ISSN 2304-2699

Research papers collection of the Center of military and strategic studies of the National Defence University of Ukraine named after Ivan Chernyahovsky

№ 2(60), 2017

УДК 355:623 (08)
ISSN 2304-2699 (Print)
ISSN 2304-2745 (Online)

Reaserch papers collection of the Center of military and strategic studies of the National Defence University of Ukraine named after Ivan Chernyahovsky. - 2017. - № 2(60).

Established in 1997 and entered in the list of scientific professional publications of Ukraine in the sphere of technical and military Sciences (the Order of the Ministry of Education and Science of Ukraine № 241 from 09.03.2016).

The publication is indexed by Google Scholar

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Recommended for printing by academic council of NDU of Ukraine named after Ivan Chernyakhovsky (protocol № 12 from 31.08.2017).

Editorial address: 03186, Kyiv 186, Aviakonstruktora Antonova 2/32 St., corps 14,
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The jubilee issue of the scientific works of Center for Military and Strategic Studies of the National Defence University of Ukraine named after Ivan Chernyhovsky is continuing. It continues to acquaint the scientific community with research in the areas of military security, military policy, strategic planning of the Armed Forces development, defense planning, martial arts, information security, State Military Governance, conducted by Center staff and other leading scientists of the country.

The collection will facilitate the provision of comprehensive information support to doctoral students, adjuncts, and applicants for scientific degrees through the prompt publication of their scientific papers.

I express my hope for creative cooperation with those who are not indifferent to the present and future of our state, to resolve issues of modern military strategy and national security.

Head of Center for Military and Strategic Studies
of the National Defence University of Ukraine named
after Ivan Chernyhovsky
Doctor of Military Sciences, Senior Researcher R. TYMOSHENKO

Summary

UDK 355.43

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Center for Military and Strategic Studies of the National Defence University of Ukraine named after Ivan Chernyhovsky, Kyiv

Strategy of transition in conditions of hybrid war to a new format of strategic direction of the security and defense sector of Ukraine

Resume The article is devoted to the problem of the transition of the security and defense sector of Ukraine and to the strategic direction of the defense forces to a new format for the functioning and counteraction of Russian aggression.

Keywords: aggressor, hybrid war, security and defense sector, defense, strategic leadership.

Formulation of the problem. The three-year time runs out, as Russia unleashed an unprecedented hybrid war against Ukraine, occupying the Crimea and part of the Donbas. Today, the active defense of Ukraine from the Russian aggressor remains the most pressing problem of the present in order to force him to cease hostilities by conducting joint operations of the defense forces in conjunction with the organization of active resistance to it.

To this end, Ukraine has recently announced the need to move to a new format for countering an aggressor. The bill is being drafted to determine the complex of military and diplomatic steps to ensure the liberation of the occupied territories from the aggressor and to regulate new approaches to the formation of strategic direction of the Armed Forces of Ukraine and other components of the defense forces and to determine the new principles of their application against the aggressor.

Analysis of recent research and publications. The problem of moving to a new format for countering an aggressor is entirely new. In modern literature, it is still underdeveloped and requires more detailed study and discussion.

Unresolved current problems identified by the Strategic Defense Bulletin of Ukraine, enacted by the Decree of the President of Ukraine dated June 6, 2016, No. 240/2016, there is a lack of a unified strategic direction of the defense forces that would be carried out in accordance with the principles and standards adopted by the NATO member states , A clear division of responsibility for the formation and use of defense forces, which negatively affects the effectiveness of strategic direction of the security and defense sector of Ukraine.

The purpose of the article is to seek and substantiate effective strategic approaches to solving these problems in the security and defense sector of Ukraine, the transition of the Armed Forces of Ukraine and other components of the security and defense forces and their strategic direction to a new format for countering the aggressor.

Presenting main material. According to experts, the hybrid war which Ukraine has solved and is still pursuing against Russia is a long-term factor of influence on Ukrainian political, economic, military, informational, social and other spheres of life of the state. As a result of hybrid actions of Russia deformed the system of global and regional security and international law. Almost all of its international security assurances for Ukraine, in particular within the framework of the Budapest Memorandum, turned out to be neglected. Instead, Russia has used the concept of a hybrid war against Ukraine, which is hybrid from the structural and functional point of view, and asymmetric in content. It attaches great importance to the greatness of the armed forces and their ability to carry out fast and efficient operations in any theater of war, in particular, in non-traditional conditions of "the integrated application of political, economic, informational and other non-military measures" implemented by an aggressor based on Military force. This was confirmed by the Chief of the General Staff of the Armed Forces of Russia, Army General V. Gerasimov, in his speech at the final conference of the Academy of Military Sciences of the Russian Federation (RF) on February 27, 2016. At the same time, he stressed the need to increase the role of non-military methods of pressure from Russia, primarily through political, economic and humanitarian elements. Information confrontation and rapid growth of information influence it recognized as a cornerstone of the RF in all these areas.

It follows from the above that the current confrontation of Ukraine against the Russian

aggressor is also appropriate to rally and pursue precisely in all of these four areas.

The first direction is the advocacy of political, economic, energy, transport and other national interests of the state in the geoeconomic space by peaceful means, using diplomatic missions, international organizations, two or multilateral intergovernmental treaties, etc.

The second - defending the national interests of Ukraine in the information and cyberspace.

The third is the strengthening of the internal security of the state, the basis of which is the fight against the interference of the special services of other states in internal affairs; Counteracting terrorism, banditry, separatism; Fight against espionage and intelligence of foreign states; Monitoring and promoting the stability of interethnic, interdenominational, interethnic and other areas of national relations, etc.

The fourth - the armed struggle with the gradual build-up of troop groups to expand control over the territories occupied by the enemy. An effective element of the security and defense sector of Ukraine in this response should be an effective system of strategic guidance.

The analysis of these problems and the experience of conducting military operations in the ATO confirms the lack of readiness of the components of the security and defense sector of Ukraine, including its strategic leadership and defense forces, to adequately counteract Russian aggression in the context of conducting an uninvited hybrid war against Ukraine.

The task of Ukraine in these conditions is not to create a new format of the system of strategic guidance by the forces of defense, that is, strategic military management, but to create a new format of a unified system of management of the security and defense sector of Ukraine as a whole.

Considering ways of developing a new format for strategic direction of the security and defense sector in modern security conditions, it is necessary in our opinion to distinguish, first of all, the two concepts of "strategic direction of the security and defense sector" and "strategic military management of the forces of defense". In the legislation of Ukraine and in the works of well-known scholars, they are not specified or delimited. However, a more detailed analysis of these concepts and functions of the components of the security and defense sector, defined by the Constitution of Ukraine, other legislative and regulatory acts, and modern conceptual documents, makes it possible to formulate their next list.

Functions of strategic direction of the security and defense sector:

Formation and implementation of a single state policy in the field of national security and defense;

Collecting and studying the military-political situation, analyzing the situation and trends in the development of the foreign and internal political situation, determining on this basis the strategies and priority directions of ensuring national security and defense;

Comprehensive assessment and forecast of potential and real threats to the state, economic, public, defense, informational, ecological and other types and objects of security of Ukraine;

Planning, organization and control over the implementation of measures of political, economic, military, social, scientific, technical and other nature, adequate to these threats;

The formation of the State Defense Order and the draft Law of Ukraine "On the State Budget of Ukraine"; Financing of expenses for national security and defense;

Declaration of war, introduction of a regime of war, announcement of mobilization and decision to put into effect a state mobilization plan;

Consideration and solution of other urgent issues of national security and defense of the state.

Strategic Military Control Functions:

Analysis and evaluation of military-strategic situation;

Forecast of trends in the development of forms and methods of military actions and means of armed struggle, justification of directions of development of the Armed Forces and other components of the defense forces;

Strategic planning of their application for the defense of the state:

Determination of the requirements for personnel, armaments, military equipment, material, technical, energy, financial, information, food, land and water resources, communications, funds and property necessary for the proper performance of the tasks assigned to him and control the completeness and quality of their provision;

Planning and control in a special period for military transportation of all kinds;

Management in the field of defense and securing in the legal order of the public order in Ukraine or in certain areas where a state of war has been introduced;

Management of strategic deployment of the Armed Forces and other determined components of the defense forces;

Conducting intelligence and information-analytical activities in order to maintain the readiness and combat use of the Armed Forces and other components of the defense forces;

Realization of other powers determined by laws and other normative-legal acts of Ukraine.

The object of strategic military management here should be defense forces as a component of the security and defense sector of Ukraine.

Taking into account the elements and requirements of the Strategic Defense Bulletin of Ukraine from 2016, it is possible to outline a new format of the strategic defense management system of the model 2018 and then 2020, gradually approaching its transition to the format provided by NATO standards. It should be borne in mind that one of the main conditions for the establishment of such a system of defense according to NATO principles and standards should be the restoration of the OOC, as an organ of operational and strategic grouping of troops and army corps, operational and tactical associations.

The Commander-in-Chief of the Armed Forces of Ukraine, as the highest military officer, should lead the strategic military command of the defense forces of the entire security and defense sector of Ukraine. He must obey the President of Ukraine and the Minister of Defense of Ukraine and be his military adviser.

According to world experience of wars and military conflicts, including ATO format in Ukraine, it is expedient to establish the Main Chief of Staff of the Commander-in-Chief of the Armed Forces for direct control of the defense forces.

In the member states of NATO, the base of the organization of military command of armies is the Joint staff. NATO administrative and operational standards can only be applied to the Joint Headquarters structures, and not to the structures of other headquarters.

The Chief of the Armed Forces of Ukraine should be directly subordinated to the Commander of the OSC, Commander of the Armed Forces, the Airborne Forces and the Military Intelligence. The commander of the OOC through the SAC must manage the grouping of the Armed Forces to be allocated to the NATO forces and the operational-strategic grouping of troops to be assigned to the state's defense.

The analysis of the nature of military threats closely related to each other in all spheres of state functioning, the latest methods of preparation and conduct of hybrid wars, as well as the experience of conducting military operations in the ATO confirms the need for the integration of the management efforts of the state leadership in all spheres of security and defense of Ukraine into a unified system Strategic direction of the security and defense sector of the new format in accordance with current conditions and needs. This approach will be in line with one of NATO's basic principles of clear division and delegation of responsibilities in the formation and implementation of decisions throughout the management system - from the military-political leadership to a separate unit.

Taking into account the experience of NATO member states and in accordance with the requirements of the Constitution of Ukraine, the Laws of Ukraine "On the Defense of Ukraine", "On the Fundamentals of National Security of Ukraine," the National Security and Defense Council of Ukraine may be the main consolidating base of the strategic direction of the security and defense sector of Ukraine, however Subject to the clarification of the legislative functions of its functions and the corresponding reformation of its organizational and staff structure. According to Art. 107 of the Constitution of Ukraine, the main functions of the National Security and Defense Council in this area may be:

Assessment of the military-political, economic, informational, criminal and other conditions and its influence on the security and defense of the state;

Definition of threats to national security in all spheres of vital activity of the state;

Substantiation of strategic goals, goals and main directions and tasks in all spheres of the state's operation to counter the hybrid aggression of the enemy;

The formation of comprehensive programs to counter the aggressor at each stage of the preparation and conduct of the hybrid war by the enemy;

Drafting of necessary legislative and other normative legal acts concerning state defense and preparing them for submission to the Verkhovna Rada of Ukraine by the established procedure;

Coordination and control of executive bodies, and in a special period of private business, in the field of national security and defense, etc.

In this context, in our opinion, it would be advisable to form the structure of the NSDC situational center, for example, as an option, within the financial and economic group of the Cabinet of Ministers of Ukraine; Information Group from the Ministry of Information; A group of internal security from the security forces and law enforcement agencies and a group from the Ministry of Defense.

In a threatening period (with the onset of aggression), to strengthen the situational center, it is expedient to form operational groups (on an ongoing basis) under the leadership of the deputy prime minister and deputy ministers (departments).

Conclusion. The analysis of the above-mentioned problems and existing experience gives grounds to assert that the strategic direction of the security and defense sector of Ukraine is a complex of political, legal, economic, military, scientific, informational and other measures of the state in identifying and defining effective methods of neutralizing threats to the national interests of the state.

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The article came to the release 07.07.2017

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Стратегія переходу в умовах гібридної війни до нового формату стратегічного керівництва сектором безпеки і оборони України

Резюме. Стаття присвячена проблемі переходу сектора безпеки і оборони України та стратегічного керівництва силами оборони до нового формату функціонування й протидії російській агресії.

Ключові слова: агресор, гібридна війна, сектор безпеки і оборони, сили оборони, стратегічне керівництво.

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Стратегия перехода в условиях гибридной войны к новому формату стратегического руководства сектором безопасности и обороны

Резюме. Статья посвящена проблеме перехода сектора безопасности и обороны Украины и стратегического руководства силами обороны к новому формату функционирования и противодействия российской агрессии.

Ключевые слова: агрессор, гибридная война, сектор безопасности и обороны, силы обороны, стратегическое руководство.

UDC 355.357+351.862.211.5

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Estimated timing for introducing Telecommunications Standards NATO Armed Forces of Ukraine

Resume. The article assessed the timing input Telecommunications Standards NATO Armed Forces of Ukraine. Evaluation carried out using expert-analytical procedure method of network analysis. As predicted timing of the creation of communications and telecommunications NATO standards proposed three alternatives - the short, medium and long term.

Keywords: NATO standards, telecommunications, network analysis method, the Armed Forces of Ukraine.

Formulation of the problem. Providing quality telecommunication systems Armed Forces Ukraine is one of the most important tasks facing them in the context of systemic reform. One of the key issues to be addressed in modern terms - how and when to transition to NATO standards, without losing the required level of performance of systems and data.

This transition should be carried out taking into account the opportunities and resources allocated to reform the security sector of Ukraine. The introduction of the Armed Forces of Ukraine the NATO communication systems are not simply replacing hardware that would meet the standards of NATO or the transfer to the new standards of use. The implementation of NATO standards is a complex task that requires a combination of organizational effort, technological developments, changes in certain ways to control and interaction.

In this context, the issue of updated terms the transfer of telecommunications Armed Forces of Ukraine to NATO standards. The study of this issue and to resolve it will provide planning of the transition to NATO standards without losing the efficiency of existing telecommunication systems.

Analysis of recent research and publications. The question of introducing NATO standards in Ukraine today is not thoroughly studied. This is especially concerns the subject area. Most of the works devoted to the study of conceptual issues entering NATO standards. In some studies carried disclosure of the contents of the reform process and the transfer of the Armed Forces to NATO standards [1], the role of Ministry of Defense of Ukraine in the implementation of NATO standards in Ukraine [2] and other issues. However, most publications today having are mostly viewing nature, aimed at informing the public about the implementation process and the overall coverage of issues [3].

Specific issues - implementation of telecommunications NATO standards and compatibility in terms of reach this area allied not considered.

The goal of article is to determine the projected timing of implementation of telecommunication NATO standards in the Armed Forces of Ukraine. This will enable the prediction for the tasks of defense planning in the direction of reforming the existing communications and telecommunications.

Presenting main material. To avoid double interpretation of the article will use the term "telecommunication implementation of NATO standards in the Armed Forces of Ukraine" in the next interpretation.

Introduction Telecommunications Standards NATO Armed Forces of Ukraine - a process that involves the introduction of a common course of action, fixing common terminology and establishing conditions for the unification processes in engineering systems, telecommunications and communications of the Armed Forces of Ukraine and NATO and partner countries. Thus NATO standards in the field of telecommunications by analogy [2] can be divided into administrative, operational and logistical:

- administrative standards define management processes and exchange information, work order documentation;
- standards aimed at operational planning of telecommunications and communications;

- logistical standards define common requirements for weapons and military equipment to allies, lifecycle management, and maintenance items codification in the field of telecommunications.

With the given definition that implementation of telecommunications NATO standards is a challenge that is not limited to the transfer of certain standards such as STANAG 4628, regarding communication protocols for military use or STANAG 3910, to increase data transmission, high-speed channels. This task involves a number of organizational and technical measures for technical re-equipment, improving the level of training personnel, changing the system of training, funding issues, in-depth international cooperation and so on. In addition, compliance with NATO standards does not include upgrading telecommunications systems all samples of a NATO member state. That is a question of choice for equipping units, departments and agencies.

Given the complexity of the issue of evaluation timeframe introduction Telecommunications Standards NATO can be assessed using analytical methods networks [4], which allows you to describe the problem with the system approach and make the assessment based on expert-analytical reasoning with limited quantitative data provides a plausible result.

To use this method you must create groups (clusters) factors affecting the problem and options to solve it. These groups should unite heterogeneous (unilateral, multilateral, external and internal) bonds that reflect the interaction within the system. An example of such a network is shown in Fig. 1.

As an alternative to assess advisable to choose the following terms: introducing NATO standards in the short term - two years; introducing NATO standards in the medium term of 5-6 years; introducing NATO standards in the longer term of 7-9 years.

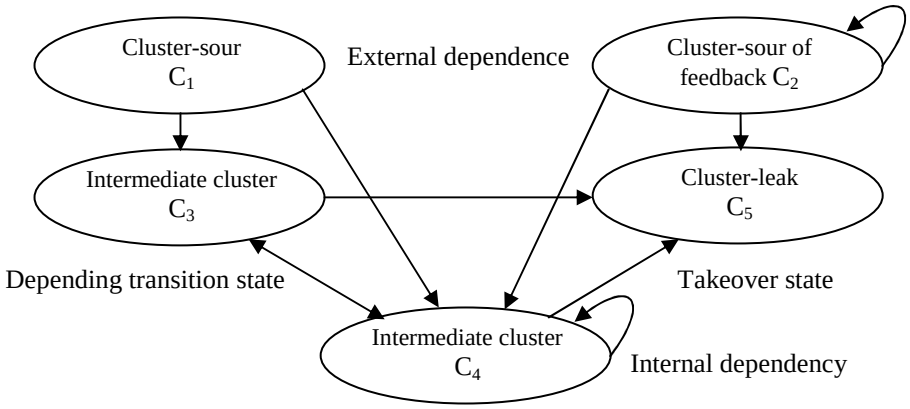

Fig. 1. An example of a network for solving the problem of evaluation

The cluster according to the above definition includes the following expedient.

1. Implementation of administrative standards in telecommunications Armed Forces of Ukraine. They include:

- translation and adaptation of the regulations governing the telecommunications activities in the framework of NATO - 1a;
- establishing or reforming administrative units adapted to NATO standards - 2a;
- implementation procedures for the NATO standards in telecommunications Armed Forces of Ukraine - 3a.

2. Implementation of standards aimed at operational planning of telecommunications systems and communication. They include:

- transition from the existing standards and procedures with accepted NATO - 1b;
- training that can operate according to NATO standards in telecommunications practice - 2b;
- transfer units communications and telecommunications NATO standards - 3b.

3. Implementation of logistical standards. They include: transfer of telecommunications equipment to NATO standards - 1c; development and creation of individual telecommunications system based on NATO standards - 2c.

4. Financing Telecommunications Standards implementation process of NATO Armed Forces of Ukraine. They include:

- financial conditions for the implementation of NATO standards in the field of telecommunications in the Armed Forces of Ukraine-1d;
- necessary funding for the implementation of NATO standards in telecommunications Armed Forces of Ukraine-2d.

Net assessment deadlines for the introduction Telecommunications Standards NATO Armed Forces of Ukraine is shown in Fig. 2.

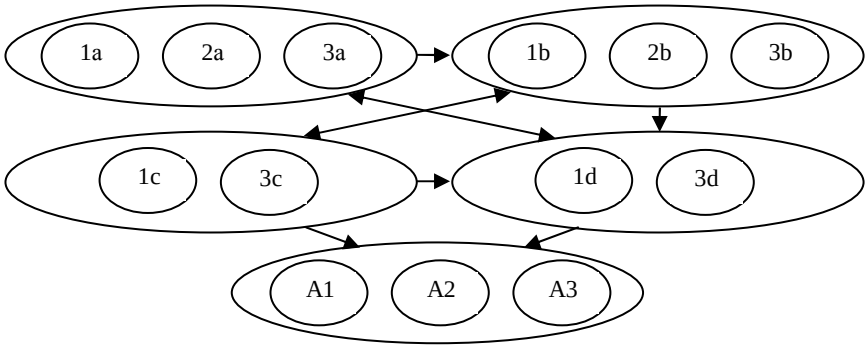

Fig. 2. Network for evaluating timing for the introduction Telecommunications Standards NATO Armed Forces of Ukraine

Evaluation Cluster network features. 2 were carried out using a standard scale [4] and computing power MS Excel. The result of evaluation of terms shown in Fig. 3 This is due to several reasons, among which the main ones are - a significant amount of financial resources required to resolve technical issues (equipment and refurbishment), unwillingness to move soldiers and executives (the need to learn new terms and standards of practice requires a long period). In fact, work on the implementation of NATO standards in the Armed Forces of Ukraine started in 2015, and implementation of standards occurred only in 2016 [5]. At a time when the issue of financial security implementation standards are not resolved definitively speak about deadlines makes no sense.

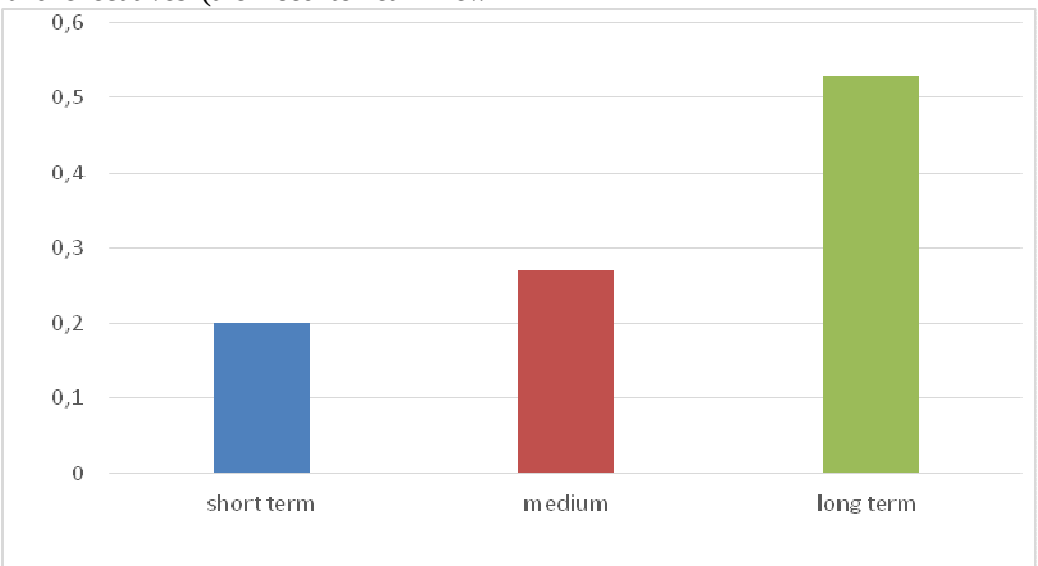

Fig. 3. The result of the evaluation deadlines for implementing telecommunication NATO standards in the Armed Forces Ukraine

Conclusion. The result of evaluation deadlines for the introduction Telecommunications Standards NATO Armed Forces of Ukraine showed that today there is no number of conditions for the rapid implementation of these standards. The main reasons for this situation are the financial and technical. To effectively mastering those standards obviously need a set of additional measures.

Future research should consider developing a detailed plan for the transfer of all telecommunication systems Ukraine Armed Forces to NATO standards. Such development should include the development of a set of measures which will allow for technological innovation, personnel changes, organizational restructuring and resolving other issues.

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The article came to the release 15.05.2017

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Оцінка термінів впровадження телекомунікаційних стандартів НАТО в Збройних Силах України

Резюме. В статті здійснена оцінка термінів введення телекомунікаційних стандартів НАТО в Збройних Силах України. Оцінка здійснена з використанням експертно-аналітичної процедури методу аналізу мереж. В якості прогнозованих термінів створення системи зв’язку і телекомунікації за стандартами НАТО пропонується три альтернативи – короткотермінова, середньотермінова та довготермінова.

Ключові слова: стандарти НАТО,телекомунікації, метод аналізу мереж, Збройні Сили України.

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Оценка сроков введения телекоммуникационных стандартов НАТО в Вооруженных Силах Украины

Резюме. В статье проведена оценка сроков введения телекоммуникационных стандартов НАТО в Вооруженных Силах Украины. Оценка проведена с использованием экспертно-аналитической процедуры метода анализа сетей. В качестве прогнозирования сроков создания системы связи и телекоммуникации в соответствии со стандартами НАТО предложены три альтернативы – кратковременная, средневременная и долговременная.

Ключевые слова: *стандарты НАТО, телекоммуникации, метод анализа сетей,*. Вооруженные Силы Украины.

UDK 355.02

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Formation of an integrated risk management system as a component of the defense planning system

Resume. The article suggests an approach to the formation of an integrated risk management system as a component of the defense planning system with the functions of a system analysis of the development of capabilities of the defense forces and risk management, which is envisaged by the task of defense reform. The system will enable relevant officials to make informed decisions in the course of defense management, in order to maximize positive and minimize negative consequences (risks) of decisions taken in conditions of uncertainty and saving resources.

Keywords: integrated system, risk management, defense planning, military reform, development of capabilities, defense forces.

Problem statement. The Defense reform in Ukraine operational objective 2.2 [1] envisages the creation of an integrated risks management system by the end of 2017 as an integral part of Defense planning. This shall allow avoiding strategic mistakes causing significant damages in the future. It will also facilitate enhancement of Defense planning quality and formation of essential operational (combat, special) capabilities.

In order to achieve the operational objective there have been 3 essential tasks and related indicators [1] as well as executive authorities identified (MoD of Ukraine alongside with other parts of Defense Forces supported by the National Security and Defense Council). Having said this the third essential task (deadline – end of 2017) is creation of Defense forces and its integral parts development analysis system via a designated body with the functions of Defense forces system analysis.

Today we may say that the Defense forces development State programs/plans monitoring and evaluation working body has been created – the MoD and Armed Forces of Ukraine reforms committee. However, till now there has not been formed a functional organ with Defense forces system analysis functions. This organ shall be created with consideration of organizational and resource capabilities available as well as constrains, restrains and positive experiences of foreign countries. Science and military experts (risk-managers) who will comprise the new organ shall be in charge of supporting decision making by performing an objective system analysis of the decisions effectiveness, expected effects and influence over the end state not only during Defense reform, but also during Defense planning that is done in circles and aimed at the Armed Forces and other Defense forces constituencies capabilities development strategic planning.

Analysis of the latest researches and publications, and also legislative acts of Ukraine [2–13] shows that the process of risks management during planning process is constantly developing and is regulated by several state executive power organs. For example, by the Law of Ukraine as of 07.07.2010 # 565, and by orders of some ministries and organs (i.e. Order # 637 as of 04.12.2002 of the Ministry of Labour and Social Policy of Ukraine, Orders of the Ministry of Finance # 461 as of 16.06.2010 and # 995 as of 14.09.2012, Decision of the National commission on securities and stock market # 1282 as of 25.09.2012 and others), that regulate essential organizational and legal basis of the risks evaluation and management.

The aim of the article is to describe an integrated risks management system that serves as an integral part of Defense planning and has such functions as risks management and Defense forces capabilities development system analysis. Creation of such a system is foreseen by the Defense reforms objective, and will allow performing solid decision making to the state holders during Defense management. This shall therefore maximize positive while minimize negative outcomes (risks) of the decisions taken under the conditions of uncertainty and resources saving.

Main material. The approaches analysis to the long-term Defense planning risks evaluation [3] has shown the following results:

1. The risk assessment procedure requires special attention and integrated approach in the course of defense planning. It also requires an appropriate scientific and methodical apparatus for security environment risk assessment, taking into account the defined defense policy (strategy),

available vs. necessary capabilities of the forces and the state resources that are vital to be maintained and developed (upgraded), put in stock or disposed as well as ensuring that resources have been provided for the long term.

2. The analysis of external and internal factors that affect the military security of the state, existing research methods and scientific and methodological approaches makes it possible to assert that risks are predictable, depending on a number of factors that can be controlled or responded to during planning and decision making.

3. In order to avoid strategic mistakes that can lead to significant losses in the future (over-spending of financial resources, inefficient use of the state's economic potential, etc.), it is necessary to have an appropriate scientific and methodological tool for risk assessment and management in defense planning. Additionally it is vital to have an integrated assessment software for measuring the effectiveness of the decisions taken without excessive calculations and time losses. Minimizing risks and managing them during defense planning will contribute to effective planning of the measures aimed at ensuring the state's defense capability and the flexibility of adjusting the risk strategy based on the priorities, strategic goals and resources of the state.

The risk management system is a set of subsystems (procedures) and their elements (objects, subjects, stages, steps, measures) that are in certain relationships and relationships with each other and jointly provide solutions to a specific problem of maximizing positive while minimizing the negative consequences (risks) of the decisions taken under the conditions of uncertainty and resources saving.

Based on the analysis of existing scientific methods, as well as recent studies and publications [3-13] on risk assessment and management, a comprehensive model for risk assessment and management in defense planning is suggested. The structure of the model is presented in Fig. 1.

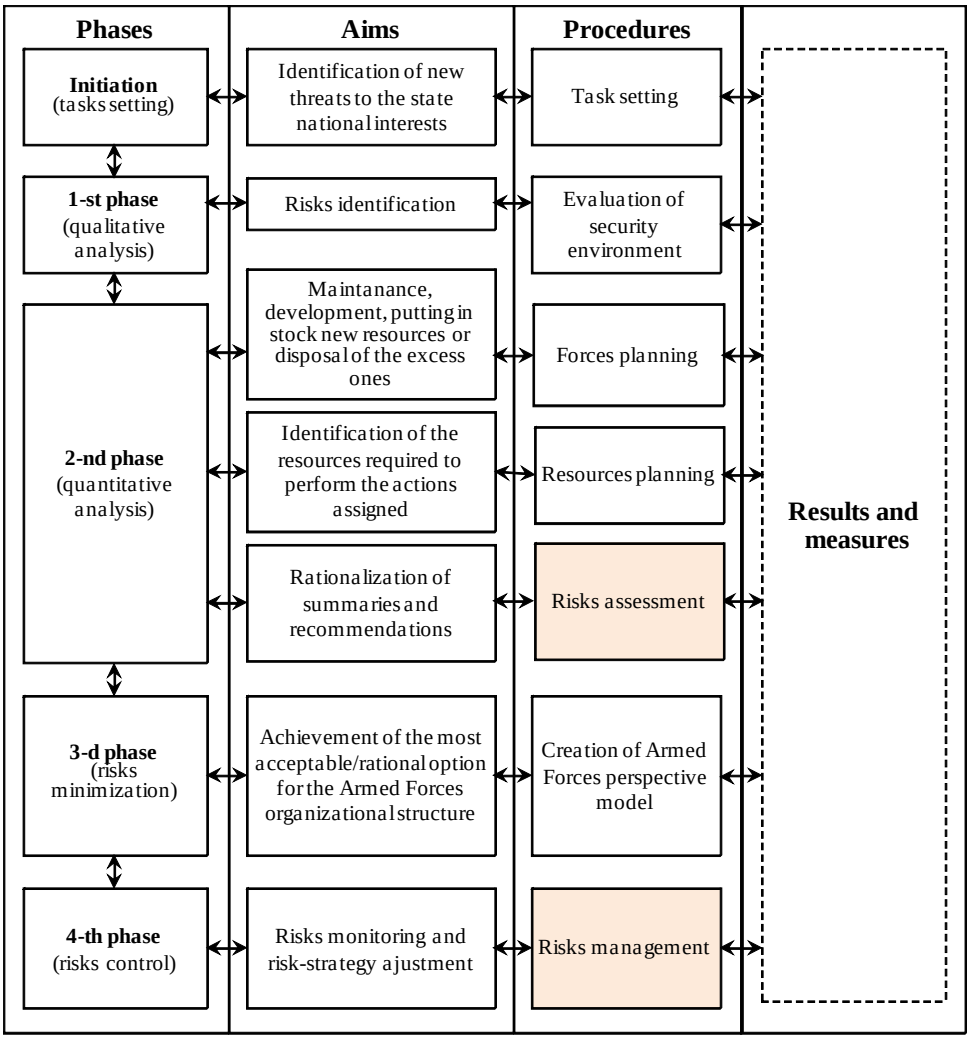

Fig. 1.

The comprehensive model distinguishes the following stages of risk assessment and management:

Qualitative risk assessment;

Quantitative risk assessment;

Risks minimization;

Risks control/monitoring.

These stages are preceded by the initial stage - the assignment of tasks, including the definition of limitations and assumptions.

The purpose of qualitative risk assessment is to identify the main types of risks (expected challenges and threats) that affect the overall process. This makes it possible, at the initial stage of the analysis, to clearly assess the level of the risks depending on their quantitative composition and take the decision as to except or not these risks by implementing a certain solution.

The results of qualitative risk analysis are inputs for quantitative analysis, i.e, analysis of planned activities, resources and forces requirements, based on expected challenges and threats that are posed during fulfillment of a specific task /decision-making process.

At the stage of quantitative analysis, with the help of system analysis and relevant scientific and methodical evaluation apparatus, they calculate the numerical values of the values (coefficients, percentages) of the selected feasible risks and the level of risk to the object as a whole, the possible damage and the probability of the risks.

At the risk minimization stage, several options are considered (i.e. decisions, organizational structure) and they use appropriate coefficients for the importance of the measures (elements), choose the most appropriate (rational) option according to the selected criteria, specify the main tasks, Force composition, resources, capabilities to be achieved, and make plans.

At the final stage (risks control) it is necessary to monitor the implementation of the measures planned, to control the risks probability during defense planning, to analyze the results of these measures and the level of achievement of the strategic goals identified in order to be able to adjust the risk strategies, the ways to achieve the goals, to take into account the results received in the course of the next defense planning cycles or to ensure leadership prompt response to emerging problems during the implementation of program and planning measures.

In general, an integrated risk management system in the course of defense planning can be outlined schematically as shown on Figure 2. The system must be connected with other defense systems through information links. On the basis of an integrated risk management system in the course of defense planning, it is proposed to develop its organizational scheme of operation.

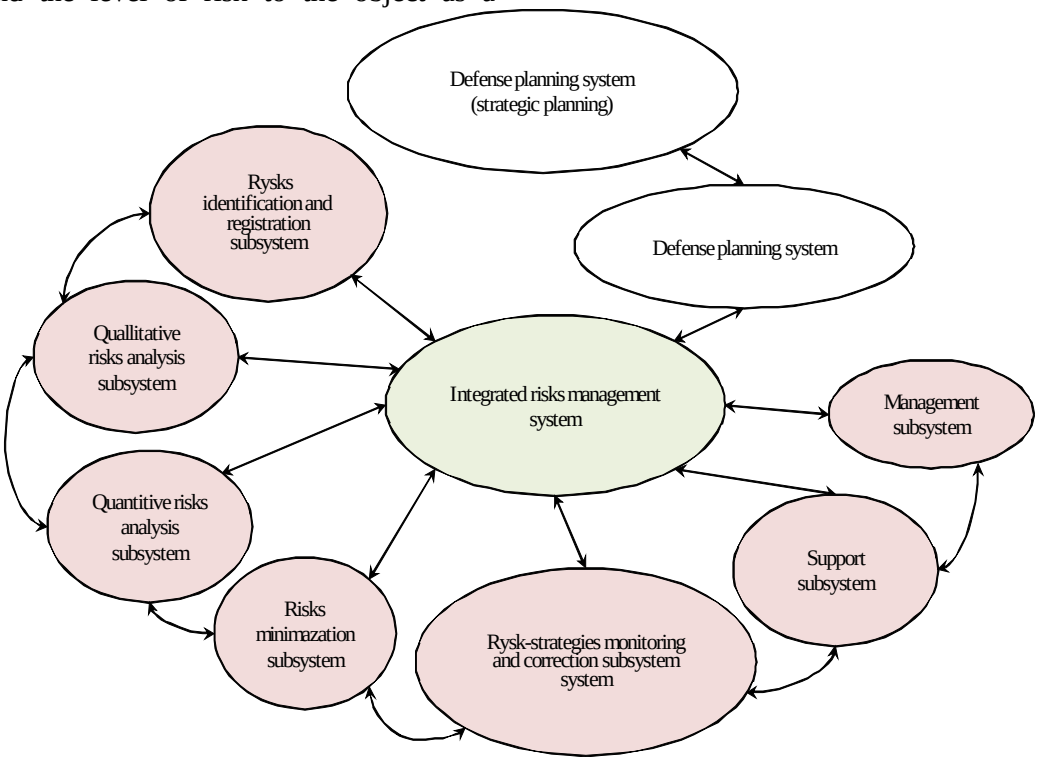

Fig. 2 – Defense planning integrated risks management system

In addition, one of the other up-to-date tasks on the issue of introducing a risk management system into the MoD of Ukraine, along with other components of the defense forces

with the support of the National Security and Defense Council of Ukraine, is to define the organizational structure of the risk management body during defense planning. The above will contribute to the achievement of the strategic goal 2 of the defense reform to ensure the effectiveness of the planning and resource management system through risks management and minimization in defense planning for the more efficient and cost-effective use of resources during implementation of the relevant programs and plans.

The following entities may be offered to comprise Defense planning and capabilities development risks management scheme for the MoD and GS of Ukraine (see Figure 3) :

Chief risk manager;

Department of risk management coordination within the Department of Military Policy, Strategic Planning and International Cooperation of the Ministry of Defense of Ukraine;

Risk managers of other structural subdivisions of the Ministry of Defense of Ukraine and the General Staff of the Armed Forces of Ukraine;

Foreign experts;

Other risk managers (officers, volunteers).

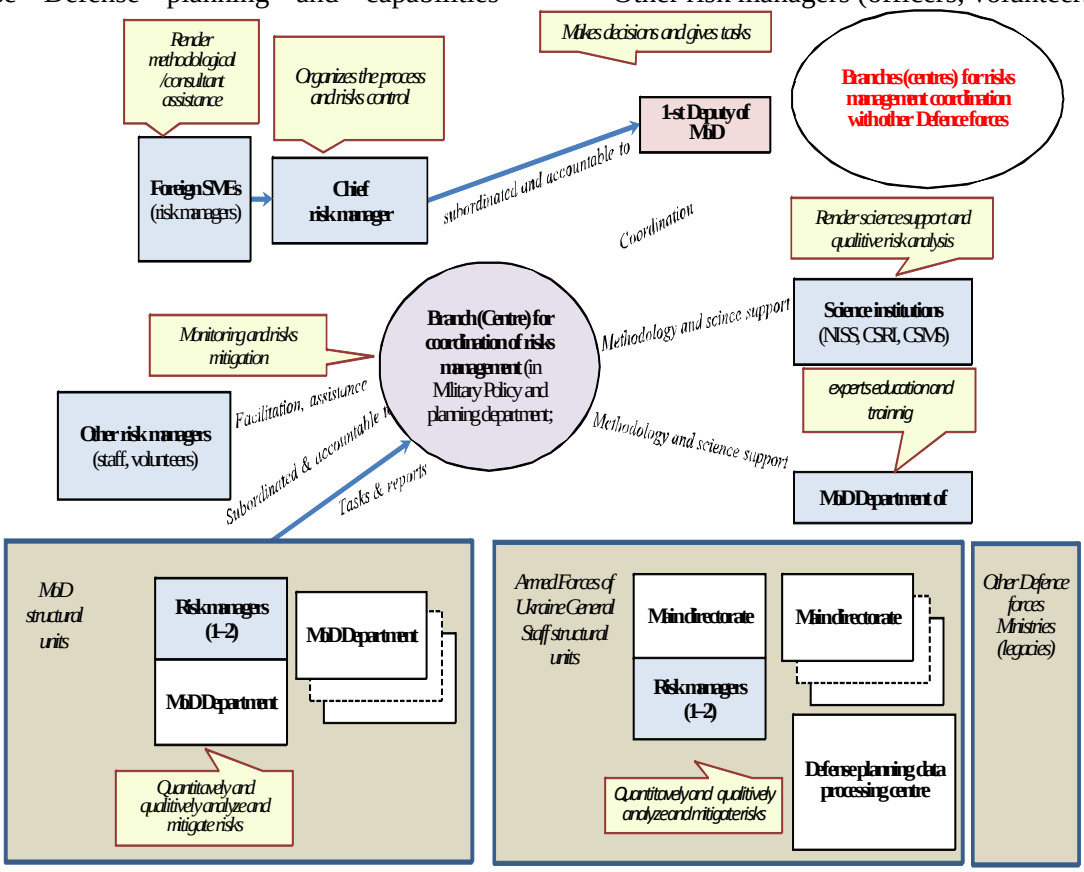

Fig. 3 – Defense planning risks management organizational chart

The structural elements of the risk management system will be roughly assigned the following tasks.

Структурні елементи системи управління ризиками орієнтовно матимуть таке призначення.

Chief risk manager is to manage, and control the effectiveness of the risk management process in the Ministry of Defense of Ukraine and the GS of the Armed Forces of Ukraine, as well as interact with the main risk managers of other components of the defense forces to develop proposals for minimizing risks (reducing their impact) and avoiding significant strategic decision making mistakes that the leadership may make during the defense forces components capabilities development.

The chief risk manager shall act as a supervisor for full-time and freelance (within the margins of the risks management tasks) officials and will be directly subordinated to the First Deputy of the Minister of Defense. During the planning of the capabilities development of the Armed Forces and other components of the defense forces, the chief risk manager may serve as the adviser to the First Deputy Minister of Defense of Ukraine to minimize the risks that significantly affect the development of capabilities of the forces (forces), and report on the results of his/her activities and the activities of the subordinates Risk managers, including the results of the risk

management coordination branch. Aslo, as an independent expert, the chief risk manager shall endorse the Armed Forces of Ukraine capability development documents based on the analysis and suggestions of the risk management coordination branch. He/she shall also carry out the instructions of the First Deputy Minister of Defense of Ukraine within his/her responsibilities.

The risks management coordination branch is proposed to be established as part of the Department of Military Policy, Strategic Planning and International Cooperation of the Ministry of Defense of Ukraine (DMPSP and IC) as it processes a large amount of information on national security in the military and defense sector. In DMPSP and IC there are appropriate offices and subdivisions working on issues of strategic planning of capacity development of the Armed Forces of Ukraine.

The branch should become the main body in the Ministry of Defense of Ukraine, which will collect and process information on potential (existing) risks in order to monitor and mitigate them, and will develop risk-reduction strategies for the development of capabilities of the Armed Forces of Ukraine. The main function of the branch is to coordinate risk management in the Ministry of Defense of Ukraine and the Armed Forces of Ukraine in order to support the decision-making process on the development of the capabilities of the Armed Forces of Ukraine and other components of the defense forces. Specialists of the branch will be directly subordinated to the head of the branch and within the main purpose – to the chief risk manager.

Within the framework of performing risk management tasks, the full-time (or tasked with additional functions) risk managers for the MoD and GS of Ukraine structural organizations are suggested to be subordinated to the chief of the risks management coordination branch

At the stage of implementation of the risk management system the risk managers of other structural subdivisions of the Ministry of Defense of Ukraine and the General Staff of the Armed Forces of Ukraine should be appointed among freelance specialists, admitted to state secrets, with significant experience in the field of work and analytical abilities. The tasks of their activities should be defined as follows:

Quantitative analysis, risk assessment and mitigation to acquire abilities identified;

Risk management at the appropriate level;

Conduct summary of information on risks identification, analysis, assessment and management in structural units.

Risk managers of other structural subdivisions of the Ministry of Defense of Ukraine and the General Staff of the Armed Forces of Ukraine should be subordinated to the Head of the Department for Risk Management Coordination.

Other risk managers (public officials) who work in scientific institutions, as well as volunteers and military experts may also be involved in the risk management activities.

Existing methods, scientific methodical apparatus and approaches can be used to perform risk assessment procedures. The new methods can also be developed to meet the risk assessment requirements.

Today, one of the most successful system technologies that enables a comprehensive assessment of the impact of external and internal factors, strengths, weaknesses and capabilities of the state that influence the protection level of the interests of society and the state, is the SWOT analysis proposed in 1965 by Harvard University professors to develop Organizational behavior strategies.

SWOT analysis is a convenient widely accepted methodology used to develop strategies in a wide variety of life spheres, and, according to research findings, is a mandatory preliminary step in the preparation of strategic plans (decisions).

The data obtained as a result of the application of the SWOT analysis can serve as a basis for developing strategic goals, helping risk managers develop an effective strategy for resolving defense policy issues. Unfortunately, SWOT-analysis is not currently used in the structural bodies of the Armed Forces of Ukraine.

In the Ministry of Defense of Ukraine and the Armed Forces of Ukraine defense planning integrated risk management system, the following elements should be foreseen to maintain the state of effective functioning of the system:

Foreign experts (risk assessment specialists) in the field of defense;

Scientific research institutions (NISS, Central Scientific Research Institute of the Armed Forces of Ukraine, Centre for Strategic Military Studies of the NDU);

Educational and scientific institutions of the Ministry of Defense of Ukraine (Department of Military Education and Science, Higher Military Educational Institutions).

Foreign experts (risk assessment specialists) in the field of defense will take part in solving the problem issues of the integrated risk management system implementation in the Ministry of Defense of Ukraine and the Armed Forces of Ukraine: they will advise to the chief risk manager of the Ministry of Defense of Ukraine and the Armed

Forces of Ukraine and will train risk managers and other Defense Planning Specialists.

Research institutions will scientifically support and qualitatively analyze the risks; they will carry out necessary scientific research (scientific support) and develop (improve) scientific and methodical means for risks assessment and management.

Educational institutions of the Ministry of Defense of Ukraine will prepare specialists in defense management issues within the framework of the risk management process. They will also take part in the process of scientific and methodological support of the integrated risk management system in the Ministry of Defense of Ukraine and the Armed Forces of Ukraine.

In order to create and operate mentioned above, it is necessary to develop the Regulation on the organization of functioning of the integrated risk management system in the Ministry of Defense and the Armed Forces of Ukraine. It is proposed to be approved by the order of the Minister of Defense of Ukraine. The Regulation should specify:

– інші питання (аналогічно структурам існуючих положень про органи управління).

- functional area of an integrated risk management system;

- the main tasks of the integrated risk management system;

- organizational structure;

- order of organization, accountability and interaction;

- principles of risk management (task 2.2.1 in accordance with [1]);

- other issues (according to the structures of the existing regulations on the command and control bodies).

Основними напрямами з моніторингу стану реформування та розвитку Збройних Сил, оцінювання та контролю ризиків для коригування ризик-стратегії мають бути:

The main directions for monitoring of the state of reform and development of the Armed Forces, risks assessment and control to the end of adjusting the risk strategy should be:

1) C2 system;

2) personnel policy status;

3) military education;

4) equipment status of the Armed Forces of Ukraine with weapons and military equipment;

5) troops (forces) training;

6) completeness of material and technical support to the troops (forces);

7) health care status;

8) military infrastructure;

9) economic and real-life support activities;

10) missile fuel components, missiles, ammunitions, military equipment and armament disposal status;

11) financing status.

Conclusions Thus, the proposed integrated risk management system and the organizational chart of risk management during defense planning on its basis will enable:

to influence purposefully relevant officials and support them at the decision-making stage in order to avoid strategic mistakes that can lead to significant losses in the future (over-spending of financial resources, inefficient use of the economic potential of the state, etc.);

to improve the quality of defense planning based on the capabilities of the Ministry of Defense of Ukraine and the Armed Forces of Ukraine in order to plan the implementation of a strategy whose objectives are defined during strategic planning in the Defense sector;

to assess objectively the effectiveness of the decisions made, the expected effect and the impact on the final result;

to make informed decisions for the relevant officials in the course of defense management to maximize the positive and minimize the negative consequences of the decisions taken under conditions of uncertainty;

to introduce modern Euro-Atlantic approaches and effective policy of the planning and resource management system in the Ministry of Defense of Ukraine and the Armed Forces of Ukraine;

implement the operational objective 2.2 of the defense reform in Ukraine.

In a longer perspective (after 2020), provided that the integrated risk management system is effectively implemented, it should be expanded and thoroughly developed.

The prospect of further research, taking into account the results obtained, is to develop (refine) the principles of the functioning of the integrated risk management system during the implementation of government programs (plans) for the development of components of the defense sector in accordance with the defined tasks 2.2.1 [1].

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The article came to the release 19.06.2017

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Формування інтегрованої системи управління ризиками як складової системи оборонного планування

Резюме. У статті запропоновано підхід до формування інтегрованої системи управління ризиками як складової системи оборонного планування з функціями системного аналізу розвитку спроможностей сил оборони та управління ризиками, яка передбачена завданням оборонної реформи. Система надасть можливість відповідним посадовим особам приймати виважені рішення в ході оборонного менеджменту з метою максимізації позитивних і мінімізації негативних наслідків (ризиків) прийнятих рішень в умовах невизначеності й економії ресурсів.

Ключові слова: інтегрована система, управління ризиками, оборонне планування, оборонна реформа, розвиток спроможностей, сили оборони.

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Формирование интегрированной системы управления рисками как составляющей системы оборонного планирования

Резюме. В статье предложен подход к формированию интегрированной системы управления рисками как составляющей системы оборонного планирования с функциями системного анализа развития способностей сил обороны и управления рисками, которая предусмотрена задачей оборонной реформы. Система даст возможность соответствующим должностным лицам принимать взвешенные решения в ходе оборонного менеджмента, с целью максимизации положительных и минимизации негативных последствий (рисков) принятых решений в условиях неопределенности и экономии ресурсов.

Ключевые слова: интегрированная система, управление рисками, оборонное планирование, военная реформа, развитие способностей, силы обороны.

UDK 355.45.02

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Approaches to strategic planning capabilities of troops (forces) in the security and defense sector of Ukraine

Resume. In article is analyzed existing research, organizational and legal approaches to the strategic planning capabilities of troops (forces) in the security and defense sector of Ukraine.

Keywords: capabilities, security sector and defense forces, strategic planning.

