

## Reviews on the development of the theory of logistic support of the Air Force of the Armed Forces of Ukraine

- **Vitalii, Tyurin**, Candidate of Military Sciences, assistant professor, The National Defense University of Ukraine named after Ivan Cherniakhovskyi, Ukraine, *e-mail: tyurin\_vitaly@ukr.net*
- **Volodymyr, Mirnenko**, Doctor of Technical Sciences, Professor, Honored Worker of Education of Ukraine, Head of the Department of Logistics of the Air Force, The National Defense University of Ukraine named after Ivan Cherniakhovskyi, Ukraine, *e-mail: mirnenkovi@gmail.com*
- **Anatolii, Saliy**, Candidate of Military Sciences, assistant professor, The National Defense University of Ukraine named after Ivan Cherniakhovskyi, Ukraine, *e-mail: saliy-a@i.ua*
- **Pavlo, Open'ko**, Candidate of Technical Sciences, Chief of the research Department of the Institute of Aviation and Air Defense, The National Defense University of Ukraine named after Ivan Cherniakhovskyi, Ukraine, *e-mail: pavel.openko@ukr.net*
- **Oleksandr, Avramenko**, Candidate of Technical Sciences, The National Defense University of Ukraine named after Ivan Cherniakhovskyi, Ukraine, *e-mail: savram1977@gmail.com*

**Received:** October 26, 2019 | **Revised:** December 15, 2019 | **Accepted:** December 31, 2019

**JEL Classification:** F63, F50, C02.

**DOI:** 10.5281/zenodo.3595920

The existing separate arms theory and the theory of the Logistics of the Armed Forces as components of military science lose their functional purpose as partial theories in modern conditions of operations (combat actions). The article proposes a unified theory of logistics of the Air Forces of the Armed Forces of Ukraine, based on the existing theories of armament and the logistics of the Armed Forces, based on the general laws and established consistent patterns, trends, principles, forms and methods of the use of the logistics of the Air Forces of the Armed Forces of Ukraine. The objective function of the logistics system of the Air Forces of the Armed Forces of Ukraine is formulated, which is to achieve compliance of the capabilities of this system with the predicted volume of tasks of the logistics. In order to implement this compliance it is necessary to ensure the convergence of requirements and capabilities at all levels of logistics management. The purpose of the article is to determine the main provisions of the new unified theory of logistics of the Air Forces of the Armed Forces of Ukraine taking into account modern forms and methods of conducting operations (combat actions), requirements concerning the formation of a unified logistics system of the Armed Forces of Ukraine and logistic support, created management bodies, forces and assets of military units (formations) logistics of the Air Forces of the Armed Forces of Ukraine. The assessment of the functioning of the Air Forces logistics system of the Armed Forces of Ukraine is proposed on the basis of the stated views on the logistics theory of the Air Forces of the Armed Forces of Ukraine by assessing the set of real capabilities of each subsystem that is the part of its structure and system as a whole. At the same time, the assessment of the quality of the logistic support of the military units (formations) of the Air Forces of the Armed Forces of Ukraine should be related to the level of implementation of the potential capabilities of the logistics system when solving problems of each subsystem at the stages of combat training, unblocking and operational deployment, preparation and conduct of operations (combat actions), restoration of combat capability of troops (forces).

**Keywords:** logistics of the Air Forces of the Armed Forces of Ukraine, logistic system of the Air Forces of the Armed Forces of Ukraine, logistics.

### Introduction

The organizational structure of the logistics management bodies, the list of necessary assets of logistics, their functional duties and tasks were basically determined in pursuance of the measures of the State Program for the

Development of the Armed Forces of Ukraine up to 2020 (approved by the Decree of the President of Ukraine - Supreme Commander-in-Chief of the Armed Forces of Ukraine dated March 22, 2017, No. 73/2017) concerning the

creation of a unified logistics system of the Armed Forces of Ukraine as a result of the joint work of the General Staff of the Armed Forces of Ukraine and the interested military authorities.

The perspective logistics system of the Armed Forces of Ukraine provides for vertical division: planning (determination and planning of meeting troops' requirements) and executive (maintenance of necessary material resources and provision of troops with material resources and services). Therefore, a set of measures are planned to be taken in the Air Forces of the Armed Forces of Ukraine in order to improve the logistic system by creating a planning and executive authority for managing logistics, providing air commanders with satisfying functions for providing logistical facilities, forming airbases for the provision of aviation brigades, transfer of certain military units of logistics to the air commands.

