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

№ 1(59), 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. - № 1(59).

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

The collection contains articles on the following topics: military strategy, military security and military policy of the state; the construction and development of armed forces; defense and budget planning, justification of programs of development of armed forces; economic, information and technological security; informatization and management informatization projects of the armed forces; military-applied aspects of the system analysis and mathematical modelling; historical, social, and organizational aspects of the study of problems of military science and education.

Program goals of the collection: informing research institutions of the Ministry of Defence of Ukraine, other ministries and agencies, potential customers of scientific-technical products of the Center of military and strategic studies, the National Defence University of Ukraine named after Ivan Chernyakhovsky and publication of results of degree candidates (certificate of **state registration of print media** from 28.11.2013 series KV № 20446-10246 PR).

Recommended for printing by academic council of NDU of Ukraine named after Ivan Chernyakhovsky (protocol № 5 від 24.04.2017).

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UDK 355.43

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Some approaches to the strategy of confrontation and counter the aggressor

Resume. Scientific organizational and legal approaches are analyzed in relation to forming in the sector of safety and defensive of Ukraine of strategy of peaceful opposition and counteraction to the aggressor.

Keywords: aggressor, active defense, security and defense sector of Ukraine, Defense Forces.

Formulation of the problem. Now increasingly becomes apparent that undeclared attack Russia's armed forces by the decision of its present rulers of the territory of Ukraine and the application on the eastern borders and the Crimea military force against the sovereignty, territorial integrity and independence of Ukraine, or in any other manner inconsistent with the UN Charter, international law defined as aggression (from the Latin. aggression - attack).

Other ways to this shameful inhuman act in accordance with international law belongs attack attributed Russia’s armed forces for military ground, marine, air force and military ships Ukraine, Crimea annexation, occupation of the territory of the eastern regions of Ukraine, etc.

We must understand that this is not a civil war, which the aggressor is trying to name their blatant military aggression, using the most modern weapons and lethal military equipment that Russia’s representatives in the Hague court make desperate attempts, these are evident throughout the international community facts to recognize.

According to the Military Doctrine of Ukraine - is armed clash between the two states within the territory of Ukraine for actively driving and continuous comprehensive support rulers of, especially professionally trained its military personnel with more than 40 various types of modern military equipment and weapons.

The Russian Federation has already sent in Donbas about 1000 various artillery systems, 400 tanks and 200 missile systems of volley fire. Now they crowded around 4,200 regular troops and 40,000 fighters and have approximately 23,000 troops in the occupied Crimea.

So - this is war, which has killed more than 10 thousand Ukrainian - civilian and military. It continues today. Overall, the monitoring mission of the Human Rights in Ukraine documented 33,146 conflict victims among the civilian population, the military and armed groups were killed and 9900 wounded 23,246.

The civil war - this is another format fight. This usually is between citizens of one country or society for power, less of everything between the two formations of the wreckage is still a single state, not Russian aggression.

Analysis of recent research and publications. Russian aggression, as emphasized by the President of Ukraine, which is still ongoing, and the military threat from the East, evident in a long historical perspective - is the defining factors of our security policy and military planning.

Now most researchers are actively seeking new approaches to more effectively counter the Russian aggressor. In particular, academician V. Horbulin outlined five scenarios, which can be further development of the events, including on the Crimea.

First Deputy Minister of Defense of Ukraine Doctor of Military Sciences, Professor Ivan Rusnak in his article examines the experience of defense building in the hybrid wars, specifies priorities for further strengthening national defense, gives the basic perspective directions to counteract external aggression gives his author's views on the conceptual and programmatic foundations for further development of national defense, taking into account the international dimension of security, stresses the importance of further development of the security and defense of Ukraine as an integrated system and so on. It justifies some other way on the need for timely and adequate response to modern challenges and threats, taking into account significant changes in the geopolitical space and Ukrainian society and committed errors.

However, in this situation, as claimed, the British General Deputy Supreme Allied Commander Adrian Bradshaw to confront Putin

needed “grand strategy”. Above it should work now.

The purpose of the article. Analyze the problem, to outline possible ways and directions of formation of a new strategy against Russian aggression in order to improve the capacity of the Armed Forces and other components of the security forces and defense, increasing their readiness to repel armed aggression.

What are the reasons for such aggressive behavior “brotherly” state?

FAQ first. Some militarists argue that armed resistance if based on the will of the majority of the population, as it is explained and Russian rulers. However, history knows little wars that appeared the result of the will of the people. Most often people forcibly drawn into a war with their rulers. Is no exception and so-called “popular will of the Russian people” against Ukraine and beyond.

Recent studies show that attitude to war mainly neutral and wars occur only when the leaders come to power with a psychologically abnormal condition and attitude toward casualties. Among those called Napoleon, Hitler, Macedonian and some current Russian rulers. They led their country in times of crisis is when people looked leader (idol) with a strong will and hand, which, as it seemed, able to solve their everyday problems. But this contradicts even the Christian commandments.

It is dangerous turns and now “strategy to return as Russian aggression”. It is said even the British Financial Times interview, General Deputy Supreme Allied Commander Adrian Bradshaw. He rightly argues that Russia will remain a threat as long as its president Putin is in power and what the consequences could be disastrous if the West loses coherence in response “to the enemy, in whose hands all the levers of power”.

Explanation of the second. The aggressive intentions and actions of the Russian rulers to expand their allegedly of Russian national interests, the struggle for leadership in the geopolitical space and greater influence in the international arena can be roughly divided into four main stages.

Stage one concerns the Russian Federation inwardly political solve problems after suspending its territory the democratic process that began with the collapse of the USSR and the formation of a new ideological platform, creating convenient power of political parties to ensure its dictatorship. Confronting Rush dictatorship led to the war in the Caucasus, which claimed the lives of thousands of innocent people.

Stage two – the restoration of political and economic independence of former Soviet republics, prompting furious opposition of their democratic reforms and to prevent their independent entry geopolitical and geo-economic space. To this end, Russia is stepping up a hefty military power and launched direct military aggression and the seizure of some areas of former Soviet republics, as happened in Transnistria, Georgia and Ukraine.

Stage three – the creation of a number of international associations of Russia for economic confrontation between the West and enhance its role in the geo-economic space: SCO (China, Russia, Kyrgyzstan, Kazakhstan, Tajikistan and Uzbekistan); BRICS (Brazil Russia India China South Africa), and to combine raw regions – Africa, South America and Asia with a strong production capacity in China, Russia and India.

Step four – an unprecedented increase Russian military-industrial complex and military-economic potential to intimidate the international community in the geopolitical rivalry and military superiority for the creation of the armed forces of neighboring countries.

His strategic goal of Russia became the return of the former territories of the Russian Empire by any means and methods open up to direct aggression against the former Soviet republics. To this end, in 2014 it defined doctrinally legitimate use of its forces outside of and use of nuclear weapons as if in response to the application against it or its allies even conventional weapons.

Analysis of the causes of armed conflict unleashed by the Russian Federation against Georgia and Ukraine confirms that this doctrine is the basis of modern defense policy, which has created and continues to create new challenges and military threats to the entire civilized world.

What possible strategy for combating the aggressor?

As we see it, the current strategy to fight Ukraine from Russian aggression advisable to focus on four areas.

The direction of the first – the peaceful way of upholding economic, energy, market, transport and other national interests in the geo-economic space under international law, bilateral and multilateral agreements, etc, political, diplomatic, legal, including judicial, and other non-forcible methods and active participation in international legal, commercial, financial and other organizations, is the most civilized and promising to counter the aggressor.

Experience confirms that only under conditions of peaceful settlement of international

disputes in all visible and invisible areas and "fronts" can achieve a balance of national interests that fosters peaceful coexistence previously opposing parties. Conversely.

Second direction – strengthening the fight and defend national interests in the information space to mobilize supporters, "demobilization" of opponents and neutralize opponents and those who try to directly or indirectly promote informational aggression of the enemy.

Third direction – strengthening internal security, which is based must be:

fight against the aggressor special service interventions in the internal affairs of Ukraine;

countering terrorism, banditry, separatism;

struggle against espionage and foreign intelligence services;

monitoring and promoting stability of interethnic, interfaith, interethnic relations and other national and more.

It should be borne in mind that the aggressor State other than outright lies, actively uses the whole arsenal of "asymmetrical" means inwardly political to destabilize the situation in Ukraine and internationally.

The direction of the fourth – a reflection of the military aggression, restoration and protection of the territorial integrity of the state. Bitter experience has shown that one of the basic conditions for invasion of Russian aggressor's armed groups on the territory of Ukraine appeared to support some part of the secret services of Russia prepared in advance and his mercenaries local population and the Donbas. The absence of such support would have prevented the occupation or annexation of these territories even in terms of international law.

It is important and timely intervention in confrontation with the aggressor Ukraine and sanctions against Russia, which allowed prevent the spread of armed conflict in other areas and encourages a certain extent aggressor to end the conflict on the diplomatic level. These actions should be stronger.

Some politicians as the main way of achieving peace with the aggressor put forward the thesis if some need negotiations, including with Russian mercenaries in the Donbas, manifested utopia, which pushes itself aggressor. It is worth remembering the wise words of the famous German politician Otto von Bismarck, who advised not to look for signing agreements with Russia if we justify because they are not even worth of paper on which are written. Striking evidence of this is signed by Russia December 5, 1994 Budapest Memorandum on the refusal of Ukraine of nuclear weapons with the commitment of Russia "refrain from the threat or use of force against the territorial integrity or political independence of Ukraine, and that none of its (*RF*) weapons will not be used against Ukraine." Bismarck argued that since Rush necessary or fair play or do not play and never fought for in every stratagem they will tell unpredictable stupidity. This is a lesson which finds its echo in the Hague court.

In Ukraine is sometimes pronounced calls for input on its territory or in Donbas "martial law". It seems that it is desperate, but still not fully thought out appeals. Here we must consider that this is not a simple legal procedure as the results and the order of implementation, which even at the request of numerous ranks of supporters of the event, can not always use the Ukrainian authorities.

The legislation of Ukraine defines two consonant but ambiguous concept of "state of war" and "martial law". According to the Hague Convention on the opening of hostilities in 1907 and Art. 106 of the Constitution of Ukraine declaration of a state of war is made by the President of Ukraine to the Verkhovna Rada of Ukraine in the event of armed aggression against Ukraine. He makes a presentation and decides on the use of the Armed Forces of Ukraine.

Declaration of a state of war – a complex legal and diplomatic procedure, which is the official report of the state-aggressor established international norms order to terminate her peace and transition to a state of war. About the declared state of war should immediately notify the neutral state.

Declaration of a state of war even if it is not accompanied by their own combat action marks the beginning of the state and has certain legal consequences for both parties, in particular:

stop diplomatic and consular relations between states, withdrawn staff of embassies and consulates;

terminate the validity of contracts (non-aggression, the neutrality of the military alliance, economic and cultural agreements between the warring states). Some multilateral agreements terminate in relations between the countries participating in the war;

begin to act international standards adopted specifically to armed conflict (union contracts and mutual and military assistance agreements on the rules of war, the latter can not be denounced, etc.);

property owned by a hostile power (except for property diplomatic missions and consular offices), subject to confiscation;

belligerent merchant ships that were before the war in enemy ports must leave the enemy port,

which set a deadline for their release free, after which such vessels are subject to requisition and detention of the war, regardless of their origin; warships subject to compulsory requisitioning;

for aggressor citizens can apply a special regime, restricting freedom of choice of residence, internment or forced settlement in certain places and so on.

Second. “State of War” is not to be confused with the “martial law” or the special legal regime. Such a regime could be introduced in Ukraine or in its particular areas only in the manner specified claim 19 century. 92 of the Constitution of Ukraine and the laws of Ukraine.

Special legal regime of martial law may be introduced in the following cases:

a) armed aggression or threat of attack;

b) danger to the state independence of Ukraine and its territorial integrity.

Special legal regime involves:

A) providing national authorities and local authorities, military command, military government powers required to:

a) the threat, rebuff an armed aggression;

b) national security;

c) eliminate the threat of danger Ukraine's independence, its territorial integrity.

B) Temporary, due to the threat, restriction of constitutional rights and freedoms of citizens and the rights and legitimate interests of entities indicating the validity of these restrictions.

C) special measures law regime:

1) the enhanced protection of important state facilities;

2) the introduction of labor for working people;

3) the use of facilities and human resources of enterprises, institutions and organizations of all forms of ownership for defense;

4) forced alienation of property in private or municipal property, delete the property of state enterprises;

5) a special regime of entry and exit restrictions on freedom of movement of citizens, foreigners and stateless persons and movement of vehicles;

6) establishment of military-housing obligations for military cantonment so on. All 24 of the law provide special measures to ensure the legal regime of martial law.

In addition, in terms of the special regime of martial law shall be prohibited:

1) change the Constitution of Ukraine and the Constitution of Crimea;

2) the presidential elections in Ukraine and the Verkhovna Rada of Ukraine, the Verkhovna Rada of Crimea and local governments;

3) conduct of national and local referendums;

4) carrying out strikes, mass meetings and events.

According to the International Covenant on Civil and Political Rights in the case of the introduction of martial law regime must immediately report by UN Secretary General States Parties to the present Covenant, to limit the rights and freedoms of man and citizen, which is a deviation from the obligations under the International Covenant and the extent of the deviation and the reasons for such a decision stating the date of termination of the relevant deviations from the obligations under the said Covenant.

Conclusions

1. Under current security conditions peacetime defense and active defense of Ukraine from Russian aggression is most relevant strategy today. It is about the format defensive strategy referred to in Military Doctrine of Ukraine (p.21).

Anti-aggressor state can not be limited to individual military, economic, informational, internal political or other measures. Weighty aggressor conflict can be achieved only if the consolidated applying a determined and appropriate actions and measures by all available forces and means and in all possible directions and “fronts” of the unequal struggle for national interests of Ukraine.

2. The rapid development of the media should more actively used to reinforce influence as the world population of the aggressor and its henchman and on the international community to geopolitical space. Information in this area has become one of the main squares countering aggressor.

3. Aggravation fight the aggressor for the expansion of their interests and leadership in the geopolitical space, attempts to restore lost influence in the international arena, etc., require significant reforms and greater consolidation of international organizations, primarily the UN and the Security Council, the IMF, WTO, especially in terms of strengthening the responsibility for violation of the aggressor or even disregard international law and the failure of the undertaken international obligations Russia has once again ignored.

4. The main strategic direction counter the aggressor in the present situation remains preparedness of the security and defense of Ukraine, its economy and society to repel Russian aggression.

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The article came to the release 17.03.2017

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Деякі підходи щодо стратегії протистояння та протидії агресору

Резюме. Проаналізовано наукові та організаційно-правові підходи щодо формування в секторі безпеки і оборони України стратегії мирного протистояння та протидії агресору.

Ключові слова: агресор, активна оборона, сектор безпеки і оборони України, сили оборони.

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Некоторые подходы относительно стратегии противостояния и противодействия агрессору

Резюме. Проанализированы научные и организационно-правовые подходы относительно формирования в секторе безопасности и обороны Украины стратегии мирного противостояния и противодействия агрессору.

Ключевые слова: агрессор, активная оборона, сектор безопасности и обороны Украины, силы обороны.

UDK 355.02

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Defense reform: some directions to avoid dangerous risks

Resume. Analyzes the views of the classics and some of the solutions to the problems during defense reform.

Keywords: mission, changing, the defense reform, the defense forces, capabilities, culture, strategy, thinking beliefs, values.

The problem statement and its connection with important scientific and practical tasks. In this year will be tree years how Russia started of the real war in the Ukraine. She broke of the board, occupied part of the territory of Donbas and full territory Crimea. In this ware killed approximately ten thousand Ukrainian peoples – civil and military. This war continues today. President of Ukraine said about it recently.

Most pressing problems in this tame is defense software in this condition Russian aggression. It is for this held defense reform. At its base is mission in approximation and integration Ukraine to EU and make some condition for accession to NATO, search effective road achieving strategic goals in the difficult current conditions.

Research and using this road achieving strategic goals defense reform and avoid this if possible errors and risks is the most important today.

The purpose of this article. To take analyses visions on the high-level direction effective defense reform and avoid if it possible errors and risks on this road.

The main materials research exposition and full explanation of the results. Analysis of documents elaborated in Ukraine, particularly about the defense reform shows that the lion's share falls to the Armed Forces. And according to the Concept of the security and defense of Ukraine approved with the Decree of the President of Ukraine on March 14, 2016 №92/2016, the Ministry of Defense and the Armed Forces of Ukraine are the main organization responsible for planning, responding to the threats of all components of the defense forces to ensure defense of Ukraine, protect its sovereignty, territorial integrity and inviolability. This is the goal of the Action Plan for implementation of defense reforms in 2016 – 2020 years.

The expected result is to create it on the principles and standards adopted in the states-members of NATO, effective, mobile, equipped with modern weapons, military and special equipment Defense Force model 2020 can provide such defense is guaranteed.

Given the hybrid Russian aggression that constantly goes on and does not give us another chance to “survive” than the timely warning of effective changes, especially in the defense sector. Change – is the law of life, persuaded 35th US President John F. Kennedy. For those who addressed only to the past or present, he has warned, will certainly lose future.

Many scientists in the world working on the study of the phenomenon of the need for “change”. But do they succeed easily. “Nothing is so hard not running great Machiavelli argued, and nothing is so much doubt and success is not as dangerous in handling as the establishment of a new order. Each innovation is fierce enemies, he argued, that life was good before, and lingering supporters, who are unsure whether they live in a new way”. Among them is the so-called technical “well-wishers”.

To solve these problems it is important to take into account the best international experience. In particular, the German-American psychologist Kurt Lewin Tsadek in 1947, proposed a three-stage model of change: unfreezing, transformation, freezing. This model was improved other classics.

Thus, great interest to solve these problems cause publication of our outstanding specialist Professor at Harvard Business School Jhon P. Kotter. His ideas and developments are broadly in the world, including in respect of joint defense capabilities of the state. An example of such use serves as the final report of the special group of experts who worked on the improvement of strategic planning, resource support and their use for the development of the combined capacity of

the Ministry of Defense USA (Joint Defense Capabilities Studies (Improving DOD Strategic Planning, Resourcing and Execution to Satisfy Joint Capabilities), Final Report 2004).

The overall changes in J. Cotter has eight consecutive stages:

A) Phase unfreezing:

earliest people a sense of the need for change;

creation of reformers to change management;

statement of the ultimate goals and development strategies change;

promotion of vision;

a broad delegation of authority to the maximum low level of subordination;

ensuring rapid measurable progress.

B) Phase change (transformation):

consolidate the achievements and the transition to these problems.

C) Phase freeze:

rooting changes in corporate culture.

The author warns that in every given stage can appear in one of the eight mistakes that can derail success and have very serious consequences:

error №1: excessive complacency. It happens when beginning of changes in the managers and staff do not have sufficient understanding of the inevitable need for change. This has fatal consequences because excess complacency always prevent the objectives of the restructuring;

error №2: the inability to create enough influential team of reformers. For the success of the structural adjustment characteristic that the president (head of the highest structures), head of department or head and another five or fifteen active advocates improvement of the organization should work together as a team;

error №3: underestimation of the ability to formulate final goal. Every time when you can not describe in five minutes that perspective that identifies and addresses the specific program of modernization and did not find the audience understanding and interest - know that you are waiting for big trouble;

error №4: Propaganda vision lag of 10, 100 or more times. Agitate for change can and word and deed. Nothing discredits the idea of reform more than the behavior of senior officials (heads), contradicting the fact that they preached in words.

The greatest damage confidence in the workers action plan amendments provide managers performed at odds with the concept of change. With this rule derive important conclusions:

1) until the top leaders of their behavior will not implement new ideas to persuade officials to justice and their appeal is not easy, and sometimes impossible,

2) even if the promotion of new ideas progressing successfully, you should always keep an eye on the behavior of senior managers to identify and promptly remove differences between their words and actions;

error №5: passivity to obstacles, thus allow to block the new vision. New beginnings much less succeed if the employees, even if there is understanding of the need for reform, feeling powerless before the huge obstacles along the way. In some cases, these traffic congestion exist only in their imagination, and the problem arises is to convince these people in no real obstacles. Each time the most energetic and full of the best intentions of the leaders shy away from fighting with obstacles, it necessarily affects the willingness of employees to work for change;

error №6: the lack of a sense of rapid progress. There is a risk of loss of tempo changes, if at the same time not to put short-term tasks that give tangible (visible) result;

error №7: premature celebration of victory. While the changes have not yet become an integral part of corporate culture (which may take from three to ten years), the share of new principles of the organization “hanging by a thread”, so how can prevail old tradition;

error №8: changes are not rooted in the corporate culture. Changes in the life of rooting only after becoming an everyday habit, a way of being in the workplace, when members of the “flesh and blood” not only in the production units, and in the management of the organization. As long as a new style of behavior will not be in the organization generally acknowledged, not become the norm, followed by freely employees, it will degrade every time, as soon as the reform process stops.

The above errors are not fatal. If you know the likelihood of their occurrence and proactively act skillfully for their prevention, it is possible to avoid errors, or significantly mitigate their negative effects.

Speaking of the problematic aspects of defense planning in the transition period should take into account that, according to independent consultant “GG Consulting” Glin Grant that transformation should not be limited only to the weapons, units and processes. It is also a change in the nature and way of thinking especially managerial staff. It is contained in the culture, values and ideas.

The magazine “Harvard Business Review” in 2011 shows the figure of 70%. This part of all initiatives concerning changes fails. It is a cruel figure. In fact, as the most defensive reviews management structures and divisions of troops (forces) in the post the successful achievement of transformation almost did not happen. In this context to outline a model that will help make these changes were at least parts of the 30% success rate.

Practice proves that transformation mostly fail because of erroneous focus on processes and structures instead focus on thinking, beliefs, convictions and relation to the phenomena.

The key to success in the defense reform may understand of their own culture. It is worth mentioning two of the world’s scientists – E. Shane and G. Hofstede to manage organizational culture.

The concept of “culture” in simplified form can be described as a way of thinking and behavior. Great Dictionary of Modern Ukrainian defines this concept as a set of material and spiritual values created by mankind throughout its history; is created to meet the spiritual needs of man; education.

Understanding the need for transformation to a more rapid and effective achievement of the strategic goals of defense reform - so we can formulate the mission of this publication.

Conclusions. To ensure more effective implementation of defense reform, based on research, as appropriate:

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

to develop and adopt established procedures relevant legal act of national level “On organization and strategic planning in the defense and security sector of Ukraine”, and the relevant guidelines for its implementation and execution;

to organize work to improve the common functional components of the defense forces in a given situation and crisis situations, as such is defined in functional strategies and plans of the USA, Poland etc;

to increase the professional level of managers at all levels and personnel, creating a consolidated, more effective system for training and appointment of staff.

In order to achieve the mission outlined defense reform, leaders at all levels should make corporate culture in organizations (units) understanding of the need for change, and the daily use of these classical practices of world-renowned scientists on the order of execution and ensuring these changes, avoiding assumptions described them errors.

The direction of future research. To solve the problems outlined a need to further study the leadership of staff and existing approaches to their implementation in practice of troops (forces) and in the process of defense reform in all areas envisaged by the Action Plan.

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The article came to the release 23.02.2017

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Оборонна реформа: деякі шляхи уникнення небезпечних ризиків

Резюме. У статті проведено аналіз поглядів класиків та деяких шляхів розв'язання проблем під час проведення оборонної реформи.

Ключові слова: місія, зміни, оборонна реформа, сили оборони, спроможності, культура, стратегія, мислення, переконання, цінності.

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Оборонная реформа: некоторые пути избегания опасных рисков

Резюме. Анализируются взгляды классиков и некоторые пути решения проблем во время проведения оборонной реформы.

Ключевые слова: миссия, изменения, оборонная реформа, силы обороны, возможности, культура, стратегия, мышление, убеждения, ценности.

UDK 351.863

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Directions of further perfection of national legislation in the field of mobilizational preparation and mobilization

Resume. In the article the analysis of influence of operating normatively-legal base of Ukraine is conducted in the field of mobilizational preparation and mobilization. A necessity and directions of further perfection of the legal field of the state are set forth.

Keywords: mobilizational preparation, mobilization, armament, military technique, Armed Forces.

Raising of problem. On implementation of Decrees of President of Ukraine during 2014-2015 years six turns of partial mobilization are conducted in the state.

Due to the conducted measures of mobilization it was provided: increase of battle and numeral composition of groupments of troops (forces);

maintenance on a due the levels of military efficiency of troops (forces), in particular those which execute task in an anti-terror operation;

strengthening of echelon of guard of state boundary and constituent is from a technical protection and proceeding in the objects of a transport infrastructure;

completing of soldiery parts (subdivisions) which was created again, by a personnel and transport vehicles of national economy;

creation of the system of addition to not complete set losses of personnel.