Formulation of the problem. In modern conditions when Russia takes an aggressive actions using hybrid technology, occupation of some territories of Ukraine, the use of military force, including the Armed Forces of Ukraine and other components of security and defense forces for national defense and active defense and counter these threats are becoming more important. This requires new approaches to strategic planning of defense and security forces on the basis of capacity. Given these problems, defense reform, which is carried out in Ukraine must meet the actual needs of Defense of Ukraine and strengthen the capacity of the security forces and defense, increasing their readiness to perform assigned tasks and participate in joint military operations (operations) against the aggressor.

Analysis of recent research and publications. Research these problems show that today in defense and security sector of Ukraine has not turned out the necessary methodological basis, no single vision and definition of “capacity”, especially “components of the security forces and defense”. In particular, “capacity” is defined as “due to certain resources and capacities ability to achieve measurable results during the engagement in certain circumstances in accordance with certain standards”. The Great Dictionary of the modern Ukrainian language - as a property and the ability to implement something and the presence of conditions conducive to these actions and the possibility. A combined this concept (power (capabilities) is defined in the governing documents of the NATO member states, namely as the ability to achieve the desired effect at the set standards and conditions based on the combination of means and methods used to solve a set of problems.

In the Armed Forces of Ukraine, this concept is also defined differently. In particular, the Defense Ministry of Ukraine Regulations referred to as a property that allows for specific actions to achieve specific goals identified based resources. In today's Strategic Defense Bulletin of Ukraine - both quantitative and qualitative indicators characterizing the ability of the components of the defense forces performing their task of national defense and repel armed aggression against Ukraine in accordance with available capacity of the state.

There are differences in the views of military experts associated not only with the lack of a common vision of the conceptual apparatus of the security and defense of Ukraine, but also the methodology of transforming capabilities of troops (forces) in the quantitative and qualitative indicators for the transition of the Armed Forces of Ukraine and other components of the defense forces planning on the basis of capacity. There are no proper scientific and methodical approaches to the assessment of the capabilities needed to maintain or increase (upgrade) form or recycle (excess). No implementation is planning and in the defense and security sector of Ukraine.

The purpose of the article. Analyze the problem, to outline possible ways and mechanisms for its solution to improve strategic planning capacities of the Armed Forces of Ukraine and other components of the defense forces, increasing their readiness to repel armed aggression and defense.

Presenting main material. Strategic planning capacity building component Defense Forces guiding concept paper on the method recommended to ground-based power. The “capabilities of troops (forces)” in this article is based on the principle closer to NATO standards due understood the necessary resources and capabilities of their ability in the performance of their tasks identified certain standards and conditions to achieve the desired result.

The strategic planning capabilities of the Armed Forces of Ukraine and other elements of the security forces and defense in the defense and security sector of Ukraine, in our opinion, it is advisable to similarly defined in. This is where the Ministry of Defense of Ukraine, is defined concept

of the security and defense of Ukraine the main body responsible for organizing the process recommended in that process fulfill four basic procedures: analysis and assessment of the security environment; force planning; resource planning and risk assessment for subsequent formation of the desired future structure of troops (forces). It is part of the necessary troops (forces) to jointly perform certain tasks specific scenario or situation, rather than separate security forces or the defense forces, as some interpret practice.

The process of capacity building component of the security forces and the defense, namely the Armed Forces and other forces behind this approach can be realized through joint planning security and defense sector and the implementation of a number of specific procedures, including the implementation of the recommended certain steps.

Step 1. Analysis and evaluation of military and political situation, establishing a list of real and potential military threats, including:

analysis of international relations, their content and focus, intention States or other entities to address political issues and the views of the military and political leadership role in military and law enforcement methods to solve these problems;

evaluation of the impact of global economic, political, demographic and other problems of national security and defense of Ukraine;

review of military plans and preparations states, political entities, evaluation of the danger that comes from certain military and political conflict or conflict areas;

Development of methods and means of armed struggle and efforts of these countries for their further improvement;

the formation and dynamics of military-political alliances (blocs) and analysis of their objectives;

the emergence of new foreign and domestic political and (or) economic conditions that threaten the national interests of Ukraine, analysis of trends of their further development;

evaluation of the information space and its impact on national security and defense of Ukraine;

Assessment of other entities that affect the state and the system of national security and defense in the long run.

The result of this step is to determine the list of challenges and threats in the military sphere and possible scenarios of development in the long term.

To ensure a uniform approach to refine scenarios using templates, whose structure should include:

general description of the scenario;

assumptions about the use of military force;

political and military objectives, to be achieved;

physiographic conditions, military and civil;

assumption of support troops (forces);

general counsel of operations (actions).

The results of the step can also be lessons from evaluations military and political situation, characteristic challenges and suggestions for the list of scenarios the use of troops (forces) and possible scenarios for future planning of troops (forces).

Step 2. Identifying tasks that must be performed to neutralize certain crisis scenario (prevention and elimination of consequences, etc.); they can be formulated only after the description and analysis of the situation (or variant) of a script that requires the use of (involvement) of the components of the security forces and defense and vehicles.

Defining objectives for joint implementation of elements of the security forces and the defense of the defined scenarios (situations) can be based on those listed in the current doctrines and regulations regarding the preparation and use of the defense forces, the military charters, guidelines, etc. (standard assignment) or determined based on projected situations challenges, risks and threats.

The challenge, depending on the level can be:

national strategic executed at the state level and are binding on all components of the security forces and defense;

Strategic performed all kinds of families and troops (forces). They can be part of national or independent;

operating as part of the Strategic performed separate species and genera of troops (forces) for their intended purpose;

tactical characterized by certain level of performance of combat missions units and units.

Objectives should cover not only the immediate process of their implementation during certain crises of a military nature, but also advance joint training of troops (forces) and their resources. For this matrix is formed rational distribution of tasks between the components of the defense forces. It should contain basic data for development planning capabilities of each component that makes it possible to engage the optimal number of troops (forces) ensuring their efficient use and saving of resources.

Step 3. A description of the performance of certain tasks and the factors that affect their performance (physical, military, civilian), which together constitute the operational requirements (military) capabilities.

To describe the operational capabilities are taken into account specific conditions (geographical, climatic, socio-political, purely military, technological, etc.), which will run tasks defined scenarios (situations). It uses standard conditions directories that contain information in three areas: physical environment; military conditions for use of troops (forces); civil society or the environment. It uses Indicative list of typical organizational structures and capacities tentative catalog of typical organizational structures of the components of the defense forces and means, which must include the characteristics (requirements) of fixed capacity in advance defined list of basic (typical) structures.

Product capacity model structures developed and refined based proceeds into service of new models of weapons and military hardware, equipment, organizational measures, development of forms and uses of troops (forces).

The list of conditions and criteria for the tasks identified scenarios (military, physical, civic) – a requirement to operational capabilities that the recommendations Ministry of Defense should include quantification of the actual conditions that may arise in the course of prescribed tasks. They are based on the standard specifications set out in the governing documents. Quantitative indicators sometimes they may differ from the standard, but must conform to actual conditions.

Step 4. Defining standards tasks as necessary requirements in certain circumstances, including the selection of the characteristics of the sample standard armament, military personnel (combat, logistics, technical and medical support, management) or by category (components) operational (military) capacities (readiness, intelligence, deployment and mobility, application, control of troops (forces) and communications, logistics, survivability and protection of troops (forces).

The typical structure of troops (forces) used to describe a design capacity (reference) unit.

Strategic planning in the defense and security sector in accordance with accepted Ukraine conceptual documents should include the need for this procedure as adapted by standards adopted in the member states of NATO.

Step 5. Determination of capacity requirements for troops (forces) and means necessary for each scenario and possible situations on which determine the total capacity of troops (forces) and means that you must have to effectively respond to identified threats.

The publication Ukrainian military specialists "Approach to determining the requirements necessary opportunities" presented an approach by which to determine the requirements for the capabilities of troops (forces) on a specific sequence of actions and combine information on available capacities, objectives and terms of their performance and projected scenarios of use troops (forces). Here is the specific architectural option to require the capability to perform tasks in one of the scenarios. However, the proposed approach requires the development of appropriate techniques and automated data processing to perform on the basis of transition to a series of mathematical models that provide the optimal solution of a number of issues regarding strategic planning capabilities of troops (forces), such as developing a list of typical structures, defining forces and means and estimation of their value, forming directory capabilities of troops (forces) and others.

In carrying out these procedures should be used the experience of NATO, which has its Defense Planning Process (*DDP*) to determine the requirements for the troops (forces) that fulfill certain military operations. This process requires first to determine military capabilities that are deployed with combat forces for these operations. And for this to be developed individual plans for the mission and its implementation (S & R) for different situations. With these plans NATO can keep control of storage resources in the same way as is done with fighting resources.

The term "*strategic planning*" NATO is not used but the procedure effectively used to develop the forces and capabilities. One of the guiding documents such planning is ministerial leadership (*Ministerial Guidance*), which is developed every two years, which formulates the political, economic, technological and military aspects of building and developing countries.

Setting goals NATO formation and development of its most important components, such as armaments control in crisis management and communication, logistics, nuclear and resource planning carried out by the relevant planning documents for 5 years. Viewing these documents feasible by using a specific procedure – Defense Review (*Defence Review*). That's according to the results issued every two years, updated and revised versions of the said documents.

Ukraine participates in activities to integrate into NATO's Defense Planning Process (*Defence Planning Process*, *DPP*). Analysis tools it

indicates that one of the effective mechanisms for harmonizing procedures such planning is to determine the functions and tasks of all components of the security sector, taking into account existing methodological approaches. Their value is that implementation procedures and mechanism for determining the functions and objectives allows us to construct a logical sequence of planning documents, minimize duplication, and create a system rationale necessary resources. Identifying specific tasks and functions provides better opportunities for planning based on functional capabilities and search capabilities needed to support them. The implementation of this step is to develop a list of tasks relevant authorities and structural units at strategic defense pivni. They are recorded in a special matrix logic of which is that for the execution of each task is determined by only one responsible structure. The remaining structures involved in resolving the problem should be performed only auxiliary functions. The list of tasks and responsibilities in NATO are reviewed regularly. A necessary condition for their implementation in a changing security situation is adaptation to existing levels escalate the situation. Therefore, for each level of escalation matrix developed by a separate division of responsibility that reflects the transformation of these tasks and responsibility for them.

Step 6. Resulting from the above step by step procedures:

The list includes scenarios use of troops (forces) and

List of tasks to perform certain troops (forces) in this situation of a military nature;

determined subject to certain tasks (factors affecting their performance - physical, military, civilian) and includes a list of conditions that affect the performance of certain tasks;

developed standards as minimum requirements to perform certain tasks in certain conditions;

directory structures formed common capabilities which must include a description of the characteristics (requirements) of the basic operational capabilities advance defined list of basic units of the (points) management of individual assets, and systems and software to support them. The results formed the typical catalog capabilities of the Armed Forces and other components of the security forces and defense;

determined necessary capability requirements of forces and means to neutralize involved (prevention and elimination of consequences) crisis scenario and made some description of requirements for capacity capabilities to perform certain tasks under the said scenario;

the planning components of the security forces and common defense and their preparation and use in crisis situations military nature based on certain situations, problems and requirements for operational (military) capabilities. It should include evaluation results available capacity components of the security forces and defense determine their conformity to implement the tasks defined scenarios and the difference between the required and available capacity. Determined difference is considered the basis for force planning and measures to retain existing or creation of new capacity or their extension, those of which it is necessary to get rid of (recycle).

Based on the US experience, it has practical value and order study the needs of all forces and means to deal with the enemy, regardless of their subordination. To execute the crisis in the US generated consolidated appropriate response forces that can quickly deploy and equip. This approach can be used in defense and security sector of Ukraine for the organization of joint reaction forces its constituents defense and security crisis. They are provided in the Appendix to the Concept of development of the security and defense of Ukraine, in particular in respect of strategic defense planning Ukraine, protect its sovereignty and territorial integrity and inviolability, which is especially relevant in today's security environment.

It should draw attention to the fact that the said legal act to the national (national) level attributed not all determined by law tasks the components of the security forces and the defense, as it sometimes seek some practice, but only six of them, which determine the specific responsibilities components defense and security sector of Ukraine for the organization of planning for and responding to threats during a joint exercise of the tasks of application capabilities for the purpose of appropriate crisis.

The first of them – “Defense of Ukraine, protect its sovereignty, territorial integrity and inviolability” for which provision is primarily responsible Ministry of Defense.

In other cases, the security forces and defense with strategic planning for the inherent purpose specified in current legislation, namely regarding the combat training of troops (forces) ensuring law enforcement; combating terrorism; Civil Protection software and more.

System Planning Division also provides appropriate levels of objectives: strategic (strategic generic tasks list), operational (operational generic tasks list) and tactical (tactical generic tasks list).

Strategic (national) list of common tasks involves identifying all structures of the state, acting in the interests of defense at the strategic level. But these processes of strategic planning in the defense and security sector of Ukraine should be normalized in the relevant laws and other regulations.

Conclusions. With regard investigated as appropriate:

1) improve the regulatory framework of the security and defense:

develop and adopt, especially the Law of Ukraine "On the security and defense of Ukraine", as recommended by the Supreme Council of Ukraine of 05.07.12 number 5086-VI, and to continue to develop the draft Law of Ukraine "On planning in defense and security sector of Ukraine";

develop and adopt established order legal act of the state level, such as General of the organization and strategic planning in the defense and security sector of Ukraine and the relevant Guidelines for implementation and realization in the sector;

identify and normalization in that legislation specific model and structure of the defense and security sector, the list of its components, their functions and the procedure for preparing the implementation of common tasks, organize their interactions, bringing the system to current needs, challenges and threats on the basis of modern European and Euro-Atlantic approaches ;

organize joint work on improving the functional activity of components of the security forces and Defense of Ukraine in a particular situation and crisis situations, as such is defined in functional strategies and plans of the United States;

2) introducing modern approaches and methods of strategic planning in the defense and security sector of Ukraine, the need to automate its processes, integrated approach to solving organizational, legal, information-analytical, resources, personnel and other problems.

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The article came to the release 25.05.2017

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Підходи щодо стратегічного планування розвитку спроможностей військ (сил) в секторі безпеки і оборони України

Резюме. Проаналізовані наявні наукові та організаційно-правові підходи щодо стратегічного планування розвитку спроможностей військ (сил) в секторі безпеки і оборони України.

Ключові слова: сектор безпеки і оборони, сили безпеки і оборони, спроможності, стратегічне планування.

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Подходы относительно стратегического планирования развития возможностей войск (сил) в секторе безопасности и обороны Украины

Резюме. Проанализированы существующие научные и организационно-правовые подходы относительно стратегического планирования развития возможностей войск (сил) в секторе безопасности и обороны Украины.

Ключевые слова: возможности, сектор безопасности и обороны, силы безопасности и обороны, стратегическое планирование.

UDK 356.35

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Problematic issues concerning the improvement of the defense planning system in the Ukrainian defense forces

Resume. The article deals with some problematic issues concerning the system of defense planning in the Ukrainian defense forces and approaches to their solution at the present stage of state development.

Key words: Armed Forces, security and defense sector, defense forces, defense planning, state development programs, normative and legal framework.

Formulation of the problem. At the current stage of the reform of the security and defense sector (SDS), defense planning (DP) issues on the basis of capabilities in Ukraine are acute and are at the center of attention of researchers and experts in military construction. The Euro-Atlantic orientation of Ukraine led to the approximation of the strategic planning system (SP), including defense planning, to NATO standards. Prospects for the development of state defense capabilities, defense planning, and the state of the Armed Forces of Ukraine remain problematic and unresolved at present, under conditions of incomplete, and sometimes even missing, legal and regulatory framework.

Solving these problematic issues will facilitate the implementation in practice of specific tasks of defense planning in Ukraine.

The degree of development of the problem. An analysis of the current state of defense planning in the Ukrainian Defense Forces revealed a number of problems in its organization and conduct in conditions of existing and potential threats. The most significant of these are the imperfection of defense planning procedures, their inconsistency with the budget process, the lack of effectiveness of the mechanisms for managing defense resources and the coordination between the components of the Ukrainian Defense Forces [4-5].

Problems of improving defense planning in the defense forces were considered in scientific publications by I. S. Romanchenko, V. Yu. Bogdanovich, M. N. Denejkina, P. M. Krikun and others [8]. At the same time, insufficient attention was paid to the issues related to the development of the OP method based on the capabilities and adaptation of the OP in the defense forces of Ukraine to the standards of the NATO member states.

Such a situation requires further improvement of the OP system based on the capabilities of the Ukrainian defense forces. At the same time, the defining conditions of its development should be considered consistency with similar systems of OPs of all components of the defense forces of Ukraine.

The purpose of this article is to highlight the outstanding problems of improving the existing OP system in Ukraine's defense forces and identify the main ways of overcoming them.

Presenting main material. Defense planning is based on the Laws of Ukraine [1-2], the Decrees of the President of Ukraine [3-5] and other normative-legal acts and is carried out in the following main directions: strengthening of the country's defense capability; increase of combat readiness and combat readiness of troops (forces); protection of the state border; organization of civil defense; military exercises of military liens.

Defense Forces are considered as a component of ensuring the national security of Ukraine, and to a certain extent - as a component of the security and defense sector of the state. Due to the close interaction of the defense forces with the security forces, the tasks of strengthening the country's defense capabilities are being addressed, and appropriate measures are taken to ensure its security [5].

In accordance with the current legislation of Ukraine, the Defense Industrial Complex (ОПК) has the function of providing the Armed Forces of Ukraine and other components of the Ukrainian Defense Forces with modern weapons and military equipment to fulfill their state defense tasks.

Defense Planning in Ukraine, as defined by the draft Law of Ukraine "On Amendments to the Law of Ukraine" On the Organization of Defense Planning "adopted by the Verkhovna Rada of Ukraine on the basis of March 4, 2015, is an integral part of the state planning system that should be implemented in order to provide defense capability state by defining priorities and directions for the development of the forces of defense, armament and military equipment, infrastructure, training of troops (forces), as well as the development of appropriate concepts, programs and plans for taking into account actual and

potential threats in the military sphere and the economic and financial capacity of the state.

In order to implement the state policy in the areas of national security and defense of Ukraine and in order to ensure the harmonious development of the components of the security and defense sector of Ukraine (SBU), it is envisaged to implement a defense planning system that will be integrated into the JV system [5].

The main objectives of the OP in the specified system are determined by:

an assessment of the readiness of the security and defense forces to perform the specified tasks, as well as the results of measures for their development in the previous period;

definition of the principles, objectives and main tasks of the state policy in the field of military security and defense, priorities and directions of development of the SBGS, taking into account real and potential military threats and economic opportunities of the state;

definition of requirements to the structure, number of personnel and indicators of the provision of weapons, military and special equipment, other property;

defining the expenditures of the State Budget of Ukraine for defense needs;

formation of a state defense order;

planning of mobilization training activities.

The experience of defense planning in Ukraine shows that significant progress has already been made in this direction, namely: on the basis of the Laws of Ukraine "On the organization of defense planning" [2] and "On Democratic Civilian Control over the Military Organization and Law Enforcement Bodies of the State" [6] annually A White Paper was published, which highlighted the current state of the Armed Forces of Ukraine and the main directions of further military construction. In addition, for the first time in 2005-2007, an overview of the security sector (security services and intelligence agencies of Ukraine) was conducted.

The activity of the Armed Forces of Ukraine in recent years has become more transparent, the normative and legal base of defense planning is developing more rapidly, the mechanism of defense planning implementation is improved, first of all, in terms of the delineation of planning functions between the Ministry of Defense of Ukraine and the General Staff of the Armed Forces Ukraine [5].

A further prospect of development of defense planning is: introduction of a method of defense planning on the basis of capabilities; integration of defense and budget planning into defense forces into a unified system [5].

It should be noted that the maintenance of defense capability is a function of the state, therefore, the relations of the Ministry of Defense of Ukraine with other ministries (departments) involved in the implementation of state defense tasks and structural subdivisions of the Cabinet of Ministers of Ukraine should be reviewed in terms of redistribution of functions and clarification of responsibility for the state defense capability [5].

The experience of defense planning of NATO member states suggests that the planning, programming, budgeting and implementation of the system provides the basis for the effective construction of the armed forces and is considered by the country's leadership as the most effective mechanisms for ensuring military security and the defense of the society and the state. Therefore, in all leading countries of the world, defense planning is a function of the state. This thesis is being implemented in the "Strategic Concept of Defense and Security of the States Members of the North Atlantic Treaty Organization", adopted in November 2010 in Lisbon.

At the parliamentary hearings, a proposal was made to create under the Cabinet of Ministers of Ukraine a structural unit with the functions of managing the issues of defense capability and coordinating efforts of the ministries and departments dealing with the security and defense forces in the planning and implementation of defense state programs. But until now, these proposals have not been implemented.

At the same time, the lack of coherence of the interaction between the security forces led to the responsibility for mobilization deployment for the anti-terrorist operation in the Armed Forces of Ukraine, responsibility for management of the sphere of defense - in the Ministry of Defense of Ukraine [4]. Today, the management of the state defense sphere needs further implementation of the provisions of the Presidential Decrees adopted in 2015-2016 [3-5].

Integration of defense and budget planning in the defense forces can provide an improvement in maintaining the required level of defense capability of the state. Such steps can be taken only under the guidance of the Cabinet of Ministers of Ukraine and implemented in ministries and departments that are responsible or involved in defense capabilities of the state.

Therefore, today, when "there is no direct link between defense and budget programs, there is a problem in evaluating the efficiency of using budget funds" [5]. The study of ways to eliminate contradictions in the process of implementing a single function between defense and budget planning shows that the most realistic option for integrating the two systems for Ukraine is when, at the time of planning, they are responsible for ensuring the structure interact and each delegates part of its powers, remaining independent, while budget planning should be a derivative of defense planning [5].

In practice, we have a situation where the amount of funds allocated by the Ministry of Defense of Ukraine determines the scope of tasks and measures of defense planning, but in recent years, defense spending was at the level of 40-50% of the identified need. However, world practice shows that resource planning should be part of the

defense planning process and determine the amount of funding as a means of achieving the goals of planning, that is, the ability of the state to defense [4].

So far, Ukraine's defense planning system has been close to Western standards, mostly in form but not expressive in nature. In particular, today "... the issues of the organization of the planning process: levels of hierarchy, consistency, reporting and accountability systems, list and structure of documents being developed remain unresolved" [7]. As a result, the inconsistency of the regulatory framework, the chaos in the adoption of key defense construction decisions, the lack of subordination of the individual components of the defense forces to a single goal, which led to the inconsistency of their strategic development priorities.

In recent years, the state leadership has made significant progress in improving defense planning in the Armed Forces of Ukraine and other components of the Defense Forces and the SBGS in general, in particular: new editions of documents and documents on issues of defense in the security and defense sector of Ukraine were adopted, namely: National Strategy Security of Ukraine, Military Doctrine of Ukraine, Strategic Defense Bulletin of Ukraine, Concept of Development of the Security and Defense Sector of Ukraine, Orders of the Ministry of Defense of Ukraine on the Approval of the "Regulations on Medium-Term and Short-Term Defense is planning MoD and Armed Forces of Ukraine "[3,4,5,9].

Based on the Strategic Bulletin, the State Program for the Development of the Armed Forces of Ukraine up to 2020, and other defense programs have been developed, approved and implemented.

Defense planning in Ukraine, as an integral part of the state planning system, should be carried out by defining priorities and directions for the development of the forces of defense, armaments and military equipment, infrastructure, training of troops (forces), as well as developing relevant concepts, programs and plans, taking into account real and potential threats and financial and economic opportunities of the state.

Taking into account the above-mentioned provisions, the defense reform currently being actively pursued in Ukraine should meet the actual needs of Ukraine's defense, contribute to the strengthening of the defense forces, and increase their readiness to carry out their assigned tasks.

The Strategic Bulletin sets out the ways to achieve the objectives of defense reform, in particular to increase the capabilities of the defense forces to a level that will enable the state defense tasks to be carried out and restore its territorial integrity, contribute to the implementation of the Common Security and Defense Policy of the European Union and cooperation with NATO.

According to the new Strategic Defense Bulletin [5], the heads of the bodies of management of other components of the defense forces should participate in planning the defense of the state and determine the requirements for the capabilities of the defense forces, agree with the GS of the Armed Forces of Ukraine programs and plans for the development of the respective components of the defense forces, their technical equipment, training, comprehensive provision and execution of state defense tasks, as well as administering the use of subordinate forces. In accordance with Euro-Atlantic standards, inter-agency coordination and a combination of capabilities of the defense forces to enhance their efficiency and resource conservation should be strengthened.

In order to fulfill the tasks set out in the Strategic Defense Bulletin [5] and to improve the defense planning system in the Armed Forces of Ukraine, on May 25, 2017, the Ministry of Defense of Ukraine approved "Recommendations for the organization of defense planning on the basis of capabilities" (Recommendations on OPs) [10]. Recommendations on OPs were developed in order to form a common understanding among the MoE and the Armed Forces of Ukraine on the approaches to its implementation and implementation procedures. They provide for the use of common terminology, principles and objectives, procedures for the implementation of certain procedures, monitoring and development of capabilities in the Armed Forces of Ukraine in the process of gradual transition to an appropriate defense planning methodology based on capabilities. Subsequently, the provisions of the OP Recommendations are intended to be used by the Defense Forces as part of the capabilities-based defense planning organization.

Conclusion. Further improvement of defense planning in Ukraine's defense forces in order to develop the capabilities necessary for adequate response to threats to national security, protection of Ukraine, its sovereignty, territorial integrity and inviolability of borders, active participation in the implementation of the Common Security and Defense Policy of the European Union, support for international peace and security becomes a comprehensive goal of defense reform.

It seems that the above-mentioned approaches should be taken into account as modern theoretical and legal foundations in the course of approaching a unified defense planning in the SBU.

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The article came to the release 04.06.2017

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Проблемні питання щодо удосконалення системи оборонного планування в силах оборони України

Резюме. У статті розглядаються окремі проблемні питання щодо системи оборонного планування в силах оборони України та підходи їх вирішення на сучасному етапі розвитку держави.

Ключові слова: Збройні Сили, сектор безпеки і оборони, сили оборони, оборонне планування, державні програми розвитку, нормативно-правова база.

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Проблемные вопросы усовершенствования системы оборонного планирования в силах обороны Украины

Резюме. В статье рассматриваются отдельные проблемные вопросы системы оборонного планирования в силах обороны Украины и подходы их решения на современном этапе развития государства.

Ключевые слова: Вооруженные Силы, сектор безопасности и обороны, силы обороны, оборонное планирование, нормативно-правовая база.

UDK 355.02

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Features of defense planning in NATO-member states, on the basis of capabilities

Resume. The article analyzes the peculiarities of organization and implementation of defense planning based on capabilities in NATO member states. On the basis of this analysis, the authors suggest their vision of the ways to improve the existing defense planning system in the Armed Forces of Ukraine and adapt it to the requirements of NATO standards.

Keywords: defense planning, capabilities, armed forces, standards, NATO.

Statement of scientific problem. One of the operational objectives of defense reform in Ukraine is the improvement of the defense planning system (DP) in accordance with the Euro-Atlantic principles and approaches. In fulfillment of the specified tasks, the MO of Ukraine has begun a new stage of improvement of the defense planning system, within the framework of the stated strategic goal No. 2, namely, the implementation of the planning of the development of the capabilities of the Armed Forces of Ukraine [1]. To succeed in solving this problem, it is necessary to study the experience of the Allies and its incorporation into a new defense planning system based on the capabilities of the Armed Forces of Ukraine. This requires the identification of key milestones in NATO's defense planning, in particular: understanding of the process of sharing the capabilities of NATO between the national capabilities of the Allies that are necessary to achieve common goals; the organization of defense planning of the member states of the Alliance and the influence of the characteristic features of the national system, the adopted planning systems, its development, the conditions under which planning is carried out.

The analysis of recent researches and publications shows that the problems of forming the future outline of the Armed Forces of Ukraine, with the experience of Allied member states, are being actively explored today. A wealth of studies and defense planning documents are devoted to the study of defense planning in NATO member-states on the basis of capabilities. The leading Ukrainian scientists are actively pursuing this issue: Gorbulin V., Shelest Y ., Polyakov S., Askarov V. , Timoshenko R., Denekhin M. , Loza I. , Saganyuk F. and others.

However, insufficient attention was paid to the issues related to the development of a defense planning method based on the capabilities and adaptation of the defense planning system of the Armed Forces of Ukraine to similar systems of NATO member states. It did not take into account certain differences related to the peculiarities of defense planning based on the capabilities of individual member states of NATO and the Alliance as a whole and the possibilities of adapting the defense planning system of the Armed Forces of Ukraine to similar systems of these states.

The purpose of the article is: to analyze the peculiarities of the organization of defense planning on the basis of capabilities in the NATO member states, to find out the problem aspects of the existing defense planning system of the Armed Forces of Ukraine and identify the main directions of its improvement based on the experience of the Allies.

Presentation of the main material. Improvement of the defense planning system in Ukraine (hereinafter referred to as "DP") in the direction of transition to planning on the basis of capabilities and its approach to NATO standards adopted - is for the Armed Forces of Ukraine tasks for the near future, as defined in the Concept of Development of the Security and Defense Sector of Ukraine and the National Security Strategy Ukraine [1, 2].

Also, in [1, 3] it is determined that in the development of the Defense Forces DP system, as part of the national planning system, the implementation of modern methods used by the member states to improve defense capabilities, in

particular the application of the principle of a comprehensive approach to defense, methods of planning on the basis of capabilities, as well as the implementation of purposeful preparation for the tasks for the purpose and logistical support of the state defense needs.

NATO is today the largest military international organization that declares the security of every state that is part of it. Security is based on the principles, the main of which is [4]:

standardization and operational interoperability of the Alliance of Allies;

optimization of the organizational-staff structure, combat and numerical composition in accordance with the conditions of conducting modern wars and armed conflicts;

transparency of the military budget of the member states, etc.

Implementation of these principles is ensured, including by the developed system of defense planning on the basis of capabilities (hereinafter the DSDPC), which is formed in the Alliance.

In accordance with the stated principles, the requirements of the DSDPC system are NATO, among which the most important are:

promotion of cooperation and the development of relations between them in all spheres in which their general and individual interests are provided;

joint responsibility, as well as mutual recognition of responsibilities;

political solidarity of NATO member states;

general activities to maintain adequate military strength to maintain the Alliance's strategy and policy.

The DSDPC in NATO is carried out in the interests of joint use of forces (forces). It is based on a unified process of planning forces both for application and for the development of their capabilities [5; 6].

An important goal of the Alliance's DSDPC is to create and develop military crisis management capabilities both within and outside NATO. The list of these capabilities is determined by the NATO Strategic Defense and Security Concept [7]. The purpose of the NATO Response Force is determined on the basis of the requirements of NATO Strategic Committees and includes the "Target Tasks for the Development of NATO Armed Forces", which are aimed at providing the opportunity to address the full range of operational missions.

In Alliance countries, for the organization of the DSDPC, a model has been adopted based on key concepts such as strategy, ultimate goals, forces and means, risk, security environment and resource constraints. The adopted model reflects the dynamics of the process of developing a national security strategy and eliminates the discrepancies between the DSDPC indicators defined in those countries. It is assumed that the DSDPC process should be cyclical, with the rearrangement of key indicators, the ability to change the selected goals, improve forces and tools, review strategies and periodically monitor the degree of risk that is expected during the development of programs and plans.

The DSDPC process in NATO includes five main stages, which are generally consistent and cyclical.

The first stage - the definition of the principles of state policy in the field of security and defense. It is being implemented in order to formulate political guidelines for all components of the security and defense sector. It provides for the development (clarification of the provisions) of the basic documents in the field of national security and defense.

The second stage is the definition of needs (capabilities). At this stage, in order to achieve the identified political goals, based on the analysis of risks and threats, the development of probable scenarios for the use of armed forces (operations) is carried out and a Unified List of Minimum Needs Capacity is formed.

The third stage is the distribution of capabilities and task definition. Based on the list of minimum required capabilities, the distribution of these capabilities between NATO countries is carried out. Forming lists of desirable capacities to be achieved (allocated) by each Alliance country and separately for collective capabilities (to be achieved through NATO collective resources). In order to simplify the implementation process, Lists of Desired Capabilities can be broken down into Target packages that will be implemented gradually.

The fourth stage is implementation. The main content of the phase is the fulfillment of the tasks defined by the Lists of the desired abilities to create (develop) capabilities. The said involves the development (updating) of the guidelines (statutes, manuals), the procurement (modernization) of the military equipment, training of personnel, conducting exercises, application (testing) and improvement of capabilities. Capacity development tasks are carried out through the implementation of NATO standard documents (standards).

Fifth stage - evaluation of results. An assessment of the results is carried out to determine the degree to which the capabilities of the member states of NATO are achieved. Based on the results

of the evaluation, a Capacity Review and Capacity Report are prepared. On the basis of the report, the tasks are clarified and plans for capacity development (adjustments) adjusted.

The DSDPC process is used in the planning of the development of forces and capabilities (capabilities) for the medium and long term.

The adopted model is constantly being improved in line with the development of the methodological foundations of NATO's DSDPC.

In general, the DSDPC is aimed at creating and developing military capabilities, in preparation for responding to identified threats. The overall structure of NATO's DSDPC can be considered on the one hand as a set of interdependent processes and procedures, namely: assessment of HBO, planning of forces, resource planning and risk assessment that may arise in the future. On the other hand, as a set of processes of long-, medium- and short-term planning, documents that are being worked out, as well as a methodical apparatus justifying the main provisions of these documents [5, 6].

At the same time, the assessment of HBO is based on an analysis of the projected risks and threats, as well as the objectives and capabilities identified for NATO member states for a given forecasting period, and is the basis for substantiating the planning of forces. Planning of forces is based on the developed list of situations to react to which it is carried out.

The analysis of situations for planning and listing of available military capabilities allows us to develop short and medium term requirements for the development of the composition of forces. The DSDPC, through Force Planning, defines the list of forces, means, capabilities and structure requirements needed to respond to the most dangerous circumstances.

At the same time, during the planning of forces, the requirements for the capabilities for the next planning period are determined. The results of the defense capability review are reported to the Military Committee.

During operational planning, the same list of situations is considered, as for the planning of forces for the risks and opportunities for their occurrence. The DSDPC Working Group produces a priority list, which should be further elaborated.

The contribution of operational planning to the DSDPC is carried out during the process of reviewing the objectives of the forces. Operational planning defines a list of requirements for capabilities of forces and means, at a minimum, and, preferably, a list of forces and facilities for specific planning situations.

During the planning of forces, the Alliance member states agree on their adequacy, coherence, interoperability and effective interaction in fulfilling their assigned tasks [5-17].

The use of the planning, programming, budgeting, execution system, which is the basis of the DSDPC of the member states of the bloc and of the EU, shows the interconnection of these processes [6, 9].

The processes are interconnected by direct and feedback: long-term planning is implemented by medium-term programs, the main source of which is budget allocations. Changes in scheduled resources automatically trigger a revision of mid-term programs, which, in turn, require a review of long-term plans. The feedback determines the adjustment of the previous process as a result of performing the lower one. Thus, the continuity and dependence of the types of planning on the achieved results are ensured.

It should be noted that NATO is an intergovernmental organization whose member states allocate the resources needed to ensure its operation. At the same time, the vast majority of the Armed Forces and resources of NATO member states remain under the command and control of their states.

Allies are committed to jointly or individually provide troops (forces) and the necessary capabilities that NATO needs to achieve its goals and objectives. The DSDPC process in the Alliance is the main tool for finding the necessary capabilities, timely formation and achievement of the given level of opportunities (purchases).

It is accepted that a high level of effectiveness of NATO's DSDPC is a prerequisite for achieving the political, military and resource benefits that member states expect from the Alliance. Throughout NATO's DSDPC process, the Allies, without losing their national sovereignty, can coordinate their defense plans with the interests of NATO in order to identify, achieve and provide a reasonable share of their Alliance forces and capabilities to enable them to fulfill their entire range of tasks.

The majority of NATO member states in the implementation of OPs are not only addressing the needs identified by the Alliance, but also the task of developing their own Armed Forces. However, in some states with a small number of Armed Forces, within the framework of the OP, measures for the development of the Armed Forces are planned, aimed only at the identified needs of NATO.

Conclusions and perspectives of further research. Thus, the peculiarity of the NATO POPs is that each State of the Alliance has its own system

of DSDPC, the main content of the organization and implementation of which is influenced by the characteristics of the economic system; the system of forecasting and system of planning of its development adopted in the state; the conditions under which the planning is carried out; national traditions and so on. This requires the harmonization (integration) of their own national plans for the development of the Armed Forces with the NATO Defense Plan.

The prospect of further research is to analyze the content of long-, medium- and short-term defense planning based on the capabilities of NATO member states and the implementation of the experience gained in the perspective defense planning system of the Armed Forces of Ukraine.

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The article came to the release 04.07.2017

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Особливості оборонного планування у державах-членах НАТО, на основі спроможностей

Резюме. В статті аналізуються особливості організації та здійснення оборонного планування на основі спроможностей в державах-членах НАТО. На основі цього аналізу авторами пропонується своє бачення шляхів удосконалення існуючої системи оборонного планування у Збройних Силах України та адаптації його до вимог стандартів НАТО.

Ключові слова: оборонне планування, спроможності, Збройні Сили, стандарти, НАТО.

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Особенности оборонного планирования в государствах-членах НАТО, на основе возможностей

Резюме. В статье анализируются особенности организации и осуществления оборонного планирования на основе возможностей в государствах-членах НАТО. На основе этого анализа авторами предлагается свое видение путей совершенствования существующей системы оборонного планирования в Вооруженных Силах Украины и адаптации его к требованиям стандартов НАТО.

Ключевые слова: оборонное планирование, возможности, Вооруженные Силы, стандарты, НАТО.

UDK 351.86

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Harmonization of the defense planning process on the basis of opportunities with the process of the medium-term budget planning

Resume. The article is devoted to topical problems of coordinating the process of defense planning with the process of the medium-term budget planning, implementation of which is stipulated in the Strategy for Reforming the Public Financial Management System 2017-2021. The structural scheme of the content of this strategy is given. The tasks of the strategy in the aspect of ensuring the defense capability of the state are singled out.

Keywords: defense planning, the medium-term budget planning, the medium-term financial plan, the strategy of reforming the system of public financial management.

"We are clearly aware that the issue of defense planning is the one of the most important in the state, the level of security of Ukraine will depend on its effectiveness"
Minister of Defense of Ukraine
General-Army S. T. Poltorak

01.03.2017

Formulation of the problem. The results of the annexation of the Autonomous Republic of Crimea, as well as the long-term anti-terrorist operation in the East of Ukraine, proved weak management of scarce resources and clearly demonstrated the existing gaps in the process. Thus, domestic defense planning does not have sufficient capacity to adapt to changes in the military-political situation around Ukraine, does not ensure an operational redistribution of financial resources in the context of hybrid warfare (especially its economic component). The stumbling block of these problems was the discrepancy between the financial indicators on which defense planning documents and the actual amounts of financing of the Armed Forces are being drafted, which are approved by the State Budget.

In the context of strictly limited financial resources, the problem of the effectiveness of budget expenditures is very relevant. The achievement of the necessary efficiency in using budget allocations can not be carried out without qualitative budget planning for the medium term. Such planning provides the interconnection between strategic and tactical measures. Of particular importance is medium-term budgeting in the period of economic stagnation (war, economic crisis, economic sanctions, etc.).

On February 8 at the meeting of the Cabinet of Ministers of Ukraine, the draft Strategy for the Management of Public Finances for 2017-2021 (next – "Strategy") was approved at the meeting of the Cabinet of Ministers of Ukraine. The implementation of this Strategy, in particular, includes the introduction of the medium-term budgeting. This will include the allocation of budget funds in accordance with the development priorities for 3 years and the definition of development goals for 5 years, as well as the development of a system for evaluating the effectiveness of the Strategy implementation by key indicators.

Analysis of recent research and publications. Recent publications concerning the problem of coordinating the process of medium-term budget planning with the process of sector planning were covered by research: Kisel I. [5], Seleznev A. [7], Faizullaev E., Azizova I. [6]. At the same time, little attention was given to the problems of coordinating the defense planning process with the medium-term budget planning process, especially among domestic scientists.

Presentation of the main material. Today, the issue of organizing an effective defense planning system has become a priority. The development and implementation of new approaches to defense planning by defense forces has been envisaged in a number of new conceptual documents [1-4]. The key requirement of these normative documents is the introduction of capabilities-based defense planning, the effectiveness of which is confirmed by the practice of the use of NATO member countries.

The defense planning process is sectoral planning (defense planning) and is considered as a key component of the strategic planning and management of public defense resources that should be integrated into the national strategic planning system.

Defense Planning in Ukraine was initiated with the adoption by the Cabinet of Ministers of Ukraine in February 2004 of projected spending figures from the general fund of the state budget for defense needs for the period up to 2015. They provided for financing of the needs of the Armed Forces of Ukraine, on average, at 2% of GDP per year. Subsequently, these indicators were abolished and the management of financing needs for defense was carried out in "manual" mode.

By this time, budgetary relations in Ukraine were limited to one year, despite the fact that the main spending units (including the Ministry of Defense of Ukraine) prepared their requests for the planned and two subsequent periods, and the indicative indicators in these budget requests had rather limited use in the planning of expenditures in subsequent periods. Thus, the state did not have an effective mechanism for funding measures envisaged by defense planning documents, especially in the medium and long term. In addition, the link between the priorities of state policy, expenditures of the state budget and the results of the activities of the main spending units was extremely weak.

The lack of a regulated budget planning mechanism for more than one year did not allow for efficient forecasting of budget expenditures for the future, and managers of funds at all levels clearly formulate plans for their activities, both in the short-term and in the medium and long-term.

In general, the budget for the medium term contributes to the achievement of a higher level of stability and predictability of economic performance in the state. In addition to performing the stabilization function, medium-term planning is an instrument for solving such important problems: increasing the efficiency of the budget process and financial discipline; increasing the transparency and efficiency of spending budget funds; promoting the development of innovative potential and investment attractiveness of the country [5].

One of the main benefits of mid-term budgeting is that it enables budget administrators to more accurately determine the probable amount of resources in the future. Since the medium-term budgeting budget for the next fiscal year is only part of a multi-year (3-5 years) public finance plan, which is updated annually and shifts for one year ahead.

The medium and long-term budget planning for many years has been successfully applied in most developed countries of the world.

Developed countries Australia, Austria, Great Britain, Denmark, Canada, Germany, the Netherlands, the United States, Hungary, Finland, France, Sweden and many other countries have begun to form their budgets in the mid-20s. So, in Australia, Spain, Sweden, medium-term budget planning spans three years, in the US and Germany, the budget plan is for a five-year period. The introduction of this system of budgeting immediately had a positive impact on the efficiency of the distribution of budget funds, contributed to increased transparency in the financing of budget programs and controllability of the budget process [5]. The countries of the former USSR have only begun the transition to medium-term budget planning.

In Ukraine, with the adoption of the Strategy (Figure 1), the transition to medium-term budget planning has begun. The implementation of the Strategy is aimed at building a modern and effective public finance management system, in particular in the field of defense, which will be able to provide high-quality public services, efficiently accumulating resources and distributing them in accordance with the priorities of state development in the medium and long term. That is, the ultimate goal of a promising public finance management system is not to increase spending, in particular to defense, but to achieve concrete results, in particular, to ensure military security of the state, and to the Armed Forces - the necessary (prospective) capabilities.

Among the main tasks of the Strategy, it is necessary to distinguish the following:

full-fledged implementation of strategic and medium-term budget planning that will ensure the allocation of resources in accordance with the state's prioritized priorities and the strengthening of the overall fiscal discipline;

introduction of an effective system of planning and evaluation of the state budget execution, increasing the role and responsibility of the main spending units in determining priorities of their activities and efficient use of funds for their achievement;

increasing the efficiency of public expenditures through a comprehensive analysis of expediency and cost effectiveness and changing approaches to their implementation by moving from institutional maintenance to providing quality public services.

Fig. 1. The strategy of reforming the public finance management system for 2017-2020

Thus, in the aspect of ensuring the state's defense capability, the Strategy puts forward quite ambitious and, at the same time, extremely important tasks.

1. Development of the system of state strategic planning, which until now existed only fragmentarily. Due to the lack of an integrated system of strategic planning and the hierarchy of strategic documents, unresolved problems of effectiveness and the definition of links between budget programs of the main spending units and their strategic objectives remain. An integral part of the state strategic planning is strategic planning in the field of defense - as a sector strategy (in accordance with the law of Ukraine "On the organization of defense planning", defense planning is an integral part of the system of strategic planning and management of public resources).

2. Increasing the independence of the main spending units. The Minister of Defense will have the authority to allocate (redistribute) the allocations for budget programs within the approved medium-term ceilings, approval of budget program passports, and expand the authority to manage state assets in management.

3. Transition from the cost of resources for maintenance (defense forces) to providing high-quality public services (capacity to ensure military security of the state).

It should be noted that medium-term budget planning is a continuous process that coordinates the allocation of resources in accordance with the priorities of socio-economic policy with the needs of sectors in the resources for the implementation of sectoral programs [6, p. 142].

The main mechanism for coordinating the process of medium-term budget planning with the process of defense planning on the basis of capabilities (as a sectoral plan) will be the introduction of a procedure for political discussion within the framework of the Cabinet of Ministers of Ukraine (Strategic Council). The Strategic Council is proposed as an interim body for making collective decisions on policy priorities and the appropriate allocation of resources at different stages of the budget cycle.

In addition, at the meetings of the Strategic Council, it will be possible to coordinate capacity development issues not only in the armed forces, but also in the defense forces as a whole.

The main directions of fiscal policy will be transformed into a strategic document a budget declaration, which will include, inter alia, the medium-term fiscal forecast, the assessment of fiscal risks and the limits of budget expenditures (aggregate and in the context of the main spending units), including the basic amount of public capital investment, for increasing the compliance of budget expenditures with the priorities of state development. Involvement of the Verkhovna Rada of Ukraine in budget planning and approval of the maximum amount of expenditures will be carried out at the stage of discussing the budget declaration. (Strategy).

Thus, the medium-term budget declaration will serve as an instrument for combining the state's strategic priorities with the possibilities of the state budget.

The main paradigm of the problem of co-ordination of medium-term and defense planning will be that "in the economy and finances the uncertainty factor is manifested, the proportion of any plans, including the budget, can not be predicted with absolute precision" [7, p. 9]. Therefore, the transition to medium-term budget planning in Ukraine should be not only a technical change in the budget formation, taking into account two budget periods in the calculations, but a systemic change in the budget policy, which should provide a strategic approach to the definition of priority measures and the appropriate allocation of limited resources.

Conclusion. The importance of the introduction of medium-term budgeting is that it creates the basis that will enable the linkage of costs with the priorities of state policy and limit them within the framework of budgetary realities. Thus, the implementation of the provisions of the Strategy will ensure the continuity of the state's defense policy, as well as reduce the level of uncertainty and increase the efficiency when allocating budget funds for defense purposes.

The adoption of a three-year budget, coupled with an effective mechanism for making annual changes, will provide an opportunity not only to effectively plan large-scale defense projects for capacity development, but also to effectively manage such projects. In addition, medium-term budgeting contributes to increased transparency in the financing of budget programs and the manageability of the budget process.

Further research should be devoted to the development of an effective mechanism for making annual changes in the implementation of medium-term budget planning.

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The article came to the release 13.07.2017

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Узгодження процесу оборонного планування на основі спроможностей з процесом середньострокового бюджетного планування

Резюме. Стаття присвячена актуальним проблемам узгодження процесу оборонного планування з процесом середньострокового бюджетного планування, впровадження якого передбачено Стратегією реформування системи управління державними фінансами 2017-2021 рр. Наведено структурну схему змісту зазначеної стратегії. Виокремлено завдання стратегії в аспекті забезпечення обороноздатності держави.

Ключові слова: оборонне планування, середньострокове бюджетне планування, середньостроковий фінансовий план, стратегія реформування системи управління державними фінансами.

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Согласование процесса оборонного планирования на основе возможностей с процессом среднесрочного бюджетного планирования

Резюме. Статья посвящена актуальным проблемам согласования процесса оборонного планирования с процессом среднесрочного бюджетного планирования, внедрение которого предусмотрено Стратегией реформирования системы управления государственными финансами 2017-2021 гг. Приведена структурная схема содержания указанной стратегии. Выделены задачи стратегии в аспекте обеспечения обороноспособности государства.

Ключевые слова: оборонное планирование, среднесрочное бюджетное планирование, среднесрочный финансовый план, стратегия реформирования системы управления государственными финансами.

UDK 351.86

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Development of defense planning as an integral national planning system in the sphere of security and defense for the conditions of rapprochement with NATO standards

Resume. The analysis of the state and requirements for the national defense planning system was carried out in the context of a wide range of modern military threats and development prospects in accordance with NATO principles and standards.

Keywords: defense planning, military threats, military security, the defense of the state, defense forces, defense review, strategic planning of the use of defense forces, budget planning, defense capabilities, the military security strategy, the defense planning cycles, NATO standards.

Formulation of the problem. The wide range of modern military threats, the need to review a wide range of issues related to state defense, necessitate a strategic review of the concept of defense, taking into account the experience of overcoming the current crisis, the introduction of new methods of defense guided based on Euro-Atlantic and national experience and meet the criteria - high efficiency at acceptable costs. At the same time, a fundamentally new functional structure is created - the security and defense sector of the state as the main element of the system of ensuring military security in determining the role of this defense force.

These and other factors require significant changes in the principles, content and order of defense planning, as set forth in the Law of Ukraine “On the organization of defense planning”.

Analysis of basic research and publications. Despite the considerable domestic experience of research on the definition and implementation of defense planning, as the results of the defense review show, "the imperfection of defense planning procedures, their lack of coherence with the budget process, and the imperfection of the mechanisms of program management of defense resources" remain.

There are insufficiently researched conditions that are critically necessary for the subjects of defense planning in the awareness and timely resolution of the following management tasks: clarification of military-political goals and tasks and their legislative and normative design; rational allocation of resources, first of all financial, to achieve these goals and to fulfill the respective tasks; creation of an effective mechanism for allocating allocated resources for defense and control over their use.