The current integrated logistic system of the Air Forces of the Armed Forces of Ukraine is a set of combined logistic command units of the command of the Air Forces of the Armed Forces of Ukraine, departments of logistics of air commands, services and units of the logistics and combat service support of military units (subdivisions) with subordinated assets of logistics, the number of which is determined by the combat composition, structure, tasks of the military units (subunits) of the FP and intended for solving the tasks of planning and the logistical support of the forces (forces), as well as the implementation of logistics measures of the military units (divisions) of the Air Forces of Ukraine in their daily activities, during combat training, mobilization, operational deployment and combat readiness, preparation and conduct of hostilities, restoration of combat capability of military units (subunits) [1].

The logistic system of the Air Forces of the Armed Forces of Ukraine is designed to fulfill the tasks of logistics of military units (subunits) in the conduct of operations (combat actions)

under any conditions of the situation. Its main tasks are: the definition of the requirements of the Air Forces of the Armed Forces of Ukraine as for the armament and military equipment (weapons and military equipment) and other material means (MM); Planning supply of weapons and other military equipment to military units (subunits); organization of military transportation; creation of immovable stocks; accumulation, storage and accounting of weapons and military equipment and other MM;

provision and organization of transportation of weapons and military equipment; organization of the operation of the weapons and military equipments of the nomenclature of logistics; organization of the restoration of the weapons and military equipment of the nomenclature of logistics; logistics assets control; organization of airfield engineering support of aviation basing; control over the organization of airfield maintenance of flights in military units of the Air Forces; organization of vital functions of military units (subunits).

The objective function of the logistic system of the Air Forces of the Armed Forces of Ukraine is formulated as the achievement of the compliance of the capabilities of this system with the predicted volume of tasks of logistics. In order to implement this condition it is necessary to ensure that the requirements and capabilities are consistent across all levels of logistic management. Deviations from these conditions must be compensated within the set limits by the reserve of opportunities at each level of the hierarchy. In order to achieve this goal the logistic system of the higher level, which is the logistics of the command of the Air Forces of the Armed Forces of Ukraine, must have a reserve of abilities to influence the lower level in case of critical situations appear. In this case, the scope and timing of the measures in the interests of air commands and units (subunits) of the Armed Forces of Ukraine are determined.

## Material and Method

The analysis of the logistic support systems of the leading countries of the world, NATO-

member states (partner countries) [2-5] was carried out to determine the main views on the

logistics theory of the Air Forces of the Armed Forces of Ukraine, and logistic systems of the Armed Forces of Ukraine [6] has been carried out and all elements of this system which participate in the combat service support of operations (combat actions) of military units (subunits) were examined. The approach of the decomposition of the logistic system of the Air Forces of the Armed Forces of Ukraine allowed revealing the influence of each element on the implementation of its logistics functions.

Speaking about the logistic support system at the current stage, it should be noted that the Air Force is the only one service of the Armed Forces of Ukraine in which logistics has been operating since 2004, when there was an attempt to approximate NATO standards concerning the logistic support in the military sphere. It allows dealing with technical and logistics issues effectively, using an integrated approach to planning and organizing the implementation of security tasks. At the same time, combining the technical system and the logistic support system into a unified logistics system, as is currently the case in the Air Forces, contributes to the guaranteed implementation of the tasks of support of subordinated troops, thus the unity of command determines the interconnection between the subsystems of technical support and logistic support.

The optimal composition and logistics structure of the Air Forces of the Armed Forces of Ukraine, improvement of forms and methods of logistic support, development of logistics' principles, management and interaction methods elaboration contributed to the successful solution of tasks.

At the same time, the subsystem of the technical support of the Air Forces of the Armed Forces of Ukraine (under the nomenclature of logistics) requires to be improved, as at present stage separate technical support tasks are organized within different chains of command

(there is no single authority who organizes the implementation of all kinds of logistics technical support).

The development of the theoretical elaboration of the issues of logistic support for conducting operations (combat actions) is based on solving logistic problems of the Armed Forces of Ukraine, namely the search for ways to resolve the discrepancy between the desirable and the actual state of logistics, which is considered in the publications of Romanchenko I. S. [7, 10], Khazanovich O. I. [7], Tarasenko A. V. [8], Shuenkin V. O. [9, 10], Rolin I. F. [11], Seratyuk V. M. [12] and Krizhny A.V. [13].