The analysis of realization of the first turns of partial mobilization allowed to educe problem questions, namely: insufficient volumes of geared-up mobilizational resources on an account in soldiery commissariats;

a necessity of forming of the modern system of social defence of servicemen and increase of motivation of liable for military service is to passing of military service.

Therefore there was a necessity for the further improvement of national legislation in the sphere of mobilizational preparation and mobilization.

Degree of worked out of problem. It is devoted the question of mobilizational preparation and mobilization the determined amount of publications. [1-4]

In a greater degree there were the lighted up problems of logistical support of mobilizational development of troops (forces). By the question of making up of the staff connections and soldiery parts by a personnel, the technique of national economy was spare less attention.

By a research purpose estimation of scope of all questions in the sphere of mobilizational preparation and mobilization of the state the modern legal field and his influence on implementation of tasks of the noted sphere.

Exposition of basic material. Legal framework of mobilizational preparation and mobilization in the state is Constitution of Ukraine, Laws of Ukraine "On the defensive of Ukraine", "About Military Powers of Ukraine", "About mobilizational preparation and mobilization", "About a military duty and military service" and other laws of Ukraine, and also the normative acts given out in accordance with them. [5-11]

It is possible to assert that resulted legislative documents determine position in relation to realization of mobilizational preparation and mobilization for classic wars and soldiery conflicts, when maintenance of life of all population of the state, effort of all national economy the victories sent to achievement at armed to the fight and conditioning for signing a peace treaty.

Other business is legal accompaniment of scale anti-terror operation (farther ATO) which takes place on Ukraine first. In the conditions of peaceful life of considerably anymore part of population, than that, which is attracted for realization of operation, operative adaptation of the legal field is needed foremost for the successful decision of tasks of completing of troops (forces) by a personnel. It is needed for this purpose, as practice showed, to decide three key tasks:

stimulation of liable for military service is to passing of military service;

providing of social defence of servicemen is in modern economic terms;

an increase of responsibility of participants of process of mobilization is for end-point of process.

To the first block of initiations of bill, in relation to stimulation of liable for military service to

passing of military service, it would be expediently to enter: confession of military service after an appeal during mobilization as new separate type of military service, that would allow to pay to the citizens, called during mobilization, cash cover at the level of servicemen of contract service;

a grant to possibility voluntarily to conclude contract on passing of military service in a special period and repressing right to remain on military service after demobilization;

increase of maximum age of stay in a supply for liable for military service mens of all categories to 60 years (except for higher officers - 65 years), that allows to carry out a constitutional duty in relation to defence of Motherland to the volunteers, first of all those, which have an experience of participating in battle actions, peacemaking operations.

To the second block, in relation to social defence of servicemen in modern economic terms, it was considered expedient to take: distributions on servicemen, which became soldiery after an appeal during mobilization, all complex of guarantees of social and legal defence, set by a legislation for servicemen;

maintenance after servicemen of job in civil life, position, average earning on an enterprise, payments of pensions to all citizens which are called during mobilization on military service;

maintenance of right is on entrepreneurial activity for sole proprietors, at their to the prize on military service during mobilization;

release of servicemen from an extra charge to them of penalty approvals and percents for possessing a credit on the special period;

maintenance of social privileges mobilized, which got a wound, were taken prisoner or acknowledged obscurely disappearing.

To the third block, in relation to the increase of responsibility of participants of process of mobilization for end-point, it is expedient to enter: for maintenance on the account of military taught resources which are freed from military service and accepted the direct participating in battle actions, creation of the functional component system of completing of by a personnel of military of operative reserve, as a mechanism of the rapid bringing in them in interests of Military Powers;

abolition (ungrant) of postponement is from mobilization (on 6 months) to the reservists of operative ready reserve.

For realization resulted by Department of defense of Ukraine and General staff of Military Powers of Ukraine geared-up suggestions to the legislation of Ukraine, which were considered and accepted by the corresponding public organs of power. It was worked out and accepted six Laws of Ukraine.

In addition, after lessons and experience of six turns of partial mobilization it is worked out and accompanied changes to the legal field, which it is foreseen:

expansion of social privileges to the reservists (money reward at closing of deal, favourable pension, additional vacation);

obligation of citizens independently to arrive to the military commissariat in ten days' term in the case of announcement of mobilization;

strengthening of criminal responsibility for avoiding an appeal after mobilization, stay in the state of alcoholic intoxication in a battle situation;

establishment of criminal responsibility is for an obstacle to the measures of mobilization and implementation of military cargo duties;

perfection of the system of military account with determination of the personal responsibility of leaders of organs of local self-government, enterprises for his conduct and obligation of organs of local self-government, leaders of enterprises to carry out notification and arrival of the workers during mobilization;

to carry out the obligation of the National police search, detention and occasion of citizens which avoid mobilization.

Thus, including to the due to changes, brought in the legal field of the state, on results mobilization in the rows of Military Powers of Ukraine from a supply about 200 thousand and more than 8000 units of transport vehicles persons are called.

Conclusion: the existent legal field, amendments and supplements to him during realization of partial mobilization allowed successfully to execute a task to mobilization of human and transport capitals of the state.

Unfortunately substantially the legal providing of questions of satisfaction of mobilizational necessities of Military Powers of Ukraine is worse estimated in an armament, military technique, rockets, live ammunitions, other material facilities and services. Logistical support (farther МтР) of troops (forces) which відмобілізовувались and brought to battle readiness during realization of ATO carried out due to the accumulated supplies in troops (forces), from the bases (compositions) of Center and (with the use of legal instrument of government defensive order) by a supply from the enterprises of national economy. During 2003-2013 years the defensive sector of national economy was high-usage soldiery orders only on 3-4 % from his possibilities.

With beginning of ATO, when in times increased order to the enterprises, it appeared that they are unable them in time to execute. The differences of out-of-date were given material and technical base and technologies, critical condition of providing of enterprises highly skilled working, technical and engineerings shots. It is not advantageous to contain proprietors, leaders of enterprises, industries of national economy on enterprises mobilizational tasks. All of it, in large ступіні, is related to imperfection of the legal field at

it to the sphere of activity of public and not state organs of management, organs of local self-government, leaders of enterprises, establishments and establishments.

With the purpose of improvement of legislation at marked to the sphere and providing of implementation of measures of defensive reform in the field of mobilizational preparation and mobilization of defensive of Ukraine Ministry and by the General staff of Military Powers of Ukraine, soldiery educational establishments, it is suggested to expound Law of Ukraine scientific establishments "On mobilizational preparation and mobilization" in a new release taking into account experience of realization of mobilization of national economy of Ukraine, Military Powers of Ukraine, other soldiery formings during implementation of tasks from defence of sovereignty and territorial integrity of Ukraine. A project is foresee determination of new terms which are used in the field of mobilizational preparation and mobilization.

It is foreseen by maintenance of mobilization of Military Powers of Ukraine, other soldiery formings to count their bringing to readiness to implementation of tasks on purpose. Before under maintenance of mobilization of Military Powers of Ukraine translation of them was understood on the states and structure of war-time from доукомплектуванням by a personnel, armament, military technique, other material and technical facilities. In further realization of measures of the battle arranging and measures preparation of soldiery organisms was foreseen to implementation of tasks on purpose. By the way, on results mobilization during ATO a structure and quantity of MF of Ukraine changed substantially. The project of law is offer determination of maintenance of demobilization. In a current legislation absent norms are in relation to maintenance of demobilization, and a term "demobilization" is determined exceptionally.

It is suggested to maintenance of mobilizational preparation to include the question of the mobilizational planning, forming, placing, storage, use, addition, freshening (renewal) of supplies of material and technical and raw material resources, necessary for realization of mobilization and functioning of the state in the conditions of the special period and others like that. It is considered expedient to complement a legislation norms, which determine principles of planning, forming and mobilizational ordering fulfillment.

Geared-up positions, that the liable for military service, which work on the enterprises of defensive-industrial complex, which produce works from development, making, repair, modernization of armament, military technique and other wares of military-oriented for satisfaction of necessities of Military Powers of Ukraine, other soldiery formings in accordance with agreements (contracts), are subject reserving, the term of implementation of which presents not less than 6 months.

The list of enterprises, which in connection with their high public necessity rid of transmission of transport vehicles and technique to Military Powers of Ukraine, other soldiery formings, is offered to the statement.

The project of law gives interpretation of questions of organization of preparation to the rationed providing of population food and unfood stuffs, by medical service, services of connection, transport, building and domestic services, technical protection in a special period of objects, building and transport highways of defensive and important national value, transport system to providing of mobilization, redistribution of labour resources in a special period and informative providing of mobilizational preparation and mobilization;

By authors certain plenary powers of public, other public organs authorities in relation to organization of the mobilizational planning and mobilizational ordering, organization of work fulfillment in relation to forming, placing, storage, use, addition, freshening (renewal) of supplies of material and technical and raw material resources, necessary for realization of mobilization and functioning of corresponding sphere of management, administrative units in a special period, organizations of education and preparations to development of the special formings.

The project of law is formulate the duties of leaders of enterprises in relation to mobilizational ordering, assistance to the soldiery commissariats fulfillment in their work in a peace-time and during mobilization, providing of admittance and access of corresponding public servants of soldiery commissariats to the documents from a military account on enterprises for realization of control after the state of account of liable for military service; providing during mobilization of unimpeded notification of liable for military service and suppliers of transport vehicles and technique by the public servants of soldiery commissariats and appointed by them by persons; education and maintenance in readiness to work of certain elements of the system of notification, collection and supplying with mobilizational resources during mobilization. The variant of duties of citizens of actual maintenance is also offered.

The brought material over allows to draw conclusion, that the legal field corrected and has a tendency of κ of further adaptation to the terms of hybrid war of contemporaneity. It must allow the public, not state organs of management, organs of local self-government, to the leaders of enterprises, establishments and establishments more effectively to prepare and conduct the measures of mobilizational preparation and mobilizations in interests of territorial integrity of Ukraine and inviolability of her borders.

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The article came to the release 16.02.2017

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Напрями подальшого удосконалення національного законодавства у сфері мобілізаційної підготовки та мобілізації

Резюме. У статті проведено аналіз впливу діючої нормативно-правової бази України у сфері мобілізаційної підготовки та мобілізації. Сформульована необхідність та напрями подальшого удосконалення правового поля держави

Ключові слова: мобілізаційна підготовка, мобілізація, озброєння, військова техніка, Збройні Сили.

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Направления дальнейшего совершенствования национального законодательства в сфере мобилизационной подготовки и мобилизации

Резюме. В статье проведен анализ влияния действующей нормативно-правовой базы Украины в сфере мобилизационной подготовки и мобилизации. Сформулирована необходимость и направления дальнейшего совершенствования правового поля государства.

Ключевые слова: мобилизационная подготовка, мобилизация, вооружение, военная техника, Вооружённые Силы.

UDK 355.02:321.011(477)

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Determination and analysis of features of making modern soldiery conflicts

Resume. A comparison of traditional or quarantinable types of the armed conflicts and modern soldiery conflicts that on essence are the conflicts of new type is made. The concept of modern military conflict is entered; his constituents and features are examined.

Keywords: quarantinable military conflict, modern military conflict, constituents, features.

Formulation of the problem. The essence of modern military conflicts(MMC) significantly transformed and classic scenarios to solve them fail to deliver effective solutions. Some experts do not recognize the modern military conflicts, other insist that their inherent specificity. However, the scientific definition of modern military conflicts significantly affects both the choice of scenarios prevention and the entire system of strategic and defense planning in the defense and security sector. Logic seems to provide a scientific definition of modern military conflicts, determine their components and features.

Analyze of main publications. Unambiguous definition of what constitutes the MMC in the scientific literature and no. Uncertainty and fuzzy nature of the MMC is reflected in the terminology multiple titles a wide range of military conflicts such as formal and informal, traditional and non-traditional, symmetrical and asymmetrical, low and high intensity etc.

Objective. Analyze and determine the features and components of the MMC and further development of the relevant provisions of the Military Doctrine of Ukraine.

Presenting main material.

The features of conventional military conflict of the past century are: availability of subjects military and political relations, contradictions between these entities, use of weapons as the principal means of solving the aggravation of contradictions, fighting in a limited area.

Postindustrial era marked by a fundamentally new and different from the conventional, type of military conflicts. The official conclusion of the Hague Tribunal, Ukraine in 2014 in a state of armed conflict.

There are medium-term forecasts of the military and political situation in the world united opinion on the increasing number of MMC.

Military Doctrine of Ukraine in 2015 defines the following two features MMC:

asymmetric use of military force is not statutory armed groups;

integrated use of military and non-military instruments, economic, political, and psychological information.

The traditional understanding of military conflict is changing and requires correction. There are two extreme views on the issue. According to one, the traditional vision of military conflict is out of date and can not contribute to solving the security problems posed by the XXI century. From another perspective, transforming the character and nature of armed conflict, but its nature remains unchanged. No doubt the mere fact that conventional military conflict as “a form of resolving interstate or intrastate contradictions Double use of military force” is now obsolete.

Define MMC as actions undertaken by combining political, military, economic, information and international legal driving conflict scenarios in order to achieve military and strategic objectives. MMC is different from the conventional military and a clear political decision aggressor and use scenarios together. Scripts are used, are not chaotic, and built-in single and logical chain that binds the military and non-military warfare and used as weapons.

Analysis of actual and potential MMC allows you to set some differences from conventional military conflict, which belong to one of the groups: overall, political, military, economic, international law.

MMC is a continuous process that takes time and does not have a clear start and end frames. However, MMC is a cyclic process with the following phases: hidden training; strained

relations, the beginning of the conflict actions; crisis; conflict resolution.

MMC takes place on the geopolitical, military-political and military levels and consists of a multi-level actions aimed at destabilization.

Military and strategic objectives of the MMC is undermining the aggregate power of the state, position and influence government domestically and internationally, changes in government, divisions and the formation of new, more dependent states, bringing to a situation where the use of military force will simply unnecessary.

The subjects of the MMC is the state, oligarchic clans, some individuals, terrorist organizations, structures of transnational organized crime, international organization or group of countries concerned.

Conclusions.

1. The current military conflict is complex, its main components is the political, military, economic, information and international law.

2. Military strategic goal of modern armed conflict is a territorial division and the formation of new dependent countries.

3. Scenarios of modern military conflicts have many similarities, their implementation and development process is managed.

4. Military force is not decisive in modern military conflict is achieved primarily its optimal combination of economic and information component.

5. The participation of the armed forces in the modern military conflicts require significant rethinking concepts of development, changing the system transition to the formation of not only site-specific, but also to interdepartmental groups of forces and the transformation of strategic defense planning.

6. The need to develop and implement the practice of criteria and methods based primarily quantitative methods that allow rapid selection scenario Prevention modern military conflicts.

Below we developed a system of criteria and methods of selection of effective prevention scenario modern military conflicts.

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The article came to the release 16.03.2017

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Визначення та аналіз особливостей складових сучасних воєнних конфліктів

Резюме. Проведено порівняння традиційних, або *конвенційних*, видів збройних конфліктів та сучасних воєнних конфліктів, які по суті є конфліктами нового типу. Вводиться поняття сучасного воєнного конфлікту, розглядаються його складові та особливості.

Ключові слова: конвенційний воєнний конфлікт, сучасний воєнний конфлікт, складові, особливості.

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Определение и анализ особенностей составляющих современных военных конфликтов

Резюме. Проводится сравнение традиционных, или конвенционных, видов вооружённых конфликтов и современных военных конфликтов, которые по сути являются конфликтами нового типа. Вводится понятие современного военного конфликта, рассматриваются его составляющие и особенности**.**

Ключевые слова: конвенционный военный конфликт, современный военный конфликт, составляющие, особенности.

UDK 351.86: 340.137(477)

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International legal regulation of the use of armed forces in modern military conflicts

Resume. The principles of formation and use of international legal regulation of the use of armed forces in modern military conflicts are considered. Practical examples are given from the legislation of the United States and the Russian Federation on the direction of national armed forces to carry out tasks outside national territories.

Key words: military conflict, armed forces, military operations, regulatory framework for the use of armed forces.

Formulation of the problem. Modern military conflicts and how to use them in military strength characterized by reducing the role of international law. Actual practice is to consider use of the international legal framework in the direction of the Armed Forces and the US and Russia in military conflicts.

Objective. The article is an analysis of the international legal framework use of armed forces in the modern military conflicts

Presenting main material. The international legal basis for the use of armed forces and general rules of international humanitarian law, the laws and customs of war (fighting), the provisions of international and Union (coalition) agreements. These standards are defined by the UN Charter, UN Security Council resolutions, the Hague Convention of 1907, the Geneva Conventions of 12 August 1949 and Additional Protocols of 8 June 1977 and a number of others. According to the documents of the legal regulation of military conflicts defined by international humanitarian law, establishing the laws of war. International humanitarian law does not set the goal to determine responsibility for the resolution of armed conflicts. This applies only to the competence of the UN.

The UN Charter laid the foundations of the system security. The main principle of international law is to exclude the use of force or the threat of international communication practice (p. 4. 2 of the UN Charter). This principle is complemented by another: all international conflicts and disputes should be resolved only by peaceful means (para. 3, Art. 2 of the UN Charter). Integral aspect of these regulations is the principle of non-intervention (non-intervention), which provides for the maintenance of any state from interfering in the internal affairs of another, that respect for state sovereignty.

In practice not always followed these principles and rules. The reason for violations is to address priority military-political and military-strategic objectives that the national interests of the country and the implementation of allied commitments.

The exception is self-defense. Art. 51 of the Charter allows for individual or collective self-defense, the use of force only when it is committed in an armed attack. There has been striving to expand the concept of "self-defense". The question of the extent to which this or that particular situation suggests the legitimacy of the use of force in self-defense, given at the discretion of not only the Security Council, but in fact most states. As a result, the emergence of the concept of "pre-emptive" and "preventive" use of force as a "natural development of the concept of self-defense" that allows individual states formally legally use the armed forces for the application of pre-emptive strikes.

Also, there is a tendency unjustified use of armed force during military operations without a UN Security Council sanctions. Thus violated a key element of the UN Charter - the principle of non-use of force in international relations. However, military and political leadership of a number of states to justify their use of the Armed Forces allegedly under international law brings a number of arguments, which include "special powers", "exceptional circumstances" and "humanitarian intervention."

An important aspect of the international legal framework of the Armed Forces - justify the legitimacy of their use outside the national territory.

Thus, the military and political leadership of Russia believes that sending troops abroad only enough domestic law. In connection with the murder of 7 July 2006 Russian diplomats in Iraq, the Federation Council adopted a resolution which authorized the President sending units of the Armed Forces and special units outside the national territory in order to prevent international terrorism against Russia or Russian citizens and persons without citizenship who permanently reside in.

After the war with Georgia in August 2008 was amended in Federal Law "On Defense", which contains a list of grounds for use of armed forces of the Russian Federation abroad. Units of the Armed Forces can be used for: repel aggression, preventing aggression against another state, protect Russian citizens abroad, to combat piracy, maritime security, repel the attack on the armed forces or other troops stationed outside the country.

In the US legal foundations of any stay of US troops abroad is an international treaty under Art. 102 of the UN Charter and the Vienna Convention on the Law of Treaties of 23 May 1969. International agreements must meet generally recognized principles and norms of international law, to ensure respect for the sovereignty of the receiving troops, foreign troops compliance of national law tradition of noninterference in the domestic and foreign policies of these countries, non-use against them or threat of force.

The question of responsibility for the unlawful use of armed forces governed "Code of Conduct relating to political and military aspects of security" (Code of Conduct on Politico-military Aspects of Security) in 1994, aimed at solving important problems in building trust, but compared to Vienna document, it lacks verification mechanisms.

In the case of special operations in peacetime, and especially international (coalition) forces under UN auspices, obtained legally from a so-called operational requirements of the law. This concept is defined as a set of legal principles and rules of international, domestic law and the rights of other foreign countries that have a direct impact on the conduct of military operations. Under this law using specific documents detailed operational nature, taking into account the terms and requirements of other international instruments. These include the UN mandate, "Agreement on the status of forces", "Agreement on task" and "Rules of forces."

In addition, the legal basis for international transactions involving the Armed Forces formed directives of UN Secretary General, "UN legislative developments" and Directive peacekeeping force commander of the UN.

The practice of armed forces in modern terms as part of the international (coalition) military operations (operations in the Persian Gulf, Iraq, Afghanistan, Libya) has identified the need for special attention to international legal aspects of operations. In this regard, there has been a steady trend of creating unified international legal groups.

Along with the main legal instruments of the international community an important element of the international legal framework applying national Armed Forces are bilateral and multilateral agreements. These include the prohibition of agreements and distributing weapons of mass destruction, missile and nuclear technology, the use of landmines and demining in zones of conflict voэnnyh, development and use of incendiary and laser weapons ammunition and others.

Many of the above international agreements and conventions incorporated into statutes and guidelines US Armed Forces, which regulate the legal aspects of their application and conduct military operations.

Conclusions. By the problematic aspects of the application of IHL in contemporary armed conflicts and for the future include the following:

basic rules concerning the use of the Armed Forces outside the national territory;

Regulation of Legal Cooperation of States in the implementation of peacekeeping;

coordination of the implementation of IHL rules into national law, its dissemination and practical application in the military states;

determine whether the requirements of new weapons and international humanitarian law treaties;

objectives and mode of application of forces that are not part of the Supreme State;

an accurate manner and form of use of the latter in the event of an international armed conflict.

In the following will be considered especially the application of international law in hybrid conflicts.

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The article came to the release 17.03.2017

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Міжнародно-правова регламентація застосування збройних сил у сучасних воєнних конфліктах

Резюме. Розглянуто основи формування і використання міжнародно-правової регламентації застосування збройних сил в сучасних воєнних конфліктах. Наводяться практичні приклади із законодавства США і Російської Федерації щодо нормативно-правових питань направлення національних збройних сил для виконання завдань за межами національних територій.

Ключові слова: воєнний конфлікт, збройні сили, нормативно-правова база застосування збройних сил.

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Международно-правовая регламентация применения вооружённых сил в современных военных конфликтах

Резюме. Рассматриваются основы формирования и использования международно-правовой регламентации применения вооружённых сил в современных военных конфликтах. Приводятся практические примеры из законодательства США и Российской Федерации по вопросам направления национальных вооружённых сил для выполнения задач за пределами национальных территорий.

Ключевые слова: военный конфликт, вооружённые силы, военные операции, нормативно-правовая база применения вооружённых сил.

UDK 355.02

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An approach to defining the essence of Defence Forces “desired capability”, “actual capability”, and “evaluated capability” notions to improve strategic planning basics

Summary. The essence of the notion of “desired capability” and its relationship with the notions of Defence Forces “actual capability” and “evaluated capability” is defined to eliminate the differences existing in the views of military experts involved in the process of gradual transition to new principles and methodology of strategic and defence planning based on threats tailored target capabilities developement.

Key words: desired capability, actual capability, evaluated capability, notions, inter-relations, defence forces, strategic planning.

Problem description. According to the Strategic Defence Bulletin of Ukraine (hereinafter - SDB) the strategic objectives have been identified as follows: effective policies implementation, systems planning and resource management in the defence and security sector using modern Euro-Atlantic approaches and achieving operational (combat, special) desired capabilities of defence forces needed to guarantee a rebuff of a military aggression, state defence, assurance of peace and international security [1].

However, as of today there are inconsistencies in the theory and practice of strategic planning and there are disagreements among experts. These inconsistencies are related to the lack of a common vision, definitions and methodology on transferring defence forces capability data to quantitative and qualitative indicators that would ensure transition of the Armed Forces of Ukraine and other defence components to building planning based desired capabilities. Also, a common vision on definitions and methodology would help developing scientific and analytical tools for Defence Forces components evaluation, identification of those of them that require support and augmentation (upgrading), the formation of new defence forces components and recycling the ones that are in excess (surplus).

In addition, in the legal acts of Ukraine, scientific works, and articles such terms with ambiguous definition as "desired capability," "actual capability", and "evaluated" are used and, therefore, require clarification.

Analysis of recent research and publications, as well as modern conceptual documents of Ukraine for defence forces planning, response and capacity based use [1-11] shows that researchers and experts have different points of view on the issue of problem solving and achieving improvement in the field of Defence strategic planning and management. Existing polyphony of ideas and beliefs, particularly regarding the terminology in this area, does not have a negative meaning, but rather it serves as an evidence of cultural pluralism and efforts in place to resolve existing differences in opinions and terminology.

At the same time the use of terms with ambiguous definition in various documents, including legal acts, for modeling and describing strategic and defence planning on the basis of defence forces desired capabilities development hampers strategic planning methodological foundations development in the defence and security sector of Ukraine, undermines research of this complex process in general, and interfere with resolution of practical issues.