A systematic analysis of these and other issues poses an urgent need for the development of a new set of defense planning procedures that would ensure: the integration of capabilities of the security and defense sector components to respond effectively to existing and potential threats; increase the level of coordination of the components of the security and defense sector and improve the mechanisms for their consolidated development and strengthen the relevant operational capabilities to ensure military security; achievement of operational and technical compatibility with the armed forces of NATO member states; functional connection with strategic (operational) planning by the use of defense forces and budget planning.

The purpose of the article is, based on an analysis of the experience of domestic defense planning, to give their views on the prospects of its development in accordance with NATO principles and standards.

Presentation of the main material. In order to determine the prospects for the development of such a complex process, which is defense

planning, it is necessary first of all to clearly identify the procedure for defining the objectives of defense reform, the content and logical sequence of planning measures.

The starting point of this process is a strategic defense review. Its completeness, the quality of the reporting information and analytical materials prepared by its results and a clear definition of the prospects for the development of planning objects creates the basis for effective defense planning.

The prognostic indicators of the expenditures of the State Budget of Ukraine for defense needs in the long-term and medium-term perspective are an important basis for defense planning that allows a balance to be struck between ambitious defense reform goals and resource capabilities. They allow for the financial and economic calculations of the development of defense forces, as well as assess the risks in achieving the results of defense planning.

Taking into account the principles and standards of NATO's defense planning, for Ukraine in the current circumstances, the most appropriate combination of capabilities, mechanisms and tools of the two main methods of defense planning - planning, based on capabilities and threats. At the same time, other specific planning methods are used, including resource-based planning, gradual planning, scenario-based planning.

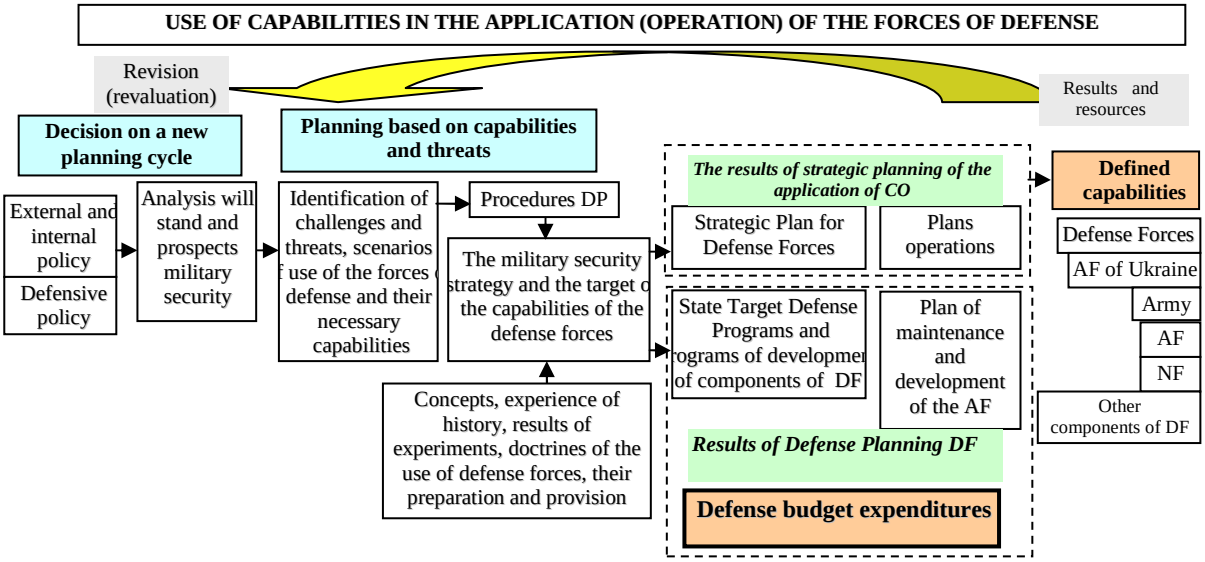

Fig. 1. Perspective structural-logical scheme of defense planning

The perspective variant of the structural-logical scheme of defense planning, which combines the mentioned methods, is presented in Fig. 1

The diagram below illustrates the logical sequence of basic procedures, including the decision to carry out the next planning cycle, the elements of strategic (operational) planning of the use of defense forces and direct defense planning in conjunction with budget planning. The results of defense planning are outlined in the main documents shown in the diagram.

Of particular importance in strategic (operational) and defense planning is the forecast of the military-political and military-strategic situation, trends in their development, the definition of the level of military threat to national security, the identification of possible forms and methods of conduct military actions and means of armed struggle.

The next stage is the planning of scenarios according to one or another projected military-political, military-strategic situation and anticipated actions of the enemy. Defined, among other things, goals and tasks of the forces of defense, as well as necessary for their fulfillment of the capabilities of these forces. The obtained data are the source for the defense planning. The defense planning process should include development planning: defense forces and their capabilities; defense control systems; armament, military and special equipment; military infrastructure; systems of logistic, medical, personnel and other types of security.

The analysis of the current defense planning system in Ukraine and its comparison with a similar system in NATO member states shows some advantages of the latter. In particular, this relates to the structure and content of defense planning documents, which convincingly leads to the need for their optimization in Ukraine.

Draws attention to the fundamental act to date in the hierarchy of defense planning documents - the Military Doctrine of

Ukraine. Following the Strategy of National Security, the Military Doctrine, by the nature of its provisions, a document distinct from strategy, creates a certain disharmony. Therefore, the Place of Military Doctrine should take the Strategy of Military Security, as is practiced in the West. Such a Strategy will be aimed at achieving certain military-political goals.

It should detail the provisions of the National Security Strategy that relate to the field of military security, identify areas for the containment and neutralization of military threats, and lay the foundations for the development of the defense forces at the present stage. The main developer of the Military Security Strategy should be the Ministry of Defense of Ukraine, whose main tasks include: "ensuring the formation and implementation of a national policy on national security in the military sphere, defense and military construction in peacetime and a special period regarding: defense planning; military-technical policy in the field of defense; military personnel policy "

Given this interpretation of the place and role of the Military Security Strategy, it should be a document of the President of Ukraine, which, in accordance with the constitutional powers, "... carries out leadership in the areas of national security and defense of the state". It is most expedient, in the opinion of the authors of the Strategy of Ukraine's Military Security, to ask the following questions: assessment of the military-political, military-strategic situation around Ukraine, determination of the level of military threats; the possible nature of a military conflict, both interstate and internal; the concept of state defense in modern conditions; integrated use of state resources (political, economic, military, informational, etc.) in the interests of defense; goals and tasks of the defense forces; main directions of development of the forces of defense; the task of the defense forces in strengthening international peace and security under the auspices of international security organizations; the implementation of the Strategy, the main tasks of defense planning, etc.

The questions posed in no way should be taken as a suggestion of a certain constant regarding the structure of the Strategy. Depending on the peculiarities of military threats, the state of the forces of defense and a number of other factors, it may have different variations. The scheme of perspective defense planning (Fig.1) provides for the development of a target package of capabilities of the forces of defense, as an addition to the Military Security Strategy, which is expedient to implement in the format of a decentralized plan or road map the achievement of the objectives of the development of the defense forces. This issue deserves attention and needs further study.

An important role in the organization of defense planning belongs to the Ministry of Defense of Ukraine and personally to the Minister.

As the head of the defense department, he, in agreement with the Commander-in-Chief of the Armed Forces of Ukraine, the Minister of Internal Affairs of Ukraine, and other leaders under whose command the defense forces are located, issues an order of the Ministry of Defense on the principles of organization of development planning for defense forces, which defines: quantitative and qualitative indicators for each component of the defense forces; the order of realization of common strategic goals of defense reform; the organization of joint training of defense forces, etc. The said order of the Ministry of Defense of Ukraine will make it possible to coordinate defense planning in all defense forces and determine the optimal ways of realizing the tasks set by the President of Ukraine. The results of this planning are reflected in the programs of development of the Armed Forces of Ukraine, programs for the development of other military formations and law-enforcement bodies (in separate sections of the "Forces of Defense"), as well as in state target defense programs.

In turn, the Commander-in-Chief of the Armed Forces of Ukraine should organize the development and submission by the commanders of the types, separate units of the Armed Forces (forces) of the Armed Forces of Ukraine for approval by the Minister of Defense of Ukraine plans (programs) for the development of his subordinated troops (forces).

In the course of strategic (operational) planning of the use of defense forces, appropriate scenarios are determined in the context of one or another projected military-political, military-strategic situation and anticipated actions of the enemy. Among other things, the goals and tasks of the defense forces are determined, as well as the forces necessary for their fulfillment. The obtained data are the source for the defense planning.

The organization and implementation of strategic (operational) planning of the use of the forces of defense is determined by the Doctrine of the use of the forces of defense. The processes of defense planning are cyclical.

The long-term cycle of defense planning is carried out on the basis of the results of the defense review and ends with the adoption of reporting information and analytical materials and the

approval of strategic long-term defense planning documents.

The five-year cycle of defense planning is held at least once in five years. During the five-year cycle, the medium-term defense planning of defense forces and the adoption of appropriate program and planning documents are carried out.

The annual cycle of defense planning is carried out in the year preceding the year for which the appropriate measures are planned. In the course of this cycle, short-term planning is carried out, and its measures are in line with the budget planning measures in the state.

Depending on the circumstances (economic or political crisis, etc.) and if necessary (for example, the decision of the President of Ukraine), one or another planning cycle may start early (before the time of completion of the previously adopted programs (plans)) or change its planned period (for example - instead of It's planned for four years). But under all circumstances, defense planning should remain the main starting point for defense planning, which is usually carried out within the framework of a comprehensive review of the security and defense sector or separately.

Taking into account the importance of the defense review and the high level of its participants, the decision to conduct this review should be taken by the National Security and Defense Council of Ukraine, which defines the main objective and main tasks of the defense review, responsible executors and the timing of reporting on its results.

The results of the defense review are summarized by the Ministry of Defense of Ukraine in the reporting information and analytical materials, which are the basis for the development of strategic defense planning documents.

Thus, implementing the proposed logical sequence of defense planning procedures, we can clarify the list of organizational, analytical, executive and enforcement activities of the defense planning process, as well as clearly outline its final documents.

Conclusions.

1. Defense planning should be considered as an integral part of planning in the field of security and defense of Ukraine, which is carried out in order to ensure its defense capability by defining priorities and directions for the development of the forces of defense, armaments and military equipment, infrastructure, training system of troops (forces), etc., taking into account financially -economic opportunities of the state. At the same time, defense planning should be maximally integrated into the state system of strategic planning of social and economic development of Ukraine.

2. Effective use of resources, primarily financial, to establish a process for assessing their use under the criterion of "cost-effectiveness" should be considered as one of the priority directions of research, scientific analysis and activities of the military authorities.

3. Sustainable development of the defense forces can be ensured on the basis of the proposed promising defense planning system adapted to NATO standards and takes into account national experience. The source documents of this planning system should be of a more practical orientation and focused on the final result for ensuring the state's defense capability.

4. Continue the practice of conducting defense reviews in the framework of comprehensive security and defense sector reviews and, if necessary, separate defense reviews according to the proposed defense planning cycles. At the same time, widely involve non-state organizations, research institutions, as well as domestic and foreign experts who are concerned with defense issues, use of mass media within the framework of strategic communications. A key role in the defense planning process should be assigned to the Committee for Reforms of the Ministry of Defense and the Armed Forces of Ukraine.

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The article came to the release 04.07.17

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Розвиток оборонного планування як складової національної системи планування у сфері безпеки і оборони за умов наближення до процедур та стандартів НАТО

Резюме. Проведено аналіз стану та вимог до вітчизняної системи оборонного планування в умовах широкого спектра сучасних воєнних загроз та перспектив розвитку відповідно до принципів та стандартів НАТО.

Ключові слова: оборонне планування, воєнні загрози, воєнна безпека, оборона держави, сили оборони, оборонний огляд, стратегічне планування застосування сил оборони, бюджетне планування, спроможності сил оборони, Стратегія воєнної безпеки, цикли оборонного планування, стандарти НАТО.

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Развитие оборонного планирования как составной национальной системы планирования в сфере безопасности и обороны при условии сближения к процедурам и стандартам НАТО

Резюме. Проведен анализ состояния и требований к отечественной системе оборонного планирования в условиях широкого спектра современных военных угроз и перспектив развития в соответствии с принципами и стандартами НАТО.

Ключевые слова: оборонное планирование, военные угрозы, военная безопасность, оборона государства, силы обороны, оборонный обзор, стратегическое планирование применения сил обороны, бюджетное планирование, способности сил обороны, Стратегия военной безопасности, циклы оборонного планирования, стандарты НАТО.

UDK 504.064.2

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Concerning the construction of the concept of environmental monitoring of the operational zones of the regional armed conflict in the conduct of the military-operational activities of the border divisions at the regional administration section

Resume. The article presents the main approaches for constructing the concept of environmental monitoring in the conduct of the service and combat activities of border divisions at the regional administration from the point of view of the formation of its functional scheme and components for assessing the changes in the state of the border natural-ethnogeny geosystems.

Keywords: ecological monitoring, concept, natural and ethnogeny geosystem, military-man-made load, armed conflict, environment, border areas, combat service, border guard, indicators, regional administration

Formulation of the problem. The armed conflict that unfolded in southeastern part of Ukraine, led to the deaths of thousands of people and growing environmental and humanitarian disaster in the Donetsk and Lugansk region. This, in turn, affects the functioning of the State Border Guard Service of Ukraine (SBGSU) on the organization of operational and service, service and combat activities, monitoring of this border region to protect national interests against external and internal multi-system threats.

The response of the SBGSU should be the rapid growth of alert and management software threats and risks in terms of the use of rapid reaction border units in the regional armed conflict in the service and combat activity [1].

As the nearly three-year experience in service and combat activity in terms of anti-terrorist operation (ATO) testifies, severe disturbance of unstable equilibrium of natural-anthropogenic geosystems in Donbas is associated with the use of a wide range of weapons and ammunition in the presence of a large number of potentially dangerous objects (PDO). This led to the development of a number of environmental emergencies caused by PDO, which holds potent chemicals, industrial waste hazard classes 1-3, radiation and burial grounds for animal refuse of hazardous biological components of anthrax spores, viruses, tularemia, plague and other pathogens dangerous epidemic diseases. The elimination of such emergencies lacks for internal resources or external borrowing.

Under such circumstances, the only thing to do is to establish a clear system of effective environmental safety in the area of ATO, one of the major subsystems of which is environmental monitoring border regions to prevent and predict the consequences and rapid response to emergencies.

This will save not only the health and viability of the Armed Forces of Ukraine military-men, SBGSU units and the local population in the conflict zone, but also prevent the development of cross-border emergencies and rapid response to their border guard units (BGUs) in the service and combat activity.

According to the Regulation on Border Guard Division of the State Border Guard Service of Ukraine, which is approved by the Ministry of Internal Affairs of Ukraine from 04.15.2016 number 311, it is assigned tasks related to the analysis of a range of multi-tag threats and risks in border security concerning monitoring of toxic and radioactive substances, hazardous materials and other items prohibited for movement across the state border of Ukraine and, to the temporarily occupied territory and out, environmental protection and conservation of natural resources, monitoring the radiation situation in the area of responsibility and measures for emergency situations of technogenic and natural character, informing public authorities and citizens about accidents, fires, natural disasters and other emergencies at the state border of Ukraine, the border zone and controlled border areas within the area of responsibility, as well as the data and facts that indicate a threat to security of society and state.

The analysis of recent researches and publications. Analysis of publications on issues of

environmental monitoring border regions indicate that several concepts are developed today in the world [2-5]. Under environmental monitoring we understand "... monitoring the health of the surrounding human environment and the prevention of crises that are harmful to humans and other living organisms" [3]. According to this definition, the main content of monitoring is the implementation of two related functions - monitoring (tracking) and prevention of emergency situations of natural or man-made. This means that performed actions should have the character of rescue work during liquidatio of emergency situations (ES).

Similar to the abovementioned concept offered B.V. Vinogradov in his monograph [4]. The object of monitoring is viewed as ecosystem, the main method - aerospace. The issue of governance, regulation, rate setting of environmental safety and optimization of its level in this concept is not defined.

In the seventies the Soviet Union had developed two alternative concepts for environmental monitoring. The author of one of them was Yu. A. Israël. The strength of this concept is the focus on fixing anthropogenic environmental changes [5]. However, analysis of this concept shows that the effectiveness of untargeted management of environmental monitoring is low.

By another concept of I. P. Gerasimov meant by monitoring "system monitoring, control and management of the environment, which is implemented in different scales ..." [6]. The role of this concept is given to science: "... monitoring, control and management of the environment should be targeted, effective and interconnected (full)". He offered three stages of monitoring hierarchy: 1st stage - bioecological (hygienic) monitoring; 2nd degree - geoecological monitoring (natural and economic) that includes observation of the natural ecosystems and turning them into natural and man-made; 3rd degree - biosphere monitoring (global).

The analysis of existing concepts in terms of their application for creation of border ecological system monitoring and current publications [7, 8, 9] requires detailed elaboration of conceptual issues concerning its essence, structure, types, features of border ecological system monitoring realisation under the condions of armed conflict in Ukraine.

In this regard, in the present circumstances of the area of Eastern and Southern regional directorate, conducting the hybrid warfare by Russian Federation against our country in terms of threats of radiation, chemical and bacteriological nature for SBGSU personnel and local population living in these and adjacent areas increases the likelihood of potentially dangerous objects by conventional ammunition [10], which could lead to large-scale emergencies.

Thus, for appropriate management decisions and environmental safety in circumstances where SBGSU carries out its tasks of protection borders of our country, there is topical scientific task of developing the concept of environmental monitoring during service and combat activity of border units in the area of regional directorate.

The purpose of the article - is the scientific study of scientific principles and approaches to the concept development of environmental monitoring during service and combat activity of border units at the area of the Eastern regional directorate capable of applying environmental management function.

Main material statement. The organization of observations of Environmental Protection (EP) in operational areas and areas of conducting service and combat activities (SCA) of border units, fundamental importance belongs to the selection of natural and industrial processes with different spatial and temporal frequencies, reflecting the scale and depth of the changes in ecosystems border region. Accordingly, environmental monitoring can be divided into the following hierarchical levels:

regional monitoring in the area of military conflict in eastern Ukraine;

local monitoring of operational areas and areas of SCA of border guard units;

object (impact) monitoring (carried out with specific military objectives or potentially dangerous objects in the vicinity of conducting SCA of border units).

Environmental monitoring of operational areas and SCA areas of border units (BGUs) in the overall hierarchical structure refers to the local and object monitoring and is a complex system, so that includes monitoring, assessment and forecasting changes of abiotic component of ecosystems influenced by hazards and pollution both as military and industrial origin and poor long-term land use in the industrial region of Ukraine and their respective reactions to these changes. A necessary condition for the successful functioning of the monitoring and forecasting is to assess the impact factors of military and technological burden (MTB), the possibility of defeat PDO and burial industrial and critical infrastructure as a result of warfare and the development of measures to manage environmental security border region.

For local areas of SCA where the PDO facilities and border infrastructure are located, it is necessary to deploy wireless sensor networks of object monitoring, organization of which should be considered with significant variability factors of MTB. This variability is determined by the characteristics of pollution sources and MTB, meteorological conditions, landscaped terrain, the state of water bodies and understretched surface and geological processes of the upper zone of the geological environment (flooding, karst, landslides, erosion, subsidence etc.).

Solving these problems at the state level so far successfully implemented only where fixed and mobile checkpoints established at: nuclear and thermal power stations in the areas of military and high-risk industrial targets (arsenals, bases, warehouses, military sites, mining, chemical and metallurgical industry) in large industrial plants, in the ground water for centralized water supply.

Today on the bases of the majority of civilian objects and objects of border infrastructure is impossible to organize a system of regular long-term observations of the EP due to the considerable complexity and significant financial costs for gaining input monitoring data and methods of their treatment, which requires specialized laboratory equipment attracting highly skilled professionals.

The concept of environmental monitoring during service and combat activity of border units in the area of the Eastern regional directorate is based on a number of fundamental principles of environmental monitoring that due to the nature of the functional tasks, as well as its place in the system of ecological safety during SCA of BGUs. Tree basic principles of this environmental monitoring shown in Fig. 1.

An important principle of environmental monitoring is the principle problem of the organization. This principle is opposed to the idea of total monitoring [7] and remove syndrome "excess data - lack of information" [6].

The program of research and observation takes place only under certain environmental problem while conducting SCA. During solving of this problem monitoring program is minimized while conducting SCA, intensity of observations decreases, and they are terminated according to certain indicators. Monitor of conducting SCA of BGUs at the Eastern regional directorate may consist of a package of this programs-organized problem:

1) state of pollution primary and researve sources of drinking water utilities of BGUs;

2) state of soil contamination in based-points of BGUs;

3) state of groundwater contamination in based-points of BGUs;

4) state of pollution of surface waters in based-points of BGUs;

5) state of surface air pollution in operational areas and areas of conducting SCA;

6) violation of the condition of natural landscapes in operational areas and areas of conducting SCA;

7) state of EP pollution by heavy metals in in based-points of BGUs;

8) state of background radiation in the operating areas and maintenance areas SCA;

9) state of radionuclide contamination of components EP in operating areas and maintenance areas of SCA;

10) state of EP depleted uranium contamination in operating areas and maintenance areas of SCA.

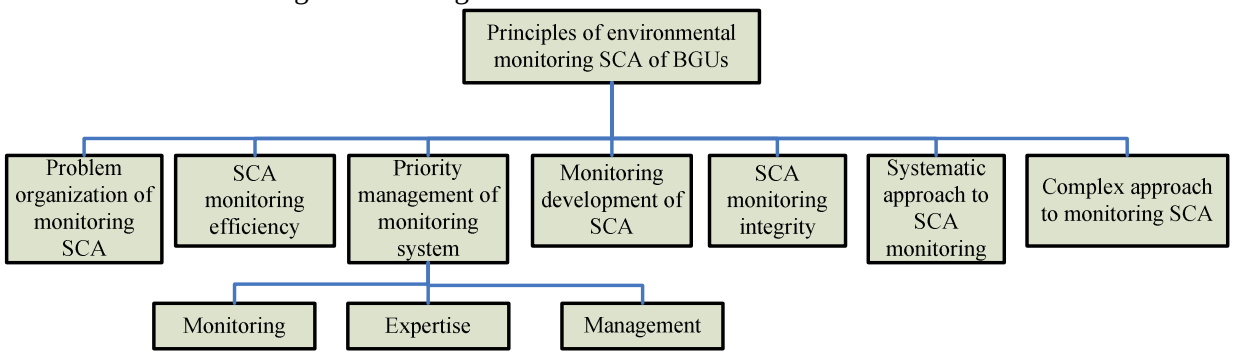

Fig. 1. Principles of environmental monitoring SCA of BGUs

Problem organizing principle always leaves room for raising new issues and deployment of new monitoring programs while maintaining SCA of BGUs, and therefore the system remains open for the development. This is the second principle of organization of environmental monitoring during the conducting of SCA of BGUs.

The principle of priority management (organizational hierarchy) emerged as the antithesis

of the environmental approach and related environmental monitoring, built on the environmental approach as untargeted at solving environmental problems in the area of military conflict. In the triad of management-monitoring-expertise, the management played a leading role, monitoring and assessment are important, but only with blocks software. The block "management" is developed according to target set outline contour of environmental problems, which will be built under the monitoring SCA of BGUs. Environmental impact assessment used as a means to narrow the possible professional solution. One of the results of environmental monitoring is targeted information designed to support management decision. In the continuity of this triad the principle of integrity is laid.

Efficiency of SCA of BGUs environmental monitoring should be expressed not only in the technical side of things - the efficiency of collection, processing and transmission of information - how to speed decision-making in critical situations while conducting SCA of BGUs. In such a requirement environmental information, provided by the commander of BGU, should be focused on the adoption of the commander's decision and include, for example, the types and possible scenarios of environmental situations and actions as for their solving for conducting SCA of BGUs.

Organization of integrated environmental monitoring while conducting SCA of BGUs is based on the principle of systematic approach to analyzing the results of observations, assessments and forecasts carried out against components of military natural and technogenic geosystems (MNTG). To assess the influence of MTB it is necessary to justify a set of indicators that would provide a full description of functional ecological state vector (ESV) MNTG [10].

Because environmental monitoring provides for the combination of observations abiotic component of the ecosystem, evaluation and prediction of responses of biotic component, principle of complex monitoring is laid in the organization and implementation of environmental monitoring of operational areas and areas of conducting SCA of BGUs - a harmonious combination of geological (geophysical), biological and monitoring sources and factors MTB.

Geological monitoring includes elements of observation, evaluation and forecasting of changes geophysical environment (the set of physical, chemical and physico-chemical processes and properties of defined areas MNTGS), namely changes of abiotic (geological) component as part of the ecosystem in the micro- and macroscale, including pollution military man-made origin by different ingredients. Its result can be defined as a state vector of abiotic environment

$$Abio = \left(A, S, W^s, W^g\right), \quad (1)$$

where A – the indicator of status of air; S-the indicator of status of the soil; W^s - the indicator of status of surface water; W^g - the indicator of status of groundwater.

The main task of the biological monitoring is to determine ESV biotic component of ecosystems, its response function (reaction) to the military and technogenic effects, rejection definition of the homeostasis at different levels of the biosphere (the level of organisms, population, ecosystem and landscape). The organization and carrying out of biological monitoring also provides monitoring, evaluation and forecast of human health and the most important populations of native species in terms of a sustainable ecosystem for the military and their economic values (eg. hunting animals and valuable commercial fish species). In addition, it is monitored and assessed the state of the most sensitive to a particular MTB populations of plants and animals. Its result can be defined as a state vector biotic environment

$$Bio = \left(Fito, Zoo, Mico, Microbo, Human\right), \quad (2)$$

where $Fito$ - the indicator of status of phytocenotic; Zoo - the indicator of status of zoocenoses; $Mico$ - the indicator of status mikotsenozu; $Microbo$ - the indicator of status mikrobotsenozu; $Human$ - the indicator of human health.

Functional problems of environmental monitoring of operational areas and SCA of BGUs areas should also include monitoring of sources and factors MTB. This monitoring should include identifying damage vegetation and soil components and defeat MNTG factors of MTB and control of their spread. Its result can be defined as a state vector of MTB.

$$MTL = \left(mtl_{мех}, mtl_{хім}, mtl_{фіз}\right), \quad (3)$$

where $mtl_{мех}$ - MTB mechanical indicator;

$mtl_{хім}$ - MTB chemical indicator;

$mtl_{фіз}$ - an indicator of physical MTB.

In this case, the proposed operating principle of ecological monitoring zones and SCA of BGUs areas, is organized and implemented as a three-pronged - geological, biological and monitoring of

sources and factors of MTB reasonably could be called a system.

If we conduct a decomposition of Environmental Monitoring System (EMS) of SCA of BGUs components for surveillance aimed at playing an objective picture of the ecological condition of MNTG and MTB, their system can be represented as a hierarchical tree (Fig. 2).

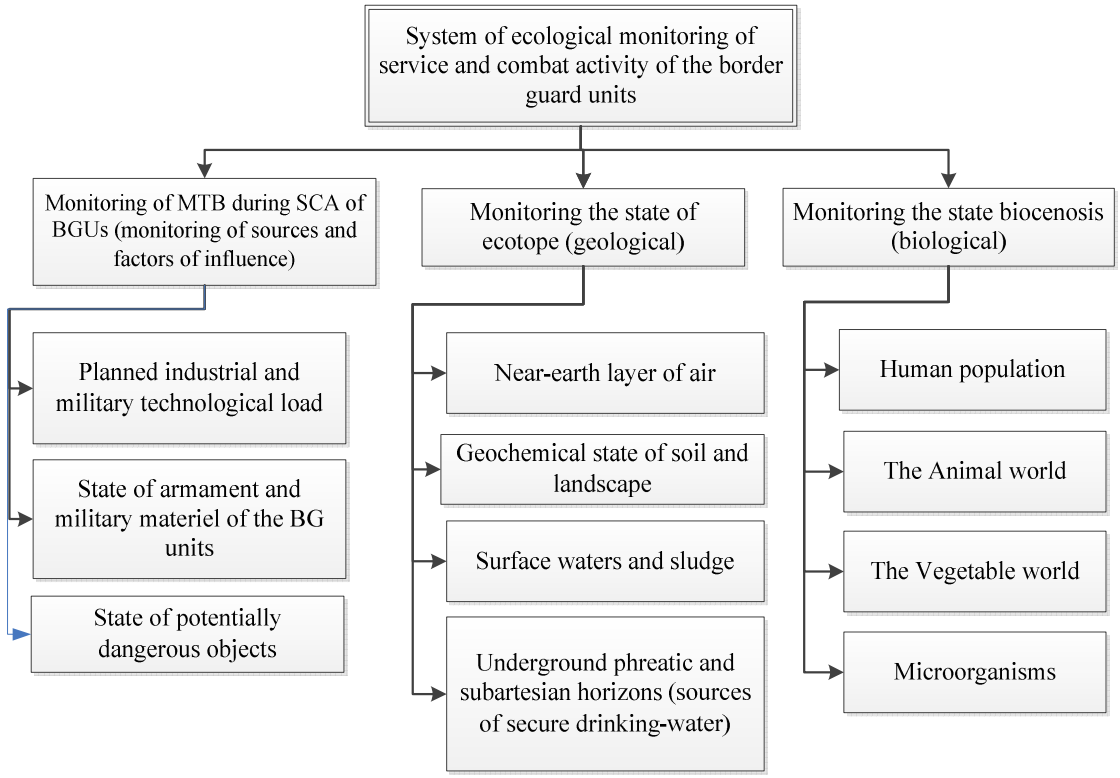

Figure 2 . Tree of systematic environmental monitoring of SCA of BGUs

Another feature of the system of organization and operation of environmental monitoring zones and SCA of BGUs areas is a combination and balance system of solving its sustematic tasks related to constant surveillance, assessment and forecasting of MNTG and monitoring tasks arising from the nature and content of the partial global environmental problems, regional or local scale.

System and complex nature of environmental monitoring also was determined using the methods of system analysis indicators characterizing factors of MTB impact on various components of the EP and state of ecosystems operational areas and SCA of BGUs areas.

In the process of environmental monitoring of operational areas and and SCA of BGUs areas it is organized and carried out surveillance, assessment and forecasting the MNTG natural changes and changes caused by the military and technological burden imposed on natural changes.

Studied systematic principle of organization and operation of environmental monitoring zones and areas and SCA of BGUs areas involves the selection of priority indicators for monitoring of surface air, lithosphere, natural biocenoses, surface and ground water, and health of SBGSU personnel and people in the areas of conducting SCA of BGUs.

We can say the following about some priority indicators for monitoring of ambient air in areas of high military and industrial loads. According to the recommendations of the World Health Organization and the experience of the European Environment Commission, one of the harmful substances contained in the atmosphere that should be monitored primarily include: sulfur dioxide, nitrogen oxides, carbon monoxide, ozone, dust, hydrocarbons, including benzo(a)pyrene and dioxin [11]. There is a priority list of chemicals contained in the air and be controlled. [12] It should be taken into account in the organization of monitoring.

Pollution of surface water, including rivers, lakes and other bodies of water is due mainly possible by runoff from areas of intensive MTB operating areas and areas of conducting SCA of BGUs, and also by private and household (municipal) sewage military camps and agricultural runoff from plowed land and farms. The most common contaminants in surface waters are petroleum products, phenols, organic compounds, compounds of copper, zinc, and in some regions of ammonium and nitrite nitrogen, formaldehyde and so on. [13].

Regarding the organization of environmental monitoring of operational areas and areas of conducting SCA of BGUs, in our view, we should included into the priority pollutant of surface water especially those which regularly exceeded the

maximum permissible concentration (MPC) established by sanitary and fishing control authority rules. The list of this kind of substances for which statistics indicated maximum permissible concentration in water should include: petroleum products, compound organic substances, phenols, anionic surfactants, ammonia nitrogen, compounds of copper, zinc, mercury, in some regions - cobalt, copper uranium [13, 14].

There are priority issues for monitoring of surface water, which should be taken into account in its organization and implemented. Complex and multi-surface water contamination can not be estimated by the sum of individual hygiene indicators (maximum permissible discharge (MPD), maximum allowable concentration (MAC), man-caused load (MCL), etc.), that is why now a method of bioassay integrated assessment behaviour of complex biological systems with complex physical action, physical chemical, chemical and other factors technogenesis have been widely used [15].

Among the priorities of operational controls lithosphere zones and SCA of BGUs areas should include status monitoring contamination of soil and groundwater, sediments of surface water bodies, development of erosive and deflationary processes in the areas of technologically loaded area of operational areas and SCA of BGUs areas.

As a soil monitoring objects we should use the following [16]:

main types, subtypes, genera, species and varieties of soils within a soil province. They should reflect the diversity of soil covering the province and all kinds and levels of anthropogenic pressures;

natural objects that are not affected by human activities (forest and steppe reserves);

reference objects on agricultural soils with their use in high culture agriculture: fields of state sorts lots; farm fields where the contour reclamation area introduced, terrain organization or system of soil or organic farming; fields that are near the specified reference objects;

options climate - precipitation and their distribution throughout the year; air temperature; number of days with strong winds; the average wind speed during dust storms and their duration during the year;

ground species - their status and level of pollution affecting the degree of pollution in general all soil;

soil and groundwater - their state reflects the direction and intensity of soil formation occurring in the formation of soil;

quantity and quality of crop production - because it reflects the level of soil fertility, the degree of degradation or contamination.

For monitoring biotic component of MNTG generally by observing, evaluating and predicting its state primary role belongs to the definition and analysis of different kinds of integrated indicators, including integral characteristics of the biocenose, including aquatic and terrestrial organisms (as determined by methods bioindication) general characteristics of the health of personnel and people living in the surrounding areas. By analogy to the radiation safety standards norms RSSN- 97, MTB gradation impact on people in 2 categories should be made:

category A (workers and BGUs personnel of SBGSU) - persons who permanently or temporarily directly interact with sources of military and technological burden;

category B - the entire population living in the areas of operational and SCA of BGUs areas and adjacent areas (zone estimated environmental impact of MTB).

There were also these types of measurements monitoring programs that should be performed when the contaminant itself is difficult to be measured (indirect monitoring). This requires measurement of the following values:

indicators of water quality (coli bacteria VPK5, HPK, blue-green algae, their primary productivity);

indicators of soil quality (salinity, alkalinity and acidity ratio, the content of nitrates and organic nitrogen, humus);

indicators of human and animal health, plant indicators lesions (cases of disease, genetic effects, sensitivity to drugs);

plant pollution indicators.

Priorities for monitoring natural biocenoses depend strongly on the type of landscape, nature and degree of specificity bileherative transformation and military facilities. The principle of hierarchy in the organization and implementation of environmental monitoring of operational areas and SCA of BGUs areas is that all of its main elements are consistent and laid in a certain hierarchy:

regional;

local (impact) or object.

Impact environmental monitoring is organized and carried out at the level of separate units of SBGSU and operational areas, and SCA of BGUs areas as independent military natural and industrial geosystems - "military man-made object - the environment."

The field of structural units of this complex ecological monitoring of operational areas and SCA of BGUs areas should include a certain set of biosphere, military and industrial objects directly linked processes of interaction. In this case, the subject can be monitored and evaluated by the influence of MTB, especially on sites and biosphere, including man, and can be taken adequate measures to normalize the ecological situation. According to modern concepts, it is at the local level, according to the monitoring of impact, operational environmental management of MNTG should be made [16].

Apart from the abovementioned, while organization and implementation of environmental monitoring of operational areas and SCA of BGUs, a number of principles are implemented:

the principle of systematic approach to studying the interaction between components of MNTG and biogeochemical cycle paths and substances;

principle of organization and operation of environmental monitoring zones and SCA of BGUs areas for ecosystem processes, when monitoring, assessing and predicting their ecosystems, their key parameters are defined (sensitive to natural changes and appropriate levels of volatility, which allow statistically determine abnormalities).

To ensure the sustainable management of environmental safety in operating areas and SCA of BGUs areas, structural and logical model was developed for environmental monitoring under various conditions of use SBGSU to ensure minimal risks and threats of disasters of natural and man-made characters in the region.

Structural and functional model for environmental monitoring system in the operating areas and SCA of BGUs areas shown in Fig. 3.

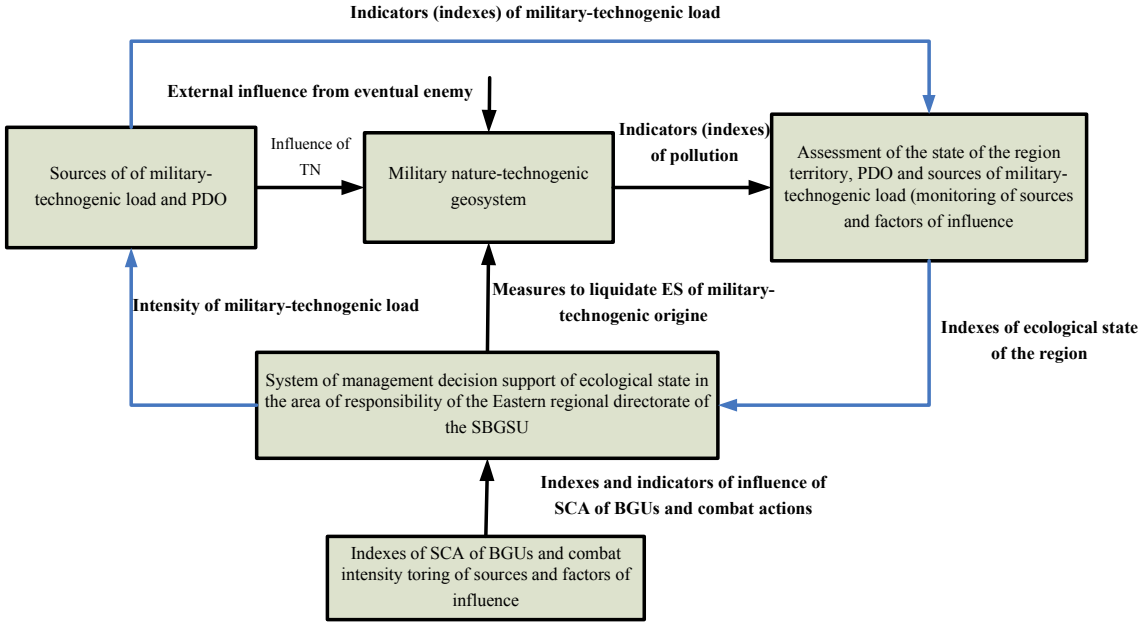

Fig. 3. Structural and functional model for environmental monitoring system in the operating areas and SCA of BGUs

Conclusions. Structural and functional model of environmental monitoring system while conducting SCA of BGUs is a set of specific methods, forms, techniques, tools and instruments regulating environmental safety through improvements which substantially improve the system that will ensure environmental safety for BGUs of SBGSU at Eastern Regional Office area.

Directions of the further investigations: For further development of this system in the article it is proposed to apply certain principles that set the stage for the development of effective environmental safety management procedures for SBGSU in emergency situations conditions of natural, technological and military-technological origin.

To assess the effectiveness of environmental monitoring mechanisms and state regulation of environmental safety at the Eastern regional directorate it is proposed to apply the methods of analysis and analytical hierarchy networks.

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The article came to the release 13.06.2017

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Підходи до побудови концепції екологічного моніторингу операційних зон регіонального збройного конфлікту при ведені службово-бойової діяльності прикордонних підрозділів на ділянці регіонального управління

Резюме. В статті наведено основні підходи для побудови концепції екологічного моніторингу при ведені службово-бойової діяльності прикордонних підрозділів на ділянці регіонального управління з точки зору формування його функціональної схеми та складових для оцінки змін стану прикордонних природно-техногенних геосистем.

Ключові слова: екологічний моніторинг, концепція, природно-техногенна геосистема, воєнно-техногенне навантаження, збройний конфлікт, навколишнє середовище, прикордонні райони, службово-бойова діяльність, прикордонний підрозділ, індикатори, регіональне управління.

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Подходы к созданию концепции экологического мониторинга операционных зон регионального вооруженного конфликта при ведении служебно-боевой деятельности пограничных подразделений на участке регионального управления

Резюме. В статьи приведены основные подходы для построения концепции экологического мониторинга при ведении служебно-боевой деятельности пограничных подразделов на участке регионального управления с точки зрения формирования его функциональной схемы и составных элементов для оценки изменений состояния пограничных природно-техногенных геосистем.

Ключевые слова: экологический мониторинг, концепция, природно-техногенная геосистема, военно- техногенная нагрузка, вооруженный конфликт, окружающая среда, пограничные районы, служебно-боевая деятельность, пограничное подразделение, индикаторы, региональное управление.

UDK 55.244.1:356.255.2

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Improvement of the morally-psychological providing as inalienable constituent of defence of troops (forces) and counteraction to negative informatively-psychological influence

Resume. An information and psychological impact as a specific modern phenomenon and effective means of achieving the objectives at the tactical, operational and strategic levels is analyzed. A system to counteract the negative information impact on personnel and commanding staff of the Armed Forces of Ukraine in the extreme and ordinary operating conditions is examined.

Keywords: defence, informatively-psychological counteraction, informatively-psychological influence.

Formulation of the problem. The urgency of the topic is determined by: the necessity of an integrated and systematic definition of effective mechanisms for the management of information security of the defense sector of Ukraine in the context of conducting an information war against it, especially destructive manipulative external and internal information and psychological influence with the use of information weapons (information terrorism) on servicemen of the Armed Forces of Ukraine and other military formations of the state; an urgent need for an in-depth study of Ukraine's information space and technologies for identifying a suggestive negative informational and psychological impact; political and legal uncertainty of the system of information and psychological security of Ukraine; the need to form perspective directions of the policy of state management of information security and the introduction of advanced world experience in organizing information and psychological counteraction.

Information psychological impact is such an influence on the individual and / or public consciousness (subconsciousness) in information psychological or other ways that causes the transformation of the psyche, change of views, thoughts, relationships, values, motives, personality stereotypes in order to influence on her activities and behavior. Its ultimate goal is to achieve a certain reaction, behavior (action or inaction) of a person who meets the perpers of psychological influence [1-3, 6-10].

Man, his life and health, honor and dignity, integrity and personal safety of a person and a citizen are recognized in Ukraine as the highest social value. The state undertakes to protect and protect the interests of its population, its citizens, both in Ukraine and abroad. These issues are of particular importance during the period of the state of emergency in the country, in particular, in the worsening of social and military situations, the complication of the military-political situation, the hybrid war, etc., since under such conditions the vital functions of the military and the local population are greatly complicated and the effective development of society becomes impossible. the state as a whole.

Analysis of recent research and publications. Various aspects of the implementation of counter negative information and psychological impact (IPsI) for military personnel (troops) during service and combat missions military force structures considered in scientific studies and research V. Bogush, G. Grachev, I. . Zamaruyevoyi, OG Karajan, VG Krys'ko, A. Litvinenko, AG Luk'yantsya, OA Mateyuka, I. K. Miller, M. Popov, G. G . Pocheptsov, SP Rastorguev, A. Rosya, VB Tolubka, A. Cherniak, AK Yudin and other scientists. An analysis of these and other works shows that:

the current understanding of countering the negative IPsI is ambiguous interpretations in different scientific sources, is not conducive to determine its nature and content, and as a result - reduced its effectiveness;

the results of current research does not provide a sufficient basis for operational and effective response to negative IPsI military personnel during the performance of their tasks in the face of the deteriorating socio-political situation due to the lack of early detection and

rapid assessment of the negative IPsI on personnel of troops (forces) and methods implementation of counteraction to such influence;

a very many of the theoretical developments regarding the counteraction to negative IPsI have not yet been brought to the level of practical recommendations (documents) and application in the practice of troops.

One of the obligatory directions of counteraction to negative IPsI, in particular, on the personnel of troops (forces) of the Armed Forces of Ukraine, is measures to improve the existing system of moral and psychological support (MPS) to minimize the consequences of such influence[4, 5, 11].

The *MPS* training and application of the training and use of forces is defined as a set of agreed upon goals, tasks, directions, locations and times of actions undertaken by commanders (heads), headquarters, officers of the armed forces for the purpose of formation, maintenance and renewal of personnel of the military-combat and psychological qualities, the moral and psychological state of the personnel of the forces (forces) at the level necessary for the successful accomplishment of assignments [6, 7].

The MPS personnel is defined as a set of social, service, moral, ethical, and psychological factors that manifest themselves in the specific conditions of the life of military teams (units, teams, calculations, posts, crews, etc.) and individual servicemen and characterize readiness (moral qualities, physical capabilities and psychological properties) of the servicemen to perform the assigned functional (official) duties on the post, to solve the tasks in the concrete combat situation and in the visa and at defined time [1, 7, 12].

The MPS is one of the main conditions for the performance of official tasks, an important component of ensuring high combat readiness and combat capability of the Armed Forces of Ukraine, units, military units, units and individual servicemen.

The purpose of the article is to justify ways and means of improving the existing system of moral and psychological support for the defense (counteraction) of the personnel of troops (forces) from negative informational and psychological influences.

Presenting main material. The events of recent years in the world and in Ukraine show that one of the important places in the system of counteracting negative IPV and ensuring proper IPU is the defense of troops (forces) from negative IPV, which is a complex of actions conducted in peacetime and wartime by the state and the military command of the country, the command, the headquarters, other military authorities and officers of the military units (units) for the prevention, neutralization (weakening), blocking and elimination of the consequences of negative IPsI on the personnel of the troops (forces).

Under the negative IPsI understood propaganda and psychological actions of the enemy, aimed at [12-14]:

reduction of combat readiness and combat capability of troops (forces), reduction of official activity, desertion among military personnel, simulation of diseases, evasion of execution of orders of commanders and bosses, distortion of the picture of combat operations and combat situation;

reducing the morale, creating a situation of uncertainty and anxiety about the personnel in relation to their future, the future Armed Forces of Ukraine and other military formations, and in wartime - the weakening of freedom to military resistance;

leveling the feeling of pride for their state, for their Armed Forces and other military formations of Ukraine, the neutralization of patriotism of servicemen to fulfill their constitutional duty to protect the Motherland;

division of military collectives, contradictions between different categories of military personnel;

the mistaken perception of military personnel of existing threats to national security, real plans and

The criteria for assessing the MPS for the troops (forces) are:

readiness of the personnel to perform the tasks, level of training and physical training;

loyalty to military personnel, military oath, level of legal consciousness of servicemen;

moral values, level of military discipline and law and order;

dominant attitudes, opinions of servicemen regarding the external and internal life of the country and the Armed Forces;

satisfaction of servicemen by the nature of military activities and service in the Armed Forces;

the status of servicemen from the local population.

Particular attention should be paid to the following types of IPsI: psychogenic, neurolinguistic, psycho-corrective, psychotropic and psychotropic [3, 10, 14]. Understanding this allows adequately to develop adequate countermeasures and protection measures.

According to military researchers, the main directions of the implementation of special protection measures are [2, 7, 15-17]:

explanations to servicemen, civilian personnel of techniques and techniques of conducting propaganda, carrying out psychological actions and actions in order to form the settings for their critical perception;

explanation to the military and civilian personnel of the essence, goals, tasks, themes, forms, methods and technical means of conducting psychological operations, their orientation, true intentions and interests;

acquaintance of servicemen with facts testifying to the advanced techniques and methods used by the enemy in order to influence the individual and group consciousness of the servicemen;

forecasting of the subject and symbolism of psychological operations, possible IPsV in order to prevent the impact, reduce its effectiveness and neutralize;

control of collective and public opinion of servicemen and civilian personnel in connection with negative IPsI;

analysis of the moral and psychological situation (socio-political, informational, national-ethnic, criminal, etc.) in the area of the deployment of military units, units and tasks;

assessment of the degree of vulnerability of military personnel from negative advocacy and psychological influences (actions) of the enemy;

control of the prevention of distribution among the military personnel of the printed production of demoralizing direction;

termination of demoralizing rumors, phobias;

prevention and cessation of panic attitudes of servicemen.

The defense of the Armed Forces (forces) of Ukraine from the negative IPV should be carried out for the purpose (Fig. 1) :

reducing the danger of negative IPsI to the command, officials of the authorities and personnel;

ensuring efficient management of troops (forces) and creating favorable conditions for their operational applicationstrengthening of the MPS of the troops (forces);

timely prevention of the development of unwanted ideology in military collectives and its influence on command and personnel of the unit (unit).

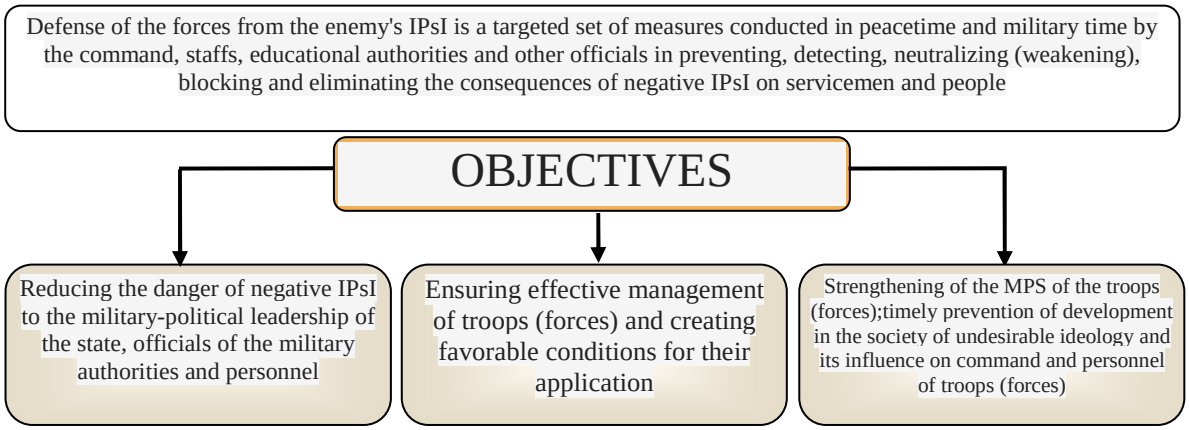

Fig. 1. Objectives for the protection of troops from the IPsI

Proceeding from this, the main tasks of protecting troops (forces) from negative IPsv can be attributed [14, 16]:

explanations of the decisions of the military-political leadership of the country, tasks facing the troops (forces), before each serviceman;

continuous monitoring of the information space in order to identify actual and potential information threats and conduct preventive information activities;

analysis and forecasting of the military-political, socio-political and informational environment; collecting and summarizing data on the sources and contents (content) of negative IPsI on the personnel of troops (forces) with the development of concrete measures for its elimination (liquidation of consequences);

operational neutralization of negative IPsI and its sources in order to prevent the demoralization, disinformation, moral and psychological suppression of troops (forces);

change in its favor the ratio of moral and psychological stability of the opposing sides, support it at the level necessary for the solution of the tasks set during the preparation and conduct of hostilities;

carrying out preventive information-psychological actions aimed at their troops (forces) and local population;

organization and early conduct of preventive measures to prevent the spread of false rumors

among personnel, preventing the emergence of massive negative psychic reactions; termination of rumors, alarming statements and unlawful actions aimed at reducing the MPS troops.