In today's conditions of conducting operations (combat actions) existing separately the theory of armament and the theory of the rear services of the Armed Forces, as components of military science, lose their functional purpose as partial theories.

**Goal of the article.** Taking into consideration modern forms and methods of conducting operations (combat actions), as well as requirements for forming a unified logistics system of the Armed Forces of Ukraine and logistics, created management bodies, forces and means of logistic support of military units (subunits) of the Armed Forces of Ukraine, the purpose of the article is to define the main provisions of the new the unified logistic theory of the Air Forces of the Armed Forces of Ukraine.

In this context the basis of the unified theory of logistics is the following methodologies:

methodology of system logistic analysis – a set of methods and techniques for the development, adoption and substantiation of solutions while examining, creating and managing of logistics systems;

methodology of the cybernetic approach to the management of logistics systems – the research of the logistics system based on the principles of cybernetics in contrary.

## Results and discussion

**2.1** On the basis of the analysis of the logistic support of the Armed Forces of the leading countries of the world and NATO member-states (partner countries) [2-5], certain types of activities,

requirements and tasks of logistic support [1], created logistic structures of military units (subunits) of the Armed Forces of Ukraine, scientific methods of research of logistics, a unified theory of

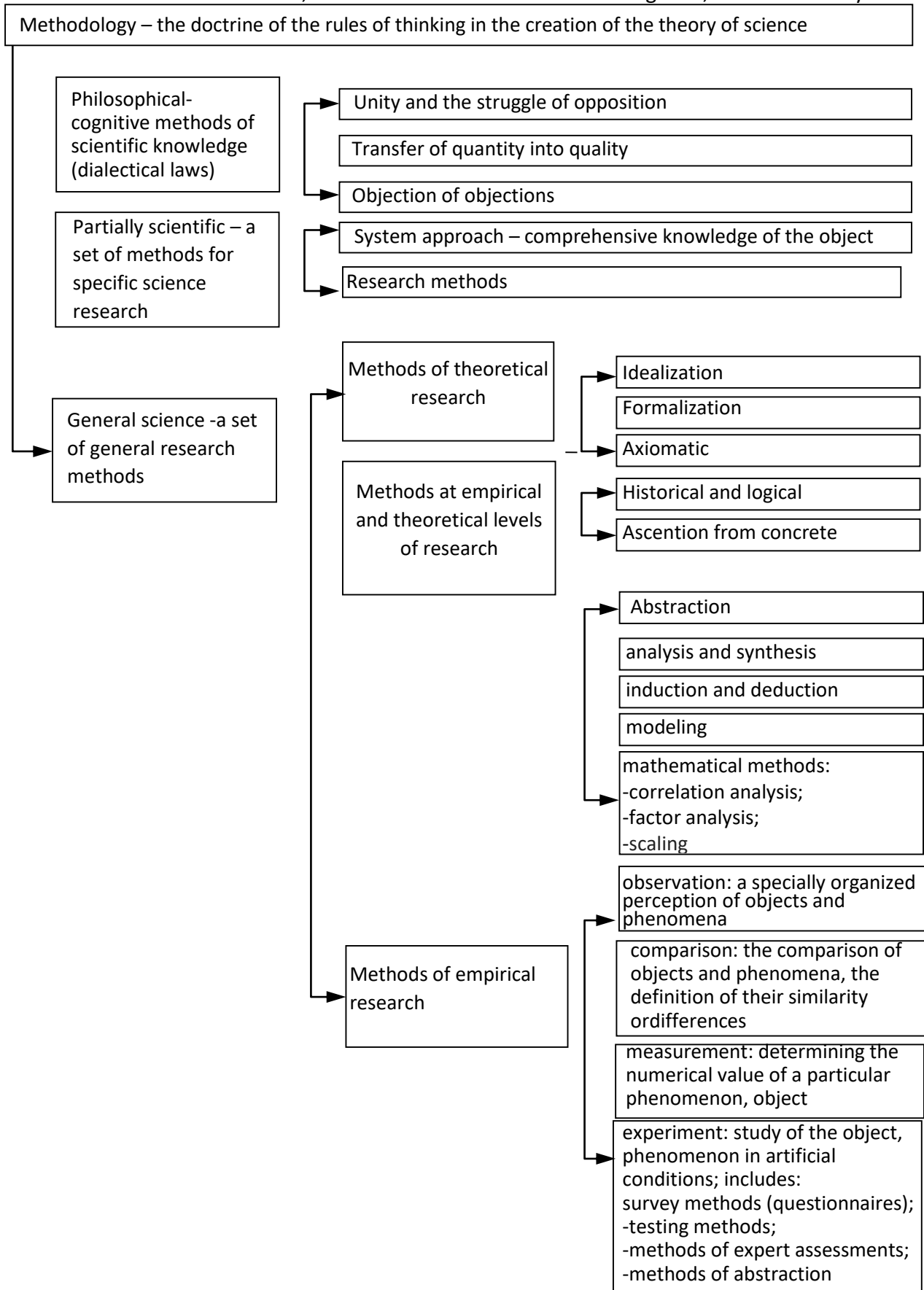


Fig.1. Block diagram of disclosure of content and component methodology

logistics of the Air Forces of the Armed Forces of Ukraine is proposed, which includes the following main components:

- the conceptual apparatus and the empirical basis of logistics of the Air Forces of the Armed Forces of Ukraine, which are based on the forms of scientific knowledge and contain scientific positions and results, as well as the mechanism of their implementation;