Thus, the current status of conceptual and categorical apparatus in the field of defence indicates the need for its proper formation, adjustment and implementation.

The aim of the article is to define the notions of defence forces “desired capability”, “actual capability”, and “evaluated capability” as well as clarification of these terms to improve methodological bases of strategic planning desired capabilities of Defence Forces components.

Main body of the article. Currently, the preliminary findings of research on developing methodological foundations of strategic defence planning show it should be based on the results of a comprehensive Defence review of all Defence Forces components and contain basic baseline data to develop strategies for their development based on strategic forecasts of socio-economic

development of the country, its Defence and resource desired capabilities.

Additionally, during the development of national strategic documents and security sector reforms implementation in Ukraine NATO approches and experience shall be used when it comes to development of a unified procedure and methodology of strategic documents, determining their methodological, legal and institutional framework and terms.During the research, it has become obvious that there is a necessity to clarify the terms (notions) of Defence Forces "desired capability" "actual capability" and "evaluated capability". This is due to their multiple meanings, their nature and inter-relations during the development of methodological basis that are used for building Defence Forces components strategic planning target capabilities, and for evaluation procedures. Thus, the Military Doctrine of Ukraine [2] introduces the term "Defence Forces desired capabilities", defined as the ability to achieve the desired result when performing defence tasks in certain circumstances in accordance with the scenarios forseen by using the resources available. However, in the text there are expressions containing the term "actual capabilities" (Chapter II, para. 7, paragraphs 3, 7, p. 12, paragraph 1) and others that focus on the term "evaluated capability".

The Concept of the security and defence of Ukraine [3] contains such expressions as "the *operationally desired capabilities* of the security and defence sector components" (Sec. I), "the *preservation of desired capabilities* to build *operational capabilities"* (Sec. III, para. 3.2), and others.

In the Recommendations on the organization and conduct of the Defence review [4] the plural term of "Defence Forces desired capabilities (actual capabilities)" means the ability to achieve the desired effects in the performance of the security and (or) defence tasks in particular circumstances according to the defined action scripts by using the resources available. In other words, it is implied that in this document the notions of "desired capability" and "actual capability" mean the same thing and collectively define the word "ability".

In the Temporary guidelines [5] the term "desired capability" means *the characteristic* that enables performance of certain actions to achieve specific goal having accounted for the resources identified. Thus, *the operational (combat) desired* capabilities mean *a set of characteristics* that determine *the ability* of military C2 body, military unit (or a Navy ship) to accomplish their tasks according to standards.

In Annex 2 to the SDB [1] *"desired capabilities"* are defined as quantitative and qualitative indicators characterizing the ability of the Defence Forces components to carry out their tasks of National defence and repel an armed aggression against Ukraine with consideration of *actual capabilities* of the state.

In addition, in other concept documents of Ukraine different word combinations have been used that indicate existing pluralism of certain terms, i.e.:

the Defence Forces *desired capabilities*;

the naval *desired capabilities* of Ukraine;

the Defence Forces Joint *desired capabilities*;

the Defence Forces operational (combat, special) *desired capabilities*;

communication *desired capabilities*;

vital *desired capabilities*;

functional *desired capabilities*;

operational (combat) *actual capabilities* (*desired capabilities*);

fire support and C2 *actual capabilities*.

In NATO dictionary the term ***"desired capabilities"*** *(capabilities)* has been defined as the ability to achieve the desired effect corresponding to given standards having used particular means and methods for the solution of the tasks set.

The Capability Codes and Capability Requirements for ACO and ACT approved as of 14.10.2011 are widely used in all NATO structures, providing a single conceptual apparatus to describe target capabilities, they have also been approved by the EU Military Staff.

Capability Codes are unique alphanumeric identifier of the functional capacities, while the characteristics of the target capabilities express the basic requirements to military units capabilities considering all areas of development (guidelines (doctrinal) documents preparation, organizational structure, training, equipment and logistics systems management, manning, logistics support, and achievement of interoperability).

The standard description of each Capability Code is used to determine the main characteristics with a focus on the task, which is supposed to be accomplished.

Each Capability Code includes:

basic *desired capability requirement* – it describes the main purpose of the Capability Code (one requirement per code);

Basic requirements for a desired capability - describes the actions that need to be taken in order to achieve the desired result (basic operation tailored *desired capabilities*);

Additional requirements for desired capability – they describe enabling characteristics that ensure *desired capability* main purpose implementation.

The results of the analysis of existing definitions (notions) of "desired capability", "actual capability", "evaluated capability" and their inter-relationships in the legal acts of Ukraine (Table. 1) indicate the differences that currently exist.

Table 1

Comparative table of existing definitions in legal acts of Ukraine

Legal acts of Ukraine	Term definition	Terms inter-relations
Military Doctrine of Ukraine	Defence Forces **desired capabilities** - the ability to achieve the desired result when performing defence tasks in certain circumstances in line with the scenarios prescribed and resources available	... **Ability to achieve** the desired result ...
The Concept of Security and Defence Sector of Ukraine Development	NIL	... Increasing the ***operationally desired capabilities*** of Security and Defence Forces and their level of preparedness ...; ... Operationally ***desired capabilities*** of Security and Defence Sector components (Sec. I), ***desired capability*** saving; p. 2. Ways to achieve ***target capabilities*** required; ... Strengthening of ***desired capabilities*** ...; ... Acquiring of the necessary operational and technical ***actual capabilities*** ...; ... **evaluated capability** to defend the national interests of Ukraine ...;
The Strategic Defence Bulletin of Ukraine	***Desired capabilities*** - quantitative and qualitative indicators characterizing Defence Forces components *ability* to carry out the tasks of National Defence and repel of an armed aggression against Ukraine assigned to them considering the ***actual capabilities*** of the state	… Defence Forces components ***evaluated ability*** to carry out the tasks of National Defence and repel of an armed aggression against Ukraine assigned to them considering the ***actual capabilities*** of the state; … … resource ***actual capabilities*** of the state; ... Naval ***desired capabilities*** of Ukraine…;
The MoD of Ukraine Order # 303 dated as of 13 May 2013	Requirements for operational (combat) ***actual capabilities*** (***desired capabilities***) - a list of conditions (military, physical, technical, etc.), criteria and accomplishment indicators of the tasks contained in the situations scenarios	... ***evaluated ability*** to achieve the desired result ...; ... requirements for operational (combat) ***actual capabilities*** (***desired capabilities***) ...;
Temporary Instruction on the organization and conduct of inspections and evaluation of operational (combat) ***desired capabilities*** in the Armed Forces of Ukraine	***desired capability*** – a property that allows to perform certain actions to achieve a specific goal considering allocated resources identified based resources	The term "***actual capabilities***" is not mentioned. Operational (military) ***desired capabilities*** - a set of properties that determine the ability of military C2 body, …;

The Table 1 shows the differences in definitions of the terms. Other examples, references and statements that describe ***desired capabilities***, ***actual capabilities*** and ***evaluated ability*** of the management cycle stake holders to describe the planning and management processes of the security and defence sector of Ukraine.

Let's summarize the ideas mentioned above so a common approach in determining the nature of notions (concepts) could be applied.

1. The terms of ***"desired capability"***, ***"actual capability"***, and ***"evaluated capability"*** are quite common, but interpreted and used in different ways.

2. They have consolidated various principles, roles, activities, functions and functional areas.

3. The most often, the term "***desired capability***" is used in two meanings: a functional notion (concept) that covers any processes, procedures and functions that characterize standards or requirements / properties (characteristics); organizational notion (concept) that describes the objects by functional areas and sub areas (organizational structure, strength and resources) and by decision-makers, their role (i.e. Reception, Staging, Onward movement management group).

4. The selected dates are interdisciplinary and are often used in theory and practice as synonyms.

5. The term ***"actual capability"*** describes the achievement of a desired effect in a particular environment for a specific period of time and maintaining this effect for a fixed period of time (actual / available).

6. The term ***"evaluated capability"*** is basically a gap analysis which describes the end state of desired capabilities acquisition by a stake holder (meets or does not meet the requirements).

7. The Modern terms and definition dictionary [12, p. 279], gives the following definitions of the terms "able" ...for what ... - that can, is capable of performing something, to do/make; "capability" – ability to do / accomplish something; "***actual capability***".

8. The term "***desired capability***" describes the processes, possible actions and state of C2 stake holders by time, conditions, requirements, situations, objectives, properties available and needed, indicators, the end states and evaluation.

10. It is suggested that the notions of ***"desired capability"***, ***"actual capability"***, ***"evaluated capability"*** should be delineated and understood in a kind of a sequence chain to eliminate differences of perceptions on the definitions of terms (Fig. 1).

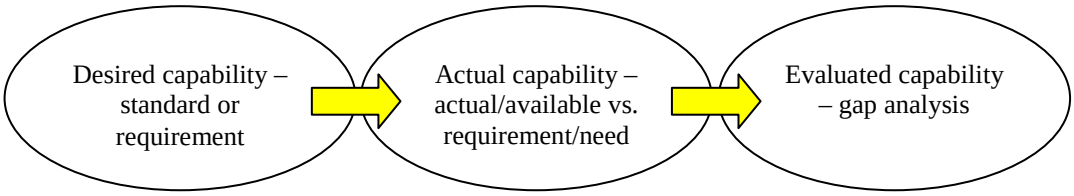

Рис. 1. Notions (terms) inter-relations

11. The idea of putting these concepts (terms) in a sequence chain aims at unification and differentiation of these concepts (terms) by quantitative and qualitative characteristics for the selection of indicators, development of the Armed Forces of Ukraine and other Defence Forces components, development of scientific and methodological ***desired capabilities*** evaluation system, evaluation and application in Defence Forces ***desired capabilities*** development strategic planning.

So it is suggested that these notions are given the following key meanings:

desired capability - standard or requirement to achieve the required result ... (identification of main, basic, supplemantary requirements / properties);

actual capability – actual / available capability tailored to enabling needs / requirements... (as compared to main, basic, supplementary desired capabilities);

evaluated capability – gap analysis between the desired capability and actual capability, a criterion or assessment / end state of desired result achievement .... (The level of achievement of the main, basic, supplementary requirements/properties of desired capabilities to determine appropriate measures).

The following example illustrates the ideas mentioned above:

1. The main ***desired capabillity*** requirement for a pontoon company - to construct and maintain a bridge with the length of 150 meters as the main river/ water barrier crossing point.

2. The ***actual capability*** of the pontoon company - to construct and maintain a bridge with the length of 119 meters as the main river/ water barrier crossing point.

3. The pontoon company ***evaluated capability*** – it is partially able to construct and maintain a bridge with the length of 150 meters as the main river/ water barrier crossing point. It is necessary to take appropriate measures to reach the ***desired capability*** of the pontoon company (i.e. to increase its capabilities from 119 to 150 m.)

The gap analysis between the pontoon company ***desired capability*** and ***actual capability*** (as in the example) helps visualizing its ***evaluated ability*** to perform the mission. This very approach makes it possible to distinguish between these terms (concepts), their characteristics, requirements and nature. Additional discussions will be required to tackle the discrepancies in the views of experts

on the definitions of such notions as “principal purpose”, “mission”, “function”, “aim”, “goals”, “objectives”, “stage” to enable their appropriate use in theory and practice of military C2.

Summary. An approach to defining the essence of the concepts of “***desired capability***,” “***actual capability***,” and “***evaluated capability***” is offered in the article. An idea of putting these concepts (terms) in a sequence chain aimed at unification and differentiation of these concepts (terms) that would clarify the overal conceptual apparatus of Strategic planning theory and practice is also suggested. The clarification of the terms will facilitate a transfer to the new principles and methodology of Strategic and Defence planning based on threat oriented ***desired capabilities***.

Further research prospect The prospect of further research in the view of the results obtained will be classification of Defence Forces components target capabilities (in functional areas, forces, means, operations, etc.) and the development of foundations of the target capabilities for typical organizational structures of Defence Forces to model strategic planning process in the Security and Defence Sector of Ukraine using current Euro-Atlantic approaches.

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The article submitted for publishing on 23.01.2017

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Підхід до визначення сутності понять “спроможність”, “можливість”, “здатність” сил оборони для вдосконалення основ стратегічного планування

Резюме. Визначено сутність поняття “спроможність” та його взаємозв’язок з поняттями “можливість” і “здатність” сил оборони для усунення існуючих розбіжностей у поглядах військових фахівців у процесі поступового переходу на нові принципи та методологію процесів стратегічного й оборонного планування на основі розвитку спроможностей, орієнтованих на загрози.

Ключові слова: спроможність, можливість, здатність, поняття, взаємозв’язок, сили оборони, стратегічне планування.

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Подход к определению сущности понятий, “возможность” и “способность” сил обороны для совершенствования основ стратегического планирования

Резюме. Определена сущность понятия "возможность" и его взаимосвязь с понятием и "способность" сил обороны для устранения существующих расхождений во взглядах военных специалистов в процессе постепенного перехода на новые принципы и методологию процессов стратегического и оборонного планирования на основе развития возможностей, ориентированных на угрозы.

Ключевые слова: возможность, способность, понятие, взаимосвязь, силы обороны, стратегическое планирование.

UDK 321:355.02(477)

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Ground of the system of indexes for the evaluation of efficiency of charges on maintenance and development Armed Forces of Ukraine in interests providing of defensive sufficientness of the state on a short-term period

Resume. In the article the system of indicators for evaluating the effectiveness of spending on maintenance and development of the Armed Forces of Ukraine. For the evaluation of the proposed common structures that make up the category of operational (combat) capabilities assignments for all scenarios to respond to the threat.

Keywords: costs for maintenance and development of the Armed Forces of Ukraine, performance metrics, operational (military) capabilities.

Formulation of the problem. Improvement of the defense planning and rational budget expenses in modern situation is one of the priorities of Ukraine's military policy. Despite the significant increase in the defense budget, the improvement of the qualitative parameters of the equipping of the Armed Forces of Ukraine still remains quite problematic. The latter is a result of difficult military-political situation concerning Ukraine, of the needs to react on whole range of problems including resistance to the military aggression from Russian Federation, as well as of the tasks concerning cooperation with NATO and corresponding approach of Ukraine standards to the standards of the organization, the implementation of qualitative weapon modernization, providing the proper motivation for military personnel and compliance with social standards for them and their families, *etc.* Addressing of these challenges will provide possibilities for achievement of the required level of defense of Ukraine in modern situation in accordance with the directives of the military and political administration [1, 2].

Statements of the Defense Review of Ukraine [3], which provides a comprehensive determination of operational (combat) capabilities or capacities, could form a basis for evaluation of the effectiveness of the expenses for maintenance and development of the Armed Forces of Ukraine, being aimed to provide short term sufficiency of the state defense. According to this definition, the "Operational (combat) possibilities (capabilities) are quantitative and qualitative parameters of the capability of the troops (forces) and equipment of the Defence Force for operational (combat) tasks, classified according to certain categories, designed for typical conditions and accepted standards of their performance."

According to this definition the operational capabilities are parameters, characterizing the ability of troops (forces) and their equipment for accomplishment of assignments in operations (combat), which are designed for typical conditions and accepted standards of performance. Regarding the Armed Forces of Ukraine they are the characteristics of military formations and units (groups of troops (forces)) that perform the tasks in conditions of implementation of a given scenario of their application. The latter concerns only these scenarios of application of Armed Forces of Ukraine. They do not imply the state's ability to provide these opportunities (this is provided by another one, namely by "The amount of resource requirements to achieve the required capacity (ability) for long terms (5-10 years)" Annex 11. [3], according to which The material basic needs (capacity) are the following elements of the organizational structure and forces:

weapons and military technology (WMT);

stocks;

military infrastructure (the fleet and aviation, etc.).

In other words, in the context of the short-term planning the following questions need to be answered.

1. What should be a system of parameters for evaluation of the efficiency of expenses for maintenance and development of the Armed

Forces of Ukraine aimed to provide short sufficiency for the state defense?

2. How does this system should be linked to the performance of short-term resource planning and cost allocation aimed for defense sufficiency of the state? In this regard the scoring study evaluating the efficiency of expenses for maintenance and development of the Armed Forces of Ukraine is greatly demanded scientific challenge.

Analysis of recent research and publications. The problems of expenses for maintenance and development of the Armed Forces of Ukraine in the interests of State defense sufficiency have been considered in the works of Rusnak I. S, Dyenyezhkin M. M Didichenko V. P., Slyusarenko M. O., Askarov V. Kh, Aparshyn I. M., Khoma V. V., Loza I. V. and many others [4-9].

In these studies a number of issues relating to defense planning, including the question of the impact of implementation, program performance, the combination of budgeting and planning activities and so on have been examined in detail. Concerning the evaluation of the efficiency of short-term planning the only problems of budget formation, definition of objectives and consistency of their achievements in a given period have been considered. The question of cost efficiency of maintenance was considered only in the context of achieving or not achieving the goal. In our opinion, at present not enough attention is paid to the problems of the efficiency of the expenses for the maintenance and development of the Armed Forces. One of the components of expenses efficiency study is the justification of the system of parameters for the evaluation of expenses efficiency for the short term defense planning.

The goal of this paper is the justification of the system of scoring parameters for evaluation of the efficiency of expenses for maintenance and development of the Armed Forces of Ukraine for the sake of the sufficiency of state defense.

Presentation of the main material. The system of the scoring parameters for evaluation of the efficiency of maintenance and development expenses of the Armed Forces of Ukraine with the goal of short term defense sufficiency of the state should be linked to the unified system of defense planning, based on a review of defense. Therefore, the use of capacity categories specified in the governing document of the Defense Audit in Ukraine [3] is enough logical and obvious. Consecutive examination of these categories will allow for revealing their essence and to consider the justification in a systematical way. It is worth noticing that in previous studies these issues have not been done yet.

The first category refers to the combat readiness of troops (forces). According to the definition, "*The combat readiness of troops (forces)* defines the capability to create and retain the necessary (sufficient) amount of troops (forces) for the prompt and effective response to threats (challenges) in predicted situations caused by changes in the situation, in providing opportunities for the increase of troops (forces) using the established system of the combat readiness and providing rotations of troops (forces), which will be involved in current operations (actions) to perform tasks in predicted situations. It also includes preparedness of the personnel to perform the combat tasks, training of the personnel, and experience being capable to perform tasks in predictable situations "[3].

Forces and tools, which provide the realization of opportunities, covered by this category, are troops (forces) of branches and their sub-branches of the Armed Forces of Ukraine. The troops (forces) consist of units or sub-units of the Armed Forces of Ukraine, which by the definition should provide response to threats (challenges) for the security of Ukraine. If one analyzes expenses belonging to this category, then they can be classified as follows.

Formation of troops (forces) implies expenses for formation of military units and sub-units which include:

manning;

formation of the infrastructure;

provision by the military equipment and ammunition;

formation of groups of troops (forces).

Support service of the troops (forces) includes expenses for the provisional support of troops (forces), namely:

financing of the personnel;

maintenance of weapons and military equipment in combat readiness conditions;

education and training of personnel (individual training, operational training, combat training);

maintenance of infrastructure;

rotation of personnel.

It should be noted that the category of combat readiness of troops (forces) concerns to all armed force units, without any exception, as well as to the facilities of the Armed Forces of Ukraine, since it implies the ability to fulfill the missions by all formations and units (which in fact means to react to threats (challenges) for the security of Ukraine).

The category "intelligence" covers all types of intelligence capabilities: technical, organizational and others, the ability to collect and process the information, to deliver promptly the reliable information to the management office for its effective use in predictable situations. It also includes the ability to gather information not only by units of the Armed Forces, but also by those of other ministries and agencies, including the information exchange (for example concerning the natural or man-made accidents and disasters).

Forces and facilities, providing realization of possibilities covered by this category are troops and their sub-units, involved in collection, processing and delivering the information.

Expenses for collecting and processing of the information can be classified as following:

support of the groups of the radio and radio-technical intelligence service, groups of air space and other intelligence service, which are supposed to collect and process the information.

Expenses for prompt delivering of the information:

formation and providing of quick, safe and efficient functioning of the system of information exchange within the Armed Forces and between other ministries and departments.

This category covers the additional expenses for intelligence service units (troops), which belong, first of all, to the list of standard troops, Annex 8 [2].

The category "deployment and mobility" covers the ability for prompt dislocation of the troops (forces) and facilities in a defined location (of deployment) and their quick motion, when performing tasks in the area of operations (mobility), in accordance with the condition of predicted situation. It implies the ability to move by means of transport of different types and access to them.

Forces and facilities, providing realization of possibilities covered by this category, are groups, which provide transportation of troops (forces), public transport structures, infrastructure.

Expenses for the deployment and mobility categories are following:

preparation of the territory for the deployment activities;

preparation of the facilities for tasks of mobility and deployment;

providing of interaction with other government agencies to address issues of transportation for certain situations according to given scenarios.

The category "application of troops (forces)" implies the ability for effective application of troops (forces), weapons and military equipment at any environmental conditions, especially for tasks concerning predictable situations.

Forces and facilities, providing realization of possibilities covered by this category, are weapon systems and military equipment as well as the personnel (military units, divisions), capable for effective employment of WMT for the situations according to predicted scenarios.

Expenses for the category application of troops are following:

combat operative training of the troops

employment of the properly trained and experienced personnel.

The category "Management and communications" the ability of troops (forces) concerning the organization and implementation of effective control of troops (forces) during the preparation and during the performance of certain tasks in predictable situations.

Forces and facilities, providing realization of possibilities covered by this category, are military units (sub-units) which provide control and communications, communication facilities and systems.

Expenses for this category are following:

equipping of troops (forces) by facilities, communication and information systems;

equipping of the administrative organisms with facilities for data processing and related software;

Security issues for protection of the information from hostile penetration and breaking of the systems of operation and communications.

The category "Logistics (military parlance, technical and medical support)" implies the ability of organization and effective implementation of prompt logistics, medical support tasks in different situations, including in operations, combat actions of the troops (forces) during the whole period of their application, to achieve the goal of their application.

Forces and facilities, providing realization of possibilities covered by this category, namely: military parts and logistics agencies.

Expenses by the category are following:

formation and keeping of material inventory in storages;

formation of military medical institutions (military units, units) engaged in the recreation of the personnel;

organization and functioning of the supply system.

The category "survivability and protection of troops (forces)" implies the ability of troops (forces) to maintain combat readiness and perform task in conditions of fire exposure by the enemy combatant (including the use of weapons of mass destruction) and the negative influence of the environment, including the consequences of natural and man-made disasters and accidents or other factors of a predictable situation.

Forces and facilities, providing realization of possibilities covered by this category are units of the engineering troops, NBC protection structure, State emergency service of Ukraine (SESU) and other institutions.

Expenses by the category are following:

building of a system of fortification and defensive structures;

equipping of troops (forces) by systems and equipment for protection and sustenance;

interaction with other organizations, which perform tasks of civil defense and elimination of disaster consequences.

The categories considered above form an integrated system, which allows for realization of the situation according to the predicted scenarios. The relationships between the elements of the system (of the categories of opportunities) in the context of their operation during implementation scenarios for situations are shown in fig. 1.

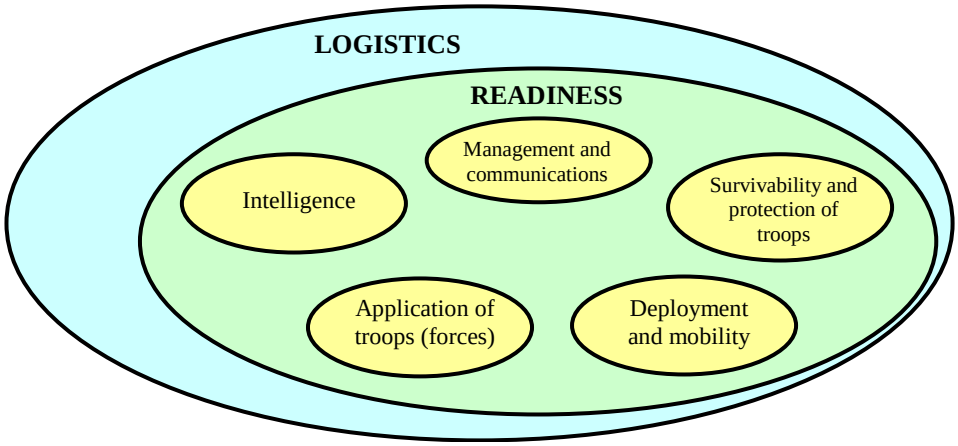

Fig. 1. Relationships between the categories of opportunities in the context of their operation during the realization of the situation according to the predicted scenarios.