In its structure, the defense of the troops (forces) from the enemy's IPsI involves the following steps: forecasting; prevention (prevention and prevention); disruption (neutralization) and elimination of the consequences of the implementation of a negative informational and psychological impact (Fig. 2, Fig. 3).

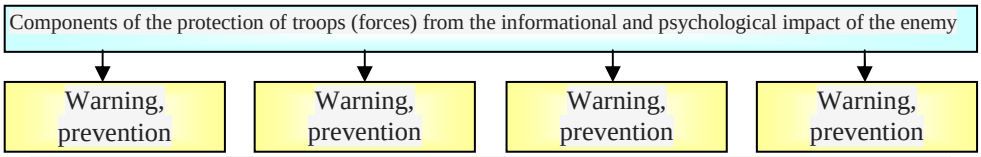

Fig. 2. Structure (components) of the defense of troops from negative IPsI

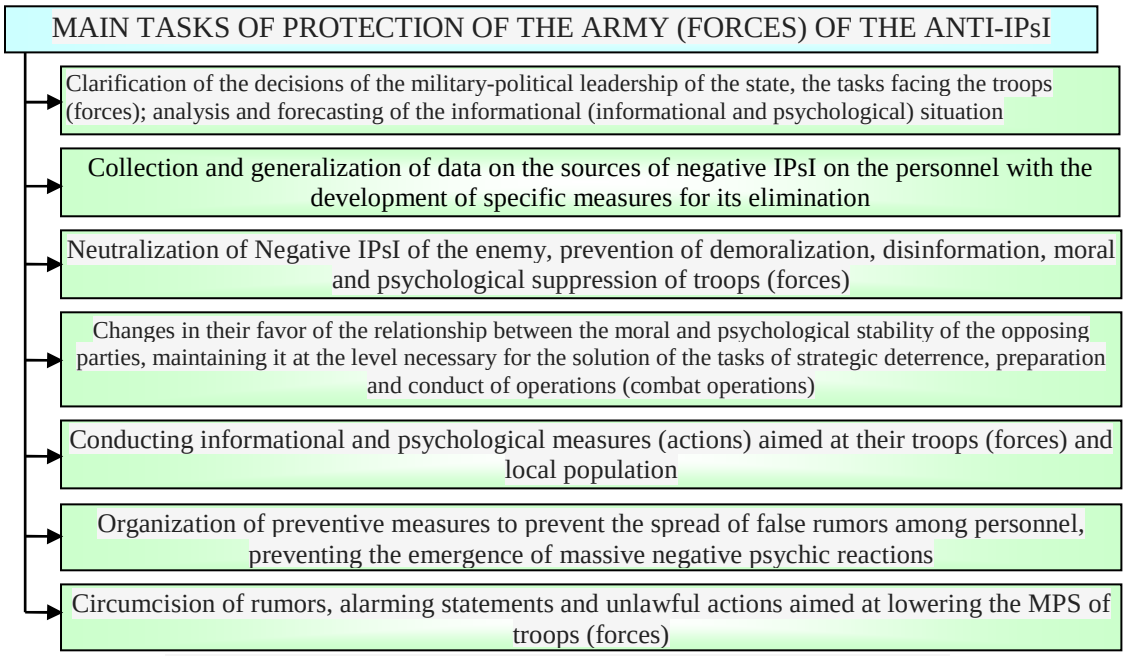

Fig. 3. The main tasks of the protection of troops from the IPsI

Forecasting is aimed at solving a number of such tasks:

mastering the knowledge about the own forces of information-psychological counteraction, which may be involved in carrying out the necessary measures;

to assess the informational and moral-psychological situation in the areas of dislocation and conduct of military operations of forces (forces);

to identify the forces, means, frontiers and areas of concentration of the main efforts of the enemy's information (psychological) operations, their capabilities, the direction of subversive propaganda, objects and possible channels of potential influence;

to predict the possible level of psychogenic loss of personnel from the advocacy and psychological impact of the enemy.

Forecasting is also foreseen for the main topics and symbols of the IPsI. The basis of such a forecast is a deep knowledge of the actual state of affairs in the subdivisions and the current level of personnel of the Ministry of Internal Affairs. It is also possible to predict in advance that the enemy will not miss the possibility of ideological and psychological influence, taking into account the disadvantages in their logistical support, the presence of inexperienced leaders, adverse events and processes in the country, low level of training personnel, miscalculations in informing the personnel, the facts of violation of disciplineand legality, national and other contradictions.

Prevention of negative IPsI implies a series of measures aimed at reducing the susceptibility and propensity of personnel to this effect:

a clear explanation of the personnel of the actual goals, methods, possible consequences and psychological mechanisms of deformation of the soldier's consciousness under the influence of enemy propaganda. Practice shows that if in an extreme situation suddenly an event occurs in relation to which a person has no experience, the reaction and his behavior become unpredictable.

obligatory warning of servicemen on the principles of subversive propaganda. Experience shows that the opponent seeks to first report certain events in order to achieve the psychological effect of "primacy", that is, to strengthen the consolidation of the first information about what has happened. Traditionally, IPsI specialists in an information message mix truthful information with disinformation, increase the credibility of their shares by working with familiar names, cities, streets, dates, facts, by attracting the opinions of famous people (politicians, athletes, artists and culture). An effective method is to attribute responsibility for failures, miscalculations, confusion to specific people (commanders, authorities, statesmen, politicians, deputies, etc.) in order to discredit them;

careful selection of people for work on communication and management. Among them there should be people mentally unbalanced, unsaid, with demonstrative accentuation of nature, timid ones. These people should realize that their reactions, mood and statements can be interpreted as a direct consequence of their possession of certain information.

The opposing party can specially or unknowingly "play" separate media. Therefore, the relevant managers, when communicating with media representatives, should take into account this and organize a controlled procedure for providing them with information, contacts with servicemen, distribution among the staff of printed publications, etc.

In order to ensure the moral and psychological stability of servicemen to the negative IPsI, they need to master certain knowledge, skills and abilities, which include [12, 14, 16]:

knowledge of methods and methods of counteracting negative IPsI and their adequate choice;

ability to detect, detect signs of negative IPsI;

skills of mobilizing personal resources to counteract negative IPsI;

skills of direct counteraction to IPsI (the choice and use of psychology of counteraction in interpersonal and mass communication);

skills of self-recognition of reflection and self-regulation;

skills of collective opposition to rumors and thoughts that destabilize and demoralize the personnel of the moral and psychological state (MPS).

Prevention of the enemy's IPV provides:

timely identification of the beginning of the IPsI, aimed at undermining the moral and psychological stability of the personnel;

continuous, objective, psychologically expedient combat and political informing of the personnel and explaining to it the real goals, tasks, subjects, methods, technical means and possible consequences of the enemy's IPsI;

reliable blocking of the enemy's IPsI channels for the military and local population;

defining and organizing the work of units (military personnel) of the relevant structures for the collection and destruction of negative opponent IPsI materials;

identification of mentally and psychologically unstable military personnel and carrying out of their individual psychoprevention;

organization in units (parts) of the system of mutual support and psychological help on the basis of introduction of methods of interference;

acquaintance of servicemen with sophisticated techniques and methods of enemy IPV, used for the purpose of psychological suppression of individual and group consciousness of troops (forces);

reconnaissance, suppression and destruction of forces and means of information psychological (psychological) operations of the enemy; assessment of the degree of vulnerability of their forces (forces) from enemy IPsI, forecasting of consequences and planning of measures for operational counteraction;

organization of preventive measures to prevent the negative consequences of IPsI on servicemen (reduction of psychological stability, level of combat readiness, attempts to be taken into captivity, etc.);

increasing the resources of the IPSV to its troops (forces) and the local population and the world community, etc.

The disruption (neutralization) of the IPsI on the personnel of the troops (forces) is achieved:

timely intelligence and destruction (neutralization) of forces and means of information-psychological operations (IPsO) of the enemy;

operational collection, analysis and destruction of advocacy materials of the enemy;

a strong cease-fire of panic, rumors, the isolation of the servicemen (units) subjected to demoralization;

continuous tracking and increasing the personnel of the MPS;

continuous informing of the military about the changes in the situation, the use of new weapons and means of IPV by the enemy;

the implementation of information interaction (bodies of psychological struggle, intelligence, electronic warfare, communication, moral and psychological support, etc.).

The disruption of the IPsI involves the rapid detection of the means of influence, their immediate suppression or neutralization. Detected subversive actions are subject to an immediate and skilled analysis, identification of their goals, possible dynamics, measures of effectiveness. Each of these shares should not be left without an appropriate counter-propaganda response.

The liquidation of the consequences of the IPsI implies:

Detection of the servicemen (subunits) subjected to demoralization, diagnostics of their IPU and provision of the necessary assistance;

analysis and evaluation of the results of IPsI, causes of effectiveness, weaknesses in the system of information and psychological protection of personnel;

Identification of the causes of disorganization phenomena among personnel and their elimination;

restoration of the organization and combat ability of disorganized units, provision of psychological help to those who need it;

taking appropriate measures to optimize the whole system of counteraction to the enemy's IPsI;

the use of appropriate sanctions (bringing to responsibility) to distributors of demoralizing rumors and panicers, defining measures to optimize the entire system of counteraction to the enemy's IPsI.

The main forms of protection of troops (forces) from IPsI are [15-17]:

separate informational-propaganda, informational-psychological and operational-preventive actions;

a complex of measures of informational and advocacy and operational and preventive character;

special information operations to counteract negative IPsI.

At the same time, the most effective way is the form of protection, such as promotional campaigns aimed at:

reducing the risk of disinfecting and psychological impact on command and personnel; ensuring efficient management of troops (forces) and creating favorable conditions for their application;

timely prevention of the development of unwanted ideology in military collectives and its influence on command and personnel of the unit (subdivision);

support for the authority of the use of troops (forces); formation of public opinion on their support and formation of full agreement and mutual understanding between local self-government bodies, local population and forces involved in hostilities;

providing information security protection, including identifying potential threats and vulnerabilities in its own communication system; support for a high level of information security (in the military sphere, etc.) and readiness to perform assigned tasks;

neutralizing negative IPsI in the media and so on.

The effectiveness of the protection of troops (forces) from IPsI is achieved: taking into account the features of the enemy's IPV and the actual MPS of the forces (forces) and the situation;

efficiency, continuity and complexity of measures to counter the enemy's IPU, high level of information-analytical work and decisions adopted on its recommendations;

taking into account the psychological patterns of human perception of information, especially in the zone (area) of tension and non-regular (emergency, military, etc.) situations;

the equipment of troops with modern technical means of counteraction to IPsI and the training of modern methods of providing information security personnel, counteracting the manifestations of information terrorism (information weapons).

The basis for the creation of a system for counteracting and protecting troops (forces) from negative IPsI should be the spiritual and ethical values of Ukrainian society. Such concepts as Patriotism, Homeland, Duty, Honor should not be questioned in favor of the political situation.

An important component of the system of counteraction and protection of forces (forces) from IPV is the historical consciousness of servicemen. It is much easier to manipulate the consciousness of those people who do not know the history of their people, their historical roots. That is why not only the personal future must worry every serviceman, but also the future of his country.

The mandatory link of counteraction and protection of troops (forces) from IPV should be the neutralization of actions aimed at lowering the prestige and authority of military service in the Armed Forces of Ukraine.

The idea of state patriotism, high historical identity, pride in its military profession and membership in the armed forces are prerequisites

for the formation of resilience to psychological operations and they should become the basis of the whole system of counteraction to the IPsI.

If servicemen experience situations involving extreme situations or excitements in general, it is advisable to use the magic formula of Willis H. Carrieer:

Ask yourself: "What is the worst thing that can happen?"

Get ready to accept this if necessary.

Then think calmly how to change the situation.

Generally accepted: morality and compassion, the ability to see beauty has always been considered a reliable way to increase psychological stability, ability and ability to save oneself and provide help to comrades.

Further research should be devoted to the analysis and definition of the content of specific measures to ensure information and psychological security of the personnel of the troops (forces), in particular the use of the system of strategic communications as a means of countering the negative informational and psychological influences; the development of stratagem and critical thinking in military personnel regarding effective counteraction to informational and psychological influences; definition of criteria and indicators (indicators) of the state of information and psychological safety of the personnel of the troops (forces).

Conclusions

1. Organized IPV on people is a specific phenomenon of the present, an important and effective means of achieving different goals at tactical, operational and strategic levels in the context of conducting information warfare as the basis of a hybrid war. Negative IPsI on military personnel is increasingly being used by various destabilizing forces as information weapons, which reduces the readiness and ability of the personnel to perform qualitative and efficient service and combat tasks assigned to them.Therefore, effective work of personnel, bodies of military management in modern conditions is impossible without the readiness of military personnel to information and psychological counteraction.

2. The psychological conditions of effective counteraction to negative IPsI on the personnel are the formation of positive motivation for them in the Armed Forces of Ukraine, personal and professional military improvement and development of skills for identifying, choosing and implementing techniques and strategies for individual and group counteraction to negative IPV, creation in a military team the conditions of frankness and sincerity in discussing the vital problems of the unit's life, socio-political and informational environment; the development of collective skills to counter rumors and delusions that destabilize and demoralize personnel.

The implementation of these conditions will increase the effectiveness of the system of counteracting the negative informational and psychological impact on the personnel and leadership of the Armed Forces of Ukraine and other military formations in both extreme and usual conditions of military activity.

3. Consequently, during the conduct of hostilities it must be taken into account that:

modern information and other operational support includes a number of activities that must be performed in full to achieve (secure) the maximum safety of military personnel;

the minimization of the consequences of the enemy's information operations depends on the correct decisions of the commanders and other units of the military administration, the concerted actions of the military units, units, units, groups of troops (forces), units of other military formations and civilian population;

the skills of counteraction and protection against the negative enemy IPsI should be well-received in advance by each serviceman.

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The article came to the release 23.06.2017

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Удосконалення морально-психологічного забезпечення як невід'ємна складова захисту військ (сил) та протидії негативному інформаційно-психологічному впливу

Резюме. В статті розглянуто інформаційно-психологічний вплив, як специфічне явище сучасності та ефективний засіб досягнення цілей на тактичному, оперативному і стратегічному рівнях. Розглянуто систему протидії негативному інформаційному впливу на особовий та керівний склад ЗС України в екстремальних і звичайних умовах діяльності.

Ключові слова: захист, інформаційно-психологічна протидія, інформаційно-психологічний вплив.

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Усовершенствование морально-психологического обеспечения как неотъемлемая составляющая защиты войск (сил) и противодействия негативному информационно-психологическому влиянию

Резюме. В статье рассмотрено информационно-психологическое воздействие, как специфическое явление современности и эффективный способ достижения целей на тактическом, оперативном и стратегическом уровнях. Рассмотрена система противодействия негативному информационному воздействию на личный и руководящий состав ВС Украины в экстремальных и обычных условиях деятельности.

Ключевые слова: защита, информационно-психологическое противодействие, информационно-психологическое воздействие.

UDK 355.40: 356.35

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Methodological approach to the creation of the subsystem of eliciting and appraisal of negative information influence on the troops personnel (of military forces) as a component system of counteracting to such influence

Resume. The methodological approach is offered for the creation of the subsystem of eliciting and appraisal of negative information-psychological influence on the personnel of troops (military forces) as a component system of the counteraction to such influence. The relevant method was developed and verified for the effective functioning of the subsystem, which allows estimating quantitatively the level of negative influence with the purpose of proactive adequate reacting to it.

Keywords: negative information-psychological influence; system of counteraction; eliciting and appraisal; method, verification; subsystem.

Formulation of the problem. Counteraction to negative informational influence is an integral part of providing information security of Ukraine, including in the military sphere. Particularly important for Ukraine, this circumstance was acquired on the eve of and during the aggression of the Russian Federation, when the consequences of negative external information and psychological influence, in particular, on the personnel of the Armed Forces of Ukraine (hereinafter - the Armed Forces of Ukraine), were acutely and tangibly manifested. Therefore, the counteraction to such an impact, first of all in the interests of ensuring a high level of moral and psychological state of the Armed Forces of Ukraine, is an urgent problem task of a high priority, which requires an urgent solution by means of organizing an effective counteraction system.

Analysis of recent research and publications. A significant number of published works on the subject of counteraction to negative informational and psychological influence, in particular, on the personnel of troops (military forces), is integrated into the textbook and concerns moral and psychological support in of the Armed Forces of Ukraine [1]. The analysis shows that today the theory of counteraction to such influence is limited at the level of conceptual and declaratory provisions, and therefore is imperfect for the practice. It lacks clear formal methods and techniques for quantitative assessments of certain aspects of this area, including the identification and evaluation of the level of negative informational and psychological impact on the personnel of the Armed Forces of Ukraine. For this reason, its quantitative assessment is not made, and the assessment of the moral and psychological state of the Armed Forces of Ukraine, which is a result, in particular, of such influence, is made on qualitative indicators on the basis of monitoring results in military formations and units and in accordance with the current instructions [2], i.e. post factum to the effects of different influences. The mentioned above does not allow conducting proactive measures to stabilize the moral and psychological state of the military forces (troops).

The purpose of the article is to consider a methodological approach to the creation of a subsystem of detection and assessment of the level of negative informational and psychological impact on the personnel of the Armed Forces of Ukraine on the basis of quantitative indicators as the conditions necessary for the creation of a respective system for counteracting such an impact with the properties of the implementation of actions of a preventive character.

Presentation of the main material. The scientific provisions of the methodological approach to the creation of a subsystem of detection and evaluation of the level of negative informational and psychological impact on the personnel of the Armed Forces of Ukraine on the basis of quantitative indicators were developed during the implementation of the planned research conducted in 2013-2017. The main essence of such an approach is as follows.

Effective counteraction to negative informational and psychological influence, in particular, on the personnel of troops (military forces), can only be carried out in the context of determining (selecting) an indicator of

effectiveness, which should be further managed through the appropriate influence. Such an obvious indicator of the counteraction effectiveness is the level of moral and psychological state of the Armed Forces of Ukraine. In this case we need to create a system of social management, where the object of management is the level of moral and psychological state of the Armed Forces of Ukraine.

It is important to ensure the stability of this control. According to the laws of cybernetics, the stability of management is ensured by the presence of so-called "direct" and "reverse" communications. Therefore, taking this into account, a general cybernetic scheme (model) of such social management is proposed, which looks like it is presented in Fig. 1

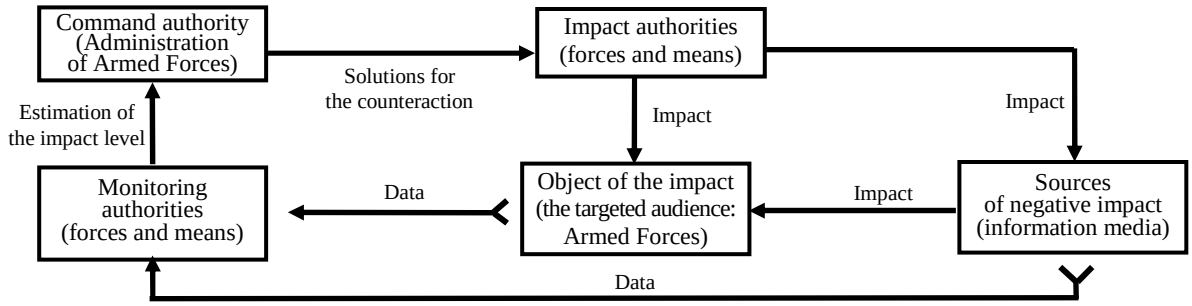

Fig.1. The cybernetic model of realization of counteraction to the negative informational and psychological impact on the personnel of the military troops (forces)

The given model can most fully provide an active counteraction to the negative informational and psychological impact on the personnel of troops (military forces) with the following obligatory phases:

detection of the impact;

assessment of the impact level;

formation of conclusions on the estimation of the level of influence and the decision on the necessity of counteraction;

planning of counteraction measures, approval of a plan of counteraction measures;

realization of measures of counteraction according to the plan;

control of the effectiveness of the implemented measures of counteraction and their correction.

In practice, this model for the Ukrainian Armed Forces is partially realized, but only within the contour bounded by the broken lines. As noted, this is not enough for carrying out preventive stabilization measures, since the assessment of the moral and psychological state of the Armed Forces of Ukraine, which is an indicator of the cumulative information influence on target audiences, has already been carried out, consequently, without analyzing the dynamics of such influence, especially the negative one, the source of which is the information space. This drawback of the current system must be compensated through the purposeful monitoring of events in the information space of Ukraine, all of which may lead to the humanitarian harm.

In order to solve the problem of creating conditions for proactive stabilization measures and implementation of the model (Figure 1) in full, the following methodological approach, which is based on the principle of quantitative assessment of the level of negative information and psychological impact, for which it is needed:

1. To introduce the practice of responding on the basis of quantitative criteria for assessing the level of such influence in the system of counteraction to the negative informational and psychological impact on the personnel of the Armed Forces of Ukraine.

2. To identify and assess the level of negative information-psychological impact on the personnel of troops (military forces) in the overall system of countering the creation of a three-level subsystem of monitoring of information processes in the information space of the state, which is depicted in Fig. 2.

In this subsystem of monitoring:

the first level – operational (indication of information processes by the identified sources of possible influence);

the second level - generalization of the data of the first level on the basis of classification, weight processing of the received information.

The third level is the detection of the negative information and psychological impact and the assessment of its level by the information on the second level.

3. To introduce in the monitoring subsystem the method of detection and evaluation in quantitative measure of the level of negative informational and psychological impact on the

personnel of troops (forces) with quantization by the degree of its significance for the moral and psychological state of the Armed Forces of Ukraine.

4. Each quantum level of the information-psychological influence on the personnel of troops (military forces) must correspond to a certain set of compensatory measures to counteract the cybernetic model (in Fig.1), in order to stabilize the moral and psychological state of a certain target audience, in general, the Armed Forces of Ukraine.

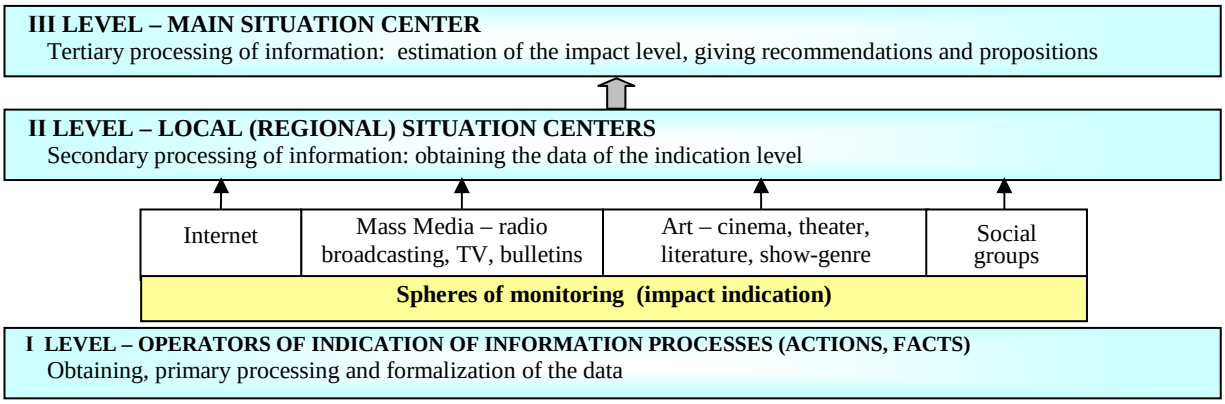

Fig. 2. Three-tier sub-system of monitoring of information processes in the information space of the state

One of the approaches to assessing the negative impact and developing the appropriate assessment methodology may be the one in which the characteristic (indicator) of the overall destructive information process in relation to a target audience (the personnel of the Armed Forces of Ukraine) is *the level of its intensity*, that is, the measure of the process per unit of time .

This simultaneously appears to be an integral indicator of both the assessment of the level of negative influence and the indicator of the detection of such an influence by the magnitude (value) of its level.

It can be stated that the value of the intensity indicator χ for a certain period of time ΔT can take certain values - from the minimum and higher. Then, the dynamics of the escalation of the intensity of the general destructive information process in the state information space in time ΔT in relation to the personnel of forces (forces) can be conditionally represented by the step function of the levels, which should be considered as partial indicators of the influence, as shown in Fig. 3. At the same time, a transition to each level must receive a certain criterion in accordance with the scale of scores χ: χ_1, …, χ_5.

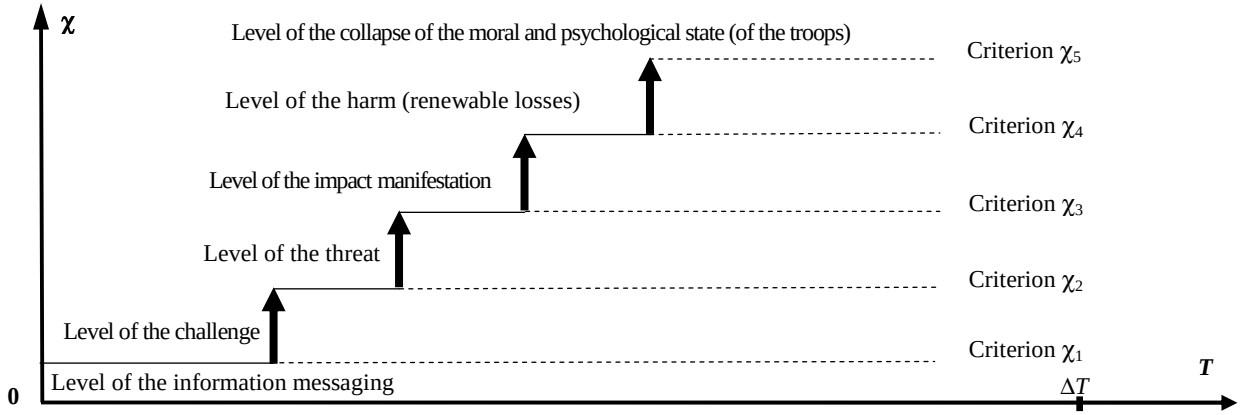

Fig.3. Dynamics of escalation of intensity of the general destructive information process

The proposed six conditional qualitative states (partial indicators) of the general destructive information process in the information space of the state and the relevant criteria that can be applied to determine its intensity as a measure of influence, in particular, on the personnel of troops (military forces), have the following definitions:

the level of the information background is the practical absence during a fixed time ΔT of observation of the information processes (actions, facts) in the information space of the state that may have a negative (subversive, destructive) character in relation to the personnel of the troops;

the level of the challenge - quantity and content of the information processes (actions, facts) during time ΔT, detected in the information space of the state

that potentially (under certain conditions) can create information and psychological threat to personnel;

the level of information and psychological threat - the number of targeted destructive information processes (actions, facts) in time ΔT, found in the information space of the state, *resulting in a decrease in the level of the moral and psychological state* of the troops;

the level of manifestation of information and psychological impact - the number of targeted destructive information processes (actions, facts) during time ΔT, found in the information space of the state, resulting in *signs of lowering the level of moral and psychological state* of troops personnel;

the level of damage (recoverable losses) - the number of targeted destructive information processes (actions, facts) during time ΔT, detected in the information space of the state, resulting in *a decrease in the level of moral and psychological state of the personnel*, which can be compensated through the existing opportunities during the time sufficient for an effective execution by the troops (military forces) of the assigned tasks;

the level of the collapse of the moral and psychological state of the troops - the number of targeted destructive information processes (actions, facts) during time ΔT, found in the information space of the state, resulting in *a significant decrease in the level of moral and psychological state* of the personnel, which cannot be compensated through the existing opportunities during the time sufficient for the purposeful execution of assigned tasks by the troops.

22 classes and 17 subclasses of information processes (actions, facts) that may negatively affect the consciousness of military personnel and, accordingly, the moral and psychological state of the personnel of the Armed Forces of Ukraine, are also established by means of the expert polls of the professional circles of Ukraine and statistical processing of the data, the average value of "weight" of each class (subclass) on a scale from 0 to 100 is established as well.

On the basis of the received statistics of all information processes (actions, facts) during the time ΔT = 1 year, my means of the expert method, the criteria for finding the level of negative informational and psychological impact on the scale of "weighted" intensity in the calculation of their total action was obtained:

criterion $\chi_1 = 200 \times 10^3$ points;
criterion $\chi_2 = 350 \times 10^3$ points;
criterion $\chi_3 = 650 \times 10^3$ points;
criterion $\chi_4 = 900 \times 10^3$ points;
criterion $\chi_5 = 1400 \times 10^3$ points.

These criteria became the basis for the implementation of the method of identifying and assessing the informational and psychological impact on the personnel of troops (military forces), which is acting on *the principle of time scaling* (relative to the base period ΔT = 1 year) of the "weighted" amount of points obtained due to the appearance in the information space of the state of a certain number of classified information processes (actions, facts) for a significantly smaller s-th period $\Delta t_s << \Delta T$ = 1 year, for example, during a month or a week. In this case, the following algorithm is used:

$$\chi_s = \chi \frac{\Delta T}{\Delta t_s},$$

here the intensity χ is calculated during the period $\Delta t_s << \Delta T$.

For example, if, during Δt_s=1 week (7 days), the total number of points is 3000, then, applying formula (1), we obtain:

$$\chi_s = 3000 \times 365/7 \approx 156{,}5 \times 10^3 \quad 103 \text{ (points)}.$$

Such number of points indicates that the level of negative information and psychological influence is located within the *information background* and in fact does not affect the reduction of the already achieved moral and psychological state of the personnel (military forces), and therefore efforts for the corresponding counteraction are inappropriate.

If during Δt_s = 1 week the number of points is calculated like 13500, then applying formula (1), we obtain:

$$\chi_s = 13500 \times 365/7 \approx 704 \times 10^3 \text{ (points)}.$$

In this case, the number of points indicates that the level of the negative informational and psychological impact is within the *manifestation of the influence*, in which the previously achieved moral and psychological state of the personnel of the armed forces begins to decrease. It should be noted that only in this range of values of the χ_s indicator, it is possible to talk about *detecting* a direct negative impact (on the basis of a slight decrease in the moral and psychological state of the troops). It is obvious that in this case, appropriate countermeasures should be applied according to the scheme in Fig. 1.

The latter example is very demonstrative from the point of understanding the fact of detecting a negative informational and psychological impact; this detection is recorded not by individual events in the information space of the state, but by their integral effect on the personnel of the armed forces, that is, when their intensity over a certain relatively short time Δt_s becomes

notable for reducing the moral and psychological state of the troops (military forces).

In order to verify the feasibility and adequacy of the methodology for detecting and assessing the negative informational and psychological impact on the personnel of the troops (military forces) it was verified, and the verification was carried out in two stages:

Stage 1 (statistically-calculated) - in the course of its execution the basic tool was the formula (1), in which ΔT = 1 year (365 days), Δt_s - the period (the number of days) of accumulation of the statistical material (events, facts in the information space of Ukraine, which may negatively affect the personnel of the Armed Forces of Ukraine according to various information sources, mainly printed and electronic media, radio and television programs) - from the position of rationality taken 91 days (quarter of a year) and four "cuts" of the criterial assessment of the level of influence over calendar year (quarterly but) are calculated, during which about 150 thousand posts are processed, 8 - 10% of which actually could adversely affect the troops (military forces);

Stage 2 (qualitative-comparative) - obtained at the first stage, the result of the criterial assessment of the level of negative informational and psychological impact was compared with a qualitative assessment of the real moral and psychological state of the Armed Forces of Ukraine, according to information from the Main Department of Moral and Psychological Support of the Armed Forces of Ukraine, obtained by assessing in accordance with the current instructional documents. As a result of the comparison, a decision was made as for the level of adequacy, and hence, the capacity of the developed methodology.

The result of the verification stage 1 is a summary, separately for each quarter of 2016, of the monitoring data of information events in the information space of Ukraine, which could have a negative impact on the moral and psychological state of the personnel of the Armed Forces of Ukraine, taking into account their weight.

The total amount of points for the I quarter was 188692, for the II quarter it was 223311, for the III quarter - 234481, and for the IV quarter - 238867, which indicates a certain increase in the information pressure on the consciousness of the personnel of the Armed Forces of Ukraine ("25% during the year).

Applying the formula (1) in relation to the points obtained for each quarter separately, we obtain the "weighed" intensity of the general destructive information process for each quarter in revaluation of ΔT = 1 year:

χ_I=188692×365/91≈756×10^3 points;
χ_{II}=223311×365/91≈896×10^3 points;
χ_{III}=234481×365/91≈938×10^3 points;
χ_{IV}=238867×365/91≈955×10^3 points.

After transferring these data to the "weighed" intensity scale, we receive quarterly indicators of the negative informational and psychological impact on the personnel of the Armed Forces of Ukraine, as shown in Fig. 4.

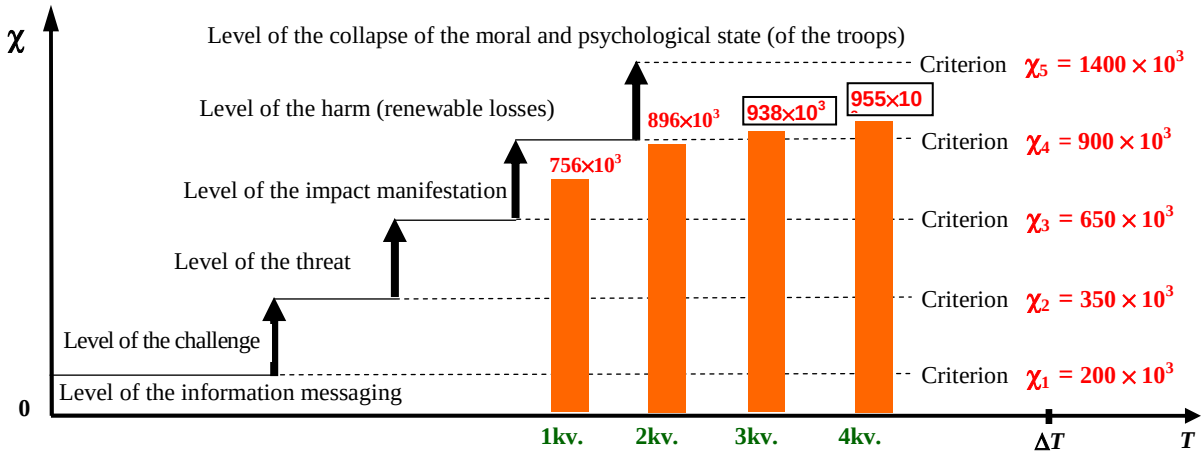

Fig. 4. Indicators of the negative information-psychological impact on the personnel of the Armed Forces of Ukraine during I –IV quarters 2016

Thus, according to the information events in the information space of Ukraine in 2016, there is approximately the same picture, since the estimated situation balances on the verge of the fourth level - the "*manifestation of the negative information and psychological influence*" and the fifth level - "*loss (recoverable losses)*", with a tendency to increase the level. This indication shows, firstly, the fact of actual influence, that is, its identification, and secondly, its quantitative and qualitative dimensions, that is, its level, in particular, in each quarter of 2016.

The analysis of the content of the reports

showed that the dominant negative informational process in the information space of Ukraine for influencing the personnel of the Armed Forces of Ukraine created Russian and individual national media in various technical forms of manifestation according to the classification directions "weakening the readiness of the Armed Forces of Ukraine for the defense of the state" and "worsening the image of the Armed Forces of Ukraine and military service".

During the implementation of verification phase 2, according to an official request, a qualitative assessment of the moral and psychological state of the Armed Forces of Ukraine for 2016 was provided by the Main Directorate of Moral and Psychological Support of the Armed Forces of Ukraine [3, 4]. The essence of this assessment is as follows.

During 2016 the moral and psychological state of the personnel of the military units and military command and control units of the Armed Forces of Ukraine is assessed as *satisfactory and such that it ensures the fulfillment of the tasks for the intended purpose*.

At the same time, the following factors had a negative impact on the moral and psychological state of the personnel:

distribution by the Russian Federation via the Internet, by negative mass media of the information about the shelling of the civilian population by units of the Armed Forces of Ukraine;

discrediting the actions of the leadership of the country and the Armed Forces of Ukraine regarding the ability to make the necessary decisions to stabilize the situation;

manipulating information on the timing of mobilization (demobilization);

untimely bringing to the military commanders and heads reliable information about the decisions of the leadership of the country and the Armed Forces of Ukraine on the solution of problematic issues.

As can be seen from the above assessment, which is independent on the results of the study with using the developed methodology, the dominant negative effects on the personnel of the Armed Forces of Ukraine in both cases are close in their contents. This means that both estimates can be compared with each other.

Firstly, the assessment of the moral and psychological state of the Armed Forces of Ukraine from the side of the Main Department of Moral and Psychological Support of the Armed Forces of Ukraine indicates the presence of a negative informational and psychological impact on the servicemen as well as indicators in accordance with the verified method. This is the first sign of the adequacy of the developed methodology.

Secondly, the conclusion of the Main Department of Moral and Psychological Support of the Armed Forces of Ukraine that "the moral and psychological state of the Armed Forces of Ukraine is assessed as *satisfactory* and that ensures the fulfillment of the tasks for the purpose" indicates that the negative informational and psychological influence in the Armed Forces of Ukraine is felt and obviously causes losses to the moral and psychological state of the servicemen. This is objectively demonstrated by a number of negative facts in the armed forces of Ukraine, especially in the area of anti-terrorist operation (ATO) in the east of the state, which, in particular, was pointed out by the Chief Military Prosecutor of Ukraine [5]. It is also clear that such an effect and damage caused by the system of corresponding measures are compensated, as the Ukrainian Armed Forces retain the ability to carry out the task for its intended purpose. This qualitative assessment means that the aggregate negative informational and psychological impact on servicemen has the consequence (in other words, the level) that the moral and psychological state of the Armed Forces of Ukraine is roughly remains *at the level of certain damage (recoverable losses)*, that is on the fifth criterion level which is determined by the developed methodology.

Thirdly, comparing this qualitative assessment with the results of the quantitative and qualitative assessment obtained by the developed method (Figure 4), it is evident that both estimates in the projection of the moral and psychological state of the personnel of the Armed Forces of Ukraine, which in its essence is caused by information the influence on the consciousness of the servicemen (positive and negative), practically coincide with both methodical approaches, and its current real status was determined, in particular, by the intensity of negative informational events in the information space of Ukraine during a year, aimed at the personnel of the Armed Forces of Ukraine. For this reason, it can be argued that the quantitative and qualitative assessment obtained with the help of the developed methodology generally corresponds to the information process, which is the second and most important sign of the adequacy of the methodology.

The above comparison results have previously confirmed the adequacy, and hence the capacity, of the methods for detecting and assessing the level of the negative informational and psychological impact on the personnel of troops (military forces) on the example of the Ukrainian Armed Forces.

Conclusions.

1. An integral part of the system of counteraction to the negative informational and psychological impact on the personnel of troops (military forces), in particular the Armed Forces of Ukraine in general, which should act on a cybernetic principle, should be a subsystem of detection and assessment of the level of such an influence, which will function on the basis of the appropriate methodological base.

2. The main methodological principle of the functioning of the subsystem of detection and evaluation of the level of negative informational and psychological impact on the personnel of troops (military forces) should be the principle of applying a quantitative measure in identifying and assessing the level of such an effect that will ensure the monitoring of its dynamics and the implementation of a proactive strategy in the cybernetic model of counteraction.

3. A promising element for the creation of such a subsystem as part of the overall system of counteraction, in particular in the interests of the Armed Forces of Ukraine, may be the developed method for identifying and assessing the level of negative informational and psychological impact on the personnel of forces (military forces) that has passed the initial phase of verification, during which its adequacy and capacity have been previously confirmed.

4. The main subjects of the implementation of the cybernetic model of the counteraction system and, consequently, the implementation of the developed methodology, in the interests of the Armed Forces of Ukraine, are the profile structural subdivisions of the Ministry of Defense of Ukraine and the Armed Forces of Ukraine: GUR MO of Ukraine (Directorate General of Intelligence of Ukraine), UIT MO of Ukraine (Information Technology Authority of Ukraine), DVON SGP of Ukraine (Department of Military Education and Science, Social and Humanitarian Policy of Ministry of Defense of Ukraine), UKP MO of Ukraine (Communication and Media Authority of Ministry of Defense of Ukraine), OOSH of the Armed Forces of Ukraine (CIP) (United Operational Headquarters Ministry of Defense of Ukraine (Center for Information Counteraction), GOU GSH MO of Ukraine (Operational Directorate-General of Ministry of Defense of Ukraine), GU MPZ MO of Ukraine (Directorate-General of Moral and Psychological Support of Ministry of Defense of Ukraine), SSpO MO of Ukraine (Forces of Special Operations of Ministry of Defense of Ukraine), GUSIZ GSH ZS of Ukraine (Directorate-General of Communication and Information Technology of Ministry of Defense of Ukraine), CU REB GUOZ ZS of Ukraine (Central Office of Radio Electronic Combat of Directorate-General of Operational Support of Ministry of Defense of Ukraine).

5. The previous feature of the assessment of the adequacy and feasibility of the developed methodology for identifying and assessing the level of negative informational and psychological impact on the personnel of troops requires further research in the process of practical implementation in order to clarify the level of its adequacy and capacity.

Further studies should focus on scientific support for the implementation of this methodology on the example of the Ukrainian Armed Forces, as well as on its correction, if necessary, taking into account the results of the experimental exploitation.

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The article came to the release 03.07.2017

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Методологічний підхід до створення підсистеми виявлення та оцінки негативного інформаційно-психологічного впливу на особовий склад військ (сил) як складової системи протидії такому впливу

Резюме. Запропоновано методологічний підхід до створення підсистеми виявлення та оцінки негативного інформаційно-психологічного впливу на особовий склад військ (сил) як складової системи протидії такому впливу, для ефективного функціонування якої була розроблена та верифікована відповідна методика, що дозволяє кількісно оцінювати рівень негативного впливу з метою випереджувального адекватного реагування на нього.

Ключові слова: негативний інформаційно-психологічний вплив; система протидії; виявлення і оцінка; методика, верифікація; підсистема.

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Методологический подход к созданию подсистемы выявления и оценки негативного информационно-психологического влияния на личный состав войск (сил) как составной части системы противодействия такому влиянию

Резюме. Предложен методологический подход к созданию подсистемы выявления и оценки негативного информационно-психологического влияния на личный состав войск (сил) как составной части системы противодействия такому влиянию, для эффективного функционирования которой была разработана и верифицирована соответствующая методика, позволяющая количественно оценивать уровень негативного влияния с целью опережающего адекватного реагирования на него.

Ключевые слова: негативное информационно-психологическое влияние; система противодействия; выявление и оценка; методика, верификация; подсистема

UDK 004.75

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Analysis of the concept of integration platform, its types, properties and methods for integrating information systems.

Resume. The article reveals the concept of integration system and its role for the Armed Forces of Ukraine. Analyzed the types of integration, performance and methods of integrating information systems.

Keywords: information systems integration, integration techniques.

Statement of the problem. Recent political and military developments forced Ukraine to live in the new reality and make lightning-quick decisions in response to the current challenges of the XXI century. In terms of military and political crisis and driving a hybrid war against Ukraine one of the most urgent task was the task of ensuring top officials of command and control different levels of reliable and timely information on logistics, management personnel, financial and economic activities and other defense resources to reduce the time for decision making and timely response to any external or internal threats and changes in the situation.

For a long time in the Armed Forces of Ukraine for information provision of various processes of defence resources management developed separate automated, information-analytical and information systems (hereinafter – IS), which are not interconnected. Territorially distributed information infrastructure of the defence department of the country today is characterized by the isolation of its components and the isolation of existing IS.

The fragmentation of IS inevitably raises the problem of interaction between these systems in order to obtain the information necessary for decision-making. This problem is also due to the large variety of existing IS that use different information technologies and standards, formats and interfaces for data exchange. In general, this leads to duplication, unreliable and untimely data acquisition, delay decisions, breach of interaction between the military control that prevents process control and management of defence resources..

The extent of the problem. One of the most promising approaches to ensuring the interoperability of distributed IS for obtaining complete and reliable information is the use of integration technologies.

Integration technology can combine separate functionally-oriented IS, unrelated to the technological level into a single information infrastructure and saves investments and reducing the cost of implementing new systems and their integration into existing infrastructure. The benefits of integration are reducing the cost of maintenance of IS and simplification of the decision-making process.

The most effective solution to this problem is the use of the so-called integration environment in the form of some integration platform.

The purpose of this paper is defined the concept and features of the architecture of the integration platform on the basis of analysis of the leading approaches.

Presentation of the basic material. Integration platform – software and hardware infrastructure that allows you to organize data exchange between distributed information systems, to support, monitor and manage component business processes. This is an innovative approach to integration issues, based on the automation of cross-cutting business processes, in which various information systems are involved.

Integration of data is the aggregation of data in different sources and providing data to users in a uniform way.

Integration of software systems and products is the exchange of data between systems with possible further processing.

The main purpose of implementing the Integration platform is to create a single information environment in the organization.

The integration platform provides a closer link between existing systems and provides the basis for automating cross-cutting business processes that represent a set of specific tasks and functions that engage various departments and information systems of the defence department.

An integration platform is not a data storage site, it is only a data federalization server that allows you to organize integration processes for information systems while working on an integration platform. The integration platform performs the following functions:

- is the place of storage of the meta-model of substantive data and provides funds for its modification;
- serves as a tool for the creation, configuration, execution and control of all integration processes, where the configuration of the integration process includes the comparison of requests for the state (municipal) service and the necessary information system information based on the meta-model of substantive data;
- determines the mode of data exchange - on request, with the change of data, on schedule, etc.;
- performs verification of the authenticity and consistency of data received from information systems.

Profits of Integration platforms:

- preservation of investments invested in existing systems by integrating them into a single information system by creating a unified transport line of the Armed Forces of Ukraine on the basis of a universal communication system between applications;
- increasing the efficiency of managing business processes as a result of the use of complete non-conflicting information from several integrated systems and the organization of "intelligent" data exchange between different applications in a unified form in real time;
- reducing the influence of the human factor and reducing the number of errors when manually transferring information from the system to the system;
- reducing the time spent on manual information search in different systems;
- reducing the costs of integrating systems that will be created in the future, by simplifying the connection to the integrated application system and providing already accumulated application information;
- fast and understandable response to business requirements by creating flexible custom services;
- reduce the cost of resources for interaction between partners and customers through the introduction of Business-to-Business (B2B) and Business-to-Client (B2C) technology.

There are two main reasons for the need to implement an integration platform for working with different IS.

First is that as the number and functional diversity of the information systems of the Armed Forces of Ukraine increases, processes of ensuring the interaction of the integration platform with a separate information system are technologically and organizationally complicated. There is also an increase in the overhead of providing such interaction, the frequent occurrence of conflicting information, increasing the importance of the speed of data provision, etc.

Second reason is the flexibility and development of the integration platform in the implementation of new information systems.

The main purpose of the integration platform is the harmonization and harmonization of the data of several information systems. Integration platform is equipped with special software adapters for gathering in uniform form information from various information systems related to a certain sphere of activity.

Data integration involves combining data in different sources and providing data to users in a unified form. The role of data integration is increasing when the volume and need for the data sharing are increasing.

Data integration systems can provide data integration at the physical, logical and semantic level. The integration of data at the physical level from the theoretical point of view is the simplest task and reduces to the conversion of data from different sources to the necessary uniform format of their physical representation. Integration of data at the logical level provides access to data contained in various sources in terms of a single global scheme that describes their joint submission taking into account structural and, possibly, behavioural (using object models) data properties. However, the semantic data properties are not taken into account. Support for a single view of data based on their semantic properties in the context of a single domain ontology provides data integration at the semantic level.

When creating an integration system there is a series of tasks, the composition of which depends on the requirements for it and the approach used. These include, in particular:

- development of the architecture of the data integration system;
- creation of integrative data model, which is the basis of a unified user interface in the integration system;
- developing methods for displaying data models and mapping maps into an integrative model for specific models supported by separate data sources;
- integration of metadata used in the data source system;

- overcoming heterogeneity of data sources;
- development of mechanisms for semantic integration of data sources.

Factors affecting integration:

Accelerating processes. Development of the defence department requires more and more often to change the structure of data, business processes, not to mention the design and user interface, which is simply constantly in the change;

Distribution. Tasks can be solved more complex, logical, organizational and geographical dispersion appears;

Heterogeneity. In a large project, it's almost never possible to stick to platforms and tools from the same manufacturer, so you have to take into account and maintain the peculiarities of several platforms;

Heredity. The impossibility of completely abandoning outdated systems, obsolete technologies, and old hardware, which, by the way, sometimes give quite good indicators of reliability and performance, but in no way contribute to integration.