- initial conceptual provisions according to the types of logistics activities of the Armed Forces of Ukraine, which consider and provide the development of the necessary methods for calculating the needs of forces and assets of logistics of the Air Forces of the Armed Forces of Ukraine; the main provisions for the preparation of the logistics infrastructure for the accumulation, separation and conservation of material resources, the use and replenishment of stocks, the operation of weapons and military equipment; increase of efficiency of logistics by activities;

- rules of logical conclusions which are based on the generalization of experience of creation and functioning of the logistics management bodies of the Armed Forces of the leading countries of the world and NATO member-states (partner countries), determine the directions of the long-term development of logistic support of military units (subunits) of the Armed Forces of Ukraine providing the ability to integrate logistics systems while performing compliant operations.

That is, as for its structure, the theory of logistics of the Air Forces of the Armed Forces of Ukraine is an internally differentiated integral system of knowledge about material, transport, evacuation, information and financial flow processes according to types of activity, which characterizes the logical dependence on some elements from others, the derivation of the content of the theory of logistics from a certain set of statements and concepts according to the defined logical and methodological principles

and rules, the basic components of which are shown in Figure.2

The analysis of the logistic support of military units (subunits) of the Armed Forces of Ukraine indicates the availability of approaches as for the use of the proposed logistics theory. The main of these approaches are the following:

- solving tasks according to the types of activity of logistics of the Air Forces during the conduct of operations (combat actions) in the established scope of tasks and in interaction with the logistics systems of the Land Forces of the Armed Forces of Ukraine, the Naval Forces of the Ground Forces of Ukraine, other military formations and law-enforcement agencies of special assignment, defence industry, and other branches of the national economy of Ukraine;

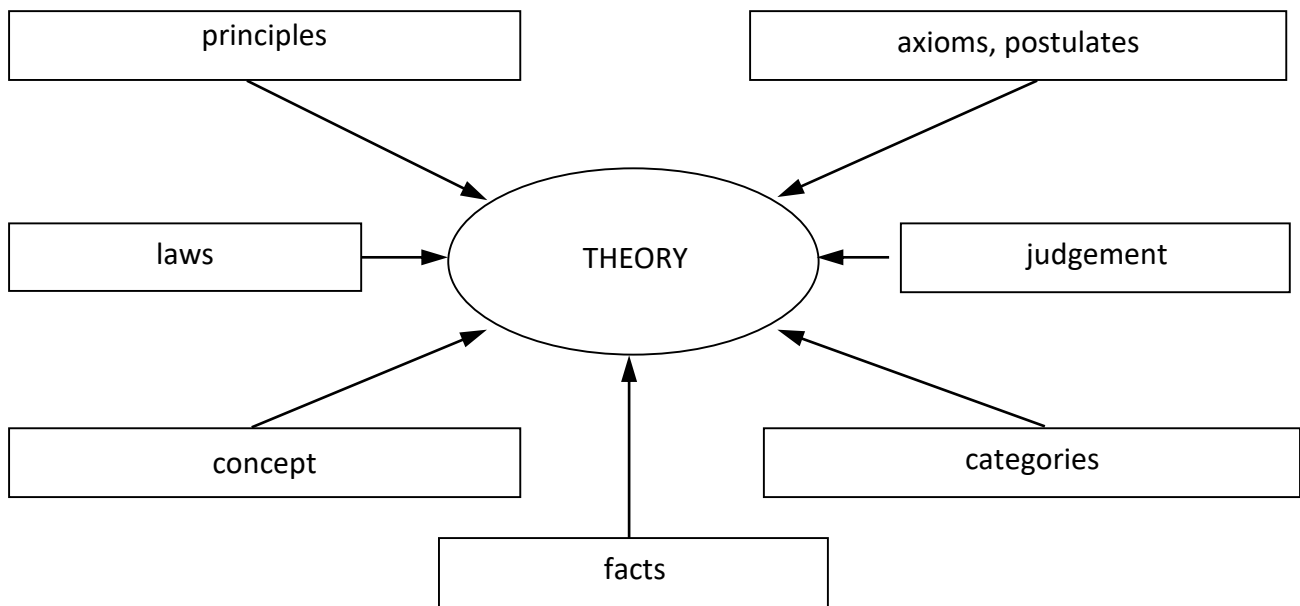
- logistical maintenance of high autonomy of conducting operations (combat actions) of military units (subunits) of the Armed Forces of Ukraine;

