni/robochi-grupi Last accessed: 11.02.2023

Edited by
Mykhailo Koval

THEORETICAL AND APPLIED ASPECTS OF THE RUSSIAN-UKRAINIAN WAR:
HYBRID AGGRESSION AND NATIONAL RESILIENCE

Mykhailo Koval, Andrii Ivashchenko, Vasyl Telelym, Tobias Sæther, Dmytro Fedianovych,
Tetiana Uvarova, Valerii Hordiichuk, Nina Andriianova, Oleksandr Peredrii, Mykola Shpura,
Volodymyr Ilchenko, Olha Demeshok, Oleksandr Ustymenko, Mykola Shaptalenko,
Iryna Zahorka, Mykhailo Lobko, Pavlo Shchypanskyi, Andrii Koretskyi, Vasyl Shvaliuchynskyi,
Serhii Pochynok, Volodymyr Prymirenko, Oleksandr Malkov, Oleksandr Yanenko,
Olena Korshets, Volodymyr Horbenko, Stepan Yakymiak, Petro Snitsarenko, Yurii Sarychev,
Vitalii Hrytsiuk, Dmytro Viter, Iryna Izhutova, Volodymyr Shubin, Oleksandr Voitko,
Volodymyr Rakhimov, Olha Pashkova, Ihor Pidopryhora, Andrii Biliuha, Vitalii Bidnyi,
Valerii Hrytsiuk, Rostyslav Pyliavets, Volodymyr Kydon, Maryna Semenkova,
Oleksandr Kotliarenko, Liudmyla Prypolova, Radion Tymoshenko, Anatolii Pavlikovskyi

Monograph

Technical editor I. Prudius
Desktop publishing T. Serhiienko
Cover photo Copyright © 2023 Canva