Chaotic. It is not always possible to fully formalize, refine and structure the data, and part of the model remains "weakly related", which is not exposed or poorly subjected to machine processing, analysis, indexation, calculation;

Conditionality. Unfortunately, information systems are limited not only by the technical framework, but also by the habits of people (which are difficult to retrain), the peculiarities of legislation (which is simply not ready for the appearance of such systems), many other factors not dependent on the developers;

Interactivity. The consumer of information constantly raises his expectations about the speed of the reaction system, the speed and speed of delivery of information. Most processes tend to be implemented in real time;

Mobility. The user of the systems began to move faster, and the interaction with him is through the public communication channels in transport, at home and in the street, in public places and everywhere;

Security. While the data was stored on the carrier inside the protected area, especially nobody cared about encryption, but now the network packets fly in the air and this can not be ignored;

High-capacity. Complexity of integration is influenced by: the number of users in the system, the intensity of the flow of data, the amount of data and resource-intensive computing;

Continuity of work cycle. Integration and upgrade of systems almost always should be carried out without stopping their functioning, smoothly, gradually and imperceptibly for the organization and its clients;

Cross-system integration. The docking task is not limited to the organization's scope, it is increasingly necessary to integrate with partners, customers, suppliers, contractors and even government structures.

The meaning of integration is that the data that the user enters into one system is automatically transferred to another. The product in which the user enters the data is called the source. And the recipient of the data, respectively, the receiver.

Quite often data is transferred in both directions, for example, after transformation in the receiver system, the results are sent back to the source. That is why integration is both one-way and two-way.

It should be understood that the integration of information systems integrates precisely the data, and only then the technical implementation of the channel, method, data format. In this regard, the main problem that occurs when integrating is the problem of data quality. There are also organizational difficulties and complexity of technical implementation of processes.

Consequently, *the typical integration problems* associated with the quality of data, include: inconsistency of integrated data, due to the lack of a company's unified master data management system; not giving the importance of profiling, analyzing and clearing data before implementing integration processes.

In summary *list of organizational difficulties*, it should be noted that these include:

- lack of responsible for the integration processes;
- insufficient administrative resource or untimely use of it;
- lack of responsible data quality;
- closure of escort services and developers of information systems;
- not drawing to the analysis of data and further development of business rules of transformation of the subject experts.

Typical *technical problems* of integration include:

- definition of data source / receiver;
- analysis of source data;
- choice of integration tool;
- harmonization of formats,
- method and frequency of data exchange (harmonization of the rules of integration);

- design and development of integration processes; testing; industrial exploitation.

However, almost always the main difficulties arise at the stages of development and testing. But the reasons for their appearance are laid before.

From software development and application development models, there are three levels of software integration: data integration, service integration, and process integration.

Nowadays, two approaches are most often used: point-to-point integration and service bus integration.

There are five levels of integration available:

I. Integration of business processes – based on the definition, implementation and management of information exchange processes between different business systems.

II. Application integration – based on the integration of data or functions of one program with another, which ensures integration, is close to real time.

III. Data integration – based on the identification and cataloguing of data for the purpose of their further use.

IV. Standard-based integration is based on the use of standard data formats (such as CORBA, JavaRMI, XML).

V. Integration of platforms – refers to the processes and tools through which systems can provide a safe and optimal exchange of information.

Integration of business processes is the automation of business processes of an organization based on a unified infrastructure for the creation and management of business processes. This integration allows you to merge into a single business process the actions performed in various application systems. Such integration allows:

- to model business processes;
- to ensure compliance with the rules of business processes;
- provide users with a single interface for tasks within business processes;
- to provide control over the execution and audit of business processes;
- make changes in business processes in accordance with business requirements;
- get data for analyzing business process execution and optimization.

Application integration by data is the organization of interaction of applications with data transmission, between these applications, without modification or with minimal modification of applications itself. At the same time, data can be transmitted both in its original form and with the implementation of the necessary transformations.

The guarantee of quality integration of applications and business processes is the integration of data and database systems.

At this level for the purpose of integration data should be:

1) identified (i.e. their location in the distributed system is indicated);

2) catalogued;

3) a metadata model (i.e. a description of the data) should be constructed.

After the completion of these three stages, data can be shared or used in database systems.

Among these standards are known specifications:

1. COM / DCOM (Component Object Model / Distributed Component Object Model) by Microsoft;
2. Enterprise Java Beans - EJB (main competitor of DCOM) with Java Remote Method Invocation (Java RMI) protocol by Sun Microsystems;
3. Components specification in the CORBA architecture supported by the OMG consortium;
4. Standards for component development of Web applications offered by the World Wide Web Consortium (W3C) – XML (Extensible Markup Language).

As a rule, application integration tools in this tool group are middleware software services. Such services are sometimes referred to as bundled software. They provide a transparent application of applications in heterogeneous network environments, providing them services with application programming interfaces (API) to interact with parts of applications distributed across different nodes of the corporate network.

Middleware services primarily include Remote Procedure Call (RPC), messaging (brokers) and Object Request Brokers (ORB), transaction monitors.

Thanks to the use of the above standards for component development of applications, it is possible to widely implement in practice the benefits of reusing components - increasing productivity in design, ease of use, uniform application structure.

To complete the integration of systems – basic architecture, hardware, and software – it is necessary to integrate heterogeneous network segments.

Platform integration refers to the processes and tools by which these systems can provide a secure and optimal exchange of information. As a

result, data can be freely transferred to different programs.

Within the “client-server” direction there are two main “dialects”: “thin” client and “thick” client.

In systems based on a thin client, a powerful database server is used – a high-performance computer and a library of so-called stored procedures that allow computations that implement the basic logic of data processing directly on the server.

The client application, accordingly, imposes low requirements for the hardware of the workstation.

A thick client in client-server architecture is a computer that provides enhanced functionality regardless of the central server.

As a rule, the server in this case is only a data store, and all work on processing and presentation of these data is transferred to the client machine.

Advantages of a thick client has:

- wide functional unlike thin;
- mode of operation of many users;
- provides the ability to work even when breaks with the server;
- high speed.

Disadvantages is:

- large distribution;
- much in the work of the client depends on which platform he was developed;
- problems with remote access to data;
- quite complicated installation and configuration process;
- the complexity of the renewal and the irrelevance of the data associated with it.

Conclusions. Today's information systems are actively developing, and the volume of processed data grows exponentially, and the form of their presentation is also changing. Combining data from all the information systems used by the defence department will be rather difficult, and the change of such systems can be quite expensive.

Existing techniques for integrating data for a complete solution to this task lack both scalability and functional coverage. These approaches mainly focus on simply moving data from one system to another and applying transformation and aggregation to data elements.

Use of semantic integration methods will help solve this problem. To date, it is actively developing and a promising area of research.

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The article came to the release 06.07.2017

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Аналіз поняття інтеграційної платформи та методів інтеграції даних інформаційних систем управління оборонними ресурсами

Резюме. Стаття розкриває поняття інтеграційної системи та її роль для Збройних Сил України. Проаналізовано види інтеграційних систем, характеристики та методи інтеграції інформаційних систем.
Ключові слова: інформаційні системи, Збройні Сили України, інтеграція, методи інтеграції.

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Анализ понятия интеграционной платформы, ее виды, характеристики и методы интеграции информационных систем.

Резюме. Статья раскрывает понятие интеграционной системы и ее роль для Вооруженных Сил Украины. Проанализированы виды интеграционных систем, характеристики и методы интеграции информационных систем.
Ключевые слова: информационные системы, интеграция, методы интеграции.

UDK 006.022(477)

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Features of the development of technical regulations for the management of the life cycle of information systems in the military department

Resume. The article analyzes the problems concerning the development and implementation of technical regulations for information systems and formulates proposals for their solution.

Keywords: technical regulations (TR), regulations, standard, information technology (IT), EU directive, information system (IS).

Formulation of the problem. During the last decade, a number of legislative acts have been adopted in Ukraine aimed at the creation and further development of information infrastructure in the state [1-4].

Informatization of the Armed Forces of Ukraine is an integral part of state informatization and includes the process of creation, implementation and application of modern methods, systems and means of receiving, processing, storing, transmitting and using information in various fields of activity of the Armed Forces of Ukraine in peacetime and war time. The main tasks of informatization of the Armed Forces of Ukraine are set out in the Order of the Ministry of Defense of Ukraine No. 80 dated February 24, 2010. “On Approval of the Concept of Informatization of the Ministry of Defense of Ukraine” [4] and special programs.

The Order of the Minister of Defense of Ukraine dated August 15, 2016 № 1773 approved the Action Plan for the Implementation of Defense Reform in 2016-2020 (hereinafter - the Plan), the purpose of which is the acquisition and maintenance by the defense forces of the required level of combat readiness, effective response to emerging military threats and military- political challenges to national security. One of the strategic objectives of defense reform is the combined management of defense forces, carried out in accordance with the principles and standards adopted by NATO member states. The corresponding task of the Plan is the development and introduction of a system of standards and guidelines for the management of the life cycle of information infrastructure systems.

The solution of the above task requires review and improvement of the regulatory framework of the technical regulation system, the main priority of which is to ensure the safety of the use of existing (and developing) elements of the information infrastructure.

Technical regulation is the legal regulation of relations in the area of the establishment, application and enforcement of mandatory requirements for products or related processes, systems and services, personnel and bodies, and verification of compliance with conformity assessment and / or market surveillance.

Technical regulation is carried out through the adoption of technical regulations (TR) in order to protect the life or health of citizens, property of individuals or legal entities, state or municipal property; prevention of misleading actions by consumers.

The urgent task is to develop a technical regulation on the management of the life cycle of information systems in the Ministry of Defense of Ukraine, taking into account NATO standards, doctrines and recommendations and the experience of the leading countries of the world.

Analysis of recent research and publications. The issue of developing a technical regulation on life cycle management of information systems (IS) is highlighted in accessible sources. In particular, the following questions are considered [5-7]:

- stages and models of the life cycle of IS;
- basic and auxiliary processes of the life cycle;
- IS Life Cycle Standards.

However, the peculiarity of the development of a technical regulation on the management of the

life cycle of IS in the military department having not been identified.

The purpose of the article is a comparative analysis of world and domestic experience in managing the life cycle of IS.

Presentation of the main material. Life Cycle (LC) of the information system (IS) throughout the existence of the system from the beginning of development to the end of its use [5].

The process of designing an IP describes the process of creating and maintaining systems in the form of JSS IP, presenting it as a sequence of stages (stages) of execution of works.

For each stage, the composition and sequence of the work performed, the results obtained, the methods and means that are necessary for the performance of the work, the role and responsibility of the participants, etc. are determined.

Full JVC IS includes: planning, analysis, design, implementation, implementation and operation.

Many leading corporations (institutions) in the world are engaged in the development of IP, JCS systems, software.

Rational Software has proposed LC IS to be divided into four stages. The boundaries of each stage are determined by the moments of time in which it is necessary to make certain decisions (Table 1).

Table 1

№	STAGE TITLE	STAGE CONTENT
I	**Initial Stage**	The scope of application of IS is determined and the boundary conditions are determined by the identification of all external objects and functional capabilities of IS, to determine the nature of the interaction of IS with external objects at a high level.
II	**Stage clarification**	An analysis of the architecture of the IS is being conducted, the possibilities of the IP are described taking into account the interrelationships between its separate components.
III	**Design stage**	The finished IS is being developed, ready for transfer to the user.
IV	**Stage of transmission of IS into operation**	Developed IS are transmitted to users.

The ISO12207 standard is the basic NATO standard for the processes of the LC IS and the software (SW) is oriented on various types of SW and IS projects, where the SW is part of. The standard defines the strategy and general order in the creation and operation of the SW; it covers the LC of the IS software from the conceptualization of ideas to the completion of the LC. The standard describes the 5 main processes of LC of the IP and software (Table 2).

Table 2

№	TITLE OF THE PROCESS	CONTENT OF THE PROCESS
I	The acquisition process	Identifies the actions of a consumer who purchases an AS (IS), software product, or software service.
II	Delivery process	Determines the actions of the manufacturer (supplier) that supplies the user with an IS, a software product, or a software service.
III	The development process	Determines the actions of the developer, which develops the principle of building an IS and a software product
IV	The process of functioning	Determines the activities of the operator-operator, which provides the maintenance of the system in the process of its operation in the interests of users.
V	The process of escort	Determines the actions of the support personnel, which provide support for the operation of the IS, a software product, which is the management of software product modifications, support for its current status and functional suitability.

The Rational Unified Process (RUP) offers an iterative development model that includes four phases: start, research, design and implementation.

Each phase can be broken into stages (iterations), resulting in a version for internal or external use. The passage through the four main phases is a development cycle, each cycle completed by the generation of the system version. If after that the work on the project does not stop, then the received product continues to develop and again will pass the same phases. The essence of RUP's work is to create and maintain UML-based models (Unified Modeling Language - a language of graphical description when developing software, modeling, system design, and displaying organizational structures).

The Microsoft Solution Framework (MSF) is similar to RUP, and also includes four phases: analysis, design, development, and stabilization.

It is an iterative, involves the use of object-oriented modeling. MSF is more focused on developing business applications than RUP.

Extreme Programming (XP). Extreme programming (the newest among the considered methodologies) was formed in 1996. At the core of the teamwork methodology, effective communication between the customer and the executor throughout the entire IP development project. The development is carried out using successively modified prototypes.

At the NATO level, the main normative documents on JS IS are as follows:

- doctrinal document NATO Policy for Systems Life Cycle Management (C-M- (2005) 0108);
- doctrinal document Allied Joint Doctrine for Communication and Information Systems (AJP-6) (for communication and information systems);
- STANAG 4728 System Life Cycle Management;
- AAP-48 NATO System Life Cycle Processes (LC processes);
- AAP-20 NATO Program Management Framework (NATO Life Cycle Model) (NATO Program Management Structure);
- STANREC 4755 Reference Documents on Life Cycle Costs (reference documents for the cost of JC);
- STANAG 4728 is actually a “cover” for three documents:

ISO/IEC 15288-2008: System and software engineering - System life cycle Processes (system and software engineering);

AAP-20 Edition C Program Management Framework (NATO System Life Cycle Model) (software development system);

AAP-48 Edition B for the NATO System Life Cycle Processes (specifies the effect of the provisions of ISO / IEC 15288-2008 for NATO).

NATO has long been dealing with LC issues for obvious reasons. The Alliance is a collective organization where each participant provides certain resources that need to interact effectively and often in real time. The resources and IS of the Allies are developing independently and in their own programs, which requires a certain level of IS interaction.

In Ukraine, ISO/IEC 12207, 15288, 15289 and some others adopted in the latest/up-to-date versions by the method of verification, without translation. That is, we have and can use the basic standards for ZHC IPs.

When creating the AS (IS), software, when state organizations in Ukraine act as customers, GOST are used: series 19.XXX, 34XXX and РД 50-34.698-90 [8-10].

The basis of the national regulatory framework in the field of documenting software is a set of standards for the Unified Documentation System (UDS). The UDS standards (GOST 19.XXX) are of a recommendatory nature. Including, this applies to all other software standards (GOST 34.XXX, International Standard ISO/IEC, etc.). The main and most part of the ESPD system were developed in the 70’s and 80’s many of the provisions are obsolete, lost their relevance and need to be reviewed. It can be argued that most of the UDS standards are obsolete. Among the main shortcomings of the UDS include:

- orientation to a single, “cascading” model of the LP software;
- lack of clear recommendations for documenting the quality characteristics of software;
- absence of system communication with other existing domestic systems of standards for LC and documentation of products;
- lack of recommendations on the composition, content and formatting of promising documents on software, consistent with the recommendations of international standards.

Highly developed countries, in particular Japan, the United States, Canada, Australia, Germany and other countries are pushing for their technology through standardization and technical regulation, mostly active in the International Organization for Standardization (ISO), the International Electro technical Commission (IEC) and the International Union Telecommunication (ITU).

In our country, the UDS directives are implemented through the TR. They have the status of normative legal acts of executive power, the requirements of which are required by the Law of Ukraine “On Standardization” [11]. This is different from the standards that have been granted the status of regulatory documents. The provisions of the latter are of a recommendatory nature. TR as normative legal acts are interagency and registered by the Ministry of Justice of Ukraine.

The distinguishing signs of the Technical Regulation and the Standard for products are given in Table 3

Table 3

Document	Status	Nature of use	Regulatory aspects		Соціальна роль
			To the document as a whole	To products	
Technical regulations	Legal act	Required	1. List of products and processes. 2. Identification rules. 3. Requirements. 4. Rules and forms of conformity assessment.	Requirements for product and process safety characteristics	Providing security
Standard	Standardization document	Voluntary	Technical requirements	Requirements for all technical (consumer) characteristics	Ensuring Competitiveness

Thus, a two-tier structure of normative and regulatory documents is created: a technical regulation containing mandatory requirements, and standards containing voluntary norms and rules harmonized with the technical regulations.

According to the Law of Ukraine "On ratification of the Partnership and Cooperation Agreement between Ukraine and the European Communities and their member states" [12] it is planned to develop on the basis of the relevant European directives and implement more than 100 TR. As of the beginning of 2017, more than 50 TR were approved. Some of them were adopted by the resolutions of the Cabinet of Ministers of Ukraine, the rest by the orders of State Consumer Standard.

At present, technical regulations are approved by the Ministry of Justice of Ukraine and published in the Official Journal of Ukraine. The State Enterprise "Ukrainian Research and Training Center for Standardization, Certification and Quality" on behalf of the State Consumer Standard of Ukraine publishes the TR. In addition, the Order of the State Committee of Ukraine for Technical Regulation and Technical Policy dated 14.12.2010 № 567 approved a working program for the development of technical regulations for the period up to 2020.

Procedures for the development and adoption of technical regulations are explained by the relevant laws and methodological recommendations, which are given in Table 4

Table 4

№	TITLE OF THE DOCUMENT
1.	The Law of Ukraine "On Standards, Technical Regulations and Conformity Assessment Procedures", as amended on October 16, 2012 № 5463-VI
2.	Law of Ukraine "On Confirmation of Conformity", as amended on October 2, 2012 № 5312-VI
3.	Rules for drafting acts of the Cabinet of Ministers of Ukraine, approved by the Government Decree of September 6, 2005 № 870
4.	Regulations of the Cabinet of Ministers of Ukraine, approved by the Resolution of the Cabinet of Ministers of Ukraine dated July 18, 2007.
5.	Guidance on the implementation of directives based on the "New Approach" and "Global Approach" guidelines (European Communities, 2000)

In accordance with the tables in Table 4 documents, the State Committee of Ukraine on Technical Regulation and Consumer Policy formulates the Guidelines for the elaboration of draft technical regulations adopted by the Cabinet of Ministers of Ukraine (hereinafter referred to as the Recommendations). These Recommendations contain general advice on the structure, content and design of technical regulations, the order of their development and approval, as well as the content of implementation measures. According to the Recommendations one can submit a procedure for the development of the Technical Regulations as shown in Fig. 1.

In carrying out the task of the Minister of Defense of Ukraine regarding the development of a technical regulation on the management of the life cycle of information systems (IS) at the Ministry of Defense of Ukraine, it is appropriate to take into account global experience in managing the life cycle of IP and the state of information management processes in the Armed Forces of Ukraine. The most knowledge-intensive task is to prepare the text of the draft TR (Phase II of the draft TR). In [13] sets out the main requirements for the text of the TR, which are presented graphically for the convenience of the perception as shown in Fig. 2.

DEVELOPMENT OF TECHNICAL REGULATIONS

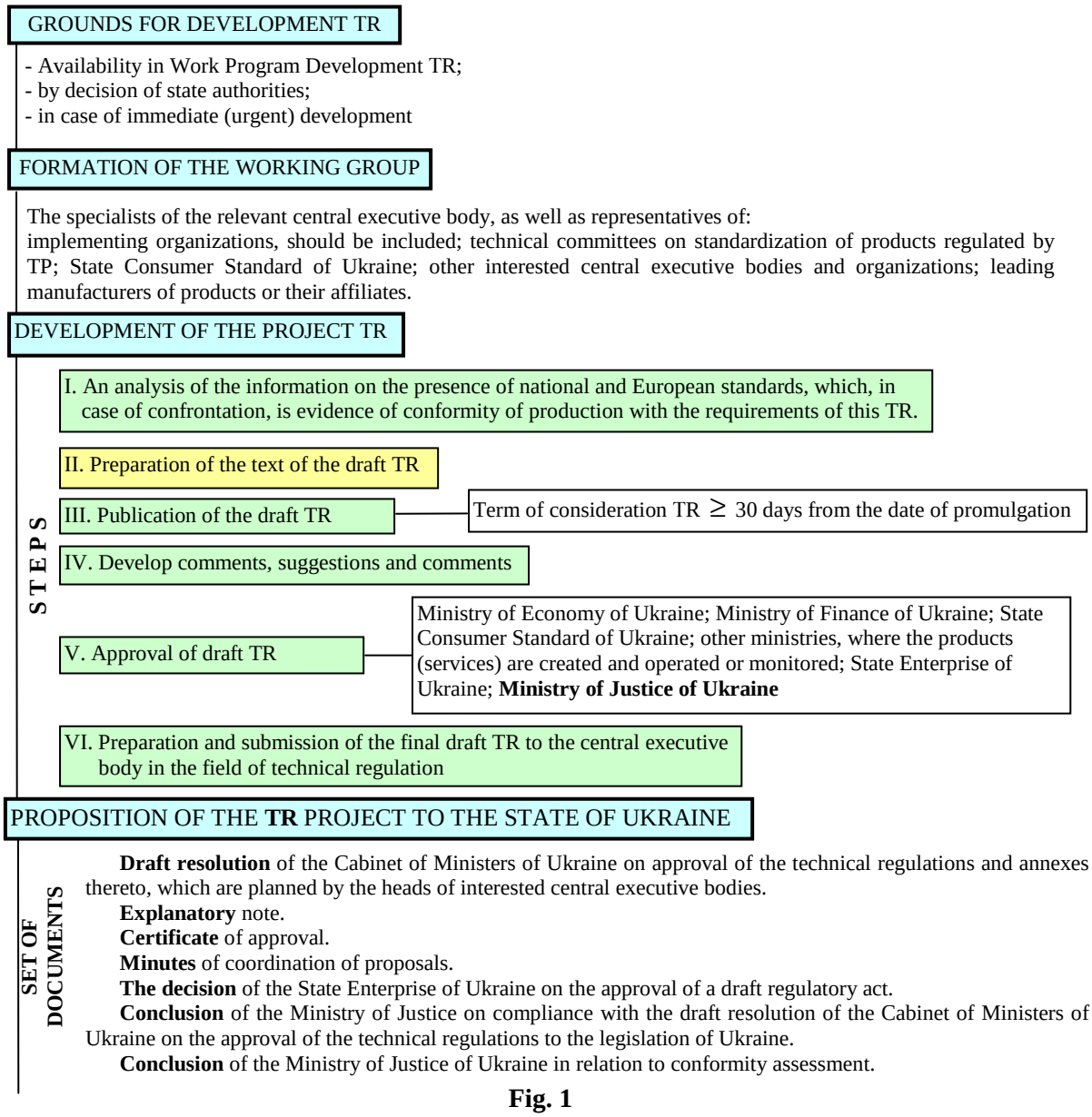

Fig. 1

Over the past few years, the Ministry of Defense of Ukraine has paid considerable attention to the automation of management processes. In this case, many IS are created, which provide data and necessary analytical calculations of individual processes of management of administrative and economic activities of the Armed Forces of Ukraine. Information between systems is transmitted electronically to magnetic (optical) carriers. For some reason, the developed systems do not have a planned interconnection, that is, each of them works separately. Given the prospect, from the point of view of world experience, the use of such systems raises questions about the expediency of their future development and improvement. The possible direction of the use of existing systems is their refinement (if necessary) and integration into a single information environment.

Thus, the current trend in the IT field is the need to ensure the exchange of data between different information systems. The rules of information interaction should characterize the responsibilities of the interacting parties, the lists and structure of the data transmitted and received the schedules and frequency of the exchange, as well as other information that contributes to the implementation of the conditions for a qualitative information exchange. Creating such a Regulation can be considered as an independent task or include relevant requirements in the section “Basic Product Requirements” of the draft TR on the management of the life cycle of information systems in the Ministry of Defense of Ukraine.

STRUCTURE AND CONTENTS OF THE TECHNICAL REGULATIONS

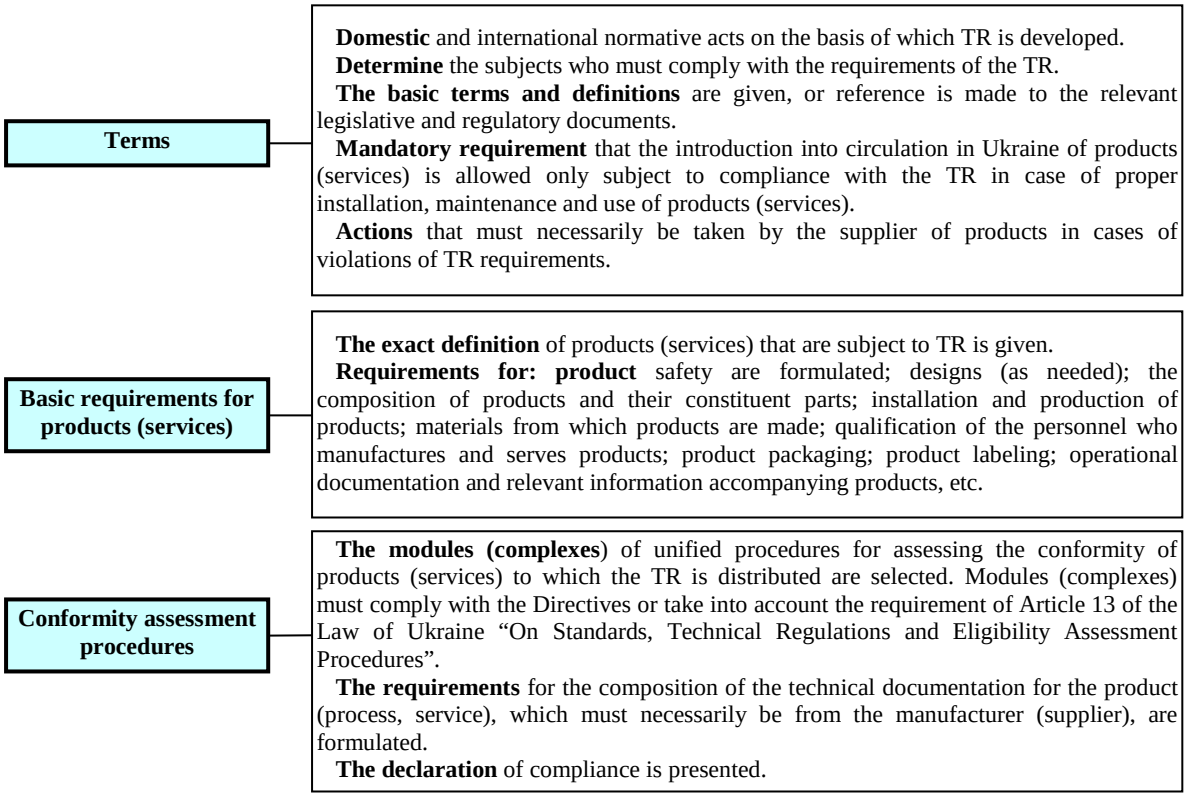

Fig. 2. Structure and contents of the technical regulations

Conclusion. In order to fulfill the task of the Minister of Defense of Ukraine regarding the development of a technical regulation on the management of the life cycle of information systems (IS) in the Ministry of Defense of Ukraine, it is advisable to carry out the relevant research work, the result of which should be the content of the TR

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The article came to the release 06.07.2017

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Особливості розроблення технічного регламенту щодо управління життєвим циклом інформаційних систем у воєнному відомстві

Резюме. У статті здійснено аналіз стану проблем, стосовно розробки і впровадження технічних регламентів для інформаційних систем та сформульовані пропозицій щодо їх вирішення.

Ключові слова: технічний регламент (ТР), регламент, стандарт, інформаційна технологія (ІТ), директива ЄС, інформаційна система (ІС).

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Особенности разработки технического регламента по управлению жизненным циклом информационных систем в военном ведомстве

Резюме. В статье осуществлен анализ проблем, относительно разработки и внедрения технических регламентов для информационных систем и сформулированы предложения по их решению.

Ключевые слова: технический регламент (ТР), регламент, стандарт, информационная технология (ИТ), директива ЕС, информационная система (ИС).

UDK 004.75

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Features of Contemporary Conceptual Architecture GIS Military Platform

Resume. The article reveals the features of GIS architecture and its role for the Armed Forces of Ukraine. The analysis of modern GIS architectures and their adaptation to military appointment in NATO is considered. The taxonomy approaches are presented to achieve a systematic approach to the concept of NATO framework architecture.

The article reveals the features of GIS architecture and its role for the Armed Forces of Ukraine. The analysis of the preconditions for the transition to a single GIS platform and analysis of NATO approaches to the implementation of modern C4ISR-type architectures has been carried out. The necessity of using the architecture of enterprise in the implementation of GIS platform is determined. The conceptual features of the GIS platform implementation strategy are presented and some recommendations are given.

Keywords: framework architecture, enterprise architecture, C4ISR, evolution C4ISR.

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Keywords: framework architecture, enterprise architecture, C4ISR, evolution C4ISR.

Formulation of the problem. In order to implement NATO standards in keeping with the interests of the Ministry of Defense of Ukraine and the priorities of the development of the Armed Forces of Ukraine, a decision was made to create an informational infrastructure of the Ministry of Defense of Ukraine. At the same time, according to the second section of the Strategic Defense Bulletin [1], one of the tasks is the creation of a Defense Forces automated system C4ISR (Command, Control, Communications, Computers, Intelligence, Surveillance and Reconnaissance) that meets NATO standards, doctrines and recommendations at all levels management (tactical, operational and strategic) with specific features of the basic capabilities.

NATO uses architectural approaches to the implementation of information systems. The term "C4ISR" is defined as the *architecture and concept of the interaction* of the components of the operational and operational-strategic level combat operational control systems. The features incorporated in the architecture and concept C4ISR makes it possible to: automatically determine the position and movement of their units and enemy troops (automatically displayed on electronic maps); choose route of movement; give target cells of the means of shooting fire damage; inform their units about the actions and locations of their neighbors and enemy.

The role of the geographic information system (GIS) in the complex information system is important. It is one of the other main. Implementation this one in NATO (according to methodologies and standards) depends to use *the GIS core* based on the GIS platform. Therefore, taking into account the best practices, requirements and standards of NATO, realization of the transition of the Armed Forces of Ukraine to C4ISR without a GIS platform is not possible.

From the point of view of the development of information infrastructure [2, 3], the Armed Forces of Ukraine need a unified (main) GIS platform. To do this, it is necessary to determine the general views of GIS platform with its architecture. Therefore, the analysis of the GIS platform architecture combining the basic principles, concepts, rules, templates, interfaces, standards, best practices for building the GIS

platform in the IT infrastructure of NATO, and defining the features of the GIS platform conceptual architecture for the purpose of highlighting the ways of adaptation in the Ministry of Defense of Ukraine is relevant the task.

The degree of development of the problem. The work concern on conceptual tasks of the deployment of GIS solutions [4]. The sources [5, 6] show aspects of framework architectures that using enterprise level to construct the GIS architecture. The papers [7, 8] highlight approaches to integrated military GIS models. The general principles of the framework architecture adopted by NATO are presented in [7, 8]. In the paper [3] the concept of enterprise architecture is revealed on the basis of the analysis of modern world approaches to the design of framework architectures and a defined place of the information infrastructure inside the Ministry of Defense of Ukraine.

The purpose of the article is to determine the features of the conceptual architecture of the military GIS platform that is based on an analysis of the leading approaches to the design of GIS in NATO.

Presenting main material. According to [4] GIS is a system that: firstly, represents a complex of interacting five components consisting of computer tools, software, geographic data, regulations and users; and secondly, functions as input, integration, storage, processing, analysis, modeling and visualization of geographic information.

Perspective scenario. To understand the importance of creating a full-featured GIS platform, we give a perspective scenario in line with NATO's approaches.

We assume that the Armed Forces of Ukraine have Command, Control and Intelligence (C2I) information systems in geographically diverse locations, which require identical data for operations. The G3 group (planning and operational group) in the General Staff of the Armed Forces of Ukraine, located in Kyiv, requires data to maintain a map for the planning of the operation. The operational command S3 (as designated by the NATO), the head of the Operations Department, operates in Odessa and needs the same data to clarify the plan for the allocation of forces and means, as well as the role of command in the operation. At the same time, the commander of the brigade, located in the ATO zone, depends on the information to accomplish its tasks. So, the G3, S3 and the Brigade commander require the same databases, but different communication and hardware solutions may be required for delivery. Since tasks are the most important priority for an operation, and time is an essential factor, and movement in most ways is complicated, the decision on the availability of geospatial databases should be easy to maintain and geospatial data is readily available and easily upgraded.

Thus, servicemen who work in diverse environments, often in dangerous conditions, need quick and easy access to accurate and up-to-date geographical information for (according to NATO information resources): battle planning (operations), assessment of terrain, navigation, analyzing intelligence, logistics management, etc.

Therefore, to ensure the effectiveness of GIS functionality at all levels, it is necessary to create a *GIS platform* to which users will be connected.

The GIS platform is a GIS platform that integrates maps, applications, data, and a specific set of users to help and support individual users, management bodies and headquarters at all levels to raise awareness and speed of making informed decisions in the context of authorized GIS access using security policy. Note that the degree of informality and speed is directly proportional to the extent of GIS distribution in the military sector.

However, to find, use, create geographic information and to exchange maps or distribute them (publishing electronic versions on the network), using any device (this may be: a stationary computer, a laptop, a terminal station from a web site, browser, mobile devices, etc.), regardless of place and time, are fairly standard procedures, provided that the modern architecture of the GIS platform is used. *The architecture of the GIS platform* is a methodology for planning, developing and managing the GIS platform implementation.

Prerequisites for NATO's transition to a new GIS platform. At the beginning, NATO needed a modern information technology infrastructure (IT) based on IT standards for the processing and operation of geospatial information. The large number of disassociated and poorly integrated outdated systems for collecting, managing, analyzing and distributing geospatial information did not meet the needs of the Alliance, built by the makers of the capabilities of most systems. Existing systems were not able to process the full amount of incoming data as they were based on outdated technologies. They were often incompatible with each other. Recognizing GIS as a fundamental technology, a new geospatial solution was proposed that would provide:

distribution of commercial software and technical support to the order of the military department (commercial off-the-shelf, COTS);

decentralized geospatial data management at each NATO headquarters with centralized quality control of the combined operational command of NATO;

standardized tasks for the development and distribution of GIS;

enhanced interface for functions for NATO services (FAS) to manage logistics and operational information in a common operational picture (COP).

Corporate (enterprise) architecture. In previous publications [2, 3], attention was drawn to the use of framework architectures or methodologies in the implementation of the concepts of a single C4ISR type management and other hereditary architectures (DoDAF, NAF, etc.). C4ISR is based on industry-standard methodological solutions such as Enterprise Architecture (EA) and a number of open architecture [3, 10]. EA is an instrument that includes a methodology that includes planning, development, and management structure (architecture) at the enterprise level. The EA also consists of operating system, system view and technical views or views typical of the framework architectures (operation view OV, system view SV, technical view TV). As a result, the creation of an architecture compatible with the classic C4ISR is a prerequisite and a tendency for NATO.

Together, architectural vision gives the general program a structure that helps to dynamically manage and manage a portfolio of solutions that includes the installation of geospatial information and services (installation geospatial information and services).

When applying any methodology of framework architecture, the existing system is often *exposed* (changes) to the existing system in order to bring it into conformity with the adopted goals (in terms of visions), taking into account the results of technical forecasting and requirements of standards [11].

The ArcGIS software is the GIS Core. Studies confirm [4] that for many years the global leader in the development and distribution of GIS software is the Environmental Systems Research Institute (ESRI). Esri has created a powerful software system called *ArcGIS*. Other manufacturers of GIS (with the corresponding GIS software) have a smaller distribution of GIS software: Intergraph Corp. MGE (Modular GIS Environment), GeoMedia GE Network Solution (General Electric Company), Smallworld GIS, Bentley Systems Inc. (MicroStation), Mapping Information Systems Corp. (MapInfo Professional), Autodesk Inc. (AutoCAD), Autodesk Map, Autodesk Survey.

It is quite logical that the software component of *the GIS core* for NATO is the ArcGIS (Esri) software. Since 2006, NATO has been co-operating with Esri and Siemens Enterprise Communications to implement NATO's core geographic services (Core GIS NATO), enterprise-level geospatial data infrastructure and services.

ArcGIS, as the basis for a geographic solution in NATO, is based on the following products:

- ArcGIS Desktop with extensions for high-performance mapping workstations;
- ArcGIS Server with spatial, 3D, and geo-referenced extensions;
- ArcGIS Workflow Manager for managing all GIS tasks, such as updating maps and queries for special geospatial analytics products;
- ArcGIS Engine and ArcGIS Web Mapping API for a set of tools for developers;
- Core Geo Viewer, an individual 2D GIS browser;
- ArcGIS Explorer, the advanced browser for 2D and 3D-GIS.

The NATO Core GIS (Core GIS) is part of the information infrastructure [6] and provides centralized geospatial services to NATO headquarters and command and control systems (C2). The relevant services and toolkits are deployed on each of the local networks in 18 NATO headquarters in 12 countries. This means that all NATO staff have access to one strategic geospatial information and geo-products, and therefore "fight on a single map".

NATO GIS servers meet the requirements of accessibility through a number of standards), which are the basis for promoting compatibility between NATO and Member States. Among them are the Standards of the International Organization for Standardization (ISO) and Open Geospatial Consortium (OGC). The main GIS of NATO provides an open structure with just the OGC web services, such as Web Map Service (WMS), Web Coverage Services (WCS) and Web Feature Services, (WFS).

The NATO GIS core uses the state-of-the-art hardware and software infrastructure to support GIS technology, including a multi-terabyte and centralized storage environment for snapshots and other geospatial products. The Oracle 11g database management system is technically responsible for storing geospatial information, such as vector geodata. All GIS platform servers in NATO are scalable and capable of supporting a large and distributed user community.

At present, NATO staff anywhere in the world can access NATO geospatial data, add their missions as layers of geospatial data and use powerful tools for processing geographic data.

Conceptual features. *Strategy implementation program*. Providing a reliable geographic platform for workflows in an organization should help reduce time for decision making. Equipped with applications, the corresponding devices allow users to work more efficiently, using GIS capabilities. Potentially, a

modern GIS platform can meet specific sectoral functional needs. This is achieved by using a range of decisions regarding the GIS project implementation strategy. Each of them is related to the costs and efforts for its implementation (Fig. 1). The following are hierarchical recommendations for reducing such effects.

The first recommendation is that when implementing a particular organization or institution, the best *configuration* should be selected by maximizing the use of the functions of existing software applications that were previously developed by the software manufacturer. An example would be the acquisition of so-called "commercially-packaged" product solutions [6, 12] (COTS) that are part of the right to use software, which then adapt to meet the needs of the organization at the expense of further adjustments. Such implementation has a lower cost than the commissioning of custom-made or pre-ordered narrow functional directions. The COTS configuration approach provides a significant amount of opportunities with the least effort and the lowest current cost.

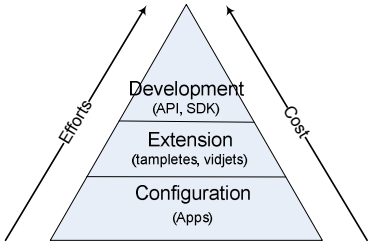

Fig. 1. GIS project implementation strategy

From the analysis of published best practice materials [12, 13], it is first necessary to set up and use additional software programs beyond the GIS functionality that are designed to meet most of the project's needs with minimal effort. Organizations must adopt the "first turning" philosophy to avoid unnecessary costs associated with development, maintenance and specialized training.

The second recommendation. If there is an increased functional requirement that can not be satisfied with the configuration provided by the software manufacturer, organizations should apply *extensions* to existing applications using templates and modular settings for software interfaces (widgets). You should also apply extensions to existing templates and applications, using discrete template enhancements, or encapsulating new features in modules or widgets that are compatible with existing applications and architecture. For example, several ArcGIS applications, such as ArcGIS Web App Builder and Dashboard Operations, provide modular templates or widget controls that developers can use to save time and effort. With these apps, developers should create new widgets to fit unique functional requirements (business needs), and then connect them to existing applications.

The third recommendation. Developing to provide functions that can not be achieved by any of the other approaches. Before deciding to go beyond the simple approach of configuring COTS, you should consider the total cost and effort associated with both the extension and the software setup. These are resources, initial development efforts, current application administration, user and developer training, technical support, and more. For example, the use of the development of the ArcGIS Web API and SDK type is difficult and most important when creating a GIS platform. Developers should try to make full use of the available components such as identity manager, webcards, geotools and web scenarios (Identity Manager, Web Maps, Geoprocessing tools, and Web Scenes) to minimize development and maintenance efforts.

In determining the best approach to ensuring high efficiency of the project, the impact of the cost and effort of each range of decisions on the GIS project implementation strategy should be taken into account in order to reduce project time to use non-standard, customized, expandable applications and templates. The "first configuration" philosophy is believed to help reduce overall costs and allow developers to focus on more complex tasks.

The conceptual architecture of the GIS platform. Based on the requirements for the GIS architecture of the enterprise level (EA), the GIS platform should consist of three different computing environments (Figure 2): *productive expluatation*, *staging* (preparation and receipt of data or quality assurance and testing), and *development*. Together they form a so-called *isolated environment*. There are four main segments of each environment: Attachments, Portal, Infrastructure, External Systems and Services [6]. In fig. 2 these segments are indicated.

The Applications section includes platform components for the interactive interaction of most users, including software applications for the end-user (e.g., ArcGIS Pro, Collector for ArcGIS, and Operations Dashboard for ArcGIS).

Applications are typically used in workflows that match one or more of the six main *location strategy models*. This is location provision, component licensing obligations, decision support, field mobility, analytics and data management).

For example, the *Model of Location Enablement* expands geospatial capabilities for each business unit by its intended purpose (through a website and simple applications) for analysts, executives, and field users to identify, use, create and share maps. For example, an observer who captures the effects of shelling in the field can, with the help of Collector for ArcGIS, perform tasks assigned *to Field Mobility Models*. A decision maker, using a situational screen (or a dashboard operational dashboard), in order to monitor information provided by staff (such as observers) locally in real time, follows the *Decision Support Model*. Consequently, software applications connect users and their functional processes (business processes) to the platform.

The *Portal* section, as a platform component, is designed to organize users and connect them to related content and capabilities based on their roles and responsibilities within the platform. The portal uses a person's identity to deliver the desired content to the right user at the right time. In terms of the type of software product, the portal can be implemented as *local solution* (for example, Portal for ArcGIS) or *cloud-based solution* (for example, ArcGIS Online). The portal provides access control, content management rules, and sharing model that allows users to share information across the organization.

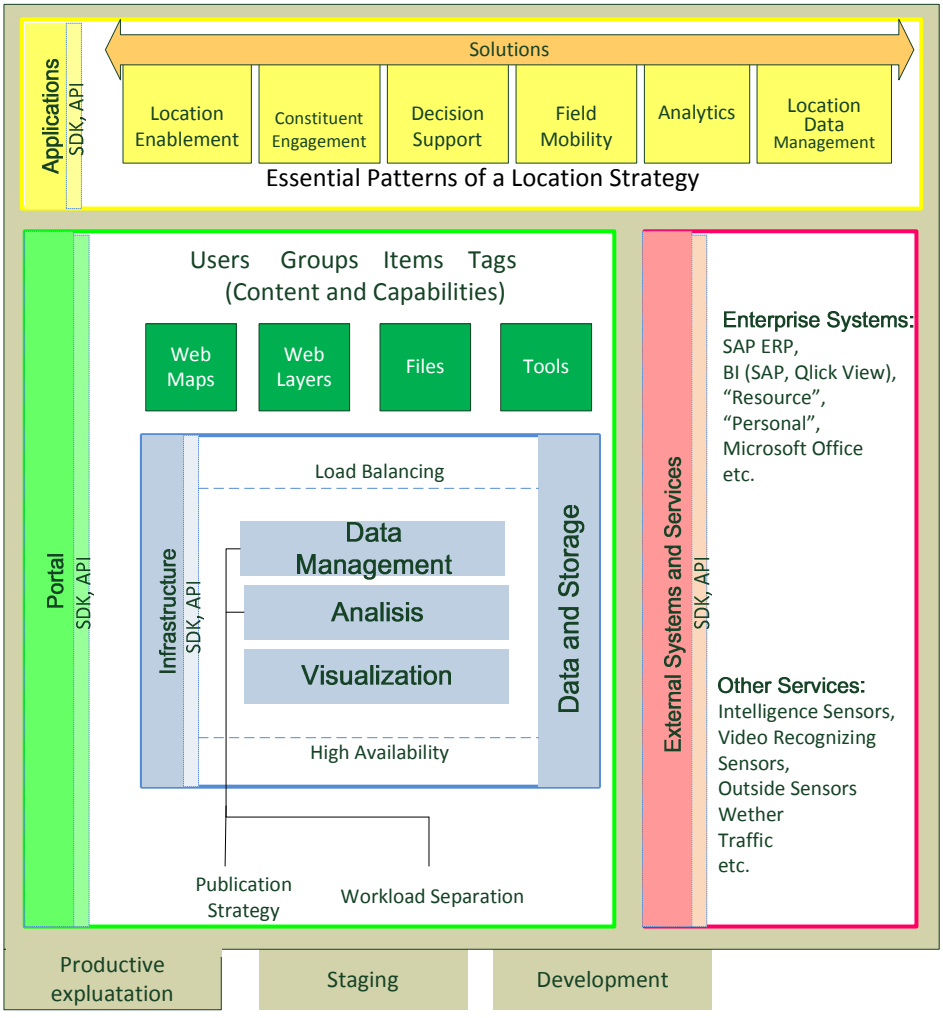

Fig. 2. Components of the conceptual architecture of the GIS platform

Component *Infrastructure* includes the technical component, software, services and repositories of data that constitute *the core of the GIS platform*. It is believed that the most important functional tasks for this component related to the platform infrastructure are load balancing, high data availability, workload allocation to the system, development of a strategy for publishing maps in real time (online publication).

External systems and services, as components, include other systems that provide GIS services or use these services for geospatial provision of their capabilities. The ability to freely integrate geodata from other information systems is a key condition for the full functioning of the modern GIS platform.

Regarding the provision of basic conditions, in order to meet the requirements of the GIS platform for performance, security and accessibility, the following basic tasks related to automation, integration at the industry level (MO of Ukraine), environment isolation, high availability, efficiency and infrastructure adequacy, balancing of workload, development and compliance with the policy of publishing maps, providing real-time, security (security policies),

distribution of workload (use hard work background tasks in non working hours).

Ensuring the implementation strategy, the main model of the location strategy, identification management, and prioritization of projects are directly proportional to the actions of senior management and the qualification level of specialists in the state of the organization. Attention is focused on staff (administrators, cartographers, programmers, users) and its internal interaction.

Conclusions. In this work, the features of the GIS conceptual architecture of the military platform were determined on the basis of analysis of the leading approaches to the design of GIS in NATO through the clarification of the concepts, content and features of the GIS architecture. It was defined place GIS in the framework architecture for building NATO information systems.

Further research should be devoted to building a model of the environment based on the GIS platform.

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The article came to the release 06.07.2017

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Особливості сучасної концептуальної архітектури ГІС платформи військового призначення

Резюме. Стаття розкриває особливості ГІС архітектури та її роль для Збройних Сил України. Проведений аналіз передумов переходу на єдину платформу ГІС та аналіз підходів НАТО щодо впровадження сучасних архітектур типу C4ISR. Визначена необхідність використання архітектури підприємства при впровадженні ГІС платформи. Наведені концептуальні особливості стратегії впровадження ГІС платформи та дані деякі рекомендації.

Ключові слова: рамкова архітектура, архітектура підприємства, ГІС платформа, C4ISR.

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Особенности современной концептуальной архитектуры ГИС платформы военного назначения

Резюме. Статья раскрывает особенности ГИС архитектуры и ее роль для Вооруженных Сил Украины. Проведенный анализ предпосылок перехода на единую платформу ГИС и анализ подходов НАТО по внедрению современных архитектур типа C4ISR. Определена необходимость использования архитектуры предприятия при внедрении ГИС платформы. Приведенные концептуальные особенности стратегии внедрения ГИС платформы и даны некоторые рекомендации..

Ключевые слова: рамочная архитектура, архитектура предприятия, ГИС платформа, C4ISR.

UDK 355.42

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Evaluation of the quality of the substantiation of the multicriteria decision for the operation (battle) of a grouping of troops (forces)

Resume. In the article the approach to the assessment of the quality of the justification for the operation (battle) is considered, which is based on the determination of the gain of the use of rational method of combat actions of troops (forces).

Key words: grouping, method of warfare, the degree of validity of the decision.

Резюме. У статті розглянуто підхід до оцінювання якості обґрунтування рішення на операцію (бій), який засновується на визначенні виграшу від застосування раціонального способу бойових дій угруповання військ (сил).

Ключові слова: угруповання військ, спосіб бойових дій, ступінь обґрунтованості рішення.

Rising of problem. Developing a solution to an operation (battle) groups of troops (forces) is one of the main tasks of the control of troops. In today's conditions of armed struggle for making a decision significant influence is made by the following factors: increasing the dynamism of hostilities; use of new military equipment and methods of conducting operations (battles); lack of combat experience commanding and commander. Generally, decisions on operation (battle) is produced under conditions of uncertainty and contradictory situation, and the uncertainty of the time limit, which necessitates finding new means and methods of decision-making by military authorities (MA) and assessment of their quality.

During the preparation of the operation (battle) certainly compared several solutions, so you need to assess in which languages in each solution is qualitatively different from the other, which determines the success of the operation (battle). However, at present MA little attention paid to quality assessment solutions produced during the preparation of the operation (battle). This situation is due to a greater extent lack of methodological quality assessment provisions of the solutions that can be used in the practice of MA.

Analysis of recent publications. The general approach to assessing the quality of the solution to the operation (battle) given in [1] involves taking into account the time parameters of its development, the information parameters, the parameters of the effectiveness of the selected methods of action and the effectiveness of the designated organizational measures. However, there are no dependencies in this work that allow the MA to quantify the quality of the decision for an operation (battle). In the papers [2,3] we propose an approach to assessing the quality of decisions, based on an information analysis of the decision making process. In this case, the assessment of the quality of the decision is reduced to an assessment of its validity. The process of making a decision is associated with a decrease in the level of uncertainty of the situation. The increase in the degree of validity of the decision is achieved by reducing the degree of uncertainty in the decisions made. To estimate the degree of elimination of uncertainty, the entropy measure of Shenon is used. The application of this approach requires the definition of the entropy of uncertainty in information, which is quite complex in practical terms.