- maintenance of high maneuverability and mobility of military units (subunits) of the Armed Forces of Ukraine in the conduct of operations (combat operations), which is provided by resettlement, transfer and promotion of military units (subdivisions) of the Airborne, development of the aerodrome network;

- creation and improvement of the logistic system of the Air Forces of the Armed Forces of Ukraine on the basis of a functional integrated system of logistics of the Armed Forces of Ukraine;

- capacity of the logistic system of the Air Forces of the Armed Forces of Ukraine to conduct operations in the operational groups of the Army (forces) of the Armed Forces of Ukraine;

- achievement of high efficiency and functionality of logistic processes and their compatibility with the NATO logistics system by applying the relevant NATO standards in the activities of the Air Forces of the Armed Forces of Ukraine [14].



**Figure 2.** The basic scheme of disclosure of content and components of the theory

**2.2.** The basis of these approaches is the modular and territorial principles of logistics constructing the infrastructure for the provision of military units (subunits) of the Armed Forces of Ukraine. In this case, the territorial system of logistics of the Air Forces is represented by a multilevel hierarchical structure, the basis of which is logistics bodies. Organizationally it includes the logistic bodies of the Command of the Armed Forces of Ukraine, air commands, and military units of the Air Forces. The logistic structure of the Air Forces of the Armed Forces of Ukraine will be brought in line with the typical structure of the logistics management bodies in all services of the Armed Forces of Ukraine and the logistic units of the strategic level.

Methodologically, the central role of the formation of the proposed logistics theory of the Air Forces of the Armed Forces of Ukraine is to determine the patterns, trends, principles, forms and methods of logistic for conducting operations (combat actions) of military units (subunits) of the Air Forces of the Armed Forces of Ukraine, which are formed within the framework of the theory of logistics and relate to logistic support.

Analysis of the development of logistic support of the Air Forces of the Armed Forces of Ukraine allows to identify patterns that reflect the stable links of the logistics system of the Air Forces of the Armed Forces of Ukraine with the development of

the branches of the national economy of Ukraine, the infrastructure of logistics and the transport system of the country. That is, for the logistic system of the Air Forces of the Armed Forces of Ukraine the dependence of the quality of the preparation, conduct and outcome of the operation (combat actions) on the state and capabilities of the logistic support system is inherent.

The complexity and interconnection of logistic support measures, namely, a clear and transparent logistic support management system (material, transport, evacuation, information and financial flows management) in the logistic system of the Air Forces of the Armed Forces of Ukraine give rise to the second regularity of its construction and functioning, which is expressed in a unity of infrastructure support of logistics of the Air Forces of the Armed Forces of Ukraine, which is an integral part of the engineering and infrastructure support of the Armed Forces of Ukraine, both stationary and mobile, for the purpose of measures of their vitality. Creation within the framework of a single logistic space of the Armed Forces of Ukraine logistics system of the Armed Forces of Ukraine will allow fulfilling the requirements of logistics of the Air Forces of the Armed Forces of Ukraine in accordance with the modular and territorial principle of construction of the logistics infrastructure.