Table 1

№	Tittles of typical structures of forces	Opportunity category
1	All the forces in accordance with the degree of readiness	Readiness
2	Transport Aviation Brigade	Logistics
	The transport helicopter	
	Regiment of material support	
	Squadron of transport helicopters	
3	Bomber (Reconnaissance) Squadron	Intelligence
	Radio Engineering brigade	
	Radio Engineering battalion	
	Squadron of remotely controlled aircraft (SRCA)	
	Regimen (brigade) of SRCA	
4	Transport Aviation Brigade	Deployment and mobility
	The transport helicopter	
	Squadron of transport helicopters	
	Engineering Regiment	
	Engineering battalion	
5	Aviation Brigade of tactical aircrafts (TA) (fighter)	Application of troops (forces)
	Air Mobile (airborne) brigade (regiment)	
	Air Mobile (airborne) battalion	
	Artillery Division	
	Marine Battalion	
	The battalion of electronic warfare (EW)	
	Coast anti-ship complex	
	Bomber (Reconnaissance) Squadron	
	Fighter squadron	
	Squadron of combat helicopters	
	Mechanized brigade	
	Mechanized battalion	
	Marine Aviation Squadron	
	Marine helicopter squadron	
	The regiment of marines	
	Marines Battalion	
	Antitank battalion	

№	Tittles of typical structures of forces	Opportunity category
	Rocket Division	
	Artillery Division	
	Self-propelled artillery battalion	
	Tank brigade	
	Tank battalion	
6	Communications Battalion	Control and communications
	Communications regiment	
	Office (headquarters) of Operational Command (OC)	
	Office (headquarters) of Air Command	
7	Division of Antiaircraft Missile of medium range	Survivability and protection of troops (forces)
	Antiaircraft Missile Regiment	
	Antiaircraft Missile Brigade	
	Antiaircraft missile artillery division	
	Antiaircraft missile division of short-range	
	Antiaircraft missile complex of short-range	
	Anti-aircraft missile system of medium-range	
	Engineers regiment	
	Engineering battalion	
	Engineering company (military unit)	
	The battalion electronic warfare (EW)	
	EW company (military unit)	
	Battalion of radiation-chemical protection (BRCP)	
	Company (military unit) of radiation-chemical protection (CRCP)	

It is proposed to accept the typical force structures with the same number of personnel, weapons and equipment and facilities, listed in the Table. 1 as parameters for the scoring evaluation of the expenses sufficiency, since they have the following properties:

can be evaluated in terms of expenses for maintenance;

can be compared with each other using peer evaluation scale;

can be applied to all situations according to predicted scenarios;

have the same lifetime cycle in terms of weapons and equipment operation;

have almost the same composition and are equipped with the same number of these types of WMT.

Since the composition of typical structures should be almost identical, the number and types of facilities should also be identical the expenses for maintenance of such structures should be almost the same or very close, which makes it possible to evaluate not only the amount, but also the cost efficiency. A significant deviation from the values of the amounts of costs for typical units should be an indication of the necessity for further analysis of the reasons for this.

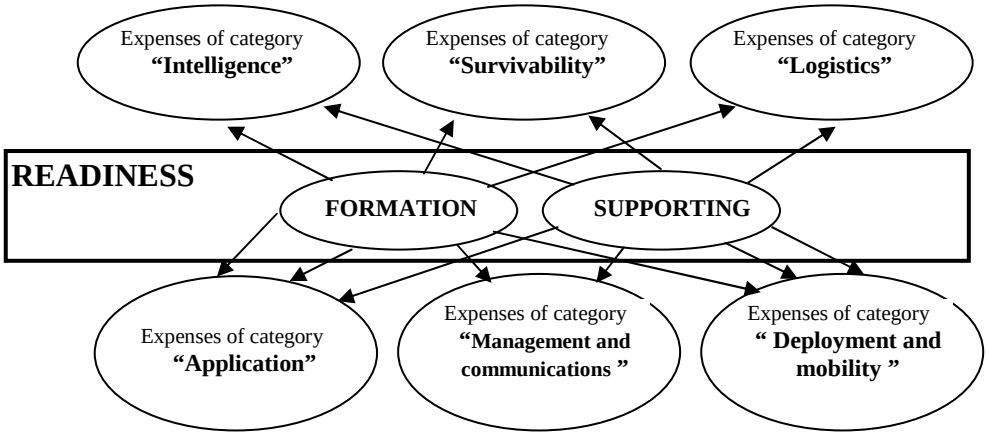

Fig. 2. Relationship for the category of opportunities "Readiness"

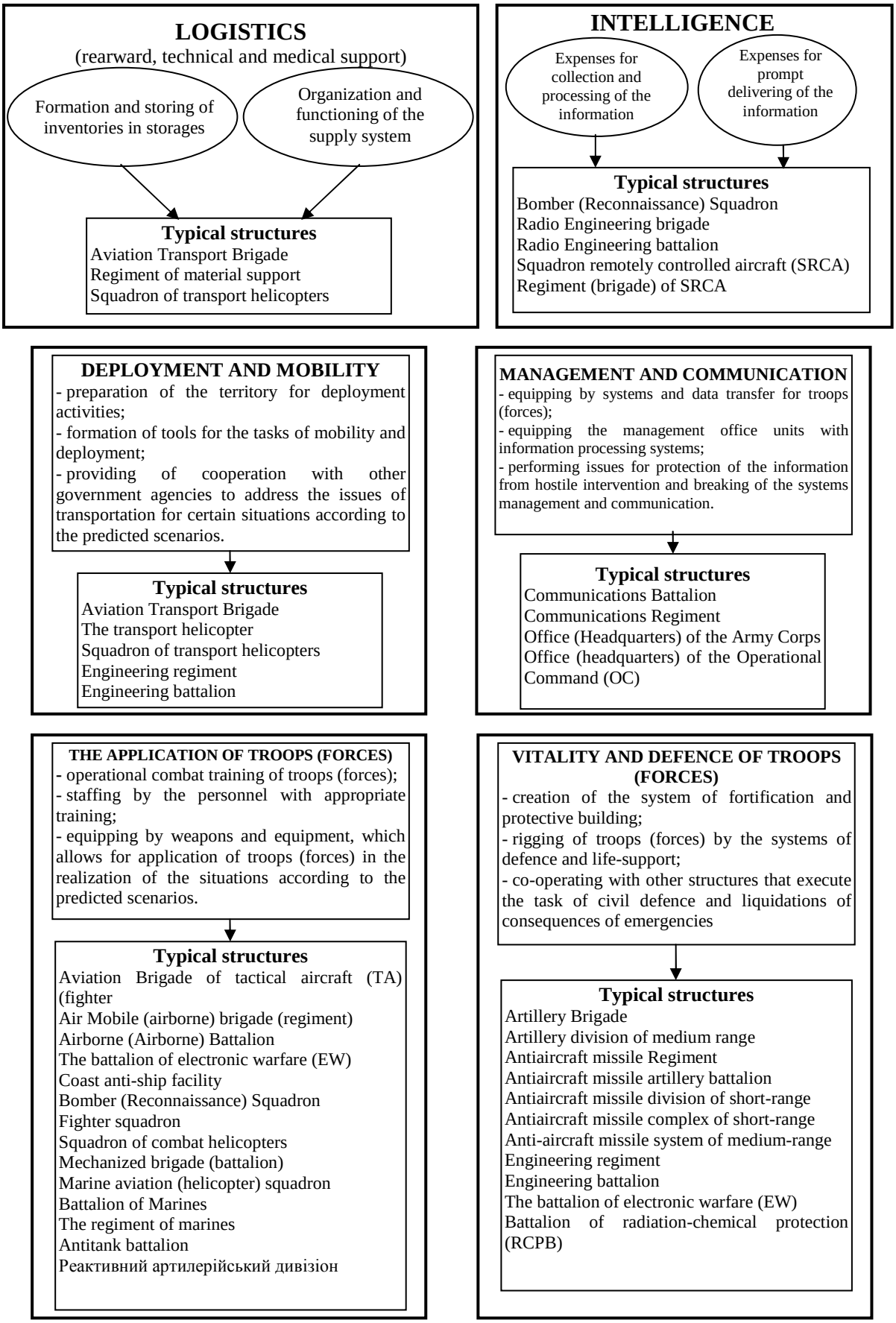

Fig. 3. A relation is for the categories of possibilities

The synthesis according to each of the capability class makes it possible to form groups (clusters) corresponding to the category to which they belong in grouping of troops (forces) involved in the realization of scenarios of predicted

situations. The formation of such groups of troops (forces) will:

combine the functional properties of strength categories and necessary number of them to perform tasks for the realization of the situations according to the predicted scenarios;

form a dependency relationship between different features and costs of their formation and maintenance;

form conditions for the evaluation of the influence of the element clusters on cost-efficiency;

account for features of lifecycle capabilities in the short term and its impact on cost efficiency.

Conclusion. Thus, a system of scoring parameters based on the list of capabilities of troops (forces) is proposed using the expert-analytical methods for the evaluation of the expenses for maintenance and development of the Armed Forces.

Each of the opportunity categories is a list of forces, short-term maintenance expenses for which can be estimated by analysis of the total costs for typical structures which belong to this list.

In case of formation of a new typical structures (for performance of certain (specific) task) the list of structures alluded to above in Table 1 can be extended.

The direction of future studies implies development of methods for the evaluation of the efficiency of maintenance and development expenses of the Armed Forces of Ukraine for the sake of state defense sufficiency for a short term.

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The article submitted for publishing on 02.03.2017

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Обґрунтування системи показників для оцінювання ефективності витрат на утримання і розвиток Збройних Сил України в інтересах забезпечення оборонної достатності держави на короткостроковий період

Резюме. У статті обґрунтована система показників для оцінювання ефективності витрат на утримання і розвиток Збройних Сил України. Для оцінювання пропонується використати типові структури, які входять до складу категорій оперативних (бойових) можливостей виконання завдань за всіма сценаріями реагування на загрози.

Ключові слова: витрати на утримання і розвиток Збройних Сил України, ефективність, система показників, оперативні (бойові) можливості.

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Обоснование системы показателей для оценивания эффективности расходов на содержание и развитие Вооружённых Сил Украины в интересах обеспечения оборонной достаточности государства на краткосрочный период

Резюме. В статье обоснована система показателей для оценки эффективности расходов на содержание и развитие Вооружённых Сил Украины. Для оценки предлагается использовать типовые структуры, которые входят в состав категорий оперативных (боевых) возможностей выполнения задач по всем сценариям реагирования на угрозы.

Ключевые слова: расходы на содержание и развитие Вооружённых Сил Украины, эффективность, система показателей, оперативные (боевые) возможности.

UDK 336.144.3:355

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Using of the system of key indexes for the estimation of the financial providing of the Armed Forces of Ukraine

Resume. Based on the test data the calculation of the integral indicator to assess the financial-economic activities of the Armed Forces of Ukraine and the qualitative interpretation of the obtained results.

Keywords: key indicators, additive-multiplicative model, integrated indicator, assessment, financial-economic activity.

Formulation of the problem. To make informed decisions for effective funding of the Armed Forces of Ukraine (Ukraine Armed Forces) in the structural units of the Ministry of Defence of Ukraine (MoD Ukraine) is formed to senior management report, which contains information about the structure of expenditure, the budget program. This data serves as a "planned financial resources" and "actual receipt of funds" and the difference between them. Also highlighted data and accounts receivable, operational and capital expenditures. These figures are expressed in general and special funds in physical terms and in percentage. However, there is no possibility to track the dynamics in the planning and spending of the defense budget.

Analysis of recent research and publications. In [1-5] are defined problem issues in the area of planning and spending of defense budget and ways to overcome them. However, the questions of operational assessment of the financial condition of the Armed Forces of Ukraine are not covered and remains relevant.

The purpose of the article. On the basis of demonstration example to prove the adequacy calculations to assess the financial support of the Armed Forces of Ukraine, using the proposed key indicators.

Presenting main material. Providing effective planning, allocation and use of financial resources - the main goal of the functioning of financial MoD Ukraine and Armed Forces of Ukraine. To assess the financial security Forces of Ukraine will use key performance indicators that were covered in [6]. For each level of management of financial and economic activity by target effective functioning and indicators describing financial and economic activity. After which was made attachment of indicators corresponding to the purposes of spending money on each level of the hierarchy and based on expert estimates calculated level of specific gravity (determining influence on each other) for each indicator. For the purpose of leveling large spread in estimates of impact indicators on each other geometric mean was calculated for each indicator and brought to another measurement scale.

The integral indicator determined on the basis of multi-additively-multiplicative models estimates generalized indicators [7, 8], the choice of which is due to the dependence of indicators at all levels of cascading.

Here is an example calculation for the sphere "Providing financial resources of the Armed Forces of Ukraine", direction Sufficient availability of financial resources for life support the Armed Forces of Ukraine. To assess this direction used 10 indicators listed in the Table. 1.

Calculation of indicators will be carried out for the situation of uneven funding of the Armed Forces of Ukraine of life during a particular year. The scenario calculation, the following: in the first months (January, February) is a significant under-funding in the coming months (March, April) - a slight financing (compensation for previous months), then the funding is in acceptable limits, but the deficit accumulates, which in at the end of the year covered significant excessive funding.

The values of the indicators related to receivables and payables are established by to the permissible limits, and those that should decrease - during the year reduced. The values other indicators related to the fulfillment of the budget will sometimes be in limits. There will be use test data (see Tab. 2-11).

Table 1

List of financial performance indicators of the Armed Forces Ukraine

№	The name and symbol indicator	
1.	q_1	Coefficient of overdue accounts receivable
2.	q_2	Coefficient of overdue accounts payable
3.	q_3	Coefficient of uncollectible accounts receivable
4.	q_4	The coverage ratio of accounts payable
5.	q_7	Coefficient of of timeliness repayment of accounts payable
6.	q_8	Coefficient of budget performance the general fund
7.	q_{10}	General fund deficit coefficient
8.	q_{11}	Relative indicator of deviation amount of actual financing from planned
9.	q_{12}	Indicator expenditure budget
10.	q_{13}	Indicator deviation amount budgeted allocations of the amount needs

Table 2

Coefficient of overdue accounts receivable

	Months											
	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII
ARov	113,4	153,3	275,6	423,5	543,9	674,6	743,6	899,1	960,7	1002,5	1087,2	1154,5
AR	374,2	743,6	1487,3	2111,6	2783,6	3156,6	3465,3	3788,0	4006,8	4154,4	4265,5	4301,5
$q_1<0,3$	**0,30**	**0,21**	**0,19**	**0,20**	**0,20**	**0,21**	**0,21**	**0,24**	**0,24**	**0,24**	**0,25**	**0,27**

ARov –overdue accounts receivable;
AR –accounts receivable.

Table 3

Coefficient of overdue accounts payable

	Months											
	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII
APov	113	102	89	81	72	61	45	34	24,5	17	11	7
AP	354	334	324	301	287	267	254	248	230,1	221	201	189
$q_2\downarrow$	**0,319**	**0,305**	**0,275**	**0,269**	**0,251**	**0,228**	**0,177**	**0,137**	**0,106**	**0,077**	**0,055**	**0,03**

APov – overdue accounts payable;
AP – accounts payable;
$q_2\downarrow$ - reduction of fixed value.

Table 4

Coefficient of uncollectible accounts receivable

	Months											
	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII
ARun	9,7	8,9	8,1	7,3	6,5	5,7	4,9	4,1	3,3	2,5	1,7	0,9
AR	374,2	743,6	1487,3	2111,6	2783,6	3156,6	3465,3	3788,0	4006,8	4154,4	4265	4301
$q_3\downarrow$	**0,0259**	**0,0120**	**0,0054**	**0,0035**	**0,0023**	**0,0018**	**0,0014**	**0,0011**	**0,0008**	**0,0006**	**0,000**	**0,0002**

ARun – uncollectible accounts receivable
AR – accounts receivable
$q_3\downarrow$ - reduction of fixed value

Table 5

The coverage ratio of accounts payable

	Months											
	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII
Rem_{ass}	352	355	324	303	290	269	255	248,3	235	224	205	191
AP	354	334	324	301	287	267	254	248	230,1	221	201	189
$q_4\geq1$	**0,994**	**1,063**	**1,000**	**1,007**	**1,010**	**1,007**	**1,004**	**1,001**	**1,021**	**1,014**	**1,020**	**1,01**

Rem_{ass} – remains of budget assignments;
AP– accounts payable.

The values indicator for the first month is due to underfunding beginning of the year scenario, the value indicator for second month in comparison with other values than by excessive funding.

Table 6

Coefficient of of timeliness repayment of accounts payable

	Months											
	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII
Bal	45	55	34	44	56	45	41	34	32,5	35	44	41

AP	354	334	324	301	287	267	254	248	230,1	221	201	189
q_7= 0,1-0,25	**0,127**	**0,165**	**0,105**	**0,146**	**0,195**	**0,169**	**0,161**	**0,137**	**0,141**	**0,158**	**0,219**	**0,21**

Bal – balance of funds on accounts;

AP – accounts payable.

Table 7

Coefficient of budget performance the general fund

	Months											
	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII
DIS	1374	5505	4057	4423	4407	4301	4313	4356	4231	4988	6510	6256
EST	1465	5211	4176	4567	4510	4300	4378	4356	4234	4988	6300	5888
q_8=0,9-1	**0,94**	**1,06**	**0,97**	**0,97**	**0,98**	**1,00**	**0,99**	**1,00**	**1,00**	**1,00**	**1,03**	**1,06**

DIS – distribution of funding at the moment of formation of the report;

EST – estimates appointment for a year taking into account changes.

According to the scenario in the first month of underfunding (0.6); carried in the next month the previous compensation - excessive funding. In the coming months as there is not a large underfunding (within 0,01-0,03), which compensated for at the end of the year.

Table 8

General fund deficit coefficient

	Months											
	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII
DIS	1304	5805	4057	4423	4407	4301	4313	4356	4231	4988	6510	6256
TAR	1515	5543	4277	4634	4591	4357	4411	4465	4244	4999	6411	6101
q_{10}=0,75-1	**0,86**	**1,05**	**0,95**	**0,95**	**0,96**	**0,99**	**0,98**	**0,98**	**1,00**	**1,00**	**1,02**	**1,03**

DIS – distribution of funding at the moment of formation of the report;

TAR - target for costs.

Usually, the demand always exceeds revenues, as shown in the table. However, the value of the coefficient also indicate uneven funding at the beginning and at the end of the year.

Table 9

Relative indicator of deviation amount of actual financing from planned

	Months											
	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII
DIS	1421	5385	4057	4423	4457	4301	4313	4356	4231	4988	6510	6056
EST	1465	5211	4126	4527	4510	4300	4378	4356	4234	4988	6300	5888
q_{11}	**3,00**	**-3,00**	**2,00**	**2,00**	**1,00**	**0,00**	**1,00**	**0,00**	**0,00**	**0,00**	**-3,00**	**-3,00**

Topically at divergence of sums of the actual financing from the annual estimate setting;

DIS – distribution of funding at the moment of formation of the report;

EST – estimates appointment for a year taking into account change.

Ideally, the coefficient should be 0, ie the amount estimated revenues correspond purposes. The positive percentage characterizes the underfunding and negative - excessive funding.

Table 10

Indicator expenditure budget

	Months											
	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII
SP	1465	5211	4176	4567	4510	4300	4378	4356	4234	4988	6300	6256
DIS	1465	5211	4176	4567	4510	4300	4378	4356	4234	4988	6300	5888
q_{12}=1	**1,00**	**1,00**	**1,00**	**1,00**	**1,00**	**1,00**	**1,00**	**1,00**	**1,00**	**1,00**	**1,00**	**1,06**

SP – spent financial resources

DIS – distribution of funding at the moment of formation of the report

This indicator must equal one, but the end of year it exceeds the established standard that characterizes the a significant excessive funding.

Table 11

Indicator deviation amount budgeted allocations of the amount needs

	Months											
	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII
EST	1465	5211	4176	4567	4510	4300	4378	4356	4234	4988	5888	6300
TAR	1515	5543	4277	4634	4591	4357	4411	4465	4244	4999	6411	6101
q_{13}=1	**0,97**	**0,94**	**0,98**	**0,99**	**0,98**	**0,99**	**0,99**	**0,98**	**1,00**	**1,00**	**0,92**	**1,03**

EST – estimates appointment for a year taking into account changes

TAR -- target for costs

The need for financial resources usually exceeds the estimated destination, as shown in Table 11, except the last month, when carried excessive finance.

Table 12

The values the integral indicator (picture 1)

	Months											
	I	**II**	**III**	**IV**	**V**	**VI**	**VII**	**VIII**	**IX**	**X**	**XI**	**XII**
Q	0,8096	0,1713	0,6979	0,7012	0,5920	0,4862	0,5905	0,4782	0,4812	0,4796	0,1495	0,1702
State	Поган	Поган	Задов.	Поган	Задов.	Добре	Задов.	Добре	Добре	Добре	Поган	Поган

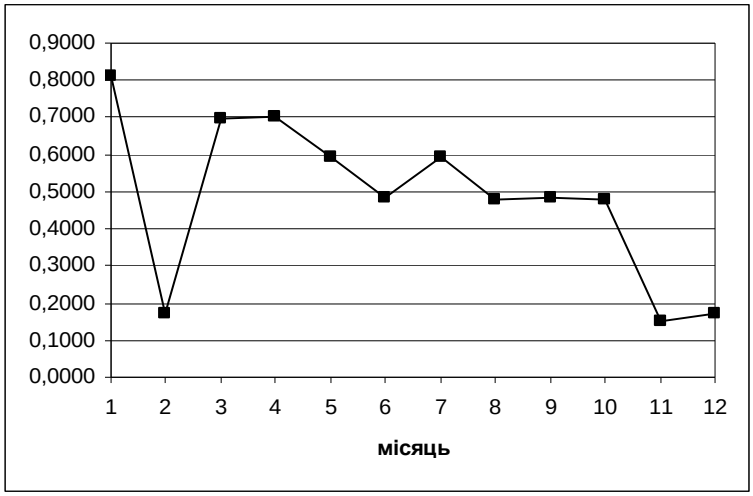

Fig. 1 The values the integral indicator during the year

We perform the Analysis of the received integral indicator values, find out what factors have influenced them in a table, where the symbol "+" - marked positive impact, and the symbol "-"– negative impact.

Table 13

Analysis of the integral indicator

	Months											
	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII
q_1	-	+	+	+	+	+	+	+	+	+	+	+
q_2	+	+	+	+	+	+	+	+	+	+	+	+
q_3	+	+	+	+	+	+	+	+	+	+	+	+
q_4	-	+	+	+	+	+	+	+	+	+	+	+
q_7	+	+	+	+	+	+	+	+	+	+	+	+
q_8	-	-	-	+	-	+	-	+	+	+	-	-
q_{10}	-	-	+	+	+	+	+	+	+	+	-	-
q_{11}	-	-	-	-	-	+	-	+	+	+	-	-
q_{12}	+	+	+	+	+	+	+	+	+	+	+	-
q_{13}	-	-	-	-	-	-	-	-	+	+	-	-
Q	1,685	-0,704	0,8079	0,8112	0,702	0,486	0,590	0,47	0,48	0,48	0,15	-0,16
State	badly	badly	satisfa ctorily	satisfac torily	satisfac torily	fine	satisfac torily	fine	fine	fine	badly	badly

Analysis Table 13 shows that good condition of financial resources for the viability of the Armed Forces of Ukraine, is when not one factor adversely affecting the results (IX, X) or only one (VI, VIII), satisfactory condition is when individual indicators (2 or 3) negative affect (III, IV, V, VII), bad condition - when more than three indicators affect negatively (I, II, XI, XII). The most negative impact in this scenario render coefficient of budget performance the general fund (q8), relative indicator of deviation amount of actual financing from planned (q11) and the indicator deviation amount budgeted allocations of the amount needs (q13). Due to the relative indicator deviation amount of actual financing from planned can be a negative value (excessive funding).

Conclusions. Thus, the proposed key performance indicators of financial support of the Armed Forces of Ukraine to adequately reflect the state of financial resources for the viability of the Armed Forces of Ukraine, which allows further provide a basis for information and analytical support of process of management decisions and implementation of internal control and risk management of financial support of the Armed Forces of Ukraine.

Areas for further research. One of the issues when using integration indicators are qualitative interpretation of the values obtained ("badly", "satisfactorily", "fine"), the definition of borders and limits of of ambiguity between qualitative assessments that require further research.

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The article came to the release 15.03.2017

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Використання системи ключових показниківv під час оцінювання фінансового забезпечення Збройних Сил України

Резюме. На основі тестових даних проведено розрахунок інтеграційного показника щодо оцінювання фінансово-економічної діяльності Збройних Сил України і наведена якісна інтерпретація отриманим результатам.

Ключові слова: ключові показники, адитивно-мультиплікативна модель, інтеграційний показник, оцінка, фінансово-економічна діяльність.