A more appropriate approach is to assess the extent to which the validity of a decision on an operation (battle) based on the results of the analysis of winnings from the application of various variants (methods) of the combat operations groups of troops (forces) is given in [4]. At the same time, the gain from the use of an alternative variant (mode) of combat operations is determined by one indicator of efficiency, which makes it impossible to assess the degree of substantiation of the multicriteria solution to the operation (battle).

The aim of the article is to develop methodological provisions for assessing the quality of the substantiation of the multicriteria solution

for the operation (battle) of the grouping of troops (forces).

Exposition of basic material. The basis of the formulation (adoption) of the decision on the operation (battle) is the design of hostilities - the main idea of the way of the grouping troops (forces) of the battle task [5]. Under the mode of combat means the procedure and techniques of the use of forces and means for solving operative and battle tasks in the interests of achieving the purpose of military action. Therefore, the quality of the solution is primarily determined by the validity of the method of combat operations of the grouping of forces (forces), which is accepted as the basis for its development.

The justification of the decision is mainly determined by:

completeness and reliability of the data used in determining the method of combat operations;

the quality of mathematical models and settlement tasks used by the MA to assess the effectiveness of combat operations;

the availability of time allocated for the decision making;

the individual features of the commanding (commander) and officers of the MA.

It is especially important to note the dependence of the quality of the justification of the decision on the time allocated for its elaboration. With decreasing of this time, both timeliness and reasonableness of decision making diminish. The first is due to a decrease in the probability of a task being accomplished within a set time period, and the second is the decrease in the number of variants (methods) of combat actions that can be considered during the development of the decision, as well as the incompleteness of obtaining data for the solution, in particular the results of design of combat operations.

The assessment of the reasonableness of the decisions should be based on the consideration of the specific laws of the processes of their development, which express the most significant relationship between various aspects of the preparation and conduct of armed struggle. Thus, there is an objective link between the methods used to prepare and make decisions and the effectiveness of the implementation of the set of combat missions [2]. Taking into account the above-mentioned regularities allows linking the assessment of the reasonableness of the decision-making process to the predicted results of achieving the goal of the operation (battle), that is, the target requirement, which is characterized by the desired result.

The projected results of the grouping of troops (forces) of the purpose of the operation (battle) is determined by the indicators used by the MA when choosing an variant (method) of combat operations. For evaluation of indicators usually use mathematical models of combat operations, settlement tasks, expert methods. Output data for design of combat operations, calculations, expert evaluation are formed on the basis of the evaluation of situation, which is characterized by the uncertainty of the parameters. It can be assumed that the uncertainty of the parameters of the situation in a certain way is reflected in the indicators that characterize the use of the grouping of troops (forces), and, consequently, in the design of operations (battle). This circumstance confirms the validity of the assessment of the validity of the decision making based on the analysis of indicators characterizing the use of the grouping of troops (forces).

Application of the grouping of troops (forces) is taken to characterize the indicators of the effectiveness of combat operations, time parameters of the tasks, the amount of resources spent during the operation (battle) or their value. These indicators, for example, include:

mathematical expectation of the relative loss of the grouping of forces (forces) of the enemy, $\grave{I}_{los}^{en}$;

mathematical expectation of the relative loss of the grouping of our forces (forces), M_{los}^{of};

average time for the task accomplishment by the grouping of troops (forces) in the operation (battle) $\grave{O}_{co}$;

the average cost of resources spent on conducting an operation (battle), B_{cb}.

These indicators are used by the MA to select a rational mode (variant) of combat operations by the grouping of troops (forces). In this case, methods of the theory of games [6-8], taxonomy [9], analysis of hierarchies [10,11], fuzzy sets [3,12], etc. can be used. The application of these methods allows several to eliminate the uncertainty of the information used by the MA in developing the design of the operation (battle).

The use of game theory methods allows us to determine the frequency (probability) of using counter-parties to their strategies, that is, the ways (variants) of combat operations of the parties. For the indicator for the formation of the matrix of the game is taken ratio of mathematical expectations of the relative costs of group troops (forces) parties in the operation (battle).

Using methods of taxonomy, the advantage of methods (variants) of combat actions is determined by comparing the indices corresponding to the analyzed methods (variants) with the indicators of the ideal method (variant), which take maximum or minimum values depending on their influence on the results of combat operations. For comparison, the expression is used

$$C_{io} = \left[\sum_j (Z_{ij} - Z_{oj})^2 \right]^{\frac{1}{2}} \quad (1);$$

$i = \overline{1, N}$; $j = \overline{1, R}$,

where Z_{ij} – the standardized value of j indicator of i method (variant) of combat operations;

Z_{oj} – the standardized value of j indicator of ideal method (variant) of combat operations;

Taxonomic indicator characterizing the advantage of the method (variant) of combat operations is determined by the formula

$$\beta_i = 1 - \frac{C_{io}}{\overline{C_o} + 2S_o}, \quad (2)$$

where $\overline{C_o} = \frac{1}{N} \sum_i C_{io}$;

$$S_o = \left[\frac{1}{N} \sum_i (C_{io} - \overline{C_o})^2 \right]^{\frac{1}{2}}.$$

Method of analysis of hierarchies also allows deciding the task of choice of method (variant) of combat operations of the grouping of troops (forces) by multi criterion reitynhuvannia of possible methods (variants) which are analyzed. A task decides the way of her hierarchical decouple which contains : set of alternatives (methods (variants)) of combat operations; main criterion of reitynhuvannia (advantage of methods (variants) of combat operations); set of factors which influence on rating (indexes); copulas are between alternatives, factors and criterion. In accordance with the hierarchical model of decision of task experts are build the matrices of pair wise comparisons, which the local are determined on the basis of, and then by their synthesis global priorities of alternatives. The constituents of global priority determine rating of methods (variants) of combat operations.

The use of unclear technology needs construction of functions of belonging of methods (variants) of combat operations of our troops (B_i) experts after every j indicator for every k method (variant) combat operations of troops of the enemy $\mu(B_i)_{kj}$ ($i = \overline{1, N}$; $j = \overline{1, R}$, $k = \overline{1, \hat{E}}$).

Everything must be built $k \cdot R$ functions of belonging.

Can be built the function of belonging by pair comparisons of methods (variants) of combat operations [3] with the use of scale of Saati [10] and calculation of own vectors of corresponding matrices of the pair comparing to the further setting of norms of their components [12]. Importance (weight) of indexes ω_j also can be appraised by a way them pair comparison. For the use of criterion of Hurwitz [13] at the decision of task of choice of method (variant) of combat operations the sums of the self-weighted discrete values of functions of belonging are determined

$$D_{ik} = \sum_j \mu(B_i) \cdot \omega_j . \quad (3)$$

The method (variant) of combat operations is elected according to expression

$$\max_i \left[\alpha \max_k \cdot D_{ik} + (1 - \alpha) \min_k \cdot D_{ik} \right], \quad (4)$$

α - weigher coefficient, which takes into account inclination of person, which accepts decision to optimism or pessimism.

The use of that or other method from considered depends on possibilities evaluations of indexes, which characterize application of grouping of troops (forces).

Thus application of the transferred methods allows choosing the rational method (variant) of combat operations of grouping of troops (forces) after the aggregate of indexes, which is basis of making of decision on operation (battle). The estimation of degree of validity of decision can be carried out by comparison of indexes which answer the select method (to the variant) of combat operations, with the mean values of indexes of all methods (variants) which are analysed MA at preparation of operation (battle).

The mean values of indicators are determined after formulas:

$$\overline{\grave{I}^{\,en}_{los}} = \frac{1}{N} \sum_i \grave{I}^{\,en}_{los_з} ; \quad \overline{M^{of}_{los}} = \frac{1}{N} \sum_i M^{of}_{los_з} ; \quad \overline{\grave{O}_{co}} = \frac{1}{N} \sum_i \grave{O}_{cî\,з} ; \quad \overline{B_{cb}} = \frac{1}{N} \sum_i B_{cb_i} . \quad (5)$$

It is necessary to mark that a method (variant) combat operations, which is answered by such values of indexes, is conditional. It is foreseen that the values of indexes are up-diffused evenly.

Differences between the values of indexes, which answer the select method (variant) of combat operations $Ì^{en^*}_{los}$, $M^{of^*}_{los}$, $T_{co}{}^*$, $B_{cb}{}^*$, and them fold mean values:

$$\Delta M^{en}_{los} = M^{en^*}_{los} - \overline{M^{en}_{los}};\ \Delta M^{of}_{los} = M^{of^*}_{los} - \overline{M^{of}_{los}};\ \Delta T_{co} = T^*_{co} - \overline{T_{co}};\ \Delta B_{cb} = B_{cb}{}^* - \overline{B_{cb}}. \quad (6)$$

It is obvious, that the brought differences over of indexes can take on both positive and negative values.

On physical maintenance a positive effect from the choice of method (variant) of combat operations of grouping of troops (forces) with the use of the considered methods is arrived at $\Delta Ì^{en}_{los} > 0$, $\Delta M^{of}_{los} < 0$, $\Delta T_{ñî} < 0$, $\Delta \hat{A}_{cb} < 0$, which can be not always executed.

The degrees of validity of decision on indexes are determined after formulas:

$$\delta^{en}_{los} = \frac{\Delta M^{en}_{los}}{M^{en}_{los\,req}};\ \delta^{of}_{los} = \frac{\Delta M^{of}_{los}}{M^{of}_{los\,pos}};\ \delta T_{co} = \frac{\Delta T_{co}}{T_{co\,set}};\ \delta B_{cb} = \frac{\Delta B_{cb}}{B_{cb}}, \quad (7)$$

where $M^{en}_{los\,req}$ is mathematical expectation of the relative loss, which required to inflict to the enemy in operation (battle);

$M^{of}_{los\,pos}$ – mathematical expectation of possible relative losses of the troops in operation (battle);

$T_{co\,set}$ – the set time of implementation of tasks is in an operation (battle);

$B_{cb\,set}$ – the set cost of the expended resources is on the conduct of operation (battle).

Coefficients δ^{en}_{los}, δ^{of}_{los}, δT_{co}, δB_{cb} payments determine on the indexes of select method (variant) of combat operations in relation to the set requirements to application of grouping of troops (forces).

Common increase of degree of validity of decision

$$\delta = \delta^{en}_{los} \cdot \omega^{en}_{los} + \delta^{of}_{los} \cdot \omega^{of}_{los} + \delta T_{co} \cdot \omega_{T_{co}} + \delta B_{cb} \cdot \omega_{B_{cb}}, \quad (8)$$

where ω^{en}_{los}, ω^{of}_{los}, $\omega_{T_{co}}$, $\omega_{B_{cb}}$ – coefficients of importance of corresponding indexes, their sum equals unit.

Both positive and negative values of coefficients are put in expression (8). Positive - when the values of indexes assist implementation of requirements to application of grouping of troops (forces) and vice versa.

For determination of coefficients of importance of indexes it is expedient to use the methods of expert evaluation, in particular method of ranging [14].

Under ranging establishment of meaningfulness of indexes is understood on the basis of their arrangement. A grade characterizes the index place of index in the aggregate (to the group) of other indexes. A major index gets the first grade, and to the index which has the least importance - last grade. Experts must dispose indexes in the order of meaningfulness (to importance) and ascribe to each of them numbers of natural row (in our case 1,2,3,4).

Further with the use of linear dependence a transition is carried out from grades to the coefficients C_{jl}, which represent the look of l expert ($l = \overline{1, L}$) to the relative value of j index ($j = \overline{1, R}$). Coefficients C_{jl} settle accounts after a formula

$$C_{jl} = 1 - \frac{r_{ij} - 1}{R}, \quad (9)$$

where r_{jl} – grade of j index, given by l expert.

After a down-scaling get

$$\omega_{jl} = \frac{C_{jl}}{\sum_j C_{jl}};\ \sum_j \omega_{jl} = 1,\ j = \overline{1, R}. \quad (10)$$

If all four index differ (are on the different places of row), coefficients ω_{jl} take on a value 0,4; 0,3; 0,2; 0,1. At being on one place of a few indexes which do not differ, grade each of them evened middle arithmetic them new numbers.

Finally after the condition of identical competence of experts of value of coefficients of importance of indexes evened

$$\omega_j = \frac{1}{L}\sum_l \omega_{jl},\ l = \overline{1, L}. \quad (11)$$

If after a competence experts differentiate

$$\omega_j = \sum_l b_l \cdot \omega_{jl};\ \sum_l b_l = 1;\ l = \overline{1, L}, \quad (12)$$

where b_l – coefficient which takes into account a competence l expert.

Authenticity of determination of coefficients of importance of indexes is estimated with the use of coefficient of concordats' [14, 15].

The considered methodical positions have a clear physical sense, MA can be used for the evaluation of degree of validity of decision on the operation (battle) of grouping of troops (forces).

Conclusions. The brought methodical positions over allow to define the increase of degree of validity of decision due to the multi criterion choice of rational method (variant) of combat operations of grouping of troops (forces). The increase of degree of validity of decision is estimated in relation to the subjunctive method (variant) of combat operations, which answers the mean value of indexes which characterize application of grouping of troops (forces) in an operation (battle). Methodical positions enable to compare methods which can be used for the multi criterion choice of method (to the variant) of combat operations during making of project of operation (battle) in the conditions of vagueness of situation.

Directions of further researches. It is expedient to take into account at the evaluation of quality of decision, but also timeliness of his making which needs not only feet of increase of validity improvement the brought methodical positions over.

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The article came to the release 06.06.2017

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Оцінка якості обґрунтування багатокритеріального рішення на операцію (бій) угруповання військ (сил)

Резюме. У статті розглянуто підхід до оцінювання якості обґрунтування рішення на операцію (бій), який засновується на визначенні виграшу від застосування раціонального способу бойових дій угруповання військ (сил).

Ключові слова: угруповання військ, спосіб бойових дій, ступінь обґрунтованості рішення.

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Оценка качества обоснования многокритериального решения на операцию (бой) группировки войск (сил)

Резюме. В статье рассмотрен подход к оценке качества обоснования решения на операцию (бой), который основывается на определении выигрыша от применения рационального способа боевых действий группировки войск (сил).

Ключевые слова: группировка войск, способ боевых действий, степень обоснованности решения.

UDK 621.396

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Analysis of the experience of the creation and operational use of operational control systems

Resume. The article analyzes the existing systems of operational management that are used in the leading armies of the countries of the world, how to use experience for building a national model of troop control.

Key words: C4ISR (Command, Control, Communications, Computers, Intelligence, Surveillance & Reconnaissance), communication and information systems, management system.

Formulation of the problem. Considering the experience of conducting an antiterrorist operation on the territory of Donetsk and Lugansk regions, there is an urgent need to provide combat approaches that carry out the missions of a multifunctional information and control system that integrates the functions of the command and control system (C2), weapons, intelligence, electronic warfare, as well as communications, navigation, orientation and recognition. During the ATO at the expense of volunteer organizations, which have been solved the missions of the battlefield control system partially.

Considering the above, separate units use system data, but the interaction of these software products among themselves is problematic.

Therefore, the problem arises of analyzing existing management systems to create an integration platform and C2 system that can be used in combat missions, considering the interaction between different branches and types of troops.

Basic research and publications analysis.

Modern methods of conducting a network-centric warfare require the creation of C2 systems.

The forces that are united by reliable networks will be able to exchange of information on a new level of quality. The exchange of information increases the quality of general awareness of the personnel on the battlefield. As a result, general situational awareness allows to provide the necessary cooperation and synchronization, to increase the stability and speed of the transfer of commands, which in turn allows to execute the combat missions more effective.

Successful execution of tasks is based on a significantly shorter duration of the “detection-recognition-targeting-defeat” combat cycle comparing with the opponent, on more accurate and complete information about the grouping of the opponent who opposes [1].

The vast majority of the scientists who have been working on this issue came to the conclusion to for the effective solving of combat tasks, is needs to have new software products that would allow to exchange of intelligence information and to transfer commands in real time and to expand of the functional to more detailed analysis of the enemy, which will allow to get the advantage with using less numbers of personnel and equipment.

The purpose of the article is to consider existing C2 systems of the armed forces of the leading countries to further stages implementation of the program to creat of the information network of the battlefield in the Armed Forces of Ukraine.

Presenting main material

It is proposed a new architecture of the mobile component of communication networks of the Armed Forces, it takes into account: the experience of development of tactical communication systems of the world’s leading countries, the modern requirements of the process of command and control and relevant requirements for tactical communication system; a modern level of development of the wireless telecommunication technology of the civilian purpose.

In the United States, intensive work is being conducted to create a unified multifunctional information and control system that integrates the functions of C2 weapons, intelligence, radio electron control, as well as communication, navigation, orientation and recognition - C4ISR (Command, Control, Communications, Computers, Intelligence , Surveillance & Reconnaissance). The architecture of C4ISR is presented in Fig. 1.

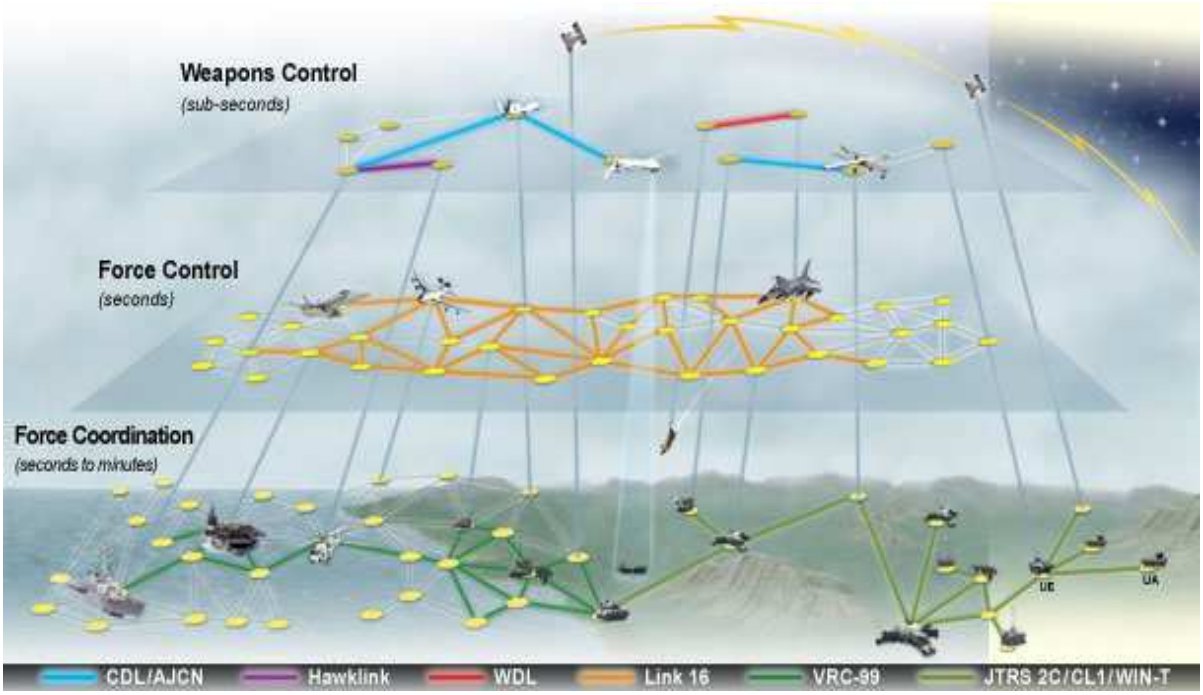

Fig. 1. Architecture C4ISR

In the armed forces of the leading countries, a phased implementation of the WIN-T – Warfighter Information Network Tactical Program has already been proposed, which provides the reorganization of the "computerized" divisions (Fig. 2.1).

The purpose of reorganization is to reduce the combat and numerical strength of the division with the simultaneous increasing the combat effectiveness at the expense of the increasing mobility, achieving an absolute advantage in information providing and intelligence capabilities.

The table 1.1 shows the stages of implementation of commercial technology and standards in the tactical military communication system within the framework WIN-T program [2].

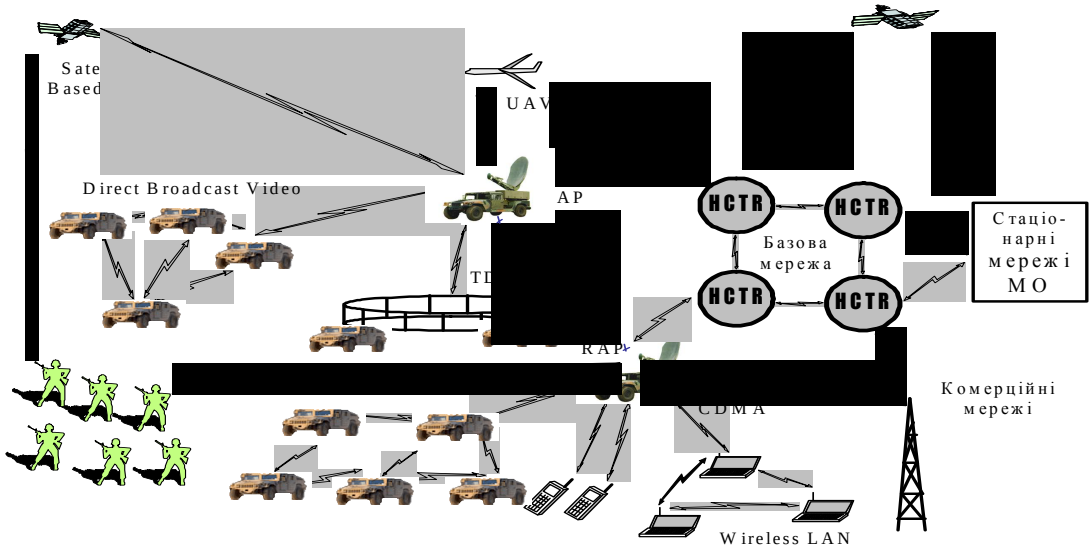

Fig. 1.2. Architecture WIN

This program reflects the essence of the construction of the promising communication systems of the world's developed countries.

There are stages of the implementation of commercial technology and standards in the tacticalof military communication system.

First of all, it was planned: to replace the existing equipment the MSE / TPN (Mobile Subscriber Equipment / Tactical Packet Network) on the commercial (IP routers, bridges, etc.); to implement commercial solutions of Wireless LAN (WLAN), which will allow to carry out moving the

subscribers within 3 miles; to provide Personal Communication Services (PCS); to start using IPv.6 protocol.

Table 1.

To 2013 p.	2013 p.
IP telephony Realization of technology CDMA, MANET High level of secrecy Autoconfiguration of the network Group transmission (multicasting)	Completely commercial basis. New solutions of mobility and network management, multimedia and IP protocols

Until this time, it was expected to unite the heterogeneous networks JTIDS, EPLRS, SINGARS, NTDR into a single - tactical Internet TI (Tactical Internet) (Fig. 1.6.) Using TMG (Tactical Multinet Gateways) gateways and INC (Internet Controller) routers, which use TCP / IP protocols.

Possible direction of increasing tactical of radio network indicators, in the conditions of reduction of budget appropriation for defence, the implementation of modern technology and standards of wireless communication of the civilian purpose. This approach is fully conform to with the concept COTS (commercial off-the-shelf), which is widely used even in the armies of the developed countries.

One of the most promising technology is to build a mobile subsystem of information exchange that can be used in special-purpose communication systems is IEEE 802.16 (WiMAX) technology, which provides high bandwidth, interference immunity and support of modern quality assurance technologies at acceptable power settings and Radio coverage area.

Requirements for promising radio devices:

• High bandwidth of the radio channel (> 200Kb / c);

• Multiband and multifunctional (FDMA / TDMA / CDMA) work;

• programmability of all types and modes of work;

• self-organization of the network (Plug-and-Play mode);

• intelligence, decentralization and optimization of network resource management functions (routing, load, topology, radio resources, security, etc.);

• work on different networks (cellular, mobile) and with different kinds of traffic (language, data, video);

• availability of positioning system;

• directed (MIMO) antennas;

• work in motion;

• modularity and open architecture;

• low power consumption;

• maximum use of civilian technologies and protocols.

In the future, the development of wireless technologies should aim at the full decentralization of the transmission network information in the tactical management chain by using fundamentally new technology [3], where the main element of the system will be a network node - a radio terminal (portable computer equipped with a radio modem) with router functions .

In this way, the issue of mobility, protection of the integrity of the network from weapons of mass destruction, and the minimum human participation in the process of managing a modern battle will be solved immediately. An analogue of this scheme is shown in Fig. 3.

At present, the using of http services is a priority for a lot of the World's developed countries. Based on the above civil protocols, automatic troop control systems were created.

In the armed forces of Denmark, the ACS "SitaWare" [4] (Fig. 4) is used to transmit tactical charts, short geographic reviews, notes and notations. Collaboration of commanders and headquarters through e-mail, forums, chats, with the possibility of transmission the military messages, the announcement about the transition to other stages of combat readiness.

The data about changing the tactical situation is displayed on the monitors of the commanders of the units, who in turn can issue orders and prescriptions both voice and data and video messages transmission.

At present, there are two similar C2 systems of the Armed Forces of Ukraine: ACS "Dnipro" and ACS "Karpaty", which are at the stage of improvement and refinement.

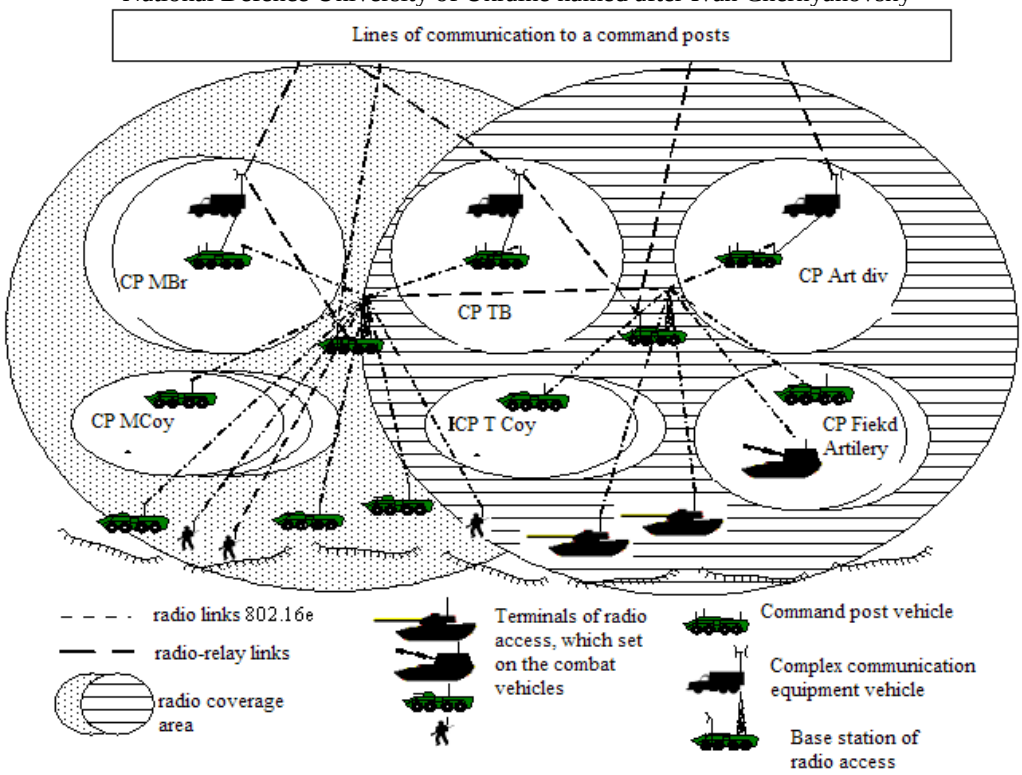

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Fig. 3. Version of the subsystem of communication and information exchange of mobile users of the communication and information system TLW JI is based on the basis of the equipment of the standard IEEE 802.16e-2005

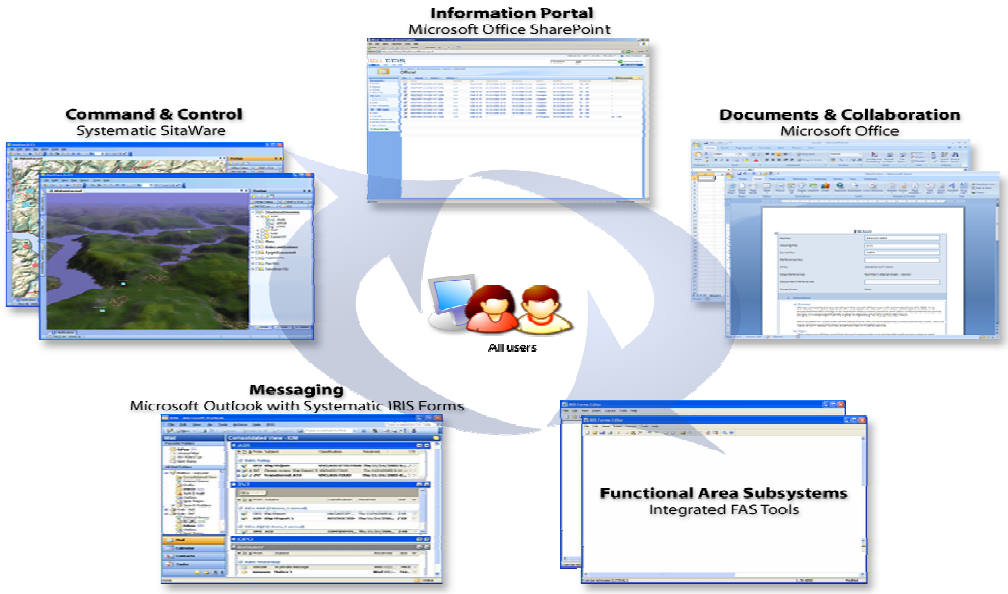

Fig. 4. Interface of the Armed Forces of Denmark the ACS "SitaWare"

The Army Battle Command System's automated command system is fn example of the use of http-services in the US armed forces (Fig. 5).

The using of these C2 system greatly increases the operative flexibility of the communication system, the unification of information that circulates in the ACS, which leads to synchronization of efforts during the battle actions. In the perspective of the development of such systems is the proving of mobile nodes to each soldier who is on the battlefield, the using of received information in all command levels in real time.

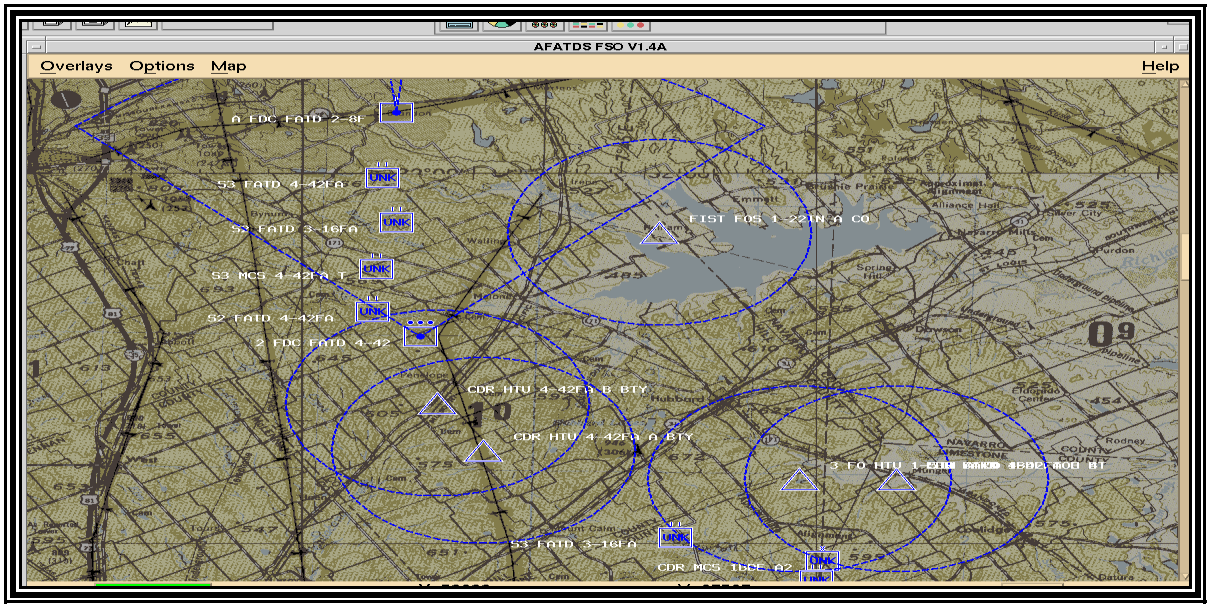

Fig. 1.5. Interface of the US Army ACS

For this purpose, IP “Delta” was created to provide information interaction and interoperability between systems of different functional purposes, built on various software and hardware platforms with the use of a wide range of information technology and geoinformation platforms, including outdated, due to using a single protocol of information exchange , which was taken in NATO member countries.

The main tasks of IP “Delta”:

Integration of various sources of information into a single information space of the Armed Forces of Ukraine;

Processing (bringing to the established form) and issuance of information on automated workplaces (etc - AWP) of officials of military agency (military units);

Strategic communications of processes of combined arms planning and managing them;

Providing access to a global information space of officials of military agency (military units, troops);

Providing of cooperation with other commands and law enforcement agency of Ukraine in the framework of a global information space.

The program module for data collection, analysis and processing (Delta Monitor) is predesigned to solve complex tasks of visualization of data from different sources, display of the operational situation on an electronic map in real time to for make operational conditions on it. It provides visualization of information, its storage, processing and distribution.

Conclusions. Existing civilian wireless communication technologies should become the basis for the establishment of mobile tactical radio networks. Application of the proposed architecture of the mobile component:

• will lead to the emergence of fundamentally new ways of fighting, change the forms and methods of troop control, and will significantly increase the combat effectiveness of troops.

• will significantly improve the basic characteristics of the communication system and automation (combat readiness, survivability, mobility, bandwidth, etc.).

The use of the Delta integration platform will ensure the interaction of units that use different software products and communication systems, which will reduce the time for decision making and increase the operational efficiency of combat units.

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The article came to the release 26.06.2017

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Аналіз досвіду створення та бойового застосування систем оперативного управління

Резюме. У статті проведено аналіз існуючих систем оперативного управління, які використовуються у провідних арміях країн світу для обгрунтування рекомендацій щодо побудови вітчизняної моделі управління військами.
Ключові слова: C4ISR, системи зв'язку та інформатизації, система управління.

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Анализ опыта создания и боевого применения систем оперативного управления

Резюме. В статье проведен анализ существующих систем оперативного управления, используемых в ведущих армиях стран мира для обоснования рекомендаций по построению отечественной модели управления войсками.
Ключевые слова: C4ISR, системы связи и информатизации, система управления.

UDK 358.1; 623.5

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Problematic issues in developing of the scenarios of military (combat) actions in prevention of military conflicts

Resume. The article presents the results of the analysis of problematic issues of determining the structure and content of the scenario of the military conflict (the planning scenario) in the interests of preventing military conflicts, implementing performance-oriented defense planning exercises.

Keywords: conflict situation, military conflict, the scenario of military conflict, the planning scenario, the scenario of military (combat) actions of grouping of troops (forces).

Formulation of the problem. In the process of forming and planning of defense policy, if necessary, to work out situations, depending on the situation and operational indicators, use scenarios. Situation is a set of conditions and circumstances that creates a particular environment. In our case, an example of a conflict situation is a military conflict. Planning scenarios are not intended to predict future situations and results. Rather, they are used in the process of developing the organizational structure of the armed forces and defense plans, for operational planning and substantiation of the requirements for capabilities. Capacity in the wide sense is defined as the ability to perform certain tasks. According to the results of previous studies the scenario approach is used to deal with possible conflict situations that may arise or have already arisen as a result of the development of the military-political situation (MPS).

At the stage of determining the requirements for future military forces for planning, a scenario is developed that is, in fact, a scenario of a military conflict as it relates to a situation in which troops (forces) can be used. Under the term scenario of a military conflict is understood a predictive description of the possible beginning, development, completion and consequences of armed struggle based on an assessment of the nature of modern military conflicts and the geopolitical position of the state. It does not specify details of the forms and methods of conducting military (combat) actions. For each scenario, the planners develop several options (inventories) of the capabilities that are planned for use. That is, the designation of a scenario is to find the answer to what should be done to achieve the desired result in a military conflict.

At the same time, in accordance with the guidance documents governing the operation of the military management bodies (MMB) during the definition of the design of the operation (combat actions), several alternative ways of its conduct are developed. Quantitative values of indicators for comparing these variants (methods) of conducting an operation (combat actions) can be obtained by simulation. Description of the conditions for assessing the effectiveness of alternative variants of the operation (combat actions) is called a scenario of military (combat) actions, which already details how to use the grouping of troops (forces) [3]. That is, at present, different terms are used: the scenario of planning, the scenario of a military conflict (or conflict situation) and the scenario of military (combat) action. All of them are designed for different purposes, have different structure, content and purpose. The most difficult task, in our opinion, is the development of military scenarios (combat actions). The complexity of their development is conditioned by the necessary detail of the source data for the quantitative and qualitative assessment of the options (methods) for conducting the operation (combat actions) that make up its basis, determined for comparison.

Analysis of recent research and publications

An analysis of recent studies [3-6] showed that they sufficiently fully reveal the order and sequence of scenario development for assessing the effectiveness of possible variants of the use of troops (forces) in the operation (combat actions). As a disadvantage, in [4] it is determined that they do not fully address the issue of taking into account the possible change in the partial tasks of

enemy troops in a military conflict, also does not determined a mechanism for adjusting the order and sequence of performing partial defense tasks by the grouping of its troops (forces) during of stage-by-stage simulation of combat operations of the opposing sides.

To solve this problem, in [4] it is proposed to use the method of forecasting processes, based on the methodology of scenario analysis of socio-economic systems. The essence of this method consists in the creation of a basic scenario of the dynamics of the process, which is considered as a consecutive choice of expert-valued intermediate states (stages of operation). According to the authors, the use of mathematical methods to select the most appropriate (probable) "microscripts" on each expert-defined phase of the operation (combat actions) will eliminate the uncertainties and contradictions that may arise from the experts during their development.

At the same time, such an approach is fully justified when the troops (forces) of the opposing sides use classical forms and methods of military action to achieve military-strategic goals, and existing mathematical models can be used to assess the effectiveness of military options (forces), for example, a total combat model (operation). Today, a military conflict can begin with peaceful anti-government actions and, as recent events in the world show, end with a brutal civil war and external interference by others, not necessarily neighbors, states or multinational forces without transforming themselves into an open armed confrontation between armed groups of the parties to the conflict.

The purpose of the article is to identify problematic issues for the development of the military (combat) action scenarios, clarification of the purpose, structure and content of the concepts of the military conflict scenario and the scenario of military (combat) actions.

The urgency of the article is substantiated by the fact that, on the one hand, the development and analysis of possible scenarios of military (combat) actions, allows us to determine how the active phase of a military conflict will develop, depending on the decisions taken, and to propose in the future several options for its solution to achieve the desired result. On the other hand, the scenario of military (combat) action allows timely identification of the risks and dangers that may arise when adopting one or another variant of the designation of the use of troops (forces) for the settlement (localization, neutralization) of a military conflict

Presentation of the main material.

It is known that scenarios for the development of any situation give the specialists who develop them, the ability to determine trends in their development, the relationship between the operating factors and form a general idea of the consequences. Comparing and evaluating possible options for developing a conflict situation, depending on the decision taken and factors that do not depend on it, but influence its development (for example, actions of the opposing or third parties in the conflict) and their comprehensive consideration, contribute to a rational decision on its settlement (localization, termination, liquidation).

There is no doubt that the scenario method involves the creation of appropriate technologies (algorithms) for their development, which provide a higher probability of developing a feasible (effective) design and minimizing the expected losses. Consequently, a capability-oriented scenario of military (combat) action should take into account the most important factors that can affect the development of a conflict situation [2].

The essence of the process of developing a scenario for military (combat) action is to establish, on the basis of analysis of many factors, a logical sequence of events that may arise in a very specific situation in order to identify alternatives (variants) of its development and partly possible consequences (in the form of losses of groups of forces (troops) of sides, economic potential, parts of the territory, etc.).

In fact, the factors that may affect the course of a military conflict and its final outcome determine its content. In turn, the disclosure of the content part in most cases is a complex task for script developers. First of all, this is due to the fact that it is very difficult to predict the mutual influence of the informational and psychological confrontation between the parties to the conflict, the influence of irregular groups, criminal gangs, private military campaigns, foreign mercenary legions, special services units, as well as military contingents of international organizations and coalitions on resolving the conflict.

Therefore, to develop a baseline scenario for military (combat) actions in the projected military conflict, the content of which is set out in [5, 6], should be supplemented by additional elements.

Before switching to the structure and content of the military (combat) scenario in the predicted military conflict it is expedient to clarify some concepts and terms. Today, during the study of military conflicts, the terms "scenario of a military conflict" and "scenario military (combat) actions" are widely used in the preparation and conduct of command and staff exercises, military games.

It is necessary to distinguish between the terms "scenario of a military conflict" and "scenario of military (combat) actions". The scenario of a military conflict can have several scenarios (options) for conducting military (combat) action. This conclusion can be drawn from the analysis of the generally accepted definition of the term scenario of a military conflict, which is given in [3]. To eliminate confusion in terms of defensive planning, it is suggested that the term "scenario of a military conflict" be used as it covers all phases of the conflict, and not only its active phase. In fig. 1 presents different approaches to the structure of the military conflict scenario. The top part of the figure gives you the approach used to create a scenario that is used during defense-based planning based on capabilities. In the bottom of the Fig. 1 Structure of the scenario used for strategic and operational level command-and-control exercises.

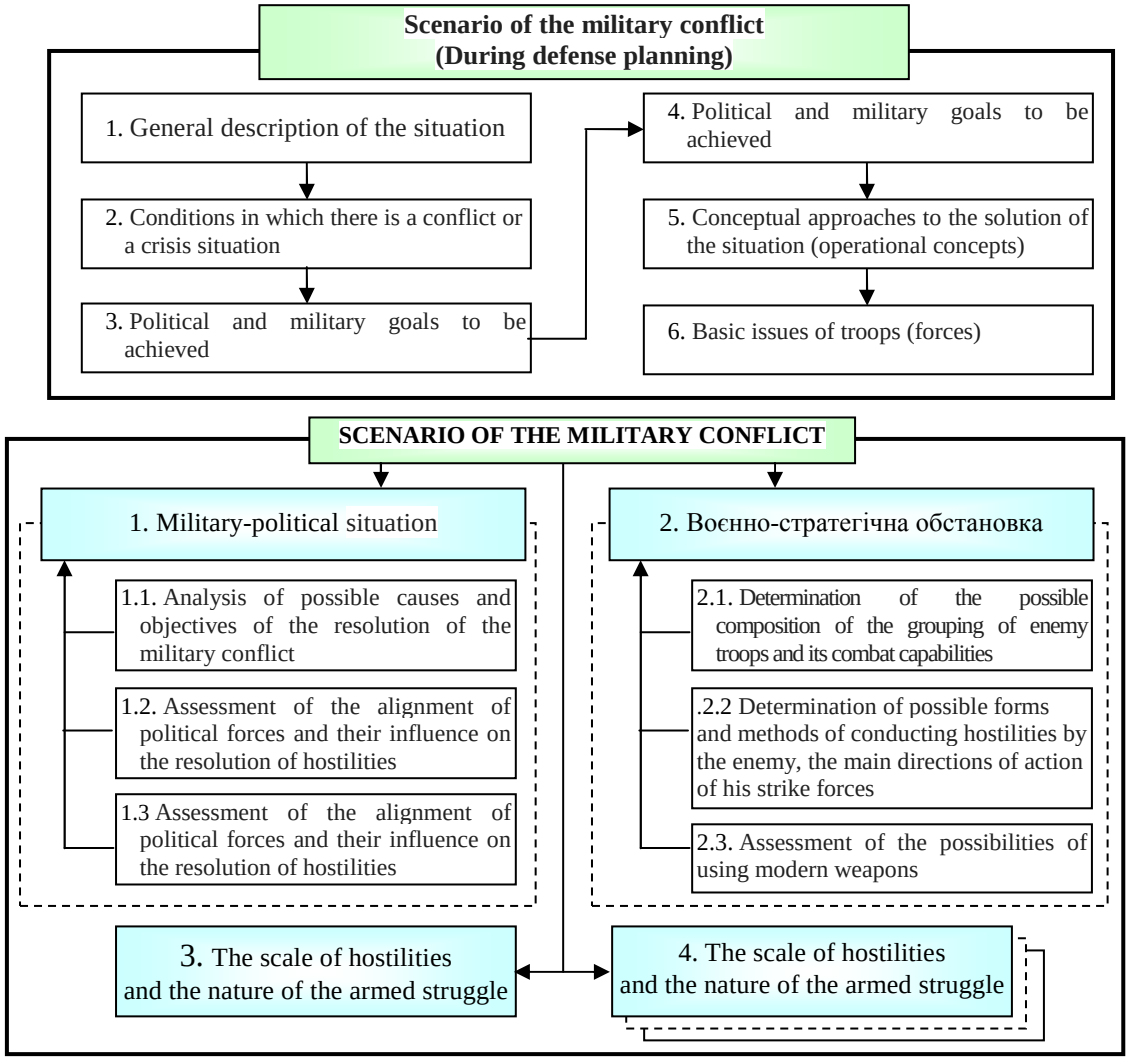

Fig.1 Comparison of approaches to the structure of the scenario of military conflict

As can be seen from Fig. 1, for each scenario of a military conflict, several scenarios of military (combat) or other actions can be developed.

They differ among themselves by the composition of the groups of troops (forces) of the opposing sides, which depends on the projected degree of participation of the armed forces of the parties in military conflict, the forms of military action that can be used by the opposing parties to achieve military-strategic (operational) goals, time rates of preparation and conduct military (combat) actions of the forces of the parties, ways of solving armed aggression (destabilizing the situation in the area of future military operations), methods of conducting operations (combat) actions within the defined forms applied ting groups of troops (parties) and others.

In general, the format of the scenario of a military conflict includes a brief description of the event, the political objectives pursued by the military-political leadership of the state to resolve the conflict, the main tasks (missions) of the armed forces and other components of the defense and security sector, the conditions of the situation and the basic requirements for the execution of tasks of military formations. The ATO experience has

shown that the non-fulfillment (delays in implementation) of individual tasks, as well as the lack of interaction between parts (divisions) of certain components of the defense sector, can significantly affect the overall situation in the conflict zone.

Situation in the scenario of military conflict is reflected as a set of factors and conditions in which the preparation and conduct of military (combat) actions will be carried out. The situation, which is reflected in the planning scenario, on a scale, is usually strategic, but under certain conditions can be specified to the operational level, and in some cases – to the tactical level.

The scenario of military (combat) actions covers only part of the scenario of military conflict, which deals directly with the preparation, conduct and, in part, the consequences of the military use of force groups in the form of operations, hostilities, battles and other actions in a possible military conflict.

It should be noted that the scenario of military conflict may not always provide for ways to settle it by conducting classical military (combat) operations. This is due to the fact that today the role of psychological, special and other types of operations in armed conflicts and local wars is substantially increasing. Military actions in the form of fighting, operations, fighting in the resolution of a military conflict are replaced by a minority in the resolution of the military conflict [6].

Therefore, it is not by accident that the operational training of troops (forces), namely: command and staff training (CST), war games, training, as well as scientific researches on the preparation and use of troops (forces) are conducted against the backdrop of a certain military situation that should be in line the nature of probable conflicts, modern tendencies and basic principles of armed struggle.

Thus, when developing the goals of conducting exercises, training, and war games, there is a need to take into account the results of the analysis of the reasons for the possible emergence of armed conflicts to which Ukraine may be involved, the probable military-political objectives of the parties in these conflicts, as well as forecasting the nature and degree of participation there of the Armed Forces of Ukraine. In our opinion, the results of such an analysis should, be reflected in the scenarios of military (combat) actions.

That is, the scenario of military (combat) actions is an integral part of the curriculum, which specifies the nature, factors and conditions for the preparation and conduct of military (combat) actions by force groups to achieve the objectives of armed struggle in a particular conflict. The basis of the scenario of military action is the military situation.

It is known [5] that a military situation is a set of factors and conditions in which the preparation and conduct of military (combat) actions is carried out. According to [5, 6], the main factors and conditions in which the preparation and conduct of hostilities is carried out include: the composition, group and character of the actions of the troops (forces) of the enemy; the status of its troops (forces), tasks set, material and technical security; position and actions of the neighbors; character of the area; climatic and meteorological conditions; time of the year and time of the day; terms of preparation for combat operations and execution of combat missions.

The military situation essentially forms the basis of the scenario of military (combat) action, which is developed in accordance with the scenario of the military conflict. Proceeding from the requirements of the guidelines, the priority task in developing the scenario of the military conflict is to predict the nature and extent of military (combat) actions.

After determining the nature and extent of military (combat) actions, other elements of the scenario, the content of which is shown in Fig. 2

It is important that the scenario of military (combat) actions should specify the probable forms and methods of the use of the aggressor's forces, as well as the possible sequence of implementation of these forms for the entire period of the conflict, and determine the appropriate forms and methods for the use of the groups of their troops.

The forms and methods of the use of troops (forces) and their degree of participation in conflicts will be determined primarily by the purpose of the conflict, the scale of military actions and the physical and geographical conditions of the area in the area of the conflict, military-political, military-strategic situation and the available military capabilities of troops (forces).

The possible scenarios of military conflicts, in which the possible involvement of the Armed Forces of Ukraine is expediently developed by experts, it is expedient to build up into a single database of military conflicts scenarios with the possibility of their further investigation and correction. For example, some publications suggest the inclusion of scripts in specialized information retrieval systems, and the methods of compiling scenarios using a computer are offered. Such approaches require more formalization of the scenarios of military conflict for their study and the

preparation of substantiated proposals for decision-making at the stage of development of military conflicts by the highest military-political leadership of the state.