The next regularity of logistic support is the centralization of management and the decentralization of the implementation of the tasks of using the logistic system of the Air Forces of the Armed Forces of Ukraine provided that the assets of logistic support for conducting operations (combat actions) are sufficient.

Knowledge of the laws allows us to understand the operation and properties of the logistics system and to form more adequate decision-making model. In the future, the patterns are manifested in the form of trends that determine the existence and improvement of the logistics system of the Air Forces of the Armed Forces of Ukraine through the interaction of this system with the infrastructure of logistics, transport system and branches of the national economy of Ukraine.

On the basis of an analysis of the organization of the operation and development of logistics systems of NATO member-states (partner countries), in particular by examining the logistical support of the troops, it is possible to identify a number of stable tendencies that are related by the limitation of most resources, the high destructive ability of enemy weapons, and the speed of conducting operations (combat actions). The tendencies, which belong to the logistics of the Air Forces of the Armed Forces of Ukraine, are the following:

- centralization of planning and organization of logistics at the level of logistics Command of the Armed Forces of Ukraine;

- the dependence of the organization and management of logistic support on the structure of the Air Forces of the Armed Forces of Ukraine, the material base and conditions for the implementation of logistic support;

- implementation of the territorial system of providing military units (subunits) regardless of their belonging to one or another service of the Armed Forces of Ukraine;

- maintaining the proportionality and optimum correlation in the organization of logistic support of the Air Forces of the Armed Forces of Ukraine in the general system of logistics of the Armed Forces of Ukraine;

- the unity of organizational and methodological foundations (organizational and information

support, analysis, planning, control) of the logistic system of the Air Forces of the Armed Forces of Ukraine at all levels of logistic support;

- compatibility of logistic assets of interacting military units (subunits);

- reduction of intermediate levels of provision, concentration of major efforts in the air command and military units (subunits), where the expenditures of logistics are incurred;

- optimization of processes of making logistic decisions based on efficiency indicators used in the logistics of the Air Forces of the Armed Forces of Ukraine;

- automation of the processes of material, transport, evacuation, information and financial flows management [15];

- the dependence of the efficiency of the solution of the increasing scope of tasks of logistics of the Air Forces of the Armed Forces of Ukraine on the amount of information used.

Trends in practice are realized through the principles of logistic support, which are consistent with legislative acts on national security and defence of Ukraine, the standards of logistics of NATO, and determine the specifics of the functioning of military units (subunits) of the Armed Forces of Ukraine in the course of the preparation and conduct of operations (combat actions).

In essence, the principles of logistic support represent a provision according to which the necessary properties of the logistic system of the Air Forces of the Armed Forces of Ukraine are formed. At the same time, the principles of logistic support provide the basis for the construction and operation of the logistics system of the Air Forces of the Armed Forces of Ukraine.

Using these principles in practice it is possible to justify the recommendations for carrying out a complex of measures to determine the tasks of logistics, the order of management of the logistic system, the volume of weapons and military equipment, logistics and the order of their transportation and supply, the sequence, timing, methods of action, interaction, the necessary composition of the group of forces and logistics, the development of appropriate planning documents on troop-contributing tasks in peace and war time [16, 17].

**2.3.** Thus, in accordance with the General Provisions of the Logistic Doctrine of the Armed Forces of Ukraine [1], the principles of logistic support are the following:

Priority – is the determination of the directions of concentration of the main assets of logistics in order to fulfill of the priority and most important tasks of the troops (forces);

Sufficiency – timely provision of necessary weapons and military equipment and logistic support in accordance with determined requirements;

Efficiency – use of assets of logistic support with the achievement of the maximum possible result;

Flexibility – a proactive approach with the ability to adapt and respond quickly to changing circumstances;

Transparency – the exchange of reliable information as for requirements and availability of weapons and military equipment and logistic support at services at all levels, taking into account the degree of access to it (ensuring the protection of confidential information);

Coordination – is the interaction of all components of the logistic system of the Air Forces of the Armed Forces to provide an effective functioning of the system in general, as well as with the logistics system of the Armed Forces of Ukraine, the bodies of foreign states, international organizations and armed forces of other states on the basis of the concluded international treaties of Ukraine, NATO –members states;

Responsibility - the logistics departments of all levels in their activities must strictly adhere to the powers granted and be responsible for the timely execution of specified tasks;