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Использование системы ключевых показателей при оценке финансового обеспечения Вооружённых Сил Украины

Резюме. На основе тестовых данных проведен расчет интегрального показателя для оценки финансово-экономической деятельности Вооружённых Сил Украины и дана качественная интерпретация полученным результатам.

Ключевые слова: ключевые показатели, аддитивно-мультипликативная модель, интегральный показатель, оценка, финансово-экономическая деятельность.

UDK 351.86

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Conception of the defensive planning on the basis of development of possibilities: problems of introduction

Resume. A brief overview of the concept of defense capability based defence planning (CBDP), which has become the "gold" standard defense planning in different countries and analyzes the problems of implementation in the Ukrainian security and defense sector.

Keywords: defense planning, capability based.

Formulation of the problem. The introduction of a new concept of defense capability planning faced a number of problems. Some of them were minor and were taken through consultations. Others are systemic in nature and require attention from all participants in the strategic planning process.

Analysis of key studies and publications. Paradigm shift defense planning was announced in the "Four Defense Review of US Forces" in 2001. To implement CBDP have been actively developed new principles, principles and models. Thus, already in 2002 there CBDP theoretical principles, developed by RAND Corporation. In January 2004, an influential research group led by Deputy Secretary of Defense Edward Aldridge finalizing principles CBDP. "Strategic Planning Guide" in 2004 finally approved the transition of US defense planning system to force development based on capabilities. "Catalog of the Joint Capabilities", became common base output data for all US Military Forces. Staffs of the Armed Forces of species made changes to the organizational structure, methods and procedure of their work.

The purpose of the article. The article is an analysis of the problems of introducing the concept of CBDP.

Main material. Ukraine's Strategic Defense Bulletin 2016 involves the development of defense planning system as part of the national planning system in the defense and security sector through the introduction of modern methods, particularly CBDP. These efforts will provide the following results: expand the list of task forces of defense and security, especially in the conditions of the special period in peacetime; increase the effectiveness of the defense and security sector, is to reduce the risks to security; optimize resource costs.

Consider the basic problem of introducing the new concept of defense planning.

1. Terminology. US DoD introduced universal definition of "capacity": the capacity - is "the ability to achieve the desired result, the criteria and conditions with a combination of capabilities and techniques and methods of their use for the tasks". Study Group Aldridge central focuses refinement and formulation of "capabilities" as the basis of all prospective defense planning system [3]. The national legal framework and specialist literature does not give a clear and precise definition of the term.

2. The principles of the new concept of defense planning. Approaches to the defense planning of the Cold War provided support stability and balance in politics and military power parity countries. The transition from strategic planning purposes to force structure represented a complex but well established process. With the collapse of the bipolar system revival reliable method of allocating resources to address new challenges was logical.

3. Changing approaches to strategic forecasting and development baseline. Currently, strategic forecasting are less predictable than in previous years, but this does not mean that baselines may not be used under the new approach. A set of scenarios that existed before should be substantially expanded and revised, including considering what specific options neutralize threats should not replace the CBDP.

4. Use the category of "risk" as the primary efficacy evaluation planning. One figure cited experts on defense planning - is the risk. As far as strategic planning, business development is usually to increase profits, and so national security strategy should include a significant reduction of risk.

5. Development of methods, models and methodologies of the new system of defense

planning. Traditional models of military conflict aimed at destroying potential opponents with full exertion of all available human and material resources, gradually sidelined in the strategic planning. Relevant are hybrid scenarios involving the entire spectrum of national power as well as Allied Forces which play a significant, but not the main part. CBDP requires developing artists use several options groupings of troops (forces) in different conditions IDPs.

6. Additive steadily expanding list of tasks to perform which should be ready force security and defense. Forces must have the necessary flexibility and adaptability of defense planning their reaction to meet any possible changes IDPs.

*7. Compatibility with existing defense programs.*Initially, the military must be identified in terms of the main tasks of defense and security sector and established standards of performance and only then in terms of alternative combinations required to perform the tasks resources.

8. Compliance Requirements integrated defense and security forces at any stage of planning. World experience in defense planning over the past 25 years is the history of progress in life the concept of a truly united forces of defense and security. CBDP concept provides additional opportunities to achieve this important goal.

9. Determination of capacity under the networking concept. The experience of crises shows that the best problem-solving does not always depend on the tactical and technical performance. Opportunities defense and security forces increasingly conditioned by the presence of innovative concepts driving operations, the introduction of new forms and methods of personnel and formation commanders with the necessary skills of management, including the use of business processes. The concept CBDP intangible factors become another element of planning.

10. The combination of capacity planning in the medium and long term and current needs of the security forces and defense. In addition to differences in organizational, methodological, technological plan, and the culture of long-term and current planning, another difference is in the head end of the system.

11. Formation of the desired list (catalog) capabilities of the security and defense of the forecast variants. CBDP implementation problem is not only the need to develop separate lists of capabilities for different forecasting horizons (which are often radically different from each other), but also in the application of this basic planning principles. Oriented capacity planning system from the final result applies to both the short and the medium and long term planning.

12. Organizational problems are the most difficult for implementation CBDP. CBDP concept requires that the translation strategy military capabilities held in joint planning body, and all the military resources included structural and financed almost entirely from the budget.

Conclusions. CBDP concept is the next stage of the strategic planning of the security and defense. Its implementation requires a deep multifunctional reform that covers all the principles of national security and defense. Implementation CBDP faced some problems. Some of them can be removed quickly enough additional training specialists in defense planning. Other problems are systemic and require greater attention by all components of the defense and security sector.

In the future will be the basic components of the defense planning process through the development of capabilities.

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The article came to the release 16.03.2017

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Концепція оборонного планування на основі розвитку спроможностей: проблеми впровадження

Резюме. Проведено огляд концепції оборонного планування на основі розвитку спроможностей, який став “золотим” стандартом оборонного планування в різних країнах. Проаналізовано проблеми впровадження цього стандарту в секторі безпеки і оборони України.

Ключові слова: оборонне планування, спроможності.

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Conception of the defensive planning on the basis of development of possibilities: problems of introduction

Resume. The review of conception of the defensive planning is conducted on the basis of development of possibilities, that already became " the gold" standard of the defensive planning in different countries and the problems of his introduction are analysed in the sector of safety and defensive of Ukraine.

Keywords: defensive planning, possibilities.

UDK 35.071

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Estimation of economic efficiency of logistic processes of logistical support of troops (forces)

Resume. In the article suggestions are expounded in relation to the improvement of existent scientifically-methodical vehicle for the estimation of efficiency of logistic processes in the system of logistical support of the Armed Forces of Ukraine.

Keywords: necessity, logistical support, financing, distribution, efficiency, logistic process.

Formulation of the problem. Experience modern local wars and armed conflicts shows that the course and outcome of the battle depends greatly on how to establish cooperation between all departments that are involved in it, and the system of logistics. It is clear that reliable functioning of logistics significantly increase the combat effectiveness of troops and their capacity to perform the tasks. Therefore, the assessment of the efficiency of logistics processes has very important significance in the system of Logistics of the Armed Forces of Ukraine (LAF Ukraine).

Analysis of recent research and publications. The analysis of the last researches, publications shows that the question of economic calculations of possibilities of the state in relation to providing of implementation of put before LAF of Ukraine of tasks is give considerable attention from the side of guidance of the state and AF of Ukraine [1-6]. Transition from a concept "satisfaction of necessities of AF in full", that existed at Soviet Union to the modern terms of development of AF of Ukraine, the necessity of realization of the detailed фінансово-економічних calculations shows after any possible variant of their application with the aim of estimation of economic efficiency of logistic processes of logistical support. Speed of increase of necessities of AF of Ukraine today far more than speed of proceeding in economic feasibilities of the state, hereupon, constantly divergence increases between the volumes of necessary financial resources for functioning AF of Ukraine and volumes that the state is able to distinguish.

It is today determined Conception of development to the sector of safety and defensive of Ukraine, that "financing to the sector of safety and defensive will need aspiration annually not less than 5 % from a gross domestic product annually, in particular on charges on a defensive - not less than 3 % gross domestic products annually". At the same time, for effective allocation of material resources necessary realization of the special researches of existent problems in the system LAF of Ukraine, and also development of corresponding scientifically-methodical vehicle for their decision. Limit nature in resources causes the necessity of estimation of economic efficiency of logistic processes of logistical support of AF of Ukraine with further optimization of allocation of present resources after objects, that use them. Therefore a decision of question in relation to the estimation of economic efficiency of logistic processes of logistical support of AF of Ukraine is the actual enough and timely task of present time.

The aim of the article is an improvement of methodological bases of estimation of economic efficiency of logistic processes of logistical support of AF of Ukraine. Exposition of basic material. Obviously, that at the terms of limit nature of resources for providing of necessary level of defensive capacity of the state high organization of work and close co-operation of all links of management, coordination of economic efforts and timeliness of realization of any measures, are needed, in fact during implementation of tasks from LAF of circumstance can sharply change, can put new tasks subdivisions, and accordingly, new tasks will arise out of their providing. In modern terms the basic requirements to logistical support of AF of Ukraine are: is ability to carry out in short spaces shifting of troops (forces) in the districts of the operative setting; it is readiness to the trouble-free supply of troops (forces) during different by the nature and scales of military operations; it is a presence of reliable control system by logistical support.

Presenting main material. By basic problems that stipulate the necessity of development of existent scientifically-methodical vehicle for an estimation and ground of efficiency

of logistic processes (LP) in the system LAF is: is reduction of quantity of organs of LAF, that resulted in objective contradiction between a structure and composition of the system LAF, by the volume of the functions fixed on them and possibilities taking into account the necessities of present time; it is creation of new subdivisions in LAF of Ukraine, that must be provided; are changes of forms and methods of application LAF of Ukraine, them LAF; it is a presence of budget constraints and question of effective allocation of resources, troops (forces) distinguished on the necessities of LAF.

Obviously, that at the terms of limit nature of resources for providing of necessary level of defensive capacity of the state high organization of work and close co-operation of all links of state power, coordination of economic efforts and timeliness of realization of large and small measures of the resource providing are needed.

Having a special purpose efficiency of logistic processes in the system LAF is determined from positions of theory of efficiency of purposeful processes, as a degree of achievement of certain goal, for example, timeliness of delivery of material facilities [7]. Under general efficiency of logistic processes a between's understands by the charges of resources on their realization and eventual effect a receipt of that for set time is the aim of operation. Thus, military-economic efficiency of logistic processes represents a between's by economic and having a special purpose efficiency.

Every logistic process will be realized at certain external terms and in interests of the put aims of $Ц_1,\ldots, Ц_i$. Thus there is a consumption of resources in size of $C_1,..., C_p$, that in course of time $T_1,..., T_m$ results in the partial effect of $Э_1,..., Э_k$, that shows up in eventual efficiency of E.

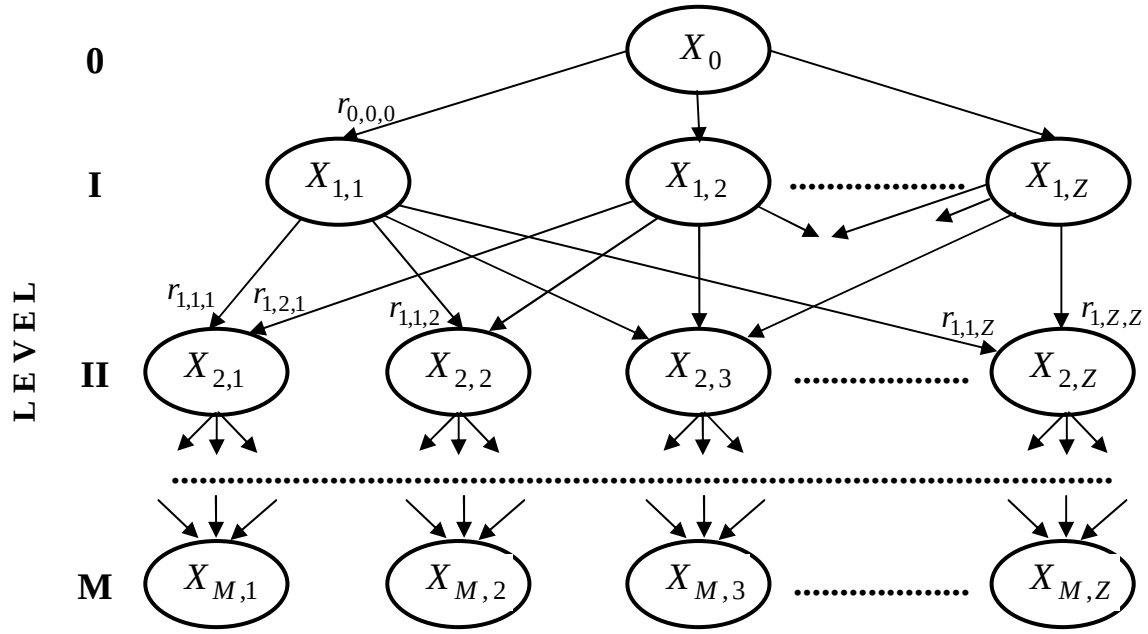
The task of estimation of economic efficiency of logistic processes in the system LAF results in the necessity of account of plenty of different indexes (preparation, loading-unloading, transporting of LAF and other). Some indexes have a permanent value and behave to the normative parameters, for example: norms of providing, norm of storage of supplies, norm a day and others like that. Separate indexes have certain limitations carrying capacity of transport vehicles, capacity of syllables, removal of suppliers of LAF and others like that. Thus, the estimation of efficiency of logistic processes it is expedient to determine as correlation of size of the got effect to the charges of resources or vice versa. In first case the index of efficiency will characterize the size of effect on unit of the inlaid facilities, in the second amount of the used resources on unit of the got effect or cost of unit of effect. It is necessary for the decision of these tasks, first of all, to define the aim of logistic processes in the system LAF, then to set criteria and to work out the algorithm of estimation them military-economic efficiency.

During realization of researches, in the first turn, the decoupling of aims of basic logistic processes comes true on a task and operations of more subzero level. Obviously, that at functioning of the system LAF an aim will be arrived at by realization of potential possibilities and to the decisions of all component tasks, which, in turn, require an objective estimation. Simultaneous or successive implementation of these tasks provides gaining end of logistic processes, and their totality creates the multilevel system of aims and tasks of logistic processes in the system LAF troops. Every task at corresponding hierarchical level has concrete maintenance that takes into account the terms of his decision (methods of storage and delivery, plenitude of financing and other). Character of these tasks determines general and partial aims of logistic processes and corresponding to them efficiency. From it swims out, that the general aim of logistic processes is arrived at as a result of achievement of partial aims and decision of partial tasks, troops sent to timely, complete and rational LAF. Decoupling of general aim of logistic processes (Xo) on stakes, presented on the tree of aims taking into account maintenance of the decided tasks in accordance with fig. 1 [8, 9].

Thus, carried out the decoupling of aims, get count of aims and tasks. Aims are up-diffused after levels. For example, the aim of X_0 is arrived at, if achieved objective $X_{1,1}$, $X_{1,2}$ and Xz. Farther like, aim of $X_{1,1}$ arrived at, when the tasks of the second level of X_2 will decide $X_{2,2}$ and $X_{2,z.}$ Thus the aims of the first level (X_1) are formed coming from the aims of basic logistic processes (storage, receipt and delivery of material facilities), second level (X_2) - going out tasks after the types of logistic processes (loading, transporting, unloading), third and next levels (Xm) - going out totality of all operations. Importance (meaningfulness, priority) of tasks of every hierarchical level of "tree of aims and tasks" is determined in future, and in further and a ration participating of forces and facilities in the achievement of primary objective. In connection with hierarchical subordination of tasks of more subzero level to the higher aims, arc can be characterized by the relation of importance (to meaningfulness, priority) of decision of z-task (of

i+1)th level for the achievement of *j*-aim of *i*-level. In this case to the arcs it is possible to put weighed coefficients in accordance of number g_{ijz},

$$0 \le g_{ijz} \le 1{,}0. \quad (1.1)$$



Pic. 1 A decoupling of aims of logistic processes and tasks is in the system LAF

Thus,

$$\sum_{z=1}^{l_j+1} g_{ijz} = 1{,}0, \quad (1.2)$$

then sum of weighed coefficients of all arcs that go out any top (any *j*- and tops of *i*- level) must equal unit. However, the weighed coefficients of *g* will depend on the stage of operation, logistic processes. It can set the weighed coefficients of arcs (coefficients of importance) an expert way and ration them so that they satisfied correlation (1.1) and (1.2). Weighed coefficients of arcs, that combine aims at the level of i with aims at level and +1 create a matrix

$$Q_i = ||g_{ijz}||, \quad (1.3)$$

what carries the name of matrix having a special purpose "facilities". It goes out from a formula (1.2), that the sum of coefficients of this matrix in every line will equal unit. If now to provide for, that the known vector-column of coefficients of importance of aims of *i*-level us

$$p_i = (p_{i1}, p_{i2}, ..., p_{ij}), \quad (1.4)$$

what satisfies to the terms

$$0 \le p_{ij} \le 1, \sum_{j=1}^{l_i} p_{ij} = 1, \quad (1.5)$$

then, using a matrix having a special purpose "facilities", can be defined vector of coefficients of importance of aims (*i+1*) of th level after a formula

$$P_{i+1} = Q_{il} \cdot P_i, \quad (1.6)$$

where matrix Q_{il} -matrix, that transposed to Q_i.

Postulated formula (1.2), it is possible to dignify the vectors of criticality, starting from *i=2 to i=m-1*-th level. Vector of important factor for the first time *i*=1 known as the importance of any purpose first level X_{iz} equal weighting factors arc that goes from the top X_0 and enters the top X_{1z}.

According to formula (1.6) value *z*-ї component vector P_{i+1} equals

$$P_{i+1} = \sum_{j=1}^{l_i} p_{ij} \cdot g_{ijz}, i = 1, ..., m-2, z = 1,2m, ..., l_{i+1}, \quad (1.7)$$

then ratio importance of goals $X_{i+1,z}$ will be the sum of the coefficients of the importance of goals *i*, weighted coefficients importance of arcs within the top $X_{i+1,z}$ of all of the level *i*.

In accordance $\sum P_{i+1,z} = \sum_{z=1}^{l_{i+1}} \sum_{j=1}^{l_i} P_{ij} \cdot g_{ijz} = 1.$ (1.8)

Simultaneously with the solution of the problem can determine the importance of the tasks of each hierarchical level "tree of goals and objectives" that is, their significance, and upon

closer study of equity participation and capabilities to achieve the main goal.

Conclusion and direction for further research. The degree of security forces LAF is the basic parameter for finding ways to improve logistics processes. The proposed scientific approach will help determine the integral index of efficiency of logistic processes, which will characterize the amount of costs per unit cumulative effect, leading to obtain a comprehensive assessment of their economic efficiency and help them make informed choice rational option under current conditions.

Focus on the end result is the need for constant change priorities criteria for evaluating the efficiency of logistics processes in the logistics by which to reduce the time of decision, the best option criteria for evaluating the efficiency of logistics processes in the logistics and will be the next step for further research.

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The article came to the release 19.02.2017

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Оцінка економічної ефективності логістичних процесів матеріально-технічного забезпечення військ (сил)

Резюме. У статті викладено пропозиції щодо удосконалення існуючого науково-методичного апарату для оцінки ефективності логістичних процесів в системі матеріально-технічного забезпечення Збройних Сил України.

Ключові слова: потреба, матеріально-технічне забезпечення, фінансування, розподіл, ефективність, логістичний процес.

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Оценка экономической эффективности логистических процессов материально-технического обеспечения войск (сил)

Резюме. В статье изложены предложения относительно усовершенствования существующего научно-методического аппарата для оценки эффективности логистических процессов в системе материально-технического обеспечения Вооружённых Сил Украины.

Ключевые слова: потребность, материально-техническое обеспечение, финансирование, распределение, эффективность, логистический процесс.

UDK 341.824:338.47 (043.2)

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Ways of providing of cybernetic safety of objects of critical informative infrastructure of the state are in a military sphere

Resume. The question of cybernetic safety of objects of critical informative infrastructure, which play a decision role in the defensive capacity of the state, is considered in the article, to her economic and social development. Certain principles and ways of improvement of defence of objects of critical informative infrastructure of the state.

Keywords: safety of informative infrastructure, critical informative infrastructure of the state, objects of critical informative infrastructure of the state, passport system of objects of critical informative infrastructure.

Raising of problem. In XXI century there is further dynamic development of soldiery technologies which substantially influence and determine forms and methods of conduct of battle actions. For today informative space next to dry land, sea, air and space actively used in the military opposing. Becomes more obvious, that than more possibility is in an informative sphere, the more so political and soldiery advantages. Therefore the problems of forming of the effective system of counteraction to the informative threats, in particular cybernetic threats in the field of defensive of the state, become extremely actual taking into account the processes of reformation and development of defensive of the state of Ukraine.

Informative space, resources, infrastructure and technologies, largely influence on the level of military potential of the state and her military powers. Today, as never, informative constituent in strategy of providing of national and military safety of the state went out on the first plan [1, 4, 12].

It is conditioned by the following:

the results of destruction and disorganization of informative infrastructure of the state are compared to the consequences of application of weapon of mass defeat;

in the conditions of stopping of cold war normalizations of intergovernmental relations in a traditional military sphere, the centre of gravity of opposing of the developed states moves to the informative sphere;

facilities which are used for negative influence on the informative and telecommunication systems became accessible not only state to the special services but also separate a criminal and terrorist groupment, as a result the problem of providing of informative safety became international and compared to global economic and ecological security.

Swift development of information technologies and globalization of the Internet resulted in a volume, that the informative infrastructure of the state became the object of criminal activity - more vulnerable places appeared for criminal encroachments. Criminal and terrorist groupments got possibility of the use of global network for achievement of the aims. From it a problem of providing of safety of informative infrastructure is substantial in the defensive capacity of the state, her to economic and social development. The processes of global informatization led to that modern society practically fully depends on the state of safety of informative infrastructure.

A cyberspace gradually grows into separate, next to traditional there is “earth”, “air”, “sea” and “space”, sphere of conduct of battle actions, in which more active corresponding subdivisions of military powers of the leading states of the world [operate 4]. Taking into account the wide use of modern information technologies in the sector of safety and defensive, creation of single CAS of management of Military Powers of Ukraine of cybernetic defence of our state vulnerable becomes to cybernetic threat.

In Constitution of Ukraine of providing of informative safety it is adopted among the major functions of the state, by the matter of all Ukrainian people (century 17). The sphere of informative safety is regulated by operating normatively-legal documents: Constitution of

Ukraine; Strategy of national safety of Ukraine (in the release of Decree of President of Ukraine from May, 26, 2015 № 287/2015); Conception of development to the sector of safety defensive of Ukraine, brought into an action by Decree of President of Ukraine from March, 14, 2016 № 92/2016); the Military doctrine of Ukraine, ratified by Decree of President of Ukraine from Septembers, 24, 2015; Strategy of cybernetic safety of Ukraine (in the release of Decree of President of Ukraine from March, 15, 2016 № 96/2016); Strategic defensive bulletin of Ukraine (brought into an action by Decree of President of Ukraine from June, 6, 2016 № 240/2016); Strategy of communications of Military Powers of Ukraine, ratified by the order of Secretary of defence of Ukraine from September, 30, 2015; ratified international agreements, in particular, Convention about cybernetic criminality [12].

For today threat to cybernetic safety actualization because of act of such factors:

insufficient level of security of critical infrastructure, state electronic informative resources and information from cyber threat;

unsystematic of measures of cyber defense of critical infrastructure;

insufficient development of organizationally-technical infrastructure of providing of cyber safety and cyber defence of critical infrastructure and state electronic informative resources.

Large actuality is acquired by actions in cybernetic space. Intellectual influence on informative and telecommunication networks with the purpose of violation of functioning of control system by troops and weapon opens wide asymmetric possibilities in relation to the decline of battle potential of opponent.

Strategy of cyber safety of Ukraine (farther - Strategy) has for a purpose conditioning for the safe functioning of cyberspace, his use in interests of person, society and state [4].

For achievement of this purpose necessary is: creation of the national system of cybersafety;

strengthening of possibilities of subjects to the sector of safety and defensive for providing of effective fight from cyber threats of military character, cyber terrorism and cyber criminality , deepening of international cooperation in this sphere;

providing of cyber defense of state electronic informative resources, information, requirement in relation to defense of which set by a law, and also informative infrastructure which is under jurisdiction of Ukraine and violation of the permanent functioning of which will have a negative influence

on the state of national safety defensive of Ukraine (critical informative infrastructure).

Analysis of the last researches and publications. For specialists the looks of domestic and foreign scientists of Бірюкова Д.С., Грачева Г.В., Дубова Д.В., Кондратова С.І., Турка Н.І., Устименка О.В., Манойла А.В., Петренка А.І., Фролова Д.Б, Прохожева А.А., Литвиненка О.В., Почепцова Г.Г., Козер Л.and other 6, 11-14].