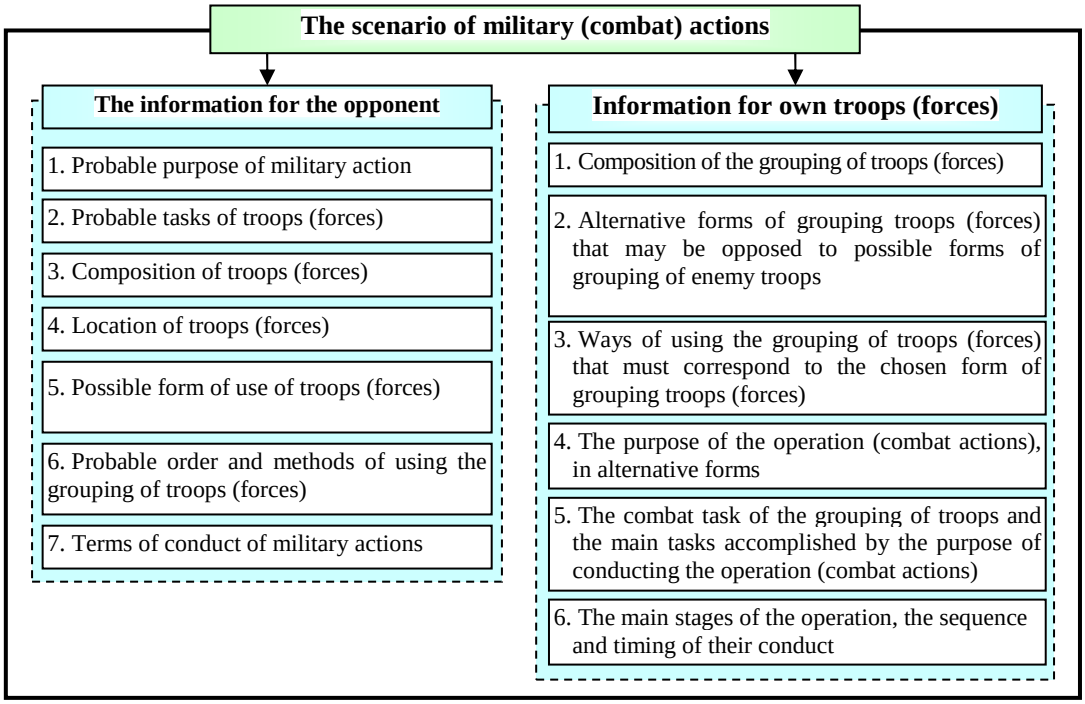

Fig. 2. Structure and content of the military actions scenario (option)

The scenarios of military (combat) actions being developed for conducting military games, command-staff exercises substantially contain the main elements of the combat (operational) environment and are the basis for the development of those who study, the design for an operation (combat actions). In accordance with the requirements of the guiding documents, the design is made taking into account (on the basis of) the results of the evaluation of the effectiveness of several variants (methods) of the use of troops (forces). The purpose of the evaluation of the effectiveness of the variants (methods) of conducting an operation (combat actions) during the development of the design is to determine the appropriate method of the use of troops (forces), as well as to specify the combat composition of the grouping of troops (forces).

It can be argued that the scenarios of military (combat) actions being developed directly for the evaluation of effectiveness (simulation of the operation (combat actions)) of the troops (forces) for the purpose of developing the design of the operation (combat actions) differ significantly in content from the scenarios that are developed during Defense planning their content and the degree of detail of the output data depends on the capabilities (peculiarities) of mathematical models, calculation tasks, and the methods by which the evaluation of the effectiveness of the use of troops (forces) is carried out and therefore proposed to call them scenarios for modeling.

The realities of the use of troops (forces) in a military conflict are always more complex and diverse, since they combine the use of troops (forces) to achieve the purpose of military (combat) actions and methods that do not foresee the use of military force [2]. It fully confirms the experience of using the troops (forces) of the Armed Forces of Ukraine and other military formations and law-enforcement agencies of special purpose during the anti-terrorist operation. In practice, some scenarios (their individual elements) can be implemented simultaneously or sequentially.

Conclusions

1. Availability of the scenarios of military (combat) actions will allow to reasonably approach the definition of the subject of operational training activities in the Armed Forces of Ukraine, to develop plans for conducting military games, command and staff exercises, trainings on which military management bodies receive practical skills in the preparation and conduct of operations (combat actions), which correspond to modern tendencies of armed struggle.

2. The need to create military strategies, military training, and scientific research on the specific operational (operational-tactical) situation, which forms the basis of the military (combat) scenario, makes it essential for the training of the troops (forces) and the military authorities.

3. The main function of the scenario of military (combat) action is to identify possible risks and consequences of conducting military (combat) actions in the course of the development of a military conflict. A wide range of possible alternative variants of localization (neutralization, elimination) of military conflicts developed by military experts will allow determining the most difficult situations which can arise during the conduct of military (combat) actions.

4. The scenarios of military (combat) actions of the troops (forces) as an alternative component of the scenario of military conflict (planning scenario) should not be oriented to the existing scientific and methodological apparatus for the evaluation of the results of conducting operations (combat actions), but rather to enable it to be identified weaknesses and give impetus to its improvement (development). This is especially true in assessing the possible outcomes of the troops (forces) in the context of the conduct of the opponent of the hybrid war, asymmetric actions, in assessing the expediency (effectiveness) of joint actions of the military formations of the Armed Forces of Ukraine and other military formations and law enforcement agencies of special purpose.

5. The advantage of using the scenario method for assessing the results of the use of force groups in possible military conflicts is that the method involves consideration of several alternatives for conducting military (combat) actions against the background of the projected military (operational-strategic, operational) environment and enables evaluate the advantages and disadvantages of each of them to choose the most appropriate in the future.

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The article came to the release 03.07.2017

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Проблемні питання розроблення сценаріїв воєнних (бойових) дій в інтересах запобігання воєнним конфліктам

Резюме. В статті наведені результати аналізу проблемних питань визначення структури та змісту сценарію воєнного конфлікту (сценарію планування) в інтересах запобігання воєнних конфліктів, виконанні заходів оборонного планування орієнтованого на спроможності.

Ключові слова: конфліктна ситуація, воєнний конфлікт, сценарій воєнного конфлікту, сценарій планування, сценарій воєнних (бойових) дій угруповання військ (сил).

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Проблемные вопросы разработки сценариев военных (боевых) действий в інтересах предотвращения военных конфликтов

Резюме. В статье приведены результаты анализа проблемных вопросов определения структуры и содержания сценария военного конфликта (сценария планирования) в интересах предотвращения военных конфликтов, выполнения мероприятий оборонного планирования ориентированного на способности.

Ключевые слова: конфликтная ситуация, военный конфликт, сценарий военного конфликта, сценарий планирования. сценарий военных (боевых) действий группировок войск (сил).

UDK 358.1

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Estimation of the operational efficiency of the artillery reconnaissance system in the interests of the enemy's fire destruction by missile forces and artillery

Resume. The article is devoted to the substantiation of the possibility of using the approaches of queuing theory as an alternative to the method of normative estimation of efficiency, which is used in assessing the operational efficiency of the artillery reconnaissance system in the interests of the enemy's fire destruction by missile forces and artillery. Also in this article, the advantage of combining the channels for obtaining and processing intelligence information in a single system is substantiated, and a methodology for assessing the operational efficiency of the artillery reconnaissance system in the interests of the enemy's fire destruction by rocket forces and artillery was developed.

Keywords: efficiency, the functioning of the artillery reconnaissance system, the enemy's fire destruction by rocket forces and artillery, the system of mass service, the flow of applications, the intensity of receipt of applications for obtaining intelligence data.

Formulation of the problem. In modern conditions, fire damage becomes especially important in defeating an enemy and attaining certain objectives of combat operations. Given the fact that in modern armed conflicts, the share of tasks with the use of weapons of mass destruction decreases, therefore the share of tasks reliant on conventional means of fire damage is significantly increasing. At the same time, the effectiveness of the fire damage depends on a number of factors. One of these factors is the conditions in which hostilities are being conducted. According to the military experts of the leading countries of the world, ignoring the conditions for conducting military operations can lead to a decrease in the military potential of military formations by 20 ... 30. The rapid change in the situation inherent in modern armed conflicts requires a reduction in the time to prepare data for the enemy's fire damage - correspondingly, the time required for the functioning of the artillery intelligence systems.

At the same time, the process of "detecting - defeating" enemy objects with missile forces and artillery also implies a certain precision of intelligence data.

Thus, in increasing efficiency, there is a contradiction between the need on the one hand to reduce the volume and duration of necessary calculations, and on the other - increase these characteristics to maximize their accuracy.

Proceeding from this, there is a need in such a scientific-methodical apparatus, which would allow to eliminate such contradiction.

The degree of development of the problem. The analysis of recent researches and publications on the above issues shows that at present, when assessing the efficiency of the functioning of the artillery intelligence system (hereinafter efficiency), it is assumed that it depends on the characteristics of the sources of intelligence used for this purpose.

Analyzing the experience of using mass service theory techniques in various fields of science and practice, it is possible to determine the advantages of these methods before the method of normative assessment of the operational efficiency of the functioning of the artillery intelligence system that is being used at the moment, which is the ability to evaluate the efficiency in Each situation in accordance with the tasks that were carried out, the ability to apply the efficiency indicator to the aggregate of intelligence tools, as a system of mass service.

Taking into account the advantages of the methods of mass service theory and the features of the functioning of the artillery intelligence system in the interests of fire damage by rocket troops and artillery, it is considered appropriate to consider the application of methods of mass service theory in developing a methodology for evaluating the operational efficiency of the artillery intelligence system in the interests of fire damage by rocket troops and

Therefore, **the purpose of the article** is to justify the possibility of using mass service theory methods to evaluate the efficiency and to develop a methodology for evaluating the operational efficiency of an artillery intelligence system.

Presenting main material. In general, the functioning of the artillery intelligence system in the interests of the enemy's fire damage by rocket troops and artillery is considered as a mass service system consisting of the following elements: the input stream of requests for intelligence data, the processing channels of applications, the queues for applications for intelligence waiting for service and Outflow of requests for intelligence data. For further research it is assumed that there are n channels of processing requests (intelligence tools) in the system, the flow of requests for intelligence data is received on the processing channels of applications. It is believed that this is the simplest stationary Poisson flow with intensity λ. It is also allowed that the service time of one application by one reconnaissance device is distributed by an exponential law with the parameter μ.

Considering the intensity of the service application, it is necessary to consider that the service channels (intelligence tools) used in missile troops and artillery are the same type and have the same capabilities as for the processing of intelligence information. Proceeding from this, the intensity of service on each of the channels N does not change and is equal to μ. Thus, the system of artillery intelligence is a SMO type M/M/N with a load.

In order to simplify calculations and increase understanding of physical sense, it is proposed that the main characteristic of the efficiency is to accept the full time of the application's stay in the system, which takes into account the waiting time in the queue (T_{och}) and the time of service (T_{obsl}).

At the same time, taking into account the constant variation of the combat situation, it is assumed that the value of the waiting time for each application will be different, that is to simplify the calculations within the required accuracy, it can be argued that n = 1, j = 1 (that is, N = n).

The system of artillery intelligence can be characterized by the following features: the system consists of a limited number of channels, each channel can simultaneously process only one application, each new application sent, having all the channels occupied, is in the queue and is in it until one of the channels is released . If an application enters the system when there is a free channel, it is immediately accepted for processing, so the mathematical expectation of the number of applications in the queue, or in other words, the average queue length will be determined as for a system with an unlimited flow of applications.

Given the sensitivity of this method to the essence of the operation of the artillery intelligence system in the interests of the enemy's fire damage by rocket troops and artillery, as well as simplicity and visibility, it would be advisable to develop a methodology for evaluating efficiency on the basis of it. For a more varied assessment of efficiency, it is proposed to select a number of partial indicators and, based on them, to determine a generalized indicator of the operational efficiency of the artillery intelligence system in the interests of rocket troops and artillery. It is known that each of the indicators must have a clear and understandable physical meaning, be "critical" and convenient for computing and characterizing the basic properties of the system. Taking into account these requirements, the partial indicators are chosen: the time of the application in the system (Tn), the increase in efficiency through the integration into a single system (δ).

Of course, a set of partial indicators should characterize the system as fully as possible. But most likely to evaluate efficiency only in a set of partial indicators is impossible, since each of the partial indicators characterizes only one property of the system. Therefore, it is necessary to define a generalized evaluation of efficiency. In this case, the generalized indicator of the evaluation of the operational efficiency of the system is proposed to accept the probability of obtaining the necessary intelligence data to a given time (P (t)).

Conclusions. Thus, the use of a common methodology for assessing the operational efficiency of an artillery intelligence system in the interests of the enemy's fire damage by rocket troops and artillery, based on the use of the method of mass service theory, reduces the amount and duration of the required calculations when maximizing their accuracy, and unlike the existing methodology, which Is based on the method of normative assessment of efficiency, provides for additional consideration of the following factors:

the possibility of assessing the functioning of an artillery reconnaissance system of variable composition;

interconnection with the conditions of a particular operation (battle);

conducting evaluation of efficiency on different indicators;

the possibility to provide recommendations for each individual situation.

The calculations have shown that the use of the method of mass service theory in assessing the efficiency of the functioning of the artillery intelligence system in the interests of fire damage by rocket troops and artillery will allow the development of recommendations that will result in the implementation of which will be possible:

Increase the operational efficiency of the system of artillery intelligence on average by 2 times;

to optimize the resource of forces and means of the system of artillery intelligence for each individual situation;

Increase the flexibility to provide intelligence to fire units of rocket troops and artillery.

Further studies in this area are proposed to be devoted to improving the methodical apparatus for receiving and processing intelligence information to ensure fire damage by rocket troops and artillery, and to assess the effectiveness of such security, to justify the optimal amount of forces and means of artillery intelligence system.

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The article came to the release 23.06.2017

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Оцінювання оперативності функціонування системи артилерійської розвідки в інтересах вогневого ураження противника ракетними військами і артилерією

Резюме. Стаття присвячена обґрунтуванню можливості використання підходів теорії масового обслуговування, як альтернативи методу нормативного оцінювання оперативності, який використовується при оцінюванні оперативності функціонування системи артилерійської розвідки в інтересах вогневого ураження противника ракетними військами і артилерією. Обґрунтована перевага об'єднання каналів отримання та обробки розвідувальної інформації в єдину систему, та розроблена методика оцінювання оперативності функціонування системи артилерійської розвідки в інтересах вогневого ураження противника ракетними військами і артилерією

Ключові слова: оперативність, функціонування системи артилерійської розвідки, вогневе ураження противника ракетними військами і артилерією, система масового обслуговування, потік заявок, інтенсивність надходження заявок на отримання розвідувальних даних.

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Оценивание оперативности функционирования системы артиллерийской разведки в интересах огневого поражения противника ракетными войсками и артиллерией

Резюме. Статья посвящена обоснованию возможности использования подходов теории массового обслуживания как альтернативы методу нормативного оценивания оперативности, который используется при оценивании оперативности функционирования системы артиллерийской разведки в интересах огневого поражения противника ракетными войсками и артиллериею. Так же в данной статье обосновано преимущество объединения каналов получения и обработки разведывательной информации в единую систему та разработана методика оценивания оперативности функционирования системы артиллерийской разведки в интересах огневого поражения противника ракетными войсками и артиллериею.

Ключевые слова: оперативность, функционирования системы артиллерийской разведки, огневого поражения противника ракетными войсками и артиллериею, система массового обслуживания, поток заявок, интенсивность поступления заявок на получения разведывательных данных.

UDC 351.746.1

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The forces and facilities action model of the State Border Guard Service of Ukraine in the period of military and political situational complication and threatening period

Resume. In the article, the tasks have been defined and the forces and facilities action model of the State Border Guard Service of Ukraine in the period of military and political situational complication and threatening period has been developed, on the basis of the general operating modes.

Keywords: State Border Guard Service, military and political situational complication, threatening period, tasks, action model.

Problem statement. In modern historical realities the role of the State Border Guard Service of Ukraine (hereinafter SBGS) as an important component of national security increases significantly and forms the core of the security and defence sectors (hereinafter SDS) together with other military formations and public authorities.

By the SDS military formations we mean the complex of military units and their management bodies created under the Ukrainian law. The complex of military units and their management bodies is staffed by military personnel and is intended to defend Ukraine's sovereignty, independence, national interests, territorial integrity in case of armed conflict or threat of attack.

The role, place and functions of SBGS in ensuring the security of state border (hereinafter SB) were laid in 1991 with the adoption of the laws of Ukraine "On the State Border", "On the Border Troops", which are specified in the Constitution, the law of Ukraine "On the State Border Service" and other legislation. Nowadays, the SBGS of Ukraine ensures the implementation of certain functions to ensure the integrity of the SB and the protection of sovereign rights of Ukraine in its exclusive (maritime) economic zone.

The annexation of the Autonomous Republic of Crimea by Russian Federation (RF), terrorist activities of sabotage groups and radical separatists in the Eastern part of the country forced the determination of the new priorities in the development of the SBGS. Also specific activities, connected with capacity building, were undertaken in management bodies.

Moreover, each new armed (military) conflict forces to correct the bodies (divisions) of the military and law enforcement units of the SDS and SBGS usage model.

Analysis of recent research and publications in which the solution of this problem has been initiated and on which the authors rely. The number of works is devoted to the use of force and means of the border department in the period of military and political situational complication and threatening period. They addressed the issues of the use of the Border Guards of Ukraine in the period of military and political situational escalation, the preparation and conduct of defensive operations during the initial period of the war, the local wars and armed conflicts in the XX century.

At the same time, it should be noted that the study of the forces and facilities model of the SBGS bodies in modern armed conflicts, "hybrid wars", has not yet been carried out, and a number of actual and practically significant problems in this area requires the attention of the researchers and needs further development.

The necessity of studying this issue as an integral part of the theory of operational art of the SBGS is caused by the significant changes in the nature and content of recent wars and local conflicts (military confrontation in Chechnya, the Russian-Georgian conflict in 2008, the conduct of the anti-terrorist operation ("hybrid war"), in the East Ukraine, etc.).

The lack of researches on this aspect greatly reduces the effectiveness of the SBGS functioning in the conditions of military and political situational aggravation and its fulfilling of tasks on SB protection. This causes the necessity and topicality of the article.

The aim of research is clarifying the tasks and developing of the forces and facilities model of the State Border Guard Service of Ukraine in the period of military and political situational complication and threatening period.

Presentation of the main material of the study. Ensuring the security of the SB is a

complex and dynamic process, which includes the involvement of a large number of different types in terms of composition, purpose and capabilities SDS forces and facilities. Analysis of legislative and regulatory documents [4, 6, 8, 13-17, 22-25], scientific papers [18, 19], generalization of the experience of Antiterrorist operations makes it possible to determine the main typical tasks assigned to the Armed Forces Ukraine, the National Guard of Ukraine, the Security Service of Ukraine and the SBGS for the purpose of ensuring the safety of SB and making a description of forces and facilities model of the SBGS and other military units of the SDS during the specified periods.

In the article, the term forces and facilities model of the SBGS of Ukraine is understood by us as the description of the process of operational and service activities, reflecting its purpose, designed to study its properties, features of functioning in interaction with internal and external elements. Forces model reflects the sequence and content of the stages of work, the set of procedures, capacities and capabilities, which are involved, and the interaction of participants in the investigated process.

The essence of the model is that with the military and political situational aggravation, tasks of ensuring the security of the SB, in particular: security of the SB, the cessation of provocative actions on the SB, the fight against the sabotage and reconnaissance force, other armed formations of the aggressor and anti-state illegally formed armed groups (hereinafter AIFAG) and others, within the boundary of a controlled border area (hereinafter CBA) will be carried out by the forces and means of the SBGS independently with the assistance of the strengthening units (reserves).

The forces and means of the SBGS will carry out the tasks, taking into account the construction of the SB within the CBA, as well as at the border checkpoints through the SB. The personnel of the border detachments (hereinafter BD), the departments of the border service and other units intended for direct protection of the SB for other tasks in this period are not involved.

In this period, the security of the SB in accordance with the situation is implemented, as a rule, in an enhanced version of the determined staffing level of peaceful time, the reserves receive tasks and act to ensure a reduction of the level of danger.

The combat reserves (operational border command posts, border command posts of rapid mobility), will be taken from the bodies (divisions) of the SBGS and will be used to strengthen the units, which are directly engaged in the protection of the SB. Also they will be used both to strengthen the protection of the SB and on areas of the SB, where armed incursions into the territory of Ukraine, armed conflicts (armed provocations) are possible.

Chiefs of the BD should transfer reinforcing units to the reinforcing mechanized company for actions in the areas of military unit's responsibility in the protection of the SB, with the aim of strengthening the protection of the SB, conducting border searches (operations) from the plans determined by the SBS's military units.

In the further military and political situational aggravation, chiefs of the BD, except the reinforcing units, should also transfer support units in the quantity of the mechanized company, during a threatening period, in the case of a direct threat of armed (military) conflict, to stop armed and other provocations on the SB, the fight against the sabotage and reconnaissance force, other armed groups of the aggressor and AIFAG in order to ensure the deployment of the troops on the SB.

Reinforcing (support) units will participate in:

conducting search operations in areas of possible location of the sabotage and reconnaissance force other armed formations of the aggressor and AIFAG in order to detect, detain or destroy them;

blocking (covering) areas of possible location of the sabotage and reconnaissance force, other armed units of the aggressor and AIFAG, as well as areas of emergencies on the SB and on the border checkpoints (into and out control points);

dismemberment and expulsion of large masses of the civilian population;

termination of provocative actions against bodies (subdivisions) of the SBGS;

destruction of small groups of the enemy who invaded the territory of Ukraine;

ensuring the nomination and deployment of troops (forces) to protect the SB.

Operational groups (representatives) from the relevant military units with the necessary means of communication, protection and security will be allocated to the management points of the BD and the dedicated reinforcement units (support units) for management and coordination.

Effective combat strength of the reinforcements (support units), operational groups, the order and their call signs, the routes of appointment, the points of meeting, the areas and time of concentration, the task, the procedure of communication and the terms of operational subordination will be determined by the SBGS leadership, in agreement with the relevant

leadership of the SDS on the basis of cooperation plans, which were developed in peacetime.

At the same time, military formations of the SDS were determined in the interests of the protection of the SB:

activate visual and other types of surveillance of the place of service by the departments of the SBGS;

provide assistance to the forces and means of the SBGS in maintaining the regime measures on the SB (in the CBA);

exhibit temporary checkpoints on the rear approaches to the SB;

take part in blocking (covering) areas (boundaries), in search of, detaining (destroying) the sabotage and reconnaissance force, other armed formations of the aggressor and AIFAG;

take measures in strengthening the protection of the locations of deployment of military formations, important military objects and approaches to them.

Border searching, that can develop into a border operation, the specific features of which are actions that do not have a pronounced character of armed struggle are carried out, when detecting violators of the SB, the sabotage and reconnaissance force, other armed formations of the aggressor and AIFAG.

Appropriate management of the SBGS may decide to carry out several operations, while they can be carried out simultaneously or consistently in cases of a mass breakthrough of violators of the SB, the sabotage and reconnaissance force, other armed formations of the aggressor and AIFAG.

With the transition to the enhanced protection of the SB determined by the plans, the military units of the SBS carry out appropriate measures to strengthen the protection of the locations of troops, important objects and approaches to them, as well as to increase the combat readiness of the reinforcement units (support units).

During the operational-service activities, the forces and means of the SBGS take part in the tasks of protecting the SB in the air space as auxiliary posts in the air defense system of the state. Proceeding from this, when detecting a violation of the SB in the airspace the SBGS's unit should:

immediately inform the nearest units and command posts of the air defense forces of the Armed Forces of Ukraine;

provide air defense troops with communication channels for reporting in accordance with the developed scheme;

organize the research on the flight of the aircraft, make a diagram and description of the violation of the SB.

The comprehensive support of the reinforcement units, as well as the support units, is directed by such SBS's military formations from which they are allocated. Medical support of the reinforcement units (support units) during the period of their being subordinated to the BD is carried out by the medical services of the BD. The medical services of the interacting military formations will assist in the evacuation of wounded and sick in the medical institutions and other units, which are in their subordination, as well as will provide other necessary assistance.

Taking into account, that the responsibility for the protection of the SB in peacetime (with the military and political situational complication, threatening period) is entrusted to the SBGS, planning, management and interaction, coordination of the activities of the SBS's military units in the interests of protection of the SB, will be carried out by the appropriate command of the SBGS.

Direct management of the protection of SB departments' actions reserves, units of reinforcement (support units) will be implemented by the chiefs of the BD in their lanes of responsibility.

During this period, the management and interaction between the forces and means of the SBGS and SBS's military units are organized by the staff governing body of these military units. The existing system of peacetime communication is used for the organization of management and interaction. Communication is organized with the use of radio and the leading means of communication.

Communication with the reinforcement units (support units), which are allocated from the plans determined by the SBS's military formations is organized by the authorities of the SBGS, for which, if necessary, communication officers from the BD with means of communication and documents of the secret management of the troops are sent to the reinforcement (support) units.

The officers from the relevant intelligence units (divisions) should be directed the governing bodies of the SBGS in order to ensure that the forces and means of intelligence are deployed.

The headquarters of the interacting military formations, the commanders of the relevant units must prepare maps with coding established in the administrations of the SBGS for the management of the reinforcement units (support units) during the execution of tasks.

Conclusions. So, the proposed model will increase the reasonableness and efficiency of decision-making on the use of forces and means of the SBGS, other military formations of the SBS and solve many issues related to ensuring their clear interaction in the performance of tasks.

We consider **prospects for further research** in the development of a methodical instrument for developing of forces and facilities models of SBGS in the conditions of a special period when entering the martial law and plans of territorial defense.

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The article came to the release 26.06.2017

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Модель дій сил і засобів Державної прикордонної служби України в період ускладнення воєнно-політичної обстановки та загрозливий період

Резюме. У статті на підставі загальних режимів функціонування Державної прикордонної служби України визначено завдання та побудовано модель дій сил і засобів Державної прикордонної служби України в період ускладнення воєнно-політичної обстановки та загрозливий період.

Ключові слова: Державна прикордонна служба, ускладнення воєнно-політичної обстановки, загрозливий період, завдання, модель дій.

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Модель действий сил и средств Государственной пограничной службы Украины в период осложнения военно-политической обстановки и угрожаемый период

Резюме. В статье на основании общих режимов функционирования Государственной пограничной службы Украины определены задачи и построена модель действий сил и средств Государственной пограничной службы Украины в период осложнения военно-политической обстановки и угрожаемый период.

Ключевые слова: Государственная пограничная служба, осложнение военно-политической обстановки, угрожаемый период, задачи, модель действий.

UDK 004.9:005.95

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Analysis of experience of leading countries of the world in relation to forming and drawing on skilled reserve in the armed forces

Resume. In the article experience of armies of leading countries of the world is generalized on creation of skilled reserve and the analysis of world tendencies is carried out in relation to automation of processes of skilled management.

Keywords: skilled reserve, completing of the armed forces, principles of forming of the armed forces, CASS of management by a personnel.

Formulation of the problem. Each state is required to build a multi-level security system that has political, economic, diplomatic and defense components. Although guns are not “the last argument”, but sometimes only the availability of effective armed forces, it allows diplomatic methods to be obtained.

In the world there are different approaches to the formation of armed forces, but the most effective, in terms of combat capability, rapid deployment and strength, were, there are and remain armies structurally consisting of regular troops and reserves [1].

The armed forces of any country and Ukraine in particular, due to the presence of an aggressive neighbor that not only has territorial claims, but also embodies aggression, must fulfill the tasks:

- support of a qualified personnel army for solving current tasks of defense;
- formation of a qualified reserve for replenishment of the personnel army and rapid increase in its composition during periods of crisis;
- creation of a mobilization infrastructure in the event of conflicts.

The contracted army of Ukraine is able to solve only the first task. Two other tasks are solved only at the expense of reservists who have been in service and training for years of military service. Thus, the Armed Forces of Ukraine require reorganization, not only in terms of the composition of the arming and quality of military training of regular troops, but also in terms of staffing and reserve preparation.

Formation of an effective Reserve for candidates for promotion and ensuring its effective use by the personnel of the Armed Forces of Ukraine requires the carrying out of certain studies that can be submitted in the form of a structural-logical scheme in Fig. 1.

The actual article is devoted to highlighting the results of research in the first direction, namely, the analysis of best practices in the formation and use of personnel reserve.

Analysis of recent research and publications. In open sources, a sufficient number of works, for example [2], devoted to improving the quality of military training of regular troops and the reserve, as well as ways of staffing the armed forces during periods of crisis and aggravation of the political situation in the region. The principles of the formation of armed forces are considered: professionally voluntary; militia and militia-personnel; recruiting In addition, the territorial and extraterritorial ways of forming the armed forces are considered.

Sources [3-5] highlight the peculiarities of the formation of an effective Reserve in the leading countries of the world.

The purpose of the article is to summarize the experience of the armies of the leading countries of the world in creating a personnel reserve and analyze global trends in the automation of personnel management processes.

Presenting main material. The result of the training of the personnel reserve is the formation of a certain number of citizens, who have undergone a preparatory selection (assessment) and have the necessary capacity to perform their direct duties in the required post in due time.

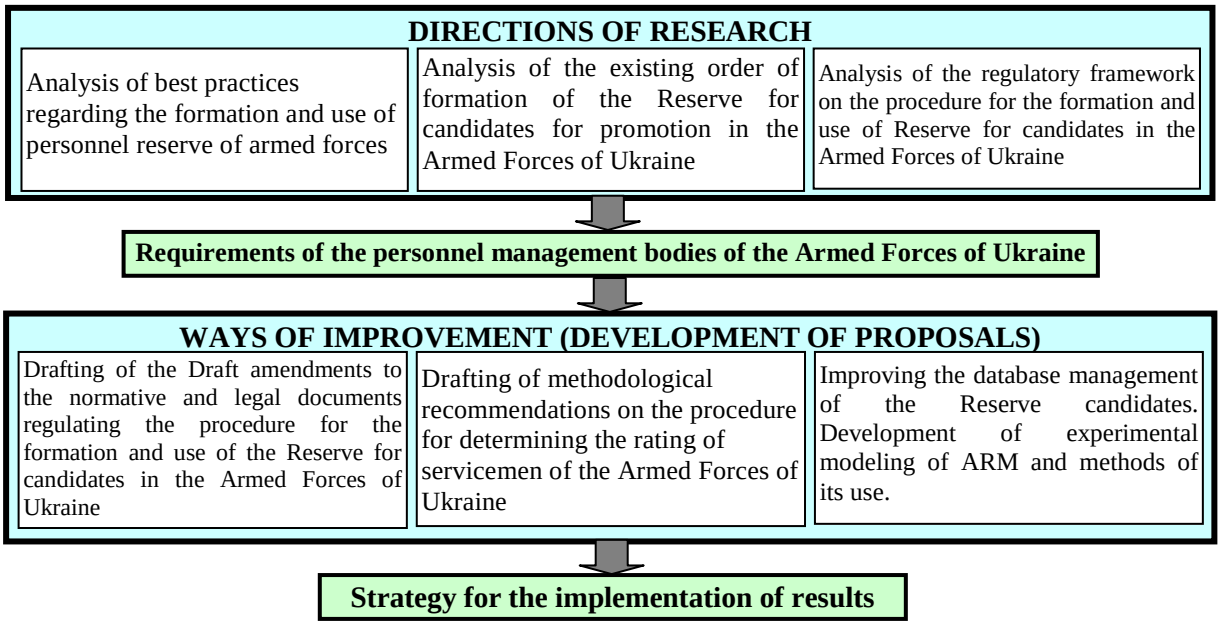

Fig. 1. Structural-logical scheme of researches

In other words, personnel reserves are citizens of the state, which are planned for appointment to the necessary posts. Such an inventory of nominees has a conditional structure. Personnel reserve (professional reserve) can be both internal and external. As for the internal reserve, it consists of active servicemen and is divided into operative and promising ones.

The operational reserve is active servicemen who are able to replace superior directors and are ready to take certain positions without any additional instructive measures.

A promising reserve is active military personnel with a high potential, but with the need for additional training.

The formation of an *external reserve* is carried out from the military-losing citizens of the state. In each state, certain categories of population are attracted to military duty.

The above classification can be represented in the form of a scheme presented in Fig. 2

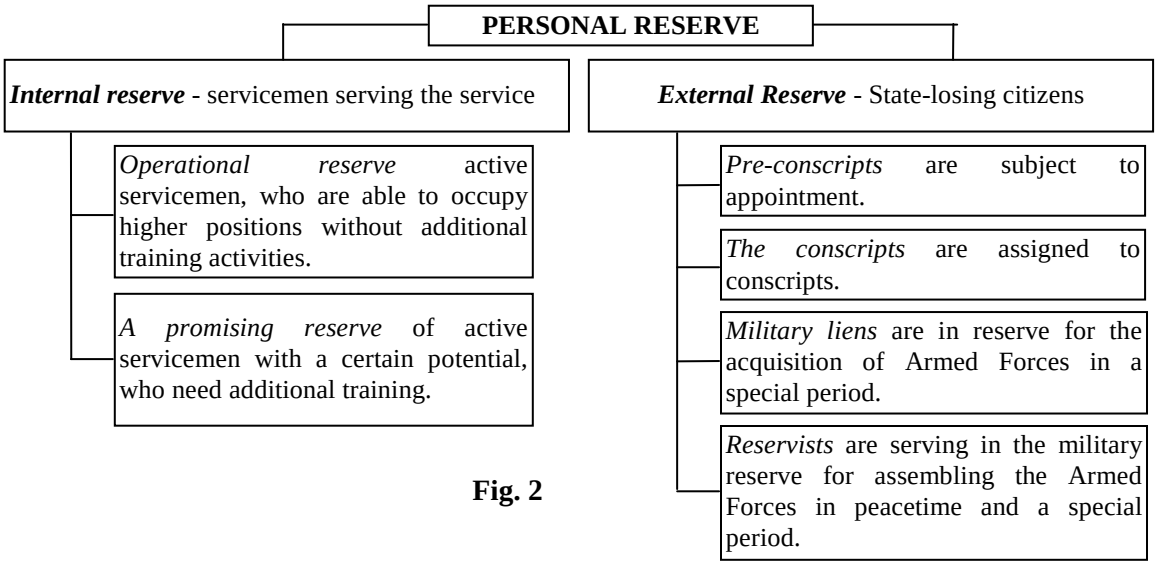

Fig. 2

Analysis of the experience of the leading countries in the formation and use of personnel reserve, according to the classification, which is shown in Fig. 2, it is convenient to hold separately for the categories of external and internal personnel reserves. In addition, it is advisable to study the experience with automation of personnel reserve accounting and monitoring of career development of active servicemen.

Professional Army. Today, fully professional armies have more than fifty states, including such large countries as Japan, India, Pakistan, Canada, Australia, Nigeria and the Philippines. Not all of them are protected from potential opponents by the oceans or territory of the Allies. Japan separates from the Russian Federation a strip of water a few tens of kilometers wide. India and Pakistan, which stably muting between

themselves, have several thousand kilometers of common land border.

The most powerful and numerous professional army is the ***United States***. The acquisition of armed forces is carried out on a voluntary basis. All candidates are subject to testing in order to identify their general level of inclinations and abilities, the possibilities and feasibility of using their chosen specialty. As a result of testing, candidates are assigned according to the relevant military-account specialties.

After taking the oath, the recruits are sent to the educational centers of the armed forces for the initial training and training in the specialty.

The National Guard occupies an unusual place in the US armed forces. On the one hand, it is the state troops (its formation is created in all fifty states), which are subordinated to state governors and used by them to support public order, disaster management and other tasks. On the other hand, the National Guard is a military reserve of the armed forces of the United States, which unites in its composition a significant part of the military power of the land forces and the US Air Force (navy forces is not within the National Guard). According to the concept of "united forces", it is considered necessary to prove the combat capability of the National Guard to the level of regular troops in terms of staffing, equipment of weapons and equipment, and the quality of combat training.

The reserve of the American armed forces, like regular troops, is completed on a voluntary basis. All reservists are in cash. The basis for payment is the contract concluded by the reservist with the Ministry of Defense. Private and sergeant warehouses of the reserve are replenished at the expense of servicemen of regular troops who are retired from the active service and are obliged under the terms of the contract to serve in the reserve, former servicemen who have expressed a desire to serve in the reserve, as well as those who had not previously served military service and were contracted. The officer's reserve consists of former civil servants, graduates of civil service training courses at civilian universities, as well as graduates of officer schools that recruit their students from reserve officers of the rank and file officers.

For service in the army of ***Japan***, persons of male and female aged 18 to 25 years are accepted. The term of service under the primary contract in the ground forces for two years, in the Air Force and Navy, as well as for the technical specialties of the land forces for three years. After the termination of the initial contract, the term of its validity can be extended.

Unlike the US, practitioners call for a reserve of volunteers who have not previously been in military service. Japan completes the reserve of its army only at the expense of persons, who have served in regular troops. Service in reserve is paid in the form of monthly cash payments to the reserve. Of the total number of servicemen who are released annually, about half are credited to the reserve, and no other military training is carried out. The retraining of reservists is carried out during the training fees. The Law on "Self-Defense Forces" provides for the possibility of holding one or two fees per year, with a total duration of not more than 20 days. In practice, the meeting was limited to five days a year. Reservists who retired from the armed forces no more than a year ago during the first year of their stay in the reserve are one-day charges. The total strength of the reserve of the Japanese "self-defense forces" is less than 50 thousand people, including 46 thousand people in the armed forces, 1,1 thousand people of the Navy, 0.8 thousand people of the Air Force.

Thus, the size of the small and young age-limit, the reserve of the Japanese army does not exceed 20% of the number of regular troops with a population of about 130 million people.

The militia and personnel-militia armies are the direct opposite of purely professional armies. For the militia army is characterized by the absence of personnel military formations and almost completes substitution of command posts by officers for whom military service is not the main occupation. In pure form, a police force exists only in Switzerland, where the male population aged 20 to 50 is considered to be a military person, suitable for health reasons before military service. The army is called by 91-92% of the male population more than in any other country (perhaps, except Israel).

Switzerland, with a population of about 7 million, is capable of unblocking and deploying 650,000 armed and trained fighters at the defensive lines for 48 hours. Small arms, ammunition and uniforms are reserved by reservists at home.

The staffing of the Swiss army has only about 3,500 people. It includes only officers and non-commissioned officer's instructor training centers. With regard to the units and connections of the Swiss Army, then command personnel of the divisions and higher are personnel. The rest are made by the military. After passing at the age of 20 years of a recruiting school with duration of 119 days, the soldiers are credited to the reserve of the first turn. In its composition, they are until they reach 32 years of age. During this period, they are

trained in 8 combat training units, consisting of parts and units that are being deployed for educational purposes in military service states. Duration of each collection is 20 days (total 160 days). At the age of 43-50 years, the military is in the reserve of the third stage. During this period, his combat training is limited to two meetings (13 days). Thus, the ordinary staff calls for military service with a total duration of 330 days. Unter-officers serve 511 days, officers 906 days.

The main feature of the *personnel and militia armies* is the peaceful maintenance of small personnel forces with short terms of compulsory military service, coupled with the support of a high degree of mobilization readiness of numerous trained reserves. In addition, in countries with personnel and police forces, in addition to the regular army and its reserves, it is usually created as an independent component of the armed forces and purely militia formations, which are usually completed on a voluntary basis.

A typical example of personnel and militia armies is ***Denmark***. Regular Danish armed forces make up about 31 thousand people, including 9.2 thousand recruits. The other contingent consists of personnel, including volunteers of the private and non-commissioned officers, who are contracted. Decisive role is assigned to trained reserves. In the case of mobilization, the number of Danish armed forces, in comparison with the period of peace, grows more than fourfold. The main purpose of regular troops is to prepare reserves and ensure mobilization deployment. In training-mobilization regiments training is conducted only by private staff. Training of junior commanders (non-commissioned officers) is carried out in schools and educational centers of the forces of the generations. Officers' training is being taught in Copenhagen, schools of reserve officers and part-time officer schools.

The purely militant component of the Danish armed forces is the “hemvern” armed voluntary organization, built on the territorial principle. She is enrolled volunteers from 16 to 50 years old. Mostly, these are former servicemen, retired from the reserve for age or health, as well as persons released for any reason from urgent military service. The command staff of “hemvern” is completed at the expense of the retired officers of the Danish army, as well as at the expense of graduates of their own command school. The personnel of “hemvern” learn, as a rule, in time free from work. Thus, in the case of mobilization, Denmark (a population of 5.1 million people) is capable of short-term deployments, including regular troops, reserves and "Hemvern" in the amount of about 200 thousand trained and armed soldiers.

Even more troops in relation to their own population may be put forward by other countries adhering to the personnel and militia system of staffing of the armed forces. Thus, ***Norway*** (population 4.2 million people.) With the strength of the regular army of 34 thousand is able, if necessary, to unblock the army for 24-72 hours in 400 thousand people. (including 285 thousand reservists of the regular army and 85 thousand militants of the local Guard), not counting 60 thousand reservists of the second stage. ***Sweden*** (a population of 6.4 million people, a regular army of 64.5 thousand people) is capable of putting up 850 thousand people for 2-3 days under the gun, including 125 thousand volunteers from the territorial guards. The latter are able to take the positions assigned to them under the mobilization plan within one hour.

It should be noted that the number of countries with personnel-militia armies continues to grow. In particular, in the mid-1970s, ***Austria*** joined the manpower and police recruitment system. Do not consider the territorial militia principle obsolete and the country with professional armies. They use it successfully to prepare reserves (for example, the National Guard of the US Armed Forces).

Personnel-recruited armies occupy an intermediate position between professional and personnel-militia. Their unifying feature is the use of the principle of military service with a relatively long (more than one year) service life of conscripts. Unlike professional, recruitment and recruiting armies have more prepared reserves and a large total number in relation to the number of inhabitants of the country. In comparison with the personnel and militia armies, they contain peaceful regular recruits, but have less reserve. As a rule, the training of their reservists differs from professional and personnel-militia armies with less intensity and regularity.

For more than half of the NATO countries, including Germany, France, Italy, Spain, Turkey, and many other countries of the world, for example, the Russian Federation, Brazil, Argentina, Indonesia, South Korea and Syria, there are more than half of the personnel. Terms of compulsory service in such armies from 12 months (Italy, Spain) to 30-36 months (Egypt, South Korea) and three to four years (China).

A typical recruiting army is the armed forces of ***Germany***. All German citizens of the sexes aged 18 to 28 must undergo urgent military service. Its duration is 15 months. More than half (55% of the total number of regular army) is completed on a

voluntary basis. All volunteers are divided into two categories: contracted servicemen (contracts are for a term of 2 to 15 years) and personnel (employees up to the statutory limit age). After the expiration of the contract, the servicemen who signed him receive an initial allowance. Personnel military after reaching the established age are entitled to a pension.

Military lenders, those who served a valid service, are credited to the reserve. All reservists are divided into several categories of readiness, according to which they can be called again in the armed forces. Servicemen who have completed an urgent service or contract service are credited to the *permanent reserve*, in which they remain assigned to their units within 12 months after the demobilization. During this time they can be called to serve on the reserve by order of the Minister of Defense, that is, without announcing in the country of mobilization. At the end of the specified period reservists are transferred to the reserve of the first turn, intended to complement the Bundeswehr to the states of wartime. Other reservists are credited to the *reserve of the second stage* and, so-called, the *general reserve*. The last two categories of the reserve are intended to fill the possible losses of troops in the course of hostilities and for the possible formation of additional units and connections. The training of reservists is carried out through training sessions, during mobilization exercises, as well as during mobilization charges on anxiety. Duration of meetings 2-4 weeks, mobilization exercises up to 12 days, mobilization charges for anxiety up to 3 days.

Russian Federation. In 2013, in the media, in particular [6], it was reported that the status of reservists of the Russian Armed Forces has not been registered and this does not allow for normal mobilization planning. One of the stages of the beginning of the reform was the creation in each district of the military management bodies responsible for the preparation of the military reserve. At the same time, one of the most difficult problems of the Armed Forces of Russia, according to analysts, is the support of the number of troops in the conduct of hostilities.

In the Armed Forces of the RF there are such concepts as current and temporary incomplete (CI and TI). *Current* is the availability of posts that are not filled by servicemen (vacant), but *temporary* when a serviceman who has been in office has left for a business trip, vacation, for treatment and has not performed his duties for a long time, but is listed as a post and must return to performing his official duties.

In 2013, a series of pilot exercises on the deployment of remaining maintenance and repair bases of armaments and military equipment (RBAME), central equipment bases (CEB) and exercises on the addition of personnel to permanent combat readiness units in both peacetime and combat operations, using different principles of the registration of personnel and manning techniques. The result was the decision to create a reserve command, which was not only controlled by the military commissariats, but also by RBAME and the CEB. In the district training centers began experiments on the training of so-called reservists under the contract. They included new battalions of territorial defense created on the basis of the Defense Plan of the Russian Federation, who performed tasks for the protection and defense of important objects of the Armed Forces infrastructure, as well as for the assistance in the fight against irregular formations.

Unlike the US armed forces, the Russian system does not plan to divide the reservists and national guards, the reserve command itself will decide, the reserve will be fixed in the part of constant readiness or in one of the storage and repair bases that are being deployed during wartime in the military unit. The formation of these bodies of military management has already been completed, and just the final test of their readiness was the study of “East-2014”.

It must be borne in mind that the system of mobilization deployment of the Armed Forces has traditionally remained under the heading “Absolutely secret” and the specific results of the verification until nothing is known. There is still no legislative decision on the status of reservists under the contract. At the same time, the system of reserve components in foreign armies of the world in the basis of the clearly stated status of the reservist, his rights and obligations to the state, on the basis of which are built up other components of the system. Russian military analysts assume that the current Minister of Defense will bring to the end of the reformation of the mobilization reserve system and the Russian Army will receive a reliable two-tier system of backup components.

Certificate. In the armies of western countries, the problem has long been solved by the creation of a two-tier system of backup components. The first level is the filling of the incompleteness directly in the troops, and the second - the deployment of additional military units, if necessary.

On July 17, 2016, President Putin signed Decree № 370 “On the Establishment of the Mobilization of the Human Reserve of the Armed Forces of the Russian Federation” [3]. Thus, Russia has made another step towards the creation of a

fully professional army. Today, about 50% of the number is soldiers, serving under the contract 300 thousand ordinary and sergeants and 200 thousand officers. But this applies to the "personnel" army, deployed and ready to engage in military operations at any moment.

The official strength of the Russian Army in 2016 is officially about one million people [7]. Until recently in many parts there was a shortage of personnel up to 30%. At the beginning of 2016, it was announced that for the first time the number of contractors exceeded the number of soldiers for the prize: currently, in the Russian army are 300 thousand contract workers and 276 thousand line-breakers. The country's mobilization system is currently unbalanced, but the active reserve remains very significant and amounts to about 2.5 million people.

Turkey. The Turkish army is the second largest in NATO than the United States. The Turkish army has more than half a million troops, and another 400,000 are in the immediate reserve. For military service in Turkey are called from 20 years, service life can last up to 15 months (conscripts with higher education are twice as likely). However, according to experts, nevertheless, the majority of recruits are people from villages who do not have almost any education. As a result, with exemplary discipline in parts, Turkish soldiers are practically unable to effectively use modern military equipment (lack of knowledge). At the same time: the core of the Turkish army is a high-quality officer corps and trained contractors. Most specialists serve in aviation, special-purpose parts and marine infantry. Also, in order to mobile in wartime, a military trainee reserve of up to 900 thousand people can be used.

It should be noted that the armed forces of foreign countries are widely used automated personnel management systems. Among the large variety of automated systems of foreign development, in which integrated functions, in terms of accounting and personnel management, the most interesting in terms of information of the military department, there are systems that allow you to perform a wide range of personnel management tasks, have modern technological solutions for the developed platforms, carry in itself integrating properties with the databases of other systems, have the necessary tools for constructing reporting forms and streaming external data.

Automated systems with the above-mentioned properties are typically Enterprise Resource Planning (ERP) systems built on a modular basis and have a Human Capital Management (HCM) module that implements not only automated personnel management but also It combines talent management, staff development, recruitment, payroll and many other solutions. The most well-known in the world, as well as the number of implementations in the enterprises, international corporations and organizations of ERP systems with the HCM module, are SAP R / 3, Oracle and Microsoft Dynamics AX (Axapta).

Undoubtedly, Western developers have invested heavily in human and material resources into the creation of HCM-module data, as well as accumulated the experience of their implementation in hundreds and thousands of foreign enterprises. At the same time, there are certain limitations for the distribution of these modules at Ukrainian enterprises (not taking into account such factors, when the owners of the enterprise are Western investors, and the implemented system adopted as a corporate standard). The main of these restrictions are:

high price of implementation and support;

functional redundancy - data HCM-modules include unclaimed while in domestic institutions function;

insufficient speed of adaptation to dynamically changing legislation;

in some cases, the lack of complete localization of interfaces.

Modern IAS, created at the enterprises of the post-Soviet area, solve many tasks of personnel management:

- ***"1C: Salary and personnel management 8.0"*** - the program of mass destination, which allows in a complex to automate the tasks of the institution related to the calculation of salaries of staff and the implementation of personnel policy;

- ***Sail-Wages system*** allows: to register in the system of questionnaires of employees, to create a staff list of employees with the possibility of creating subordinate units, to introduce standard personnel orders with their automatic processing, etc;

- information system for personnel ***"Flagship"*** - a full-featured software product class ERP, designed to create information management systems institutions;

- ***IAS "HR officer"*** - IAS personnel management, allows you to optimize the processes of human resources management in large, medium-sized institutions that are dynamically developing, describes the organizational structure of the institution, as well as the maintenance of all personnel records by automated execution of operations of acceptance, transfer, dismissal employees, as well as the preparation and registration of orders, the formation of various lists

and accounting documents, payroll calculation, etc .;

- ***IAS "Galaxy"*** focuses on institutions with full-scale personnel records, including personal card, military records, etc., as well as organizations with non-standard structures that include freelancers, team members, and a geographically diversified network of missions.