Cooperation – cooperation between the Air Forces of the Armed Forces of Ukraine and other components of the defence forces, central and local executive authorities, local government authorities, state enterprises of the military industrial complex, other enterprises of the national economy of Ukraine, as well as with the authorities of foreign states, international organizations and armed forces of others States on the basis of concluded international treaties of Ukraine as for logistic support. Cooperation should be directed towards effective and timely meeting the requirements of the Armed Forces;

Interoperability – the logistics of the Armed Forces of Ukraine aims to achieve full interoperability with NATO logistics, which will enable the integration of systems in the course of joint operations, as well as the possibility of using individual weapons and military equipment samples and logistics nomenclature of NATO member-states (partner countries) for meeting the requirements of the Armed Forces of Ukraine;

Stability – the organization of logistic support should include measures aimed at minimizing losses of allocated resources from the influence of certain factors (external and internal, positive and negative), and in the course of operations (combat actions) from the influence of the enemy.

**2.4.** Together with the established laws, tendencies and principles of logistic support the Air Forces of the Armed Forces of Ukraine require to define the concept of forms and methods. In essence, forms of logistic support represent the actions of the logistics management authorities regarding the use of logistic assets. In the meantime the forms of logistic support are directly related to the forms of action of the military units (subunits) of the Armed Forces of Ukraine and are important in the operation of the logistic system of the Armed Forces of Ukraine. Therefore, the main forms of logistic support of military units (subunits) of the Armed Forces of Ukraine are:

Logistic support for combat training and combat duty;

Logistic support for everyday activities;

logistical support for mobilization, operational deployment and bringing into combat readiness;

logistic support for operational and tactical regrouping;

logistic support for the preparation and conduct of operations (combat actions);

logistic support for the restoration of combat capability of military units (subunits).

In turn, logistical support for the preparation and conduct of operations (combat actions) it is expedient to identify:

logistic support for military units (subunits) of the Armed Forces of Ukraine in defence operations;

logistic support for the preparation of military units (subunits) of the Armed Forces of Ukraine for



an counter offensive (offensive) operation during a defence operation;

Logistic support for military units (subunits) of the Armed Forces of Ukraine in the counter-offensive (offensive) operation;

Logistic support for military units (subunits) of the Armed Forces of Ukraine in the air operations of the Armed Forces of Ukraine;

Logistic support of aircraft maneuvers of the Air Forces of the Armed Forces of Ukraine;

Logistic support for the regrouping of military units (subunits) of the Armed Forces of Ukraine.

**2.5.** The implementation of these forms is carried out by means of logistic support. On the basis of the analysis of logistics systems in the leading countries of the world and NATO member-states, it is possible to define the content the "methods of logistic support" concept. This concept implies the complex of questions of theory and practice that characterize the order and methods of using assets of logistic support for the tasks of preparation and conduct of operations (combat actions). In this case, the logistics support methods will depend on:

the nature and methods of conducting operations (combat actions) of military units (subunits) of the Armed Forces of Ukraine;

directions of concentration of the main efforts of logistics;

the available assets of logistic support and the sequence of their application;

the degree of centralization of the management of the logistics system and decentralization of the tasks of logistic support;

physical and geographical conditions of the area of operation and the nature of the deployment of assets of logistic support on the ground;

the nature of the maneuver and the regrouping of forces and means of logistic support.

Combinations of these factors determine a number of specific methods of logistic support that characterize the proposed forms of logistic support for military units (subunits) of the Armed Forces of Ukraine in the course of conduct of operations (combat actions). The choice of specific methods of logistic support for the Air Forces of the Armed Forces of Ukraine will be determined by the Deputy Chief of the logistics unit - Chief of the logistics of the Air Forces in the process of making a decision on the organization of logistic support in the preparation and conduct of operation (combat actions). Changes in conditions during the conduct of operations (combat actions) will change the combination of factors, as well as the change in the methods of logistics in general. In the subsystems of logistic support of the Air Forces of the Armed Forces of Ukraine, at operational and tactical levels, each form of logistic support will correspond only to the inherent methods of these forms.