The analysis of works shows that in the modern terms of development of person, society, state a role and place of informative component activity rises, acquires all yet greater weight and becomes one of major elements of providing of her national safety, informative safety and others like that.

Taking into account, that informative wars are constantly perfected lately, change and more used for achievement of political, economic and soldiery aims, this question requires a deep study, system and constancy.

The examples of many countries of the world (The USA, countries of ЄС, South Korea and others like that) with the developed informative infrastructure testify to the considerable increase of dependence of socio-economic stability, national safety, informative and cyber safety on the whole from the level of security of the informative, telecommunication and informative-telecommunication systems. One of major tasks there is development and realization of measures on prevention, removal and neutralization of threats to interests of the state, society and rights for citizens in the field of informative safety.

Virtual space of global informative networks becomes a strategic battle-field which changes geopolitical and military-political priorities radically. Already there is not a sharp necessity to conquer territory and hold it under control. Cyber attack is far more cheap and more effective of "classic" wars. It is enough to put out of action command not foci’s, but systems and lines of management of civil and military informative infrastructure of the state for that an out of control process began, id est chaos.

Research workers and soldiery analysts mark such factors which stipulated the indicated situation [6, 11, 12]: change of maintenance of primary objective of war, which is now sent to decline of will of opponent to resistance, destruction of him political, military-economic and morally-psychological potential, with further establishment of the loyal political mode;

high battle efficiency of high-fidelity weapon and facilities of informative influence

(especially informatively-psychological), that defined the dominant role of electronic-fire and informative operations, creation of high-efficiency facilities of informative influence (opposing) and high-fidelity weapon with the elements of "artificial intelligence";

growing non-acceptance by society of power methods of decision of international disputes, which requires substituting of traditional decimators by new more effective: informative, power, biotechnical, unlethal and others like that.

The purpose of the article is development of methodical approaches in relation to providing of cybernetic safety of objects of critical informative infrastructure, which decide in the defensive capacity of the state, her to economic and social development.

Exposition of basic material. Such basic terms and determinations of their concepts, which are used in the articles [1-5, 8, 10].

Cybernetic safety (cyber safety) - is the state of security vitally important interests of man and citizen, society and state in a cyberspace.

Cybernetic defense is an aggregate of methods measures of organizational, normatively-legal and technical character, sent to providing of cybernetic safety.

Note. Carried out by defense of elements of informative infrastructure, which form own cybernetic space (CASS of management, informative systems of design and support of decisions, informative-telecommunication systems and others like that) from destructive informative actions.

A critical infrastructure - is an aggregate of objects infrastructures of the state, which are most essential for an economy and industry, functioning of society and safety of population and lay-up or destruction of which can have a substantial influence on national safety and defensive, natural environment and to result in considerable financial losses and human victims.

Objects of critical infrastructure - of enterprise and establishment (regardless of pattern of ownership) of such industries as energy, chemical industry, transport, banks and finances, information technologies and telecommunications (electronic communications), food, health protection, communal economy, which is strategically important for functioning of economy and safety of the state, society and population.

Cyber attack is unauthorized actions, which are carried out with the use of informatively-communication technologies and sent to violation of confidentiality, integrity and availability of information, which is processed in the electronic communications system, or violation of the permanent functioning of such system.

The measures of cybernetic defense are sent to protecting of own CASS of management, control system and critical infrastructure by a weapon from cyber attack opponent, warning of attempts of realization and neutralization of educed cyber threat, exposure and blocking of built-in programmatic and programmatic vehicle facilities of establishment, realization of anti-virus defence, realization of control (to monitoring) of the state of cybernetic safety and her providing in the electronic communications systems of military-oriented.

A public informative policy in the field of cyber defense is activity of subjects of providing of cyber defense, related to prevention of cyber to war and to the soldiery conflicts in a cyberspace, by organization and realization of preparation of Military Powers of Ukraine, Government service of the special connection and priv of Ukraine, other formed in accordance with the laws of Ukraine soldiery forming, state, reconnaissance organs, and also law enforcement authorities of the special setting to the cyber defense state.

To the basic objects of critical informative infrastructure it is possible to take control system in: government; to the defensive; to the health protection; social defense; informatizations; to the credit-financial and bank system; research sector; to industry; to energy, including atomic; petroleum production; agriculture; public food consumption; transport; water-supply; communal economy; telecommunications; to the civil defensive.

To the objects of critical informative infrastructure of Ukraine, which in the first turn need defense, it is possible to take the informative systems and facilities of supervision, navigation, automation of management technological processes, informative-telecommunications systems, and also informative resources and control system of subjects to the sector of safety defensive of Ukraine, national transport system, power system, financial system, defensive-industrial complex, chemical production, medicine, civil defense of population and others like that.

To the objects of critical informative infrastructure in the field of defensive, to our opinion, it is possible to take: control system of central organs of military management, organs of management of types of Military Powers of Ukraine and births of troops, associations, connections, soldiery parts and organizations, which are included in Military Powers of Ukraine, state enterprises of Department of defense of Ukraine;

informative resources of enterprises of defensive complex and leading research establishments which perform the government defensive orders or engage in defensive problem;

programs facilities of automated and automatic control system, armament and military technique, equipped by facilities of informatization by troops and weapon;

informative resources, communication networks and informative infrastructure of other troops, soldiery forming and organs;

military objectives of the increased danger (arsenals, bases and compositions of storage of armament, rockets, live ammunitions, components of rocket fuel and fuel of Military Powers of Ukraine).

The purpose of informative activity of subjects of providing of cybernetic safety of the state is warning, timely exposure and prevention of external and internal cyber threats safety of objects of critical informative infrastructure of the state, removal of terms, that they are assisted, and reasons of their origin.

Basis of the national system of cyber safety Department of defense of Ukraine, Government service of the special connection and priv of Ukraine, security of Ukraine Service, National police of Ukraine, National bank of Ukraine, reconnaissance organs on which such basic tasks [must be fixed in accordance with established procedure 4, will present]: on Department of defense of Ukraine, General staff of Military Powers of Ukraine in accordance with the competence - of realization of measures on preparation of the state to the reflection of military aggression in a cyberspace (cyber defense); realization of military collaboration from NATO, related to safety of cyberspace and compatible protecting from cyber threat; providing is in co-operating with

Government service of the special connection and priv of Ukraine and security of Ukraine of cyber defence of own informative infrastructure Service;

on Government service of the special connection and priv of forming Ukraine - and realization of public policy in relation to defense in the cyberspace of state informative resources and information, requirement in relation to defence of which set by a law, cyber defense of critical informative infrastructure, state control in these spheres; co-ordination of activity of other subjects of cyber safety is in relation to cyber defence; realization of organizationally-technical measures from prevention, exposure and reacting on cyber incident and Cyber attack and removal of their consequences, informing of cyber threat and corresponding methods of protecting from them; providing of functioning of state center of cyber defense; realization of audit of security of objects of critical informative infrastructure is on vulnerability;

on security of Ukraine - of warning, exposure, stopping and opening of crimes Service against the world and safety there are humanities which is accomplished in a cyberspace; realization of against reconnaissance and operative-search measures, sent to the fight from cyber terrorism and cyber espionage , and also in relation to readiness of objects of critical infrastructure to possible cyber attack and cyber incident; counteraction of cyber criminality, the possible consequences of which directly create a threat vitally to important interests of Ukraine; investigation of cyber incident and cyber attack in relation to state electronic informative resources, information, a requirement in relation to defense of which is set by a law, critical informative infrastructure; providing of reacting is on computer incidents in the field of state security;

on the National police of Ukraine - of providing of defense of rights and freedoms of man and citizen, interests of society and state from criminal trespasses in a cyberspace; prevention, exposure, stopping and opening of cyber criminality; an increase of being informed of citizens is about safety in a cyberspace;

on the National bank of Ukraine - of forming of requirements in relation to cyber safety of critical informative infrastructure in a bank sphere;

on the reconnaissance organs of Ukraine - of realization of reconnaissance activity in relation to threats to national safety of Ukraine in a cyberspace, other events and circumstances which touch the sphere of cyber safety.

To basic directions of increase of level of security of objects of critical informative infrastructure of the state it is possible to take: providing of the complex going near the decision of tasks of

informative safety taking into account the necessity of differentiation of her levels;

development of general model of threats to informative safety (passports of informative dangers - calls, threats, influences);

determination of technical requirements and criteria of category objects of critical informative infrastructure (including. is an estimation of vulnerability of the noted objects, including. for to the undeclared channels of vulnerability);

creation of state register (state system of the passport system) of objects of critical informative

infrastructure, development of measures is on their defense and facilities of technical supervision after

the observance of corresponding requirements;

providing of the effective monitoring of the state of informative safety;

there is perfection of normatively-legal and methodical base (conceptions) in area of defense of objects of critical informative infrastructure;

development and perfection of the protected facilities of treatment of information of general application, and also systems of their audit;

creation of the effectively operating system of exposure and counteraction to negative informatively-psychological influences.

It should be noted that in connection with realization of Strategy of cyber safety of Ukraine, national security Council defensive of Ukraine made decision about creation of the special working organ - the National co-ordination center of cyber safety.

Strategy of cyber safety of Ukraine determines, in particular, such basic priorities for a safe, stable and reliable cyberspace in Ukraine: development and operative adaptation of public policy in the field of cyber safety, achievement of compatibility

with the corresponding standards of ЄС and NATO;

creation of national normatively-legal and terminology basis is in this sphere, harmonization of normative acts in the field of electronic communications, priv, informative and cyber safety in accordance with international standards and standards of ЄС and NATO;

development of technologies of cyber safety of mobile communication means;

development of electronic infrastructure of connection;

development and perfection of the state checking of informative safety system, and also independent audit of the system of informative safety;

development of network of commands of reacting is on computer extraordinary situations;

development of international cooperation in the field of cyber safety, support of international initiatives in the field of cyber safety, which answer national interests of Ukraine, activation of collaboration between Ukraine and ЄС and NATO with the purpose of strengthening of possibilities of Ukraine in the field of cyber safety.

The complex going near providing of informative safety foresees unity of conceptual, theoretical and technological bases of her providing at informative level of safety of all spheres of government and public activity (political, economic, social, military, ecological, spiritual and others like that), and also spheres of forming, appeal, accumulation and use of information (informative space, informative resources, informative-analytical providing of organs of state administration in all varieties of activity and others like that). The article of methodology of informative safety is research of methods, methods, facilities and channels of realization of threats to national interests at informative level, them timely exposure, prevention and neutralization.

A public informative policy in the field of cyber safety must be directed on: making and adaptation of public policy in the field of cyber safety, sent to development of cyberspace of military sphere, achievement of compatibility with the corresponding standards of ЄС and NATO;

creation of domestic and department normatively-legal and terminology base in this sphere, harmonization of normative documents in the field of electronic communications, priv, informative and cyber safety in accordance with international standards and standards of ЄС and NATO;

an increase of informative literacy of auxiliary personnel and culture of safety conduct is in a cyberspace, complex knowledge, skills and capabilities, necessary for support aims of cyber safety, introduction of state projects of increase of level of awareness of personnel of battle

in relation to cyber threat and cyber safety (cyber defense);

periodic realization of studies in relation to reacting on possible extraordinary situations and incidents in a cyberspace;

development and improvement of the checking system is after the state of priv in the telecommunication systems, and also input of the best world practices and international standards from the questions of cyber safety and cyber defense;

an improvement of informative-analytical activity (works) is in interests of cyber safety of the state in a military sphere (to the sphere of defensive);

to the cyber secret service (monitoring) cyberspace, operative exposure of potential and real cyber threat to national safety and defensive of Ukraine, realization of analysis of military-political and informative (cybernetic) situation and determination of level of potential (real) threat to

national safety of Ukraine with the use of cyberspace;

preparation of objects of critical informative infrastructure of the state to functioning in a special period and terms of martial law.

At the same time, noticeable underestimation of methods of management cybernetic safety, which enable to build problems, take away indexes, optimize decisions which are accepted. Often about a management safety does not even remember, discussing providing of safety in general and ignoring circumstance that working out the problems of safety (cyber safety) of the important telecommunication and informative systems is impossible without the decision of tasks of management by them, such as a construction of

models of threats, exposure of influences, estimation and analysis of risks, construction of models and types of defense, control of implementation of requirements in relation to safety.

Worked out and accepted to implementation, including. in Ukraine, international standards in area of informative and cybernetic safety, such as ISO 15408, ISO 27001, enable to form a certain culture in providing of cyber safety.

Providing of necessary informative strength of objects of critical informative infrastructure security it must be based on the use of only requirements of priv from an unauthorized division or change, action of destructive informative influences, and also the certificated facilities of warning and exposure of informative dangers and priv, that are supplied enterprises which got necessary licenses (permissions) in accordance with established procedure.

For realization of complex approach in relation to providing of informative safety necessary development of Conception of defense of objects of critical informative infrastructure of the state and realization of practical measures on her providing [13].

Conception must be the officially accepted system of looks to the problem of providing of informative safety of Ukraine on the whole and to defense of critical informative infrastructure and to be the systematized teaching of aims and tasks, principles, sources of threats; methods of prevention and neutralization of informative influences; objects and subjects of defence of critical informative infrastructure of the state; bases of the concerted public policy of the resource providing; role and place of state and non-state to the sector realization of public informative policy and providing of informative safety; plenary powers and responsibility are for the state and providing of defense of objects of critical informative infrastructure of the state.

Conception must present basis for forming of single public informative policy (to activity), development and realization of measures, in particular preventive, in relation to defence of national informative resources, informative environment, informative resources and objects of critical informative infrastructure to the sector of safety defensive of Ukraine.

Positions of this Conception must be taken into account at: forming and realization of public informative policy (to activity) in industry of defense of objects of critical informative infrastructure of the state;

development of plan of measures and perfection of the system of the resource providing of defence of objects of critical informative infrastructure of the state;

development and realization of the having a special purpose programs of providing of informative safety of Ukraine and measures of defense of objects of critical informative infrastructure of the state.

It follows to take into account at development of Conception of defense of objects of critical informative infrastructure of the state, that on a change to management principles in many industries of informative activity, based on centralization, more attention spared to the management, when in his basis not only the accustomed objects (man, machine, standard of technique, system and others like that) but also situation their activity or functioning is carried out in which. The informative providing it follows carefully to take into account at making decision in relation to an informative sphere and sphere of safety.

The informative-telecommunications systems of objects of critical infrastructure included to the list are the critical informative infrastructure of the state which is on the defensive from cyber attack in the first turn.

Protecting of the informative-telecommunications systems of objects of critical infrastructure of the state from cyber attack is provided by the proprietor (by a manager) of such systems in accordance with a legislation in the field of priv and cyber safety.

The possible ways of improvement of defense of objects of critical informative infrastructure of the state can be [6, 11,

12]: creation of the systems of early exposure of informative dangers (calls, threats, influences);

creation of the effective system of defense of objects of critical informative infrastructure is taking into account their

categories after the degree of vulnerability;

increase of efficiency of informative-telecommunications work;

creation of base of these violators (violations), including. Cyber terrorism.

It is also necessary to create terms for the observance of the mode of export control and non-proliferation of the uncertificated programmatic-vehicle facilities and systems, computer technique, operative reacting on incidents which are related to out commissioning telecommunication systems defensive to the sector; creation of channels of formal

and informal exchange by information about the threat of computer criminality and cyber terrorism.

Estimation of efficiency of the systems of defense of objects of critical informative infrastructure in modern methods it is recommended to conduct with the use of programmatic complexes which require high-cube of actual state information defense of object of critical informative infrastructure.

For realization of aims tasks of realization of public policy in informative space in relation to defense of objects of critical informative infrastructure of the state the corresponding subjects of providing of informative safety must follow such principles: principle of the continuous monitoring and prognostication of possible threats, which consists in collection of information on a socio-political, technological, criminal and other situation in

informative (cybernetic and others like that) space, her timely analysis in relation to changes in the attained level of his security, prognostication of further development of events and development of suggestions in relation to the adequate reacting on changes which take place, and threats (influences) which arise up;

principle of accordance of the system of reacting to the current and expected degrees (to the levels) of threats, which consists in creation of the system of operative counteraction, which is based on her comprehensive rigging the modern technical systems and facilities, account of factors of external and internal, intentional and unintentional, natural (natural calamities) threats. The created system of counteraction must be counted on counteraction to the

professionally geared-up and equipped malefactor (to the group of malefactors);

principle of sufficientness of duty forces of reacting of degree of threats is from the side of violators, which consists in the immediate and absolute stopping of violation, sufficient amount of operative (attendants) forces, corresponding their equipped and preparation;

principle of analogies, which stipulates the use of the approved technical and technological decisions and progress of the systems of secret service (exposure) and operative monitoring of other analogical structures trends;

principle of non-admission of asymmetricness of illegal actions, which consists in realization of preventive measures on non-admission of interference with work of objects of critical informative infrastructure, id est to create the invariant system to unauthorized interference with work of objects of critical informative infrastructure;

principle of evidentialness and documenting of wrong acts in cybernetic space defensive to the sector which consists in a receipt and storage of information about unauthorized interference for the legal estimation of actions of violators;

principle of computer-integrated approach of the systems, which foresees obligatory continuity of process of conduct of secret service of cyberspace of possible objects of negative influence (on all technological cycle of activity) with the obligatory account of all possible types of influences (unauthorized division, output of information, terrorism,

fire, natural calamities and others like that), understanding and realization of that, how, from whom, what to be on the defensive.

To our opinion, expedient development and acceptance of Conception of defence of objects of critical informative infrastructure of the state, input of the state system of the passport system of informative dangers and state register of major objects of critical informative infrastructure (including. in a military sphere), will assist making of single technical policy in relation to providing of cyber safety of objects of critical informative infrastructure of the state during their life cycle.

The passport of safety of object - it a document which contains information about providing of security of object and plan of measures on providing of security of object.

At forming of passport of informative danger and state register of major objects of critical informative infrastructure (including. in a military sphere) is it necessary to give successive answers for the row of questions which in a general view it is possible

to formulate so : that/who is subject to defense? (national values, technical systems of informative infrastructure, personnel of troops,

organs of military management and others like that);

from whom/what is it needed to protect? (informative dangers, informative calls, risks, natural calamities and others like that);

how is it necessary to protect? (secret service, prognostication, exposure, measures in reply, stopping and liquidation of influences, removal of their consequences, minimization of risks and others like that);

who must protect? (system of providing of informative safety, measures of the informative opposing and others like that);

as far as effective system of defense of object of critical informative infrastructure in relation to possible illegal actions?;

as far as does the system of defense of every object of critical informative infrastructure answer modern requirements?

Conclusions.

1. Development and acceptance of Conception of defense of objects of critical informative infrastructure of the state, input of the state system of the passport system of informative dangers and state register of major objects of critical informative infrastructure (including. in a military sphere) will assist making of single technical policy in relation to providing of defense of objects of critical informative infrastructure of the state during their life cycle.

2. A necessity is application of complex of measures for the improvement of defense of objects of critical informative infrastructure defensive to the sector in a normatively-legal, organizational and technological sphere (creation of the systems of early exposure of threats (influences); increase of efficiency of informative-analytical work; creation of base of these cyber criminality (cyber terrorism); logistical support; skilled providing; informative providing).

3. It is necessary to create terms for the observance of the mode of export control and non-proliferation of the uncertificated programmatic-vehicle facilities and systems, computer technique, operative reacting on incidents which are related to out commissioning telecommunication systems defensive to the sector; creation of channels of formal and informal exchange by information about the threat of computer criminality and cyber terrorism.

4. Realization of realization of measures on defense of objects of critical informative infrastructure of the state it is expedient to carry out by creation of subdivisions of the rapid reacting on crimes against the noted objects, capable on a collaboration with international organizations and others like that.

Further researches it is expedient to devote to the questions development of Conception of defense of objects of critical informative infrastructure of the state, perfection of normatively-legal base of cyber safety of objects of critical informative infrastructure, organization and conduct of state register of major objects of critical informative infrastructure in a military sphere.

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The article came to the release 22.02.2017

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Шляхи забезпечення кібернетичної безпеки об’єктів критичної інформаційної інфраструктури держави у воєнній сфері

Резюме. У статті розглянуто питання кібернетичної безпеки об’єктів критичної інформаційної інфраструктури, які є суттєвими в обороноздатності держави, її економічному та соціальному розвитку. Визначені принципи та шляхи покращення захисту об’єктів критичної інформаційної інфраструктури держави.

Ключові слова: безпека інформаційної інфраструктури, критична інформаційна інфраструктура держави, об’єкти критичної інформаційної інфраструктури держави, паспортизація об’єктів критичної інформаційної інфраструктури.

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Пути обеспечения кибернетической безопасности объектов критической информационной инфраструктуры государства в военной сфере

Резюме. В статье рассмотрен вопрос кибернетической безопасности объектов критической информационной инфраструктуры, которые играют решающую роль в обороноспособности государства, ее экономическому и социальному развитию. Определены принципы и пути улучшения защиты объектов критической информационной инфраструктуры государства.

Ключевые слова: безопасность информационной инфраструктуры, критическая информационная инфраструктура государства, объекты критической информационной инфраструктуры государства, паспортизация объектов критической информационной инфраструктуры.

UDK 519.711.3:343.98

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Determination of normatively-legal aspects of protection of the personal data is in the informative systems of the Armed Forces of Ukraine

Resume. Analyzed the issues related to integrity of the personal data during processing and transmission of information in a distributed information management system of the administrative processes of the Armed forces of Ukraine. The analysis of aspects of providing of protecting is conducted from trenching upon integrity of the personal information in the informative systems of the developed states.

Analyzed the problematic issues related to the integrity of personal data during processing and transmission of information in a distributed information management system of the administrative processes of the Armed forces of Ukraine. The analysis of the aspects of ensuring protection against attacks on the integrity of personal data in information systems of developed countries.

Keywords: the personal data, integrity of the personal data, automated system, informative system of the Armed Forces of Ukraine.

Statement of the problem. Today attempts targeted attacks on the servers of state-run enterprises and institutions to obtain certain personal data of individuals for further distribution, or harm sensitive security. Meanwhile there is an active creation of an international spatial social and information systems, the handling of personal confidential information which needs protection. The importance is now gaining legislative control over the development of the digital environment, the protection of information in information systems.

The use of information management systems and decision-making in addition to convenience in the use of conceal many dangers in the context of the use of their personal data during the registration of users [1].

Analysis of recent researches and publications. In Ukraine in professional journals investigated the development and improvement of guidelines and regulations for the protection of personal data, and creating appropriate software. These issues are the subject for such national experts, as T. Kostecka, M. Shcherbatyuk, V. Brisco and others [11, 12]. Among foreign scientists should be noted, A. Miller, G. Hallberg and I. Welder [4, 5].

Despite the fact that this issue was engaged in a significant number of scientists, many aspects currently remain unexplored or require further development, especially in the context of legal regulation of protection of personal data and organizational data protection to ensure national security. Most studies on this subject carried out to prevent violations of the integrity of personal data, i.e. the analysis focused on technical deficiencies in the protection system, as a rule, already after the alleged cyber attacks.

The aim of the article is substantiation of rational decisions on the protection of personal data in information systems of the Armed forces of Ukraine on the basis of analysis of the experience of developed countries on the protection of personal data in information systems for future use.

Presentation of the basic material. In the Armed Forces (AF) of Ukraine since 2006 implemented a unified management system, the administrative processes of the AF of Ukraine (UMS AP). In particular, the functional subsystem “Mayno” (Property) and “Jitlo” (Housing) of the Unified system for management of administrative processes of the AF of Ukraine, containing the personal data of servicemen. This information needs to be protected from interference by any persons. The data can be identified. That is, according to the Ukrainian legislation and international law, such data are in fact “*personal data*” that define an integral part of private life [2-3].

Significant experience on issues about the need to protect the right to private life while

interacting in various information systems, in particular, in social networks, received the English and American researchers and scientists. British Explorer Arthur Miller notes that "the Potential breach of privacy could prompt you to abandon information systems. Therefore, the global success in the development and diffusion of information systems depends on the adoption of appropriate measures for the protection of personal data of users" [5]. This statement of an English scholar is one of the determinants in the formation of approaches to the protection of personal data in social networks. In our country adopted the Law of Ukraine "On personal data protection", which specifies the requirements for the processing and protection of personal data, including in information and telecommunication networks [2].

In General, in European countries the legal protection of personal data covers almost two dozen of European conventions, directives and guidance, each EU country has issued its basic legislative and regulatory acts, adopt specific laws regarding the handling of personal data in different spheres of activities.