When choosing an information management system for personnel, it is necessary to pay attention to the efficiency of the areas needed to address the needs of a particular institution. Developers of domestic automation systems and implementing agencies specializing in Western software products, converge in the fact that the choice of automation system depends on the tasks that it is called to solve. It should be noted that universal solutions that fully meet the needs of institutions of different industries, sizes and management models do not exist.

1. In the armies of foreign states there are different ways of passing military service: on a permanent basis in the personnel; by contract and for a prize. The overwhelming majority of army officers of the countries under consideration are on a regular basis military service (in frames). Everything is encouraged by the long way of military service, redeployment of contracts, which increases the professionalism of servicemen, and reduces the cost of their training.

2. In modern foreign armies, the system of military personnel certification is widely used. Certification is conducted annually (USA). Permanent titles are awarded only on the basis of a positive attestation (USA, Germany, etc.). Widely used attestation at appointment. This takes into account the opinion of senior command, comrades, test results, public opinion (including in the press) of the United States.

3. Foreign personnel management systems have Human Resources (HR) modules SAP R/3 and Oracle Applications. Both systems have classic functions in personnel management: tabular accounting in the institution; recruitment procedure; taking into account professional-important properties and business qualities of the employees of the enterprise; taking into account the needs of modern staff training; planning of career development of employees of the institution and development of compensation policy for personnel, etc.

Modern IAS, created on the post-Soviet space, solves the tasks of personnel management of the institution, taking into account world trends and built on a modular principle. But the development does not provide for their integration into automated control systems of the processes of the institution of the higher level.

In the future, in order to improve the efficiency of HR decisions, it is advisable to devote research into the effectiveness of using the Reserve for candidates for promotion in the types of the Armed Forces of Ukraine.

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The article came to the release 26.06.2017

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Аналіз досвіду провідних країн світу щодо формування та використання кадрового резерву у збройних силах

Резюме. В статті узагальнено досвід армій провідних країн світу щодо створення кадрового резерву та здійснено аналіз світових тенденцій стосовно автоматизації процесів кадрового менеджменту.

Ключові слова: кадровий резерв, комплектування збройних сил, принципи формування збройних сил, автоматизовані системи управління персоналом.

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Анализ опыта ведущих стран мира относительно формирования и использования кадрового резерва в вооруженных силах

Резюме. В статье обобщен опыт армий ведущих стран мира по созданию кадрового резерва и осуществлен анализ мировых тенденций относительно автоматизации процессов кадрового менеджмента.

Ключевые слова: кадровый резерв, комплектование вооруженных сил, принципы формирования вооруженных сил, автоматизированные системы управления персоналом.

UDK. 517.948

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The Use of Multi Criteria Analysis for Prioritization Choice

Resume: The article make the examples of multi criteria analysis which support making decision for prioritization choice.

Keywords: multi criteria analysis; strategy of choice; assessment of systems.

Formulation of the problem. The tasks of selecting the most appropriate option for multiple strategies have always appeared during planning of the armed forces development. These tasks are solved based on a number of indicators that comprehensively characterize strategy, versions or systems. Examples of the strategies include: the importance or value of weapons systems and military equipment; a possibility of their implementation; a possibility of maintenance, etc. The solution may lie in choosing the most rational option described by the number of diverse criteria. A significant number of indicators, which have different dimensions and different impacts (weight) on the decision are used.

It is very important to develop approaches that allow to solve of prioritization choice tasks by expert methods, which to a certain degree are subjective, require less time, but they are more evident, flexible and allow adjusting assumptions during evaluation of choices. At the same time, expert methods provide an opportunity to incorporate the classic analytical methods into their procedures.

Analysis of basic research and publications. A large number of domestic and foreign studies are devoted to the multi-criteria choice of priority options of projects, systems and solutions. The basic principles of solving multicriteria problems are given in [1]. The work reported in [2-4] is devoted to solving certain problems of optimal choice in civilian branches.

Objectives of the article are to offer multi-criteria expert methods of solving the problem of the priority choice of systems in the military sphere by incorporating classical analytical methods; and to provide examples of practical application of these methods.

Presenting main material. Let's consider two methods of choosing the most appropriate option for several strategies and for a number of indicators that characterize this option.

1. Multiple Criteria Analysis for preferred choice based on several strategies. Suppose it is necessary to choose an *i*-th weapon system from *N* systems ($i = \overline{1, N}$), to satisfy *K* strategies the most. Each *j*-th strategy ($j = \overline{1, K}$) may be described by criteria x_{jl} ($l = \overline{1, L_j}$). The number of criteria (L_j) can be different for each strategy. It is important that the criteria fully describe the strategy. For example, the following criteria can be used for the strategy '*value for the troops'*: fast positive impact on combat effectiveness; the longevity of the system; investment; risks associated with implementation; versatility; low maintenance cost, etc. The following criteria can be used for the strategy '*ability to implement'*: cost; availability of trained personnel; access to technology; availability of necessary partnerships, etc. For multiple criteria it is possible to identify their interdependence and reduce their number by a matrix of cross-impact analysis (given in Table 2).

Each criterion x_{jl} is given an appropriate weight r_{jl} in the range of (0…1) by experts or by other analytical methods. The weight r_{jl} evaluates the importance of x_{jl} criteria for *j*-th strategy. $r_{jl} = 1$, when it completely defines the strategy, and $r_{jl} = 0$, when it is not important for the strategy. The sum of all weights has to be equal to 1, i.e. $\sum_{l=1}^{L_j} r_{jl} = 1, (j = \overline{1, K})$.

For *j*-th strategy we will define p_{ijl} ($l = \overline{1, Lj}$), a correspondence rating of the *i*-th system for criteria x_{jl}. The rating $p_{ijl\ l}$ is defined by experts or by other analytical methods in the range (0…1). Rating of *i*-th system p_{ijl} is 1 when the system completely corresponds to the criteria x_{jl} and p_{ijl} is 0, when it doesn't. It should be noted that the rating p_{ijl} of specific *l*-th criterion

for all systems have to be defined by the same method.

These data for each *j*-th strategy should be put in Table 1.

The evaluation of E_{ij} of *i*-th system on all L_j criteria for *j*-th strategy can be defined by formula

$$E_{ij} = \sum_{l} \prod_{l=1}^{Lj} r_{jl}\, p_{ijl},\ (i = \overline{1,N}; j = \overline{1,K}).$$

The higher E_{ij} of *i*-th system is, the more it corresponds to *j*-th strategy. The system is considered as priority when it satisfies the condition of 0,67 ≤ E_{ij} ≤ 1 for each strategy. Systems which fall in the range of 0,34 ≤ E_{ij} ≤ 0,66 might also be considered, the rest of the systems/options are not considered as priorities.

Table 1

		Systems, which are evaluated on 1st strategy *(j=1)*				
		System 1, *(i=1)*		**System 2**, *(i=2)*	**System N**, *(i=N)*	
Criteria x_{jl} *(j=1)*	Weight $r_{11}(l=1,L)$	*Rating* p_{11l}	$\prod_{i=1}^{L} r_{1l} p_{11l}$	…	*Rating* p_{N1l}	$\prod_{i=1}^{L} r_{1l} p_{N1l}$
Criterion x_{11}	r_{11}	p_{111}	$r_{11}p_{111}$	…	p_{N11}	$r_{11}p_{N11}$
Criterion x_{12}	r_{12}	p_{112}	$r_{12}p_{112}$	…	p_{N12}	$r_{12}p_{N12}$
…	…	…	…	…	…	…
Criterion x_{1L}	r_{1L}	p_{11L}	$r_{1L}p_{11L}$	…	p_{N1L}	$r_{1L}p_{N1L}$
	$0 \le r_{1l} \le 1$ $\sum_{i=1}^{L} r_{1l} = 1$	$0 \le p_{11l} \le 1$ $l = 1...L$	$E_{11} = \sum_{i} \prod_{i=1}^{L} r_{1l} p_{11l}$	…	$0 \le p_{11l} \le 1$ $l = 1...L$	$E_{NL} = \sum_{i} \prod_{i=1}^{L} r_{1l} p_{N1l}$

If the systems/options are evaluated by two strategies, it is convenient to present results in the Strategy Value Matrix format (Fig. 1). Priority will be given to systems for which evaluation E_{ij} are located in the square A (0,67…0,67...1). In the case of three strategies priority will be given for systems for which evaluation E_{ij} are located in the cube (0,67...0,67...0,67...1).

In practice, the choice of preferred option, as a rule, is carried out based on two strategies. In case of more than two strategies, their evaluation may be done sequentially in pairs. In this case, the comparison of evaluation is carried out on the Strategy Value Matrix. Also for convenience of calculation the following assumptions are made:

		← **STRATEGY 2**		
		1	**0,67**	**0,33**
STRATEGY 1	**1**	● Priority **A** ●	Selective 2nd priority **B**	Monitor in case value and ability increases ● **D**
	0,67	Selective 2 priority **B**	● Selective 2 priority **C**	Monitor in case value and ability increases **D**
	0,33	Monitor in case value and ability increases **D**	Monitor in case value and ability increases **D**	Do not consider

Fig. 1. Strategy Value Matrix

weight r_{jl} $(l = \overline{1,Lj})$ for *j*-th strategy are given in the range (0…30), provided something of a sum equal to 30, $\sum_{l=1}^{Lj} r_{ij} = 30$, $j = \overline{1,K}$)

degree of p_{ijl}, correspondence rating of the *i*-th system for criteria x_{jl}, is estimated in the range of (0…10);

the number of criteria for each system's evaluation is no more than five ($L_i \leq 5$), and the number of strategies - two (*K= 2*).

Under these assumptions E_{ij} of *i*-th system evaluation for the *j*-th strategy will be in the range (0…300).

The systems with evaluations E_{ij} in the range (300…200) for each *j*-th strategy will be prioritized. Systems/options which have E_{ij} in the range (200…100), should also be taken into consideration, the rest of the systems can be considered after additional studies, if necessary.

Example 1. A decision must be taken on the development of surveillance/intelligence system of the ground objects. Five options are offered for consideration:

option "Sensors", based on dispersed ground sensors;

option "Network", which is built on a network linking together existing intelligence tools;

option "Radar", based on the development of a specialized radar;

option "Drone", based on unmanned systems;

option "Helicopter", built on a helicopter platform.

The task is to select the best option

Evaluation of these systems will be done for two strategies: 'The value for the Army' and 'Ability to implement' in a defined time.

To assess the strategy of 'Value for the Army' the following characteristics may be used: efficiency of deployment; secrecy; operating in all-weather; time of non-stop working; versatility; mobility; reliability; range and likelihood of objects exposure.

For evaluation of the strategy 'Ability to Implement' the following characteristics can be used: cost; rapid implementation; availability of trained personnel; availability of technologies; availability of necessary infrastructure; availability of training system; availability of appropriate regulations.

Some of these characteristics are interdependent, such as *availability of training system* and *availability of trained personnel*. With cross-impact analysis matrix (Table 2) we can determine the characteristics that describe accepted strategy more fully.

Table 2

Strategy ***'Value for the Army'***	Efficiency of deployment	Secrecy	All-weather operating	Time of non-stop working	Versatility	Range	Uptime	Mobility	likelihood of objects exposure	
Efficiency of deployment	X	0	0	0	0	0	+	0	0	**+1**
Secrecy	0	X	0	0	0	-	0	0	0	**0**
All-weather operating	0	0	X	0	0	0	0	0	0	**0**
Time of non-stop working	0	0	0	X	0	0	+	0	0	**+1**
Versatility	0	0	0	0	X	0	0	0	0	**0**
Range of Action	0	0	0	0	0	X	0	0	+	**+1**
Uptime	0	0	0	0	0	0	X	0	+	**+1**
Mobility	0	0	0	0	0	0	0	X	0	**0**
Likelihood of objects exposure	0	0	+	+	0	0	+	0	X	**+3**

Legend:+ positive effect; *++ considerable positive effect;*
- *negative effect*; *-- considerable positive effect;*0-*neutral effect.*

For evaluation of the strategy "Value for the Army" we'll use the following five criteria: efficiency of deployment; uptime; range of actions; the likelihood of exposure the objects; time of non-stop working.

For evaluation of the strategy "Ability to Implement" a cross-impact analysis matrix is constructed. It allows for selection of the following four characteristics: cost; rapid implementation; availability of trained personnel; availability technologies.

Evaluation of the systems on these two strategies is summarized in Table 3, 4.

Table 3

		Systems, evaluated on strategy **" Value for the Army "***(j=1)*									
		" *Sensors* "		**" *Network* "**		**" *Radar* "**		**" *Drone* "**		**" *Helicopter* "**	
x_{jl} $j=1,$ $l=1...5$	W r_{il}	R p_{11l}	$\prod_{l=1}^{5} r_{1l}\, p_{11l}$	R p_{21l}	$\prod_{l=1}^{5} r_{2l}\, p_{21l}$	R p_{31l}	$\prod_{l=1}^{5} r_{3l}\, p_{31l}$	R p_{41l}	$\prod_{l=1}^{5} r_{4l}\, p_{41l}$	R p_{51l}	$\prod_{l=1}^{5} r_{5l}\, p5_{41l}$
E	4	10	**40**	8	**32**	8	**32**	7	**28**	5	**20**
T	5	8	**40**	6	**30**	7	**35**	5	**25**	3	**15**
D	7	8	**56**	4	**28**	10	**70**	7	**49**	10	**70**
H	5	2	**10**	7	**35**	7	**35**	6	**30**	5	**25**
P	9	7	**63**	9	**81**	10	**90**	9	**81**	10	**90**
	30	***E*$_{11}$=209**		***E*$_{21}$=206**		***E*$_{31}$=262**		***E*$_{41}$=213**		***E*$_{51}$=220**	

Note:
W – weight $(l=1...5)$; ***R*** – rating; ***E*** – efficiency of deployment; T - time of non-stop working; D - range; ***H*** – uptime ь; P - likelihood of exposure the objects

All ratings p_{i1l} for all systems *(i=1…5)* of the strategy 'Value for the Army' (*j=1*), except two, are to be defined by experts. The ratings for *the range* (p_{i3l}) and *the likelihood of exposure the objects* (p_{i15}) will be determined analytically using the following example.

Let's assume that the Customer defined the range and likelihood of exposure for all systems to be no less than 45 km and 0,8 accordingly. Systems that are being evaluated have the following ranges and likelihoods of objects exposure: "Sensors" (36 km; 0,65); "Network" (20 km; 0,75); "Radar" (52 km; 0,8); "Drone" (33 km; 0,75); "Helicopter"(50 km; 0,85).

For this example, the compliance degree of rating p_{ijl} to the stated characteristics will be determined as follows. *The range* - as the ratio of actual detection range to the regulatory one (45 km), in the case when the actual range extends to the regulatory one - p_{ijl} is 10. As for *the likelihood of exposure*: when the "real" likelihood of exposure (P_r) is more regulatory one (P_n) then p_{ijl} is 10; in case it is less than the regulatory one ($P_r \le R_n$) then p_{jil} = *ln (1-Pr)/(1-Rn)**10. In the physical sense it means reciprocal number of systems that need to be applied to get the desired likelihood of exposure.

Under these assumptions the rating for the range (p_{i13}) and the likelihood of exposure (p_{ij5}) for all systems will be: "Sensor" (36 km/45 km*10 = **8**; ln(1-0,65)/ln (1-0,8)*10=6, 5 → **7**); "Network" (20km/45km *10 = 4,4 → **4**; ln (1-0,75)/ ln (1-0,8)*10 =8,6 →**9**); "Radar" (52km/45km *10 →**10**; ln (1-0,8)/ ln (1-0,8)*10 = **10**); "DroneAV" (33km/45km*10 =0,7 →**7**; ln(1-0,75)/ln(1-0,8)*10 →**9**); "Helicopter" (50km / 45km →**10**; **10**).

For the strategy of "ability to implement" we will put the data in Table 4.

Table 4

		Systems, evaluated on strategy " **Ability to implement** "*(j=2)*									
		" *Sensors* "		**" *Network*"**		**" *Radar* "**		**" *Drone* "**		**"*Helicopter*"**	
x_{jl} $l=1...4$	W r_{2l}	R p_{12l}	$\prod_{l=1}^{5} r_{2l}\, p_{12l}$	R p_{22l}	$\prod_{l=1}^{5} r_{2l}\, p_{12l}$	R p_{32l}	$\prod_{l=1}^{5} r_{2l}\, p_{13l}$	R p_{42l}	$\prod_{l=1}^{5} r_{2l}\, p_{42l}$	R p_{52l}	$\prod_{l=1}^{5} r_{2l}\, p5_{52l}$
C	**10**	7	**70**	8	**80**	5	**50**	10	**100**	4	**40**
RI	**9**	6	**54**	8	**72**	8	**72**	8	**72**	8	**72**
HK	**5**	7	**35**	8	**40**	7	**35**	9	**45**	7	**35**
AT	**6**	4	**24**	9	**54**	8	**48**	7	**42**	6	**36**
	30	***E*$_{12}$=183**		***E*$_{22}$=246**		***E*$_{32}$=205**		***E*$_{42}$=259**		***E*$_{52}$=183**	

Note: ***C*** – low cost; ***RI*** – rapid implementation; ***ATP***– availability of trained personnel; ***AT*** – availability technologies; ***W*** – weight $(l=1...4)$

Place the evaluation of the systems in two-dimensional Strategy Value Matrix.

Conclusion: The priority have the systems "*Network*", *"Radar" and "Drone"*, which scored more than 200 points for both strategies and located in the square (300...200…200). However, we should not ignore the other options. Even tentative assessment we conducted indicates the need for more research and, perhaps, we have to design a new system which combines the positive

elements of the systems, which scored more than 200 points.

It should be taken into account that the final result is affected by weights r_{jl}, determined by experts. Therefore, the selection of experts for defining the weights requires special attention. It is also advisable to determine p_{ijl}, the rating of the *i*-th system for criteria x_{jl}, by special analytical/numerical and practical

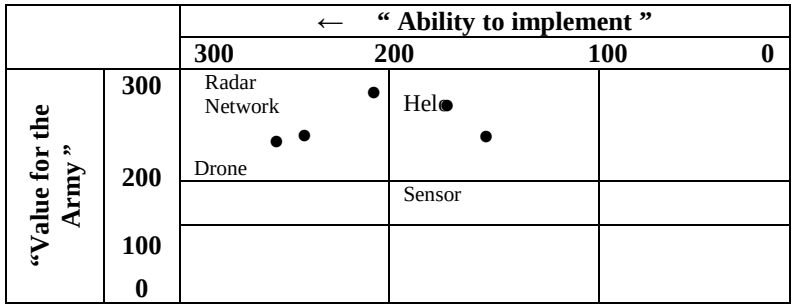

Figure 3. Comparison of the systems at the Strategy Value Matrix

2. Rational choice on a number of characteristics in different scenarios. Suppose it is necessary to select *i*-th system from *N* ($i=\overline{1,N}$) which are used in different *M* scenarios/missions and are described by the criteria x_{jl} ($j=\overline{1,M}$; $l=\overline{1,L_j}$). The selected system has to satisfy all scenarios/missions. Number of criteria x_{jl} for the missions may be different.

Each *j-th* scenario/mission ($j=\overline{1,M}$) is given an appropriate rating r_j in the range of (0…1) by the customer (or experts). The sum of all ratings has to be equal 1, $\sum_{j=1}^{M} r_j = 1$. All criteria x_{jl} are given appropriate weights k_{jl}, $\sum_{l=1}^{L_j} k_{jl} = 1, \left(j=\overline{1,M}\right)$ These weights are determined by importance of appropriate criteria for the scenario. Within one scenario weights have the same meaning for all *N* systems.

Let's define so-called 'basic system' for comparison of all systems, evaluated for the selection.

Comparison of the *i*-th system with the basic one on *l*-th criterion in the *j*-th scenario will be differentiated by qualitative correspondence rating p_{ijl}, that can possess one of five values/options:

$$p_{ijl} = \begin{cases} +2, \text{ when the system is "much better" than basic one;} \\ +1, \text{ when the system is "better" than basic one;} \\ 0, \text{ when the system is equal the basic one;} \\ -1, \text{ when the system is worse than the basic one;} \\ -2, \text{ when the system is much worse than basic one.} \end{cases}$$

Evaluation of *i*-th system E_i on all L_j criterion in all *M* scenario can be defined by a formula:

$$E_i = \sum_{j=1}^{M} r_j \sum_{l=1}^{L_j} \prod_{l=1}^{L_j} k_{jl}\, p_{ijl}, \quad (i=\overline{1,N}).$$

For convenience and visualization all comparative characteristics for each *j*-th scenario are put in Table 5.

The best is a *i*-th system with the maximum E_i score.

Below is an example for this method.

Example 2. A decision has to be taken on procurement of a transport helicopter for the Armed Forces. There are three options for consideration: Mi-8MSB-B (Ukraine), NH90 (Airbus Helicopter), AW-149 (Augusta Westland). The helicopter is planned to be used in four roles: 1st- transportation (65%, r_1 = 0,65); 2nd- search and rescue (15%, r_2 = 0,15); 3d - medical evacuation (15%, r_3 = 0,15); 4th - fire support (5%, r_4 = 0,05).

Table 5

		Systems which are compared, $i=\overline{1,N}$		
1-st *scenario (**j=1**), rating* r_1				
Criteria $l=1...Lj$	*Weight of criteria* $k_{jl}, l=1...L_1$	***System 1*** $P_{11l};\ \prod_{l=1}^{L_1} k_{1l}\, p_{11l}$	…	***System N*** $P_{N1l};\ \prod_{l=1}^{L_1} k_{1l}\, p_{N1l}$
Criterion 1 *(l=1)*	k_{11}	*Equal to **A**"* $P_{111}=0;\ 0\times k_{11}=0$		*Much worse than "**A**"* $p_{N11}=+2;\ +2\times k_{N1}=2k_{N1}$
Criterion 2 *(l=2)*	k_{12}	*Much worse than **A**"* $P_{121}=-2;\ (-2)k_{12}=-2k_{12}$		*Much worse than "**A**"* $P_{N12}=-2;\ (-2)k_{12}=-2\ k_{12}$
…	…	…		…
Criterion L_1 *(l= L_1)*	k_{1L_1}	*Better than **A**"* $P_{11l}=+1;\ (+1)\times k_{1L_1}=k_{1L_1}$		*Better than "**A**"* $P_{N1L_1}=+1;(+1)\times k_{1L_1}=k_{1L_1}$
Evaluation of the systems in scenario **1**		$E_{11}=\sum_{l=1}^{L_1}\prod_{l=1}^{L_1} k_{1l}\, p_{11l}$		$E_{N1}=\sum_{l=1}^{L_1}\prod_{l=1}^{L_1} k_{Nl}\, p_{N1l}$
2-st *scenario* (***j=2***), *rating* r_2				
Evaluation of the systems in scenario **2**		$E_{12}=\sum_{l=1}^{L_1}\prod_{l=1}^{L_1} k_{2l}\, p_{12l}$		$E_{N2}=\sum_{l=1}^{L_2}\prod_{l=1}^{L_2} k_{Nl}\, p_{N2l}$
… **N**-st *scenario* (***j=M***), *rating* r_M				
Evaluation of the systems in scenario **M**		$E_{1M}=\sum_{l=1}^{L_M}\prod_{l=1}^{L_M} k_{Ml}\, p_{1Ml}$		$E_{NM}=\sum_{l=1}^{L_M}\prod_{l=1}^{L_M} k_{Ml}\, p_{NMl}$
Evaluation of the systems in all scenario E_i		$\sum_{j=1}^{M} r_j E_{1j}$		$\sum_{j=1}^{M} r_j E_{Nj}$

Need to select the best helicopter.

The Mi-8MT helicopter we will use as "the basis" for comparison of all helicopters. General characteristics of these helicopters are given in Table 6.

Results of the helicopter evaluations are summarized in Table 7.

As we can see from the results of calculations AW-149 and Mi-8MSB-B (as a transport helicopters) get the best score mostly because of their low cost, high practical ceiling (especially Mi-8MSB-B) and good capacity. NH-90 loses because of its high cost. In our case the cost has quite high weight. For other buyers the cost can be not so important, the weight of this criterion will be lower and NH-90 would get a better score. Contrastive analysis of all helicopters in different roles/missions allows, in a simple way, for defining their strengths and weaknesses. In order to make the final decision it is recommended to analyse these helicopters by multiple criteria such as "ability to implement" and "ability to maintaine".

Conclusion. The examples of practical application of the multi-criteria approach confirm the feasibility of the approach to solving a wide range of rational choice tasks by using peer review and analytical and experimental evaluation. The combination of expert estimates and analytical calculations is an advantage. It allows for creation of more options for the evaluation, for identification of their corresponding strengths and weaknesses, and for defining of alternative solutions.

It should also be noted that human factor plays a significant role (both positive and negative) in making decisions, particularly in the military area. These methods can also assess such effects. They are simple, clear and yield practical results both in the short term and in the long term.

Table 6

	Helicopter for comparison	*Helicopters for selection*		
*General Characteristics**	***Mi-8MT(Mi-17)***	***Mi-8МСБ-В***	***AW-149***	***NH90***
Max. take off mass, kg	*13000*	*12500*	*8600*	*10600*
Crouse speed, km/h	*240*	*240*	*287*	*280*
Range, km	*610*	*600*	*800*	*800*
Practical ceiling, m	*4500*	*8000*	*2700*	*6000*
Capacity	*24 max troops or 12 wounded or 4000 kg external load*	*30 max troops or 12 wounded or 4000 kg external load*	*18 max troops or; 2720 kg external load*	*2500 кг*
Cost, million $	*17*	*9*	*13*	*32*
Main Armament	*Rocketpods, machine-guns*	*Rocket pods, machine-guns*	*Rocket launchers 81 mm, air-to-surface, and machine-guns 7.62 mm and 12.7/20 mm*	*Torpedoes, bombs; Missiles: anti-submarine and/or air to surface missiles (NFH version), 2x door gun*

**)Characteristics of helicopters were chosen from different sources and are not official ones.*

Таблиця 7

Roles M=4	General characteristics *l=1…7, j=1…4, i=1…3.*	w k_{jl}	Roles M=4	**Mi-8МСБ-В**	**AW-149**	**NH90**
Transportation, j=1,r_1= 0,65	Cost	0,30	**Basic helicopter *Mi-8MT***	+**2**×0,3=0,6	+**1**×0,3=0,3	-**2**×0,3=-0,6
	Range	0,20		**0**×0,20=0	+**2**×0,20=0,4	+**2**×0,20=0,4
	Cruise speed	0,10		**0**×0,1=0	+**2**×0,10=0,2	+**2**×0,1=0,2
	Practical Ceiling	0,10		+**1**×0,1=0,1	-**2**×0,10=-0,2	+**1**×0,1=0,1
	Capacity	0,15		**0**×0,15=0	-**2**×0,15=-0,3	-**2**×0,15=-0,3
	Armament	0,05		**0**×0,05=0	+**1**×0,05=0,05	+**2**×0,05=0,1
	Defence	0,10		**0**×0,1=0	+**1**×0,1=+0,1	+**2**×0,1=0,2
	E_{i1}	Σ=1,0		**0,7**	**0,55**	**0,1**
Search and rescue,j=2,r_2=0,15	Cost	0,25		+**2**×0,25=0,5	+**1**×0,25=0,25	-**2**×0,25=-0,5
	Range	0,25		**0**×0,25=0	+**2**×0,25=0,5	+**2**×0,25=0,5
	Cruise speed	0,10		**0**×0,1=0	+**2**×0,10=0,2	+**2**×0,1=0,2
	Practical Ceiling	0,05		+**1**×0,05=0,05	-**2**×0,05=-0,1	+**1**×0,05=+0,05
	Capacity	0,18		**0**×0,18=0	-**1**×0,18=-0,18	-**1**×0,18=-0,18
	Armament	0,05		**0**×0,05=0	+**1**×0,05=0,05	+**2**×0,05=0,1
	Defence	0,12		**0**×0,12=0	+**1**×0,12=+0,12	+**2**×0,12=0,22
	E_{i2}	Σ=1,0		**0,55**	**0,84**	**0,39**
Medical evacuation, j=3, r_3=0,15	Cost	0,20		+**2**×0,2=0,4	+**1**×0,20=0,2	-**2**×0,2=-0,4
	Range	0,20		**0**×0,2=0	+**2**×0,2=0,4	+**2**×0,2=0,4
	Cruise speed	0,15		**0**×0,15=0	+**2**×0,15=0,30	+**2**×0,15=0,15
	Practical Ceiling	0,0		+**1**×0=0	-**2**×0=0	+**1**×0=0
	Capacity	0,20		**0**×0,2=0	-**1**×0,2=-0,2	-**1**×0,2=-0,2
	Armament	0,10		**0**×0,1=0	+**1**×0,1=0,1	+**2**×0,1=0,2
	Defence	0,15		**0**×0,15=0	+**1**×0,15=0,15	+**2**×0,15=0,3
	E_{i3}	Σ=1,0		**0,40**	**0,95**	**0,45**
Fire support ,j=4, r_4= 0,05	Cost	0,15		+**2**×0,15=0,30	+**1**×0,15=0,15	-**2**×0,15=-0,30
	Range	0,20		**0**×0,20=0	+**2**×0,20=0,4	+**2**×0,20=0,4
	Cruise speed	0,15		0×0,15=0	+**2**×0,15=0,30	+**2**×0,15=0,30
	Practical Ceiling	0,0		+**1***0=0	-**2**×0=0	-**2**×0=0
	Capacity	0,10		**0**×0,1=0	**0**×0,1=0	**0**×0,1=0
	Armament	0,20		**0**×0,2=0	+**1**×0,2=0,2	+**2**×0,2=0,4
	Defence	0,20		**0**×0,2=0	+**1**×0,2=+0,2	+**2**×0,2=+0,4
	E_{i4}	Σ=1,0		**0,30**	**1,25**	**1,2**
	Evaluation of helicopters E_i			**0,60**	**0,67**	**0,25**

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The article came to the release 13.07.2017

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Застосування багатокритеріального аналізу для пріоритетного вибору

Резюме. В статті наводяться методи багатокритеріального аналізу систем за декількома стратегіями для підтримки прийняття рішення щодо вибору найбільш прийнятного варіанту.

Ключові слова:багатокритеріальний аналіз, стратегія вибору, оцінка систем.

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Применение многокритериального анализа для приоритетного выбора

Резюме. В статье приведены методы многокритериального анализа по нескольким стратегиям для поддержки принятия решения по выбору наиболее приемлемого варианта.

Ключевые слова: многокритериальный анализ, стратегия выбора, оценка систем.

UDK 355. 332:37.035

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The pedagogical aspects of the psychological training of servicemen in modern conditions

Resume. The article outlines proposals for improving the psychological training of servicemen of the Armed Forces of Ukraine.

Keywords: moral and psychological condition, psychological and pedagogical preparation, method of education.

Problem statement and analysis of recent research and publications. An analysis of the professional activity of the officer's staff shows that one of its main components is work with people. No combat task will be performed without the required level of psychological training of the personnel before the impact of the relevant psycho-traumatic factors. Modern high-tech wars considerably increase the requirements for personnel, because the wins are not weapons, and people who mastered it at a high level, are psychologically stable and prepared for action in the extreme conditions of modern combat. This requires an officer of sound psychological training, developed leadership qualities and motives for professional activity. The extent to which the level of psychological training of the officers is high is largely dependent on the success of the tasks set before the military. The ability of the state to protect its interests is formed in peacetime, although, according to Russian military experts, peacetime does not exist in principle, the war in various forms is constantly, only the confrontation becomes more or less intense, the “hot war” changes the “cold war”, and psychological, informational, economic wars never stopped [1]. The unbridled development of means and methods of armed struggle, especially in the conditions of the Russian-Ukrainian hybrid war [2], the growing role of the human factor in the use of military equipment and weapons, condition the careful training of the personnel of the armed forces, require a more stable morale and psychological state.

Radical changes in all spheres of our society, the processes of modernization of the content and structure of the national and military education, reform of the Armed Forces of Ukraine in the conditions of the antiterrorist operation, when the war is conducted not only for territory, but for the favor of the population, for the minds of men the methods of information-psychological warfare, the importance of moral-psychological factors of sustainability of military personnel, determine the increasing demands for psychological and pedagogical training of the officer corps that is both timely and relevant issues.

Analysis of recent researches and publications shows that the newest form of opposition, in contrast to the confrontation of the bipolar devices have a vague, mixed, chaotic and multiple in nature. The combination of military and non-military ways of conducting a hybrid conflict that is used for military purposes and used as a weapon requires to improve psycho-pedagogical training of the Armed forces of Ukraine. In A. Zykov, S. Smirnova, N. Copeland and others noticed how difficult it is for a soldier, especially morally on the battlefield, where large-scale use of tanks, aircraft and other weapons. This picture of the battle typical of the period of past wars. Modern armies must prepare for the conflicts of a hybrid character, so the moral-psychological component of training soldiers and officers should be given much more attention, because even Napoleon said: “the Spiritual power refers to the physical as three to one”, as Suvorov said: “do Not hands, not feet, not the human body wins and the soul which ruled and hands, and feet, and weapons-and if the soul of a warrior, big and mighty, doesn't give in to the fear, and the man did not lose heart in the war, the victory unquestionable, and therefore the need to educate and hardened warrior's heart, so that it are not frightened of any danger and was always fearless”.

The aim of the article is improvement of psychological training of servicemen of the Armed Forces of Ukraine experience antiterroristic operation.

Presentation of the basic material. Studying the experience of other countries it can be concluded that at all times the problem of the formation of the “spirit of the warrior” was seen as the main task of the military. The morale of the troops cannot be seen

or perceive by touch, but as you know, is the most powerful weapon, more powerful than a bomb, a tank, or plane. High morale troops is a tool that can turn defeat into victory. The army is not defeated until its soldiers are not imbued with the consciousness of defeat, because defeat is the conclusion of the mind, not physical condition.

In book "Why France fell" by André Maurois writes: "Now we can say that the war was lost by France at the very moment when it has begun." Only the absolutization of the Maginot line, which resulted in the transfer of all initiative to the enemy was already defeated, but an even greater danger was hidden in other factors. The material support of the army was very low: it lacked modern weapons and equipment. The leadership of years studied public opinion instead of shaping it. Thus, the question of the viability of the nation was destroyed, not strengthened.

The fall of France caused by the following reasons:

- poor leadership;
- low morale;
- lack of initiative;
- indiscipline.

Ending with this question, take a look at some tips that gives Maurois:

To be strong. If a nation is willing to die for their freedom, it will lose it.

To act quickly. Ten thousand aircraft built in a timely manner is better than fifty thousand after the battle.

To control public opinion and to shape it.

To maintain a unified country. Political parties are passengers on Board one ship, if they'd drowned him, all will be lost.

To require managers to lead an honest life. Vice, whatever it was, always is on the side of the enemy.

Unwavering faith in the ideas and the outline of life, for which to die.

Another example, in our opinion, a good illustration of tips Maurois is "Winter war" between Soviet Union and Finland. Successful defense of the Finns, unlike the French, can be explained by the high morale, which is called "the spirit of the Winter war" which refers to single-mindedness and willingness to sacrifice himself for the sake of defending the homeland. Studies support the facts that, in Finland before the Winter war, the prevailing consensus according to the fact that the government needs to defend in case of aggression. "The spirit of the Winter war" was filled almost all, even the Communists [3]. Despite the heavy losses of the Finnish army due to the high moral and psychological state was able to stop the enemy in all directions. Analysis of events showed that when the struggle becomes protracted, the outcome it decides is moral and not physical force.

The above examples indicate that the morale of the troops is a matter of life or death. Each well-organized army is interested in increasing the level of combat training in the provision of modern weapons, logistical advantage over the enemy. However, material advantage is not as important as the moral. For the modern army more dangerous is its low morale than obsolete weapons.

The characteristic feature of the "hybrid" armed conflict is the increase in the achievement of the objectives of the conflict, the specific weight of information and psychological impact on the personnel of troops (forces) in order to disorient him in an environment to reduce the ability to resist, to call for disobedience to the commanders, and the desire to defect.

So, among the personnel of the Armed Forces of Ukraine in comparison with the wars of other periods during antiterroriste operations significantly increased psychogenic loss [4].

Thus, the results of the analysis of military conflicts in XX – XXI centuries define the following regularity increase psychogenic losses of personnel and reduce the level of resistance troops on losses, which indicates an increase based on the fighting ability of the troops (forces) of psychological readiness of the personnel.

Time requirements showed that the unit commander is the main "source" improving moral and psychological state. Educational work connected with the conduct officer and is one of the most difficult. Following the example of the officer, the soldiers, thereby developing their vocational and important qualities, forming and developing confidence in their behavior. First, a personal example of the officer acts as a condition that gives him the moral right to education of subordinates. The words of the chief they believe, in the event that it does not disagree with the case, supported by practice, the ability of an officer with soldiers to overcome the hardships of military service, high professionalism. Second, the personal example of the officer is the basis of his authority. The advantages and disadvantages of the subordinate commander is judged by his deeds and actions. Based on the behavior of the chief, the soldiers formed about them, and determine the attitude. Thirdly, the personal example of the officer is of considerable visibility.

Comparison of results of estimation of psychological readiness of the personnel in 2015-2016 in the areas of antiterroristic operationdetermine the increase of trust to the direct commanders (chiefs), improving the security of weapons, military equipment, clothing, food provision and improving psychological readiness to perform tasks.

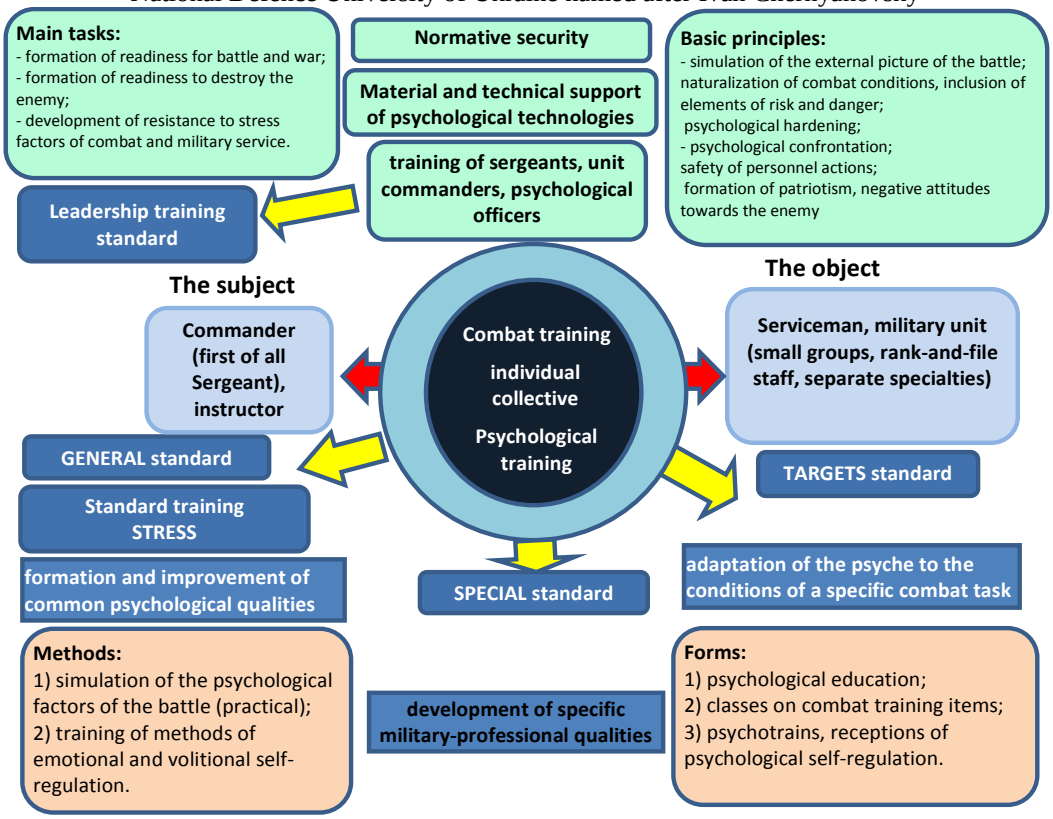

Fig. 1. System of psychology training

Psychological training in the Armed Forces of Ukraine is carried out in accordance with the requirements of the order of the chief of the General staff-Chief of the Armed Forces of Ukraine dated 16.11.2012 No. 240 "About the introduction of psychological training in the educational process of training of command bodies and troops (forces)" with all categories of military personnel: the military authorities during the events of operational training (exercises, training).

The system of psychological preparation (Fig. 1) should be based on the basic provisions and achievements of pedagogy and psychology, an advanced experience of work of commanders at all levels in the education of soldiers. Improving the teaching of psychological aspects of military training, propose to start with a definition of the hierarchy of psychological qualities of the officer as an example to follow, the main among which are: organization, responsibility, perseverance, dignity, and efficiency. Of course, the military would like to see these traits in the officer that is subordinate to the see the officer more of a commander than educator. However, officers believe that the role models in their representation must combine your confidence, honesty, kindness, respect for people, ability to listen and to listen, punctuality, largely characterizes him as a teacher rather than a commander. Thus, this contradiction is solved in the process of business and military activities and can serve as a pedagogical condition of psychological indoctrination.

One of the important indicators of the integral quality of the psychological readiness and resilience of a warrior to the effects of stress factors of modern warfare is the level of psychological preparedness of a soldier at the implementation of the regulations and special exercises. Based on this approach, a reliable conclusion about the psychological preparedness of personnel to activities in combat, in situations of danger can only be done on the evaluation of their activities that made them in the simulation of different factors (Fig.2.).

Assessment of initial level of psychological readiness and resilience to combat operations necessary to prepare the source data. They, in turn, is needed to determine the dosage level of mental workload of the personnel in the process of training for combat and humanitarian training.

The concept of psychological readiness and sustainability has many components. Sequential diagnosis is possible but very time-consuming and feasible only a qualified psychologist with a high level of training. However, the effectiveness of its evaluation is achieved by forming an expert group, which should have a basic psycho-pedagogical preparedness. In addition, we need to know not only the individual level of psychological readiness and resilience, but the level of readiness of units, and it is not just the sum of individual performance. Therefore, to determine the initial level of psychological readiness and resilience as individual (each soldier and unit, it is proposed to use an integral indicator, which may serve as an indicator of properties that can be diagnosed, given the results of

the activities of military personnel, in the performance of any of the standards of training and combat activities in the context of modeling the influence of psychological factors of battle on their psyches.

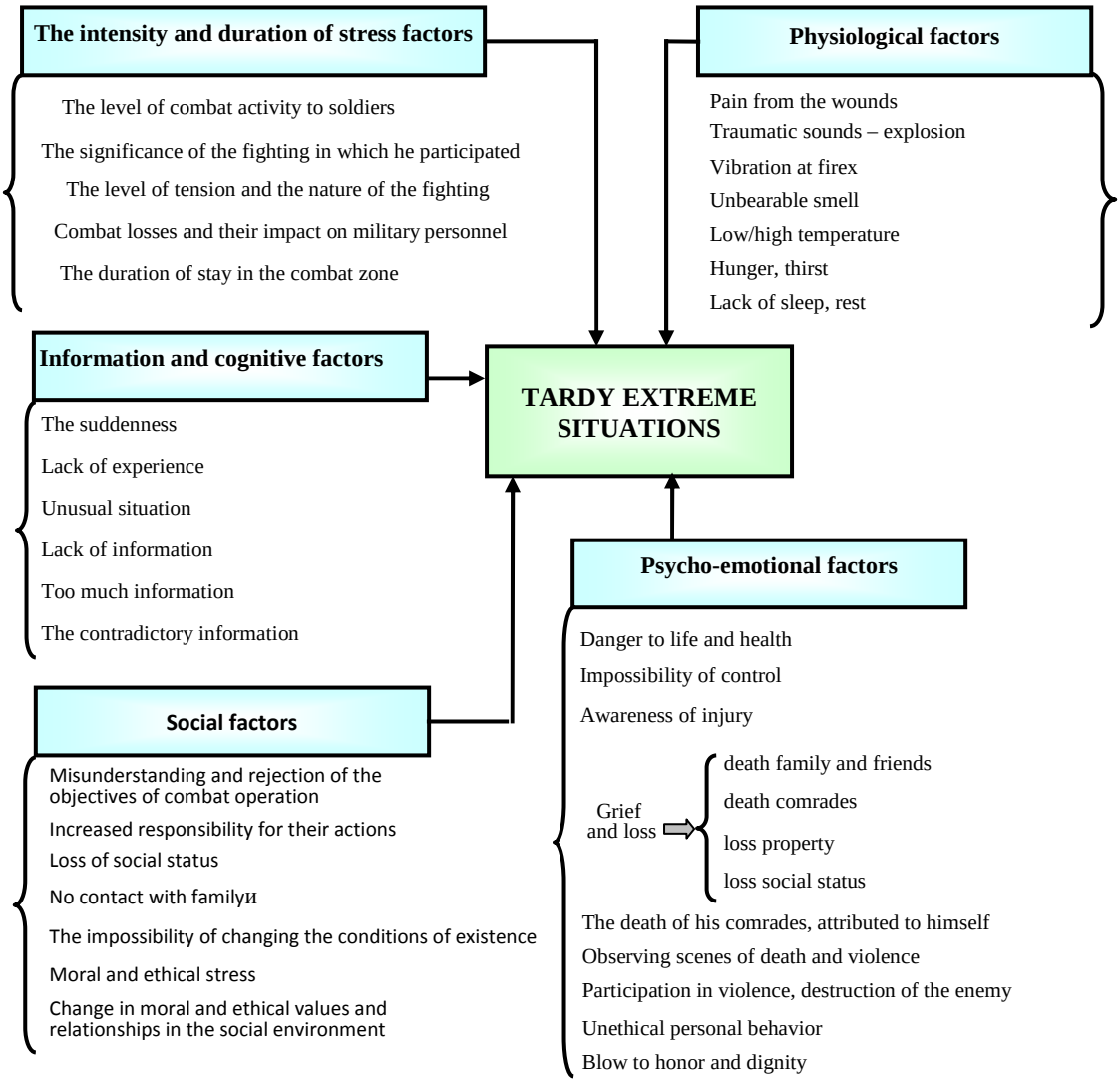

Fig. 2. Structure of factors, that influence the formation of psychological readiness

During the psychological training of subordinate unit commanders, it is important to focus on mainstreaming the combat of motives, explaining the purpose and need for the coming hostilities. The more the fighting will be filled for a member of the personal sense of value to himself, the notion of the importance of their personal role, sense of justice of their actions, confidence in yourself and your comrades, the more stable his mind to the influence of various stress factors of the combat situation. It is important to remember that while waiting for the fighting personnel must be constantly busy and the most informed. In the absence of useful activities and information arise of anxious thoughts, conversations, there are different rumors emerging fear of the unknown, there comes a General decline of morale. Mental equilibrium, not only harms the health of people, reduces their combat capability, but often requires considerable time.

To assess the psychological readiness of soldiers during training and combat activities you can take indicators on the implementation of control tasks [5]. The obtained results of each soldier individually and the team as a whole are mapped in different degrees of approximation to the conditions of the battle over the psychological content. The necessity of comparison with the activity in normal conditions due to the possibility of classification errors that occur due to the lack of appropriate knowledge and skills. Assignments are made specifically for each contingent of military personnel (and the armed forces), taking account of the problems solved by them in a combat situation. Assignments must: meet the requirements of the guidance documents and programmes of combat training.

Conclusions. Studies show that almost 80% of military personnel believe immediate commander as an example (role model), seeing it as a military professional with an active lifestyle, and military

educator. Seeing different patterns of behavior of others people have a serviceman there is a need to improve their own personal qualities, a psychological mechanism of action follow. Only actions and the actions of the officer, unlike his words, unable to give a clear understanding to subordinates about the rules of conduct. Military personnel constantly observe how the officer keeps himself in the performance of daily office activities, how he dressed, how to apply and how to behave with subordinates. Interest of subordinate causes, and the ratio of officers to their duties, how to react to different events. The special value of officer is the insistence, perseverance, perseverance, character integrity.

The main criterion of the correctness of the action is the execution of the task, the preservation of life and health of people, preservation of weapons and valuables.

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The article came to the release 04.07.2017

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Педагогічні аспекти психологічної підготовки військовослужбовців в сучасних умовах

Резюме. У статті викладено пропозиції щодо удосконалення психологічної підготовки військовослужбовців Збройних Сил України.

Ключові слова: морально-психологічний стан, психолого-педагогічна підготовка, метод виховання.

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Педагогические аспекты психологической подготовки военнослужащих в современных условиях

Резюме. В статье изложены предложения по совершенствованию психологической подготовки военнослужащих Вооруженных Сил Украины.

Ключевые слова: морально-психологическое состояние, психолого-педагогическая подготовка, метод воспитания.

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Матричная модель OLAP-систем
Matrix model of OLAP-systems

Резюме. Розглянуті особливості матричних моделей … ***(кегль 12 пт)***
Ключові слова: модель, OLAP система, інформаційні технології.
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Ключевые слова:
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Keywords

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Presentation of the basic material. The author proposes the use of analytical methods of search for optimal regime

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N ; pk; p=1 ; n *- Times New Roman 10 font;*
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S c i e n t i f i c p u b l i c a t i o n

Research papers collection of the Center of military and strategic studies of the National Defence University of Ukraine named after Ivan Chernyahovsky

Responsible for the publication:
Responsible for the publication: A. Rybydajlo
Technical editors: I. Zotova I., O. Levshenko
Computer typesetting: A. Rybydajlo
Correctors: T. Uvarova, N. Andriianova, T. Vorona

Published 12.09.2017. Format 60x84 1/8.
Offset paper. Account sheet view 8,373. Print. sheet 18,25
Order 321. Quantity 100 copies.

The publication of the National Defense University of Ukraine named after Ivan Chernyakhovsky
03049, Kyiv, Povitroflotskiy pr-t, 28

Certificate of registration of the entity publishing
in the State register of publishers, manufacturers and distributors of publishing products
series DK No. 2205 dated 02.06.2005.

Printed in the printing house of National Defense University of Ukraine
named after Ivan Chernyakhovsky
03049, Kyiv, Povitroflotskiy pr-t, 28