## Conclusions

Thus, the functioning of the logistics system of the Air Forces of the Armed Forces of Ukraine taking into consideration the stated views on the logistics theory of the Air Forces of the Armed Forces of Ukraine should be assessed, based on the requirements for logistic support by assessing the totality of real capabilities of each subsystem that is part of it and the system as a whole. In this case, the assessment of the quality

of logistic support for military units (subunits) of the Armed Forces of Ukraine can be related to the degree of implementation of the potential capabilities of the logistic system in solving the tasks of each subsystem during the stages of combat training, mobilization and operational deployment, preparation and conduct of operations (combat actions), restoration of combat capability of troops (forces).

## References

1. Order of the Ministry of Defence of Ukraine of October 11, 2016, No. 522 "Basic Provisions of the Logistic Support of the Armed Forces of Ukraine" [in Ukrainian].
2. Sumets A.M. Logistics in the Armed Forces of NATO and the Bundeswehr. Logistic Time. Retrieved from: <http://logisticstime.com/news/logistika-v-vooruzhennyx-silax-nato-i-bundesvera> [in Ukrainian].
3. NATO 2020: Assured security; Dynamic engagement – analysis and recommendations of the group of experts on a new strategic concept for NATO. Retrieved from: <http://www.nato.int/strategicconcept/expertsreport.pdf>.
4. Combat Service Support (FM 4-0). Access mode: [http://tsg3.us/tmsg\\_lib/unit\\_dig\\_lib/fm4\\_0.pdf](http://tsg3.us/tmsg_lib/unit_dig_lib/fm4_0.pdf).
5. David Beaumont. Logistics in the war. Retrieved from: <http://www.sgs-mil.org/logistika/412-logistika-v-voine-hast-1.html#sel=6:3,64>.
6. Kotov, O.B., Gurin, O.M., Novichonok, S.M. (2012). Views on the improvement of the logistics of the Air Forces of the Armed Forces of Ukraine. Collection of scientific works of Kharkiv University of Air Forces, 1 (30), 39 – 42 [in Ukrainian].
7. Romanchenko, I.S., Khazanovich, O.I., Trehubenko, S.S. (2015). Logistics systems Modeling: Monograph. Lviv: Hetman Petro Sahaidachnyi National Army Academy [in Ukrainian].
8. Tarasenko, A.V. (2013). Scientific approaches to the definition of "logistics of security and defence sector entities". *European perspectives*, 7, 54 – 59 [in Ukrainian].
9. Shuenkin, V.O. (2007). Logistics – what is it? *Science and defence*, 1, 66 – 68 [in Ukrainian].
10. Romanchenko, I.S., Shuenkin, V.O. (2007). Views on the development of the logistics system of the Armed Forces of Ukraine. *Science and defence*, 4, 22 – 27 [in Ukrainian].
11. Rolin, I.F., Morozov, I.E., Minko, O.V. (2017). Contents of the main terms in the field of logistic support for military formations. *Armament systems and military equipment*, 1 (49), 61 – 64 [in Ukrainian].
12. Servatyuk, V.M., Ugrynovych, O.I. (2013). Perspective directions of reformation of the logistics system of the Armed Forces of Ukraine. *Science and Technology of the Air Forces of the Armed Forces of Ukraine*, 2 (11). 14 – 18 [in Ukrainian].
13. Krizhny, A.V., Openko, P.V., Drannik, P. A. (2015). Prospects for the development of the technical support system for anti-aircraft missile troops. *Problems of creation, testing, application and operation of complex information systems*, 10, 148 – 157 [in Ukrainian].
14. Order of the Ministry of Defense of Ukraine dated August 22, 2017, No. 450 "On ensuring the functioning of the military standardization system" [in Ukrainian].
15. Zaklad, M.A., Biletov, V.I., Leoncheva, K.O. (2013). Automation of the rear. *Defensive Herald of the Center for Military and Security Policy*, 4, 26 – 29 [in Ukrainian].
16. Open'ko P.V., Drannyk P.A., Kobzev V.V., Brovko M.B., Zalevsky G.S. (2017). Substantiation of reliability requirements for mobility means of surface-to-air missile systems. *Advances in Military Technology* vol. 12, 1, 91-99.
17. Sachuk I., Bortnovskiy S., Artemenko A., Kalyta A., Openko P., Tyurin V. (2018). Recommendations for Practical Use of the Planning Method of Compound Technical Objects Exit into Repair During Operation According to State. IEEE First International Conf. "System Analysis & Intelligent Computing (SAIC)", October 2018, Kyiv: Igor Sikorsky Kyiv Polytechnic Institute, 121-124