Provisions that reflect the requirements of the protection of personal data imposed by the Council of Europe Convention No. 108 as they are processed in the automated system [3] and developed in more detail in the Directive of the European Parliament and of the Council 95/46/EC on the protection of users during treatment in these systems of personal data and the free circulation of these data in the system [6]. The protection of personal data in the Internet environment, in particular in social networks dedicated to other guidance documents of different European institutions:

- the recommendations of experts of the working group, which functions under article 29 of Directive 95/46/EC (WP 39 –"Privacy on the Internet");
- the recommendations of experts of the international working group on data protection in telecommunications ("Berlin group") [7].

The approach to the protection and processing of personal data are the relevant basic principles of collection, processing, storage and transmission. So personal data must be:

- treated fairly and established by law;
- collected for specified, clear and legitimate purposes and not further processed in a way incompatible with those purposes;
- accurate, relevant and not excessive in relation to certain legitimate purposes for which they are collected for further use;
- accurate and, where necessary, updated (should take all legal measures to ensure the security integrity and reliability, taking into account the purposes for which they are used, processed, deleted, or corrected);
- kept in a form that allows you to set a person-the data subject (state agencies establish appropriate safeguards for personal data stored for a predetermined time);
- treated with respect for the rights of individuals and guarantee the right to access their own data;
- processed compliance with legislative requirements protection of confidential information;
- are appropriately protected during transmission outside the country in compliance with the international standards for foreign dissemination of personal data.

These basic principles of the approach to the construction of the protection system were taken in the 90-ies with interests of several countries of the world. Now, some legal norms of developed countries have implemented a list of similar principles in national legislation or refer to the above-mentioned Convention of the Council of Europe domestic legislation. Modern information technologies are improving day by day, activate social network, significantly change methods and processes for the collection and processing of personal data (hereinafter – PD). Today continues to improve the multifunctional information space in which there is an increasing demand to further protects the PD, and the old methods and approaches are becoming ineffective.

In October 2012, on the initiative of the Ukrainian public organization adopted a Declaration "For privacy in the Internet", joined by a number of leading national telecommunications companies, and in February 2013, the "Ukrainian Association of personal data protection" conducted a study on the topic: "How to ensure transparency and openness in the processing of personal data on the web" [10]. In the course of the study revealed that most of the personal data using web-based resources are handled in such processes:

- users complete the online resources provided questionnaires;
- registration and further authorization username and password;
- registration on a specific account in the social network;
- the user has submitted their email address or phone number for feedback.

From the point of view of domestic law (article 6, 11 Law of Ukraine "On protection of personal data") the fact of registration of the user

in the social network is a mandatory element and with the consent of the customer (user), with subsequent processing (using) personal data in a social network. However, a large number of social networks does not adhere to certain legal conditions for the processing of personal data, and therefore actually illegal to image process this data and transfer them to other institutions. In the course of the study found that in many social networks available to the General public, registration is performed based on input of personal data, according to which the user can be identified, namely: name; geographic location, place of study; your phone contacts.

All the data about the person are filled with the subject of personal data without a notification of their possible further use during the operation of the personal pages in social networks. On the one hand, you can avoid this problem by entering false information, but in fact, this social network is more of a utility, which is used for the purpose of entertainment, however, if the person has the intention to create a personal page for communication or other purposes, a mandatory condition which is an indication of "truthful information" on which it can be identified, there arises a problem legal situation.

To address this problem we propose to introduce the option, the essence of which will be to ensure that in the process of registration of a person in the social network of the mandatory initial step will be the answer individuals question: "Do you agree that in the process of functioning your personal page in any social network possible processing of your personal data?", and determination of liability of owners of social networks for their storage and integrity. On the one hand, it will give the opportunity to avoid the spread of the data about the person that certainly not wished by the actual warning, on the other, it will contribute to practical harmonization of the national legislation of Ukraine, and forced the owners of social networks responsible attitude to the protection and storage of the information provided. Another problematic aspect of privacy in social networks – the inability to completely and permanently remove your data from the personal pages in social networks. This problem violates the so-called private right of individuals to protection of personal data – "right to be completely remote from the network" but does not provide the ability to locate and track criminals. These questions are entrusted to the respective state bodies.

The so-called "right to be completely remote from the network" existed in Europe since 1995, in all member countries of the EU (with the basic Directive 95/46/EC). Every user of any social network may request to delete your data at any time. But on the contrary, there are certain limits, limits. For example, if personal data are used with the purpose of freedom of speech and expression in the media, and, of course, in this case, if there is a certain legal inconsistency and, if the state or a private company is entitled to process these data in accordance with certain legitimate purposes of data processing or the consent of the person concerned. So there are limitations, although in General the rights of individuals must be guaranteed, unless there are reasons for such restrictions. The corresponding "right to be completely remote from the network" is given considerable attention in the draft of the new General EU regulation on the protection of personal data, which is now undergoing a public hearing in the EU institutions, in which security administrator system user required for clear, coherent legal and technical mechanism to implement this law.

It is also necessary to consider that according to the Directive 97/66/EC of the European Parliament and of the Council of Europe [8] legal, regulatory, and technical requirements governing the protection of PD, the rights of individuals and legitimate interests of legal entities should be clearly defined and not to create obstacles for the development in the field of information security. Achieving that balance is possible if the definition of a limited and reasonable number of requirements that do not prevent the development of new technologies and the proper functioning of the PD bases. Also, in accordance with the requirements of the Directives of the European Parliament and of the Council of Europe [6, 8] owners of information systems with the assistance of the Authorized state body on personal data protection should cooperate in the implementation process and develop appropriate technology to provide safeguards to protect the rights of individuals. In all developed countries, the recognition of activities that can be considered adequate for protection within the competence of the authorized state bodies on protection of PD, including through appropriate publications.

To solve these problems, proposed an approach by which authorized state bodies on protection of PD suggest that the owners of information systems where personal data is stored, to determine the measures of protection given these existing hazards:

- possible risks associated with processing and data storage in automated systems (hereinafter – AS);
- nature and volume of offenders who interfere in the AS;

- cost of measures for the implementation of systems of protection in the AS;

- characteristics and capabilities as where the circulated information and more.

First of all, in most cases the owners AS where it circulates personal information is not required special measures of protection, in particular the standard (described in ISO/IEC 27001). In most cases, focuses on the availability of qualified system administrators control PD protection systems (institutions, organizations) and training of staff, during processing and storage PD.

Our government takes important steps in addressing and overcoming problematic issues and the realization of the right to protection of personal data in social networks. So, in the recommendations of the parliamentary hearings on "Legislative provision of information society development in Ukraine", approved by the resolution of the Verkhovna Rada of Ukraine dated 03.07.14 G. No. 1565-VII), there is a recommendation of the government of Ukraine "to ensure that in secondary schools the presentation of the subject the rules of work in social networks, participation in shared forums, personal data protection, and network ethics, given the current state of development of information systems". The effectiveness of these recommendations the Government of Ukraine can only be evaluated after a certain period of time.

It should be noted that today the confirmation of compliance of the integrated systems of information protection (hereinafter – CISIP) in information systems/automated system (hereinafter – IS/AS), in Ukraine is carried out according to the results of state expertise in the order established by legislation. The owners (managers) of its that meet the criteria specified in paragraph 1.6 the Regulations on state expertise in the sphere of technical protection of information [9], with modifications [10], have the right to free choice regarding the use of any of the possible options (ways) of the public examination system. However, subject to the provisions of the Directives of the European Parliament and of the Council of Europe, it is advisable to expand the list of IS/AS according to which it is possible to apply this procedure.

Conclusions. State legislation of Ukraine in the sphere of protection of the PD continues to adopt best practices and best practical achievements of the EU countries with the aim of providing quality level of personal data protection.

Tools and methods of use of personal data for illegal purposes is rapidly evolving and improving, therefore, neglect the implementation of measures to protect PD are processed IS/AS departmental assignment may result in the potential for improper actions with this information.

Measures for the protection of PD, the mechanisms, the establishment of bodies responsible for PD protection, you need to plan and implement the prevention of misconduct. We emphasize that the protection of personal data in all spheres of national security should be merged under a unified leadership.

The basic principles for the collection, processing, storage and transmission will allow us to significantly reduce the risks from information leaks, violation of its integrity, and availability.

The proposed approach in the protection of PD will improve the efficiency of the perspective of CISIP IS/AS departmental assignments in the areas of medicine, logistics, surplus military property, in particular the functional subsystem "Jitlo"(Housing) of the Unified system for management of administrative processes of the AF of Ukraine, which, according to the technical requirements handled sensitive information (personal data).

Further research should focus on finding more optimal ways of addressing issues illuminated in the following areas:

- general use by the Government of Ukraine already existing recommendations of the leading countries);

legal active position of the Ombudsman of the Verhovna Rada of Ukraine of the person on human rights concerning the organization of information meetings, providing clear and practical recommendations of publications to a wide information audit results information systems for the protection of personal data;

- protection of personal data in corporate networks to ensure the effective protection of the PD users AS, to introduce the ability to develop corporate codes, which will be important in the promotion of government legislation in various fields, processing and transmission of data.

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The article came to the release 08.02.2017

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Визначення нормативно-правових аспектів захисту персональних даних в інформаційних системах Збройних Сил України

Резюме. Проаналізовано проблемні питання, пов'язані з цілісністю персональних даних при обробці та передачі інформації в розподіленій інформаційній системі управління адміністративно-господарськими процесами Збройних Сил України. Проведено аналіз аспектів забезпечення захисту від посягань на цілісність персональних даних в інформаційних системах розвинутих держав.

Ключові слова: персональні дані, цілісність персональних даних, автоматизована система, інформаційна система Збройних Сил України.

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Определение нормативно-правовых аспектов защиты персональных данных в информационных системах Вооружённых Сил Украины

Резюме. Проанализированы проблемные вопросы, связанные с целостностью персональных данных при обработке и передаче информации в распределённой информационной системе управления административно-хозяйственными процессами Вооружённых Сил Украины. Проведен анализ аспектов обеспечения защиты от посягательств на целостность персональной информации в информационных системах развитых государств.

Ключевые слова: персональные данные, целостность персональных данных, автоматизированная система, информационная система ВС Украины.

UDK 004.75

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Analysis of Architecture Frameworks for building information systems of NATO and determine architectural features C4ISR

Resume. The article exposes the features of architecture of C4ISR and her role for the Armed Forces of Ukraine. Considered retrospective analysis of modern scope architectures of military-oriented, that is used in NATO. Approaches over are brought taxonomies of NATO, that is needed for the achievement of system accordance of conception of scope architecture.

Keywords: architecture framework, C4ISR, taxonomy.

Statement of the problem. Today in the Ministry of Defense (MoD) of Ukraine and Armed Forces (AF) of Ukraine continues the process of development and implementation of new information technologies. Given the need to maintain developments of the System project of Unified control system of Armed Forces of Ukraine [1], subject to the standards of NATO in the interests of the MoD of Ukraine and development priorities of the AF of Ukraine, was developed a Road map for building the information infrastructure of the MoD of Ukraine. One of the points of the Road map is the creation of programs for standardization of information infrastructure of the MoD of Ukraine on the basis of international standards and approaches of NATO.

At the same time, these intentions are confirmed by the provisions set out in the Decree of the President of Ukraine "On decision of National Security Council and Defense of Ukraine from 20 may 2016 "Strategic Defense Bulletin of Ukraine" [2], namely, in the second section, which is dedicated to the control of the Defense force. It refers to the creation by 2020 the national telecommunications network, modernization and translation the special communication system, departmental information networks and government communication systems into modern digital technology, as well as the creation of the automated system of C4ISR (Command, Control, Communications, Computers, Intelligence, Surveillance and Reconnaissance) components of the Defense force that meets the standards, doctrines and recommendations of the NATO at all levels of management (tactical operational and strategic) with certain specific underlying features. The Bulletin also noted on the consideration of the compatibility command and control system and weapons systems with resource support systems.

When you create such a complex system it is important to define the essence, architecture, and place in the overall list of different conceptual approaches. Therefore, the analysis of the so-called Architecture Frameworks, combining the basic principles, concepts, rules, patterns, interfaces and standards of information systems of NATO and the definition of the architecture C4ISR to illuminate the pathways of their adaptation in Ukraine is an urgent task.

The extent of the problem. Aspects of the application architecture frameworks adopted in the civil sector, while building the enterprise architecture for the military sector, listed in the sources [3-5]. A retrospective of the development of military framework architectures over the past thirty years is given in [6]. General principles of framework architectures adopted by NATO in presented in [7, 8]. In [9] the concept of enterprise architecture based on the analysis of the modern world approaches to the design of the framework architectures and the place of information infrastructure of the MoD of Ukraine.

The purpose of this paper is the definition and features of the C4ISR architecture based on the analysis of the leading approaches to the design of architectures framework in NATO.

Presentation of the basic material. In the leading countries of the world have long developed a whole range of issues related to the architectural

approach in a complex organizational-technical objects, such as enterprise and information systems of the enterprise. According to the definition of the most general, the term "company" means a complex system of cultural, technological and process component, organized to achieve the objectives of the organization. Architectural approaches can be applied to the whole or unit of the enterprise or to specific applications.

Enterprise Architecture is one of the tools of organizational changes like for the entire enterprise, and the part of the organization that is responsible for information technology [10].

In world practice, there are industry standards to describe enterprise architecture, adopted by organizations such as the Institute of electrical and electronics engineers (IEEE – Institute of electrical engineers and electronics), international organization for standardization (ISO – international organization for standardization), the open Group and the like.

The advantages of the architectural approach according to the methodology of TOGAF (The Open Group Architectural Framework) [4] include:

improvement and increase of efficiency of functional processes;

costs reduction;

improving operational efficiency in functional activities;

improving the efficiency of management;

risk reduction;

improving the efficiency of IT-departments;

increase user productivity;

improving interoperability (functional interaction);

reducing the cost of support life cycle.

improving safety performance;

improving the controllability.

NATO also uses architectural approaches to implementing information systems. The term "C4ISR" is defined as the architecture and the design of the interaction components of the system of command and control operational and operational-strategic level.

C4ISR Architecture means an approach that involves a comprehensive integration of operational and strategic intelligence, surveillance, and military intelligence (Intelligence, Surveillance and Reconnaissance) systems, control, communication and computing facilities (Command, Control, Communication, Computers) [7] in a single information environment, which, in turn, ensures the integration of navigational, geographical and tactical information in a common geographic coordinate system. Together these integration processes enable you to implement network-centric architecture, command and control, which to some extent changed the approaches to conducting combat operations through the use of the principles network- centeredness.

C4ISR also know as the only large-scale software and hardware. In the name of C4ISR (Command, Control, Communications, Computers, Intelligence, Surveillance, Reconnaissance) lists the functions that should be automated. Therefore, systems built on a similar concept, called integrated systems of intelligence and control.

In contrast to the C2+ or C2SR (Command, Control, Surveillance, Reconnaissance) is concept tactical level, where the unit is an individual soldier or military vehicles, C4ISR, these units become members of a tactical military network or the Internet.

Architecture and the concept of C4ISR and C2+ provide for the creation of the information environment, which enables:

to automatically determine the position and movement of their units (is automatically displayed on electronic maps);

to automatically determine the position of the opponent and his movements (also displayed on electronic maps);

automatically select routes;

automatically to give target designation to fire weapons;

automatically inform their units about the actions and whereabouts of their neighbors and the enemy.

These features are available on the operational and tactical levels. These points for C4ISR, that is the operational level that should be added:

full automation of data collection and its processing;

automated delivery solutions to the commander, automatically based on the intelligence received, as well as information about the forces and means available;

a simulation of the battle and its possible outcomes;

offers partial solutions of the commander during the battle based on the current situation.

Thus, the difference between the levels of tactical and operational systems is the possibility of automating decision making, the simulation of a fight and predicting outcomes.

In addition, C4ISR has extended automation to logistics. Cost accounting necessary funds system is ongoing. Data requirements units in the replenishment of ammunition, tools,

logistics, necessary parts, etc. – are processed continuously, which enables to carry out deliveries in a timely manner, everything necessary to conduct successful military operations.

An example implementation of C4ISR for tactical level is software DAP (Digital Army Program) that examine the American companies Northrop Grumman and Lockheed Martin. Lope is to create a unified information field that provides situational awareness, automation management, improve the operational capacity and the most efficient use of forces, means and resources.

The retrospective analysis. The formation and development of C4ISR in received in the USA in the 1990-ies and has become a point of departure for the military framework architectures, which include the framework architecture of the countries-members of NATO.

Figure 1 shows the timeline of key stages of development of the C4ISR architecture in [6]. In 2003 it was replaced by the so-called framework architecture MoD USA – DoDAF (Department of Defense Architecture Framework) [3, 4].

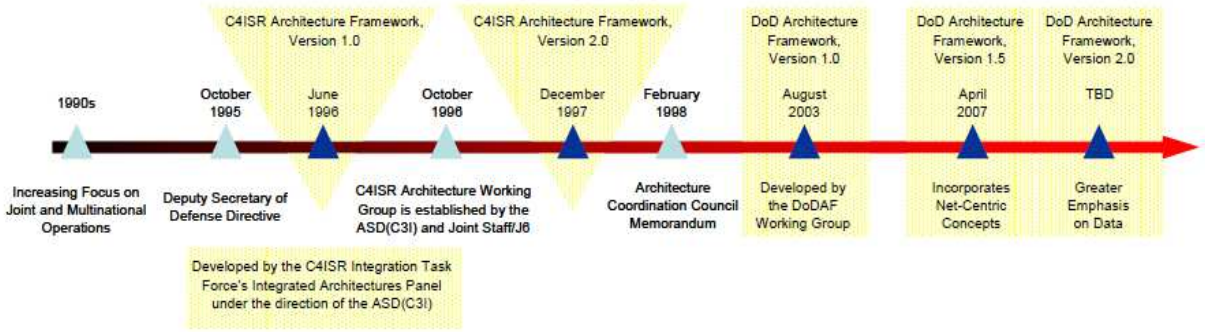

Figure 1. Evolution of the framework architecture of the USA from C4ISR to DoDAF v 2.0

In the Alliance use their own approach – NATO Architecture Framework (NAF), what to base on the special institutional approaches to the design of the architecture DoDAF and expertise of the enterprises of civil sector of the TOGAF methodology [4]. MoD of Canada uses their own framework architecture the framework architecture of the Department of National Defense Armed forces of the Canadian DNDAF (Department of National Defense / Canadian Armed Forces Architecture Framework).

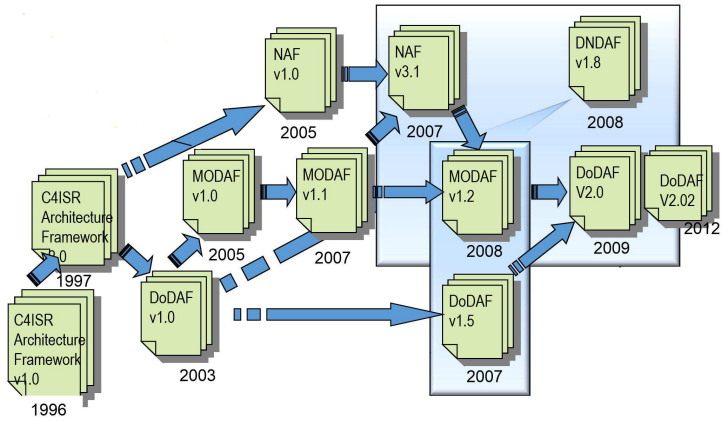

Figure 2. Evolution of the framework of the military architectures of the countries-members of NATO

Now architecture MoD USA, is based on the DoDAF architecture in the second edition (DoDAF v2.02) more fully described in the open literature in comparison with other military architectures in NATO. Previously, this architecture was agreed upon structural elements of the framework architecture of the UK Ministry of Defense (UK Ministry of Defense Architecture Framework, MODAF), the framework architecture of NATO (NATO Architecture Framework, NAF) and the framework architecture the Open Group's TOGAF, and then these elements were adapted for use within DoDAF. These harmonize with the current versions of advanced architectures NATO is shown in Figure 2 large rectangle.

Architecture DoDAF provides the rules, guidance and other guidance documents that

should be used when developing and describing architectures of the various systems used by the military departments of the USA and NATO. All of them are designed to allow the use of information technology from the perspective of rapid mobilization to carry out military operations and improving the efficiency of development of relevant systems. An important aspect of this methodology is the ability to provide a comparison, analysis, and integration architectures that simultaneously uses various functional units in a geographically distributed organizational environment. Note that the system C4ISR inherent ability to global scalability [7].

In Figure 3 shows the structure of the basic views used in DoDAF. According to this method examines three different views (operational, system and technical standards view) that combine to describe the architecture. Each of them is used to display a variety of architectural characteristics and attributes, although between them there are some overlaps. Some of the attributes unite two different ideas that ensure the integrity, unity and uniformity in the architecture description. It is believed that the most useful architecture description is "integrated", that is what unites the different ideas in the description of the systems.

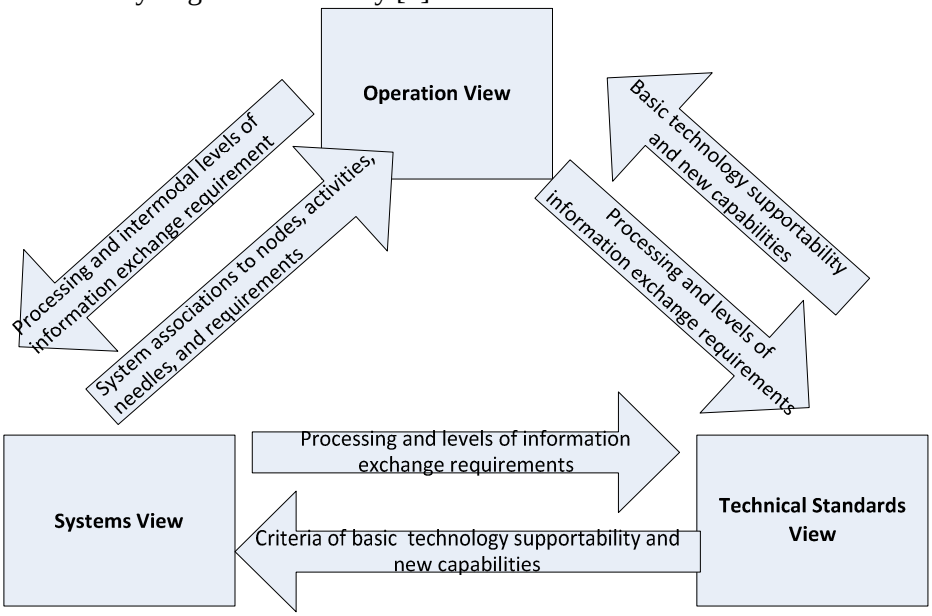

Figure 3. Three main views that are used in DoDAF

Operating view (responsible for what needs to be done and who does it) includes a description of the tasks and activities, operational elements and information flows that are necessary for activities of the Ministry of Defense. The operation includes, as a purely military functional processes and traditional business processes. Operating view includes a description (often graphical) that includes:

nodes execution elements;

scheduled tasks and activities;

information flows between nodes.

Operating view determines:

the type of data in the information exchange;

the frequency of information exchange;

the list of tasks and activities, which are provided by the information exchange;

the nature of information exchange.

Operating view relative system view (look Figure 3) dictates which procedures who are performed, what integration is needed. And in the back side of the system view, dictates which systems are generally not used.

The system view regarding the submission of the technical standards dictate what should be the specific requirements associated with integration and information exchange. In the back of the submission of the technical standards dictate the criteria for the implementation and acquisition systems.

The submission of the technical standards concerning the operational view dictates the requirements and features. In the reverse side of the operating view dictates the condition of implementation of the possibilities of new technologies.

System view (responsible for the communication characteristics of tasks that are performed) includes text and graphical descriptions of systems and the connections between them, which are used to carry out the function of the Ministry. System view describes the relationship between system resources at an operational level. These system resources support operational

activities and ensure the exchange of information among operational nodes.

View of technical standards (responsible for defining standards and agreements) defines the minimum set of rules that guide the creation, interoperability, and establishing relationships between parts of systems and elements. This view provides technical guidelines on which engineering specifications are based. By creating common blocks and developed product line.

The view of the technical standards includes the following elements descriptive documentary providing:

technical standards;

transaction for the implementation of technical standards;

special conditions during use.

the rules and criteria organized by profiles that are used in the creation of systems and elements.

There are certain aspects that are relevant to all three views of the architecture. These common aspects are reflected through the common for all views of text and graphics. Such descriptions provide information that relates to architecture as a whole, which does not fall under the responsibility of a particular view. They set the scale limits (or the coverage of the subject area) and the context of architecture. The context of architecture includes the following aspects:

doctrine, tactics and procedures;

goals and vision;

concept of operations;

scenarios;

the conditions of the external environment.

The most important element and strength of the technique are the so-called architectural products. It is a graphical, text, tabular descriptions that are created in the process descriptions of the architecture and record data relating to the process.

As part of the architecture description, all products, including graphical, should contain explanatory text. For example, for graphical products should include all abbreviations used and an explanation of their content.

Only for different views of the architecture, there are more than 20 different types of architectural products: graphic high-level description of the concept of operations, model operational activity model operational rules, the description of state transition operations, a description of the system interfaces and the like.

Taxonomy C3. Deserves the attention of a simplified approach to the development and design of framework architectures. An example of this approach is that the published classifier with the disclosure of the foundations of systematic and taxonomy – the NATO C3 Classification Taxonomy [12]. According to the results of the conference Integrated EA Conference 2012, it was recognized that NATO can use the specified classifier as a guide to achieve system compliance C4ISR. He is a synchronization tool for all types of functionality through the consultation, command and control (Consultation, Command and Control, C3). He is also hierarchically categorized list of services communication and information systems (Communications and Information Systems, CIS) and adapted to practical implementation version of NATO Architecture Framework.

This tool takes into account the strategic vision and political leadership in the framework of the Defense planning process of NATO (NATO Defense Planning Process) with the traditional CIS architecture.

Main documents determining the principles of construction and integration of the CIS to support the entire spectrum of military operations, there is a Unifying doctrine for communication and information systems AJP-6 (Allied joint doctrine for communication and information systems) [13], and standard NATO – STANAG 2525. In this doctrine describes the characteristics of CIS, the overall structure, roles and responsibilities during their deployment and operation.

CIS environment, according to NATO standards, should be used as a service-oriented architecture (Service Oriented Architecture), organizing software in the form of independent functional model of the services [7].

Services and their interaction is described in the catalog of the C3 Classification Taxonomy, at the same time, their implementation is able to achieve interoperability with other services and external systems. Combined CIS can have a service model that is “built” within this unified industrial architecture. This model “encapsulates” information services with the required level of quality.

Information services in the framework of the C3 taxonomy include:

communication services (secure transfer of information between users, terminals, information systems);

integration services (provide a total for all users, the functionality of the environment: electronic mail, data storage, directories, user authentication, printing, application access, etc.);

functional services (provide information supporting the implementation of functional tasks of users: command and control at all levels, logistics, personnel management, weapons, etc.);

communication and basic services (functional services).

For the concept of ethnic compatibility of the CIS, NATO and partner countries, there developed standard approaches. For systematic the concept of applying the principles of taxonomy, ensure unity of vision, interoperability in the design and development of CIS. Taxonomy solves the following tasks:

"fixes" technological dependence of the subsystems;

connects the subject (functional) areas of technical services;

simplifies the planning, deployment, and modernization of the CIS;

enables the "Assembly" of the elements CIS of the standard component.

The relevance of the information infrastructure of the MoD of Ukraine on the basis of the C4ISR highlights the fact that one of the priorities of national interests of Ukraine is integration into the Euro-Atlantic space, the deepening of cooperation with NATO. According to the Military doctrine of Ukraine, the Strategic Defense Bulletin of Ukraine [1], one of the main objectives is the implementation of NATO standards, to achieve interoperability of all structures of the armed forces of Ukraine and special forces with the forces and means of the respective agencies of the countries-members of NATO, integration with the command and control system C4ISR.

Conclusions. The authors defined the concept, content and features of architecture C4ISR through the analysis of the leading approaches to the design of framework architectures of NATO information systems. A retrospective analysis of a modern framework architectures for military purposes, which are used in NATO, as well as the approaches according to the taxonomy of C3 that must be considered during the building of the information infrastructure of the MoD of Ukraine.

Further research should be devoted to the analysis of the system representation framework architectures NATO.

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The article came to the release 27.01.2017

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Аналіз рамкових архітектур побудови інформаційних систем НАТО та визначення особливостей архітектури C4ISR

Резюме. Стаття розкриває особливості архітектури C4ISR та її роль для Збройних Сил України. Розглянутий ретроспективний аналіз сучасних рамкових архітектур воєнного призначення, які використовуються в НАТО. Наведені підходи таксономії НАТО, які необхідні для досягнення системної відповідності концепції рамкової архітектури.

Ключові слова: рамкова архітектура, C4ISR, таксономія.

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Анализ рамочных архитектур построения информационных систем НАТО и определение особенностей архитектуры C4ISR

Резюме. Статья раскрывает особенности архитектуры C4ISR и ее роль для Вооружённых Сил Украины. Рассмотренный ретроспективный анализ современных рамочных архитектур военного назначения, которые используются в НАТО. Приведены подходы таксономии НАТО, которые необходимы для достижения системного соответствия концепции рамочной архитектуры.

Ключевые слова: рамочная архитектура, C4ISR, таксономия.

UDK 355.24/355.3

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The mathematical model of determination of necessary quantity of the enemy's destroyed fighting means for achievement of the a predetermined measure of the prevented own troops damage in the operation which duration is *T* days

Resume. In the article the essence of a Mathematical Model is shown. The Model is used for substantiation of rational (optimal) combat staff of the Armed Forces of Ukraine through the measure of their prevented damage in operations (combat activities).

Keywords: a model, probability, fighting means, fighting potential, losses, prevented damage.

Raising of problem. The ground of rational (optimal) combat staff of the Armed Forces (farther - AF) of Ukraine comes true by an analytical design in basis of that the theory of the unscrewed losses of the troops (forces) is fixed in an operation (battle actions) [1]. One of models that are here used is a mathematical model of determining the necessary amount of the destroyed battle facilities of opponent for the achievement of the set size of the unscrewed losses of the troops in an operation by duration of *T* of twenty-four hours.

Analysis of the last researches and publications. Conclusions from the analysis of existent methodologies of ground of combat staff of troops (forces) were expounded in other publications [2-5]. In particular, it was set that mathematical models that are used in these methodologies envisage the calculation of hit of objects of opponent probability in the conditions when concrete battle facilities target at the defeat (elimination) of such object. Thus, the marked models take into account such indexes, as possible (predetermined) losses of the troops and necessary (set) losses of troops of opponent [6-8].

Unlike previous methodologies in research that is conducted by authors, *mathematical models* are used [2-5], what are based on theory of the unscrewed loss of the troops and give an opportunity to calculate hit (elimination) of objects of opponent probability for terms, when the fire of that or other object (aims) of opponent can come true by all types of battle facilities, that are at disposal of the troops (forces).

Aim of the article. Exposition of maintenance of the *mathematical mode*l of determining the necessary amount of the destroyed facilities of opponent for the achievement of the set size of the unscrewed loss of the troops in an operation by *T* duration in twenty-four hours.

Exposition of basic material. It is considered that for the achievement of the set size of coefficient (level) of battle-worthiness $\theta^{вим}$ in relation to the troops, that is predetermined by the receipt of certain size of the unscrewed loss of these troops, not taking into account the methods of battle application, and also measures of the all-round providing of battle actions of the troops, it is necessary to destroy all troops $\Delta N_{пр}$ of battle facilities an opponent for an operation by *T* duration in twenty-four hours. For this purpose it is needed to have to beginning of operation the determined amount $N_0^{вим} \geq N_0$ of battle facilities of the troops, that, due to their fire influence on the troops of opponent, gives an opportunity to bring down the average daily relative losses of the troops from $\beta_0^{'}$ to β_n.

Will mark that in obedience to the above-mentioned, use P_{npi} instead of β_{npi} causes a necessity to imagine the possible algorithm of application of the examined forces and facilities of the troops for elimination of necessary amount ΔN_{npi} of battle facilities of *i* as an opponent for period of *T* in twenty-four hours of battle actions taking into account battle possibilities of battle facilities of *j* as the troops.

1. One of such algorithms consists in that distribution of battle facilities of the troops for elimination of battle facilities of opponent comes true thus, that every group of *j* facilities in an amount N_{0j} units that or other sort of the troops,

coming from the features of their application and possibilities, targeted mainly at elimination this group with some probability P_{ji} of corresponding *i* facilities of opponent in an amount N_{0inp} units but vice versa, for example, as shown on fig. 1.

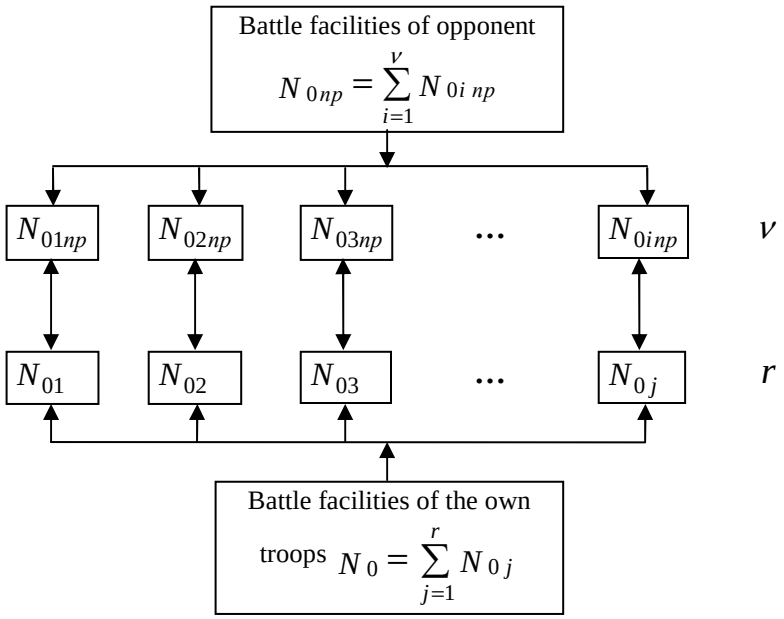

Fig. 1 Chart of algorithm of application of forces and facilities of the troops for elimination of necessary amount ΔN_{npi} of battle facilities of *i* as an opponent for period of battle actions taking into account battle possibilities of battle facilities of *j* as the own troops on condition that battle means of *j* as troops operates only against battle means *i* as an opponent

It answers the generally accepted method of distribution of the forces and facilities during planning of operation (to the fight) and is justified enough from the point of view of exception of cases of chaotic application of present forces and facilities of the own troops, their more rational use, increase on the whole of efficiency of battle application of the own troops. For example, facilities of air defense of the own troops target mainly at elimination of facilities of air attack (EFA), anti-tank facilities – mainly for elimination of tanks and similar facilities, and also separate objects, them; artillery – for elimination of point, linear and area object of opponent and others like that.

At the same time it requires from staff the certain level of subordination during planning of application of that or other sort of troops carefully to analyze intelligence data in relation to the state of opposing troops, structure and composition of their decimators. It will provide in further the justified distribution of efforts of all troops between the corresponding constituents N_{0inp} of Combat Potential (CP) $N_{0np} = \sum N_{0inp}$ of opponent, coming from the necessity of implementation of the put combat missions.

Then after *T* of twenty-four hours of battle actions, amount ΔN_{np11} of the battle facilities of the first type of opponent destroyed with probability P_{11} from present N_{01} units by battle facilities of the first type of the troops in composition N_{01} units, equals $\Delta N_{np11} = P_{11} \cdot N_{01np}$ and others like that; amount $\Delta N_{np\,ji}$ of the battle facilities of *i* destroyed with probability P_{ji} as an opponent from present odes. *j* by battle facilities of the own troops in composition N_{0j}, taking into account, that in this case *i=j*,

$$\Delta N_{np\,ji} = P_{ji} \cdot N_{0inp} \le N_{0inp}$$

Thus, necessary amount of the twenty-four hours of battle actions of battle facilities of all types of opponent destroyed for period of *T* from present $N_{0np} = \sum_i N_{0i\,np}$ units taking into account influence on them from the side of battle facilities of all types of opposing troops in composition N_0 units for the achievement of necessary value $\theta^{вим}$ will equal (*i = j*)

$$\Delta N_{np} = N_{0\,np} \cdot \beta_{np} \cdot T = \sum_i N_{0i\,np} \cdot \beta_{np\,i} \cdot T =$$

$$= \sum_j \Delta N_{np\,j\,i} = \sum_i P_{\,j\,i} \cdot N_{0\,i\,np} \le N_{0\,np}$$

However such method of distribution of the forces and facilities (fig. 1) idealizes enough and not always can be realized during battle actions.

2. It is not eliminated in the real terms of battle actions, that some *j*- and the battle means of the troops will destroy not only the corresponding battle means of opponent with some probability P_{ji} but also different on a type his decimators that will appear in the zone of actions of *j* means, as it is shown on fig. 2.

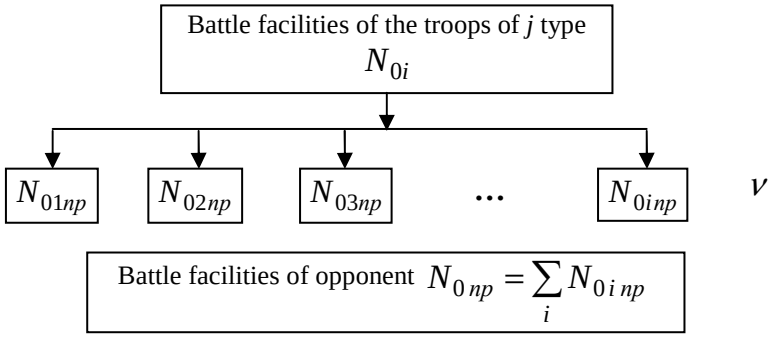

Fig 2 Example of case, when battle means of *j* as troops operates against any types of battle facilities of opponent

In this case the means of concrete type of the troops operate on an opponent regardless of actions of facilities of other types. Then for period of *T* of twenty-four hours of battle actions amount $\Delta N_{np\,11}$ of the battle facilities of the first type of opponent destroyed with probability P_{11} from present $N_{01\,np}$ units by battle facilities of the first type of the troops in composition N_{01} units will equal: $\Delta N_{np\,11} = P_{11} \cdot N_{01\,np}$; $\Delta N_{np\,12}$ amount of the battle facilities of the second type of opponent destroyed with probability P_{12} from present $N_{02\,np}$ units by battle facilities of the first type of the troops in composition N_{01} units for period of *T* in twenty-four hours of battle actions will equal: $\Delta N_{np\,12} = P_{12} \cdot N_{02\,np}$ and others like that.

Like, $\Delta N_{np\,1i}$ amount, of the battle facilities of *i* destroyed with probability P_{1i} as an opponent from present $N_{0i\,np}$ units by battle facilities of the first type it to the army composition N_{01} units for period of *T* of twenty-four hours of battle actions, equals: $\Delta N_{np\,1i} = P_{1i} \cdot N_{0i\,np}$;

common amount of destroyed by battle facilities of the first type of the troops in composition N_{01} units soldiery forming or battle facilities of all types of opponent from present $N_{0\,np} = \sum_i N_{0\,i\,np}$ units for period of *T* in twenty-four hours of battle actions: $\Delta N_{np\,1} = \sum_i N_{np\,1i} = \sum_i P_{1i} \cdot N_{0i\,np}$;

an amount of the battle facilities of the first type of opponent destroyed with probability P_{21} is from present $N_{01\,np}$ units by battle facilities of the second type of the troops in composition N_{02} units for period of *T* of twenty-four hours of battle actions : $\Delta N_{np\,21} = P_{21} \cdot N_{01\,np}$;

an amount $\Delta N_{np\,22}$, of the battle facilities of the second type of opponent destroyed with probability P_{22} is from present $N_{02\,np}$ units by battle facilities of the second type of the troops in composition N_{02} units for period of *T* of twenty-four hours of battle actions: $\Delta N_{np\,22} = P_{22} \cdot N_{02\,np}$ and others like that;

like, amount $\Delta N_{np2\,i}$, of the battle facilities of *i* destroyed with probability P_{2i} as an opponent from present $N_{0i\,np}$ units by battle facilities of the second type of the troops in composition N_{02} units for period of *T* in twenty-four hours of battle actions will lay down: $\Delta N_{np2\,i} = P_{2\,i} \cdot N_{0i\,np}$;

common amount of destroyed by battle facilities of the second type in composition N_{02} units the troops of battle facilities of all types

of opponent from present $N_{0\,np} = \sum_i N_{0i\,np}$ units for period of T of twenty-four hours of battle actions:

$\Delta N_{np2} = \sum_i N_{np2\,i} = \sum_i P_{2\,i} \cdot N_{0i\,np}$ and others like that;

amount $\Delta N_{np\,ji}$ of the battle facilities of i destroyed with probability P_{ji} as an opponent from present $N_{0i\,np}$ units j by battle facilities of the troops in composition $N_{0\,i}$ units for period of T of twenty-four hours of battle actions equals: $\Delta N_{np\,j\,i} = P_{j\,i} \cdot N_{0i\,np}$;

common amount of destroyed j by battle facilities in composition N_{oj} units the troops of battle facilities of all types of opponent from present $N_{0\,np}$ units for period of T of twenty-four hours of battle actions: $\Delta N_{np\,j} = \sum_i \Delta N_{np\,ji} = \sum_i P_{ji} \cdot N_{0np\,i}$,

where $P_{j\,i} = \frac{\Delta N_{np\,j\,i}}{N_{0i\,np}}$ - probability of elimination of j by battle facilities of the troops in composition $N_{0\,j}$ units in an operation by T duration in twenty-four hours even one battle means of i as an opponent from present $N_{0i\,np}$ units.

This probability is expressed through some known from experience of troops or parameters are got a calculation way taking into account the available amount of forces and facilities of opposing parties.

Then necessary amount $\Delta N_{np\,i}$ of the destroyed battle facilities of i as an opponent for period of T of twenty-four hours of the battle operating under present $N_{0i\,np}$ units and taking into account influence on them from the side of battle facilities of all types in composition N_0 units opposing troops for an achievement by them a value $\theta^{вим}$ will equal:

$$\Delta N_{np\,i} = N_{0i\,np} \cdot \beta_{npi} \cdot T = N_{0i\,np} \cdot P_{np\,i} = \sum_j \Delta N_{np\,j\,i} = \sum_j P_{ji} \cdot N_{0i\,np} = \\ = N_{0i\,np} \cdot \sum_j P_{ji} \le N_{0i\,np} \quad (1)$$

From swims out here, that probability of elimination forces and facilities of all types of the troops in an operation by duration of T of twenty-four hours of one battle means of i as an opponent from present $N_{0i\,np}$ units for period of T in twenty-four hours of battle actions:

$$P_{np\,i} = \frac{\Delta N_{np\,i}}{N_{0i\,np}} = \beta_{np\,i} \cdot T = \sum_j P_{j\,i} \le 1, \quad (2)$$

where $P_{np\,i} = \frac{\Delta N_{np\,i}}{N_{0i\,np}}$ – probability of elimination forces and facilities of all types of the troops in composition N_0 units in an operation by duration of T of twenty-four hours of one battle means of i as an opponent from present $N_{0i\,np}$ units.

From (2) have a necessary average daily for period of T of twenty-four hours of battle actions relative losses of battle facilities of i as an opponent as a result of influence on them from the side of all battle facilities of opposing troops for an achievement by them value $\theta^{вим}$:

$$\beta_{np\,i} = \frac{\Delta N_{np\,i}}{T \cdot N_{0i\,np}} = \frac{P_{np\,i}}{T}. \quad (3)$$

Thus, a value $\beta_{np\,i}$ can be expressed through $P_{np\,i}$, that, in turn, depends on $P_{j\,i}$ (2).

A necessary amount of the twenty-four hours of battle actions of battle facilities of all types destroyed for period of T is from present $N_{0i\,np} = \sum_i N_{0i\,np}$ units opponent taking into account influence on them from the side of battle facilities of all types of opposing troops in initial composition N_0 of units for the achievement of necessary value $\theta^{вим}$:

$$\Delta N_{np} = N_{onp} \cdot \beta_{np} \cdot T = \sum_i \Delta N_{np\,i} = \sum_i \beta_{np\,i} \cdot N_{0i\,np} \cdot T = \sum_i P_{np\,i} \cdot N_{0i\,np} = \\ = \sum_i \sum_j \Delta N_{npij} = \sum_i \sum_j P_{np\,ij} \cdot N_{0i\,np} = P_{np} \cdot N_{0\,np} \le N_{0\,np} \quad , \quad (4)$$

where, like (2), probability of elimination of all types of the troops battle facilities in composition N_0 units one battle means of opponent from present $N_{0\,np}$ units for period of *T* of twenty-four hours of battle actions – $P_{np} = \dfrac{\Delta N_{np}}{N_{0\,np}} = \beta_{np} \cdot T \cdot$

Such order of distribution of efforts of the troops will provide certain success with an operation (to the fight), as with the use of *j* means will be destroyed yet and additional, except earlier certain, decimators of opponent, then it will promote efficiency of application of the troops only.

3. Will notice that in obedience to (2) a value $P_{np\,i} = \dfrac{\Delta N_{np\,i}}{N_{0i\,np}} = \sum_j P_{j\,i} \le 1$ envisages incompatibility of events, each of that is related to elimination with probability $P_{j\,i}$ by forces and facilities of *j* as the troops of battle facilities of any type of opponent in composition $N_{0i\,np}$ units, thus elimination of these facilities of opponent comes true separately in time by every battle means of *j* as the troops. In general case these events can be compatible, elimination of facilities of opponent by battle facilities of *j* as the troops can come true in time compatible, when those or other battle facilities of the troops can operate under the same *i* means of opponent.

Such algorithm of application of the forces and facilities of all types can be represented on fig. 3, when expected, that the result of their actions will be elimination of necessary amount $\Delta N_{np\,i}$ of forces and facilities of *i* as an opponent with probability $P_{np\,i}$ at influence on them from the side of *j* battle facilities of the troops in an operation by duration of *T* of twenty-four hours and elimination these facilities with probability P_{ji} even one battle means of *i* as an opponent from present $N_{0i\,np}$ units.

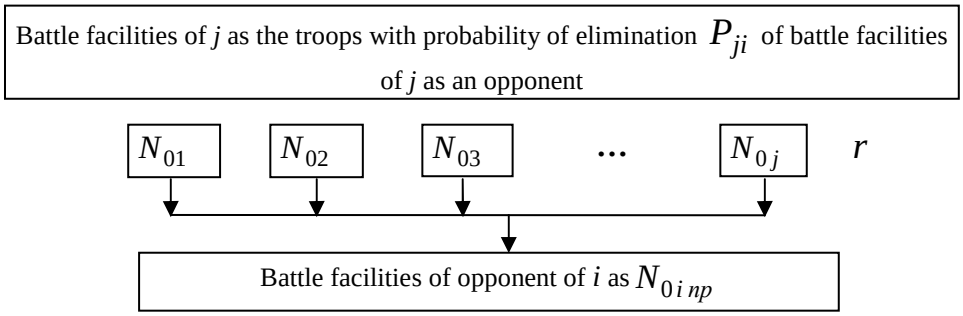

Fig 3 Algorithm of application of the forces and facilities of all types, when operate against the battle means of *i* as an opponent

In this case probability $P_{np\,i}$ of elimination forces and facilities of all types of the troops of battle facilities of *i* as an opponent for an operation will be too expressed duration of *T* in twenty-four hours through probability P_{ji}, but, unlike (2), by another method, taking into account possible compatibility of the examined events.

Really, in obedience to fig 3, probability $P_{np\,i}$ can calculate at a general case as probability of sum of *r* (*j*=$\overline{1,\ r}$) of compatible events, each of that is related to payment P_{ji} of battle facilities of *j* as the troops in elimination of battle facilities of *i* as an opponent in composition $N_{0i\,np}$ units.

For example, at *j*=$\overline{1,\ r}$ =$\overline{1,\ 4}$ probability of elimination all forces and facilities of the troops of battle facilities of *i* as an opponent for an operation by duration of *T* of twenty-four hours during influence on them of forces and facilities of all types of opposing troops taking to account that amount of $N_{0\,j}$ units facilities of *j* is as characterized by probability of elimination P_{ji} even of one battle means of *i* as an opponent from present $N_{0i\,np}$ units, will, as known, equal:

$$P_{np_i} = P_{1i}\cdot(1-P_{2i})\cdot(1-P_{3i})\cdot(1-P_{4i}) + P_{2i}\cdot(1-P_{1i})\cdot(1-P_{3i})\cdot(1-P_{4i}) +$$
$$+P_{3i}\cdot(1-P_{1i})\cdot(1-P_{2i})\cdot(1-P_{4i}) + P_{4i}\cdot(1-P_{1i})\cdot(1-P_{2i})\cdot(1-P_{3i}) +$$
$$+P_{1i}\cdot P_{2i}\cdot(1-P_{3i})\cdot(1-P_{4i}) + P_{1i}\cdot P_{3i}\cdot(1-P_{2i})\cdot(1-P_{4i}) +$$
$$+P_{1i}\cdot P_{4i}\cdot(1-P_{2i})\cdot(1-P_{3i}) + P_{2i}\cdot P_{3i}\cdot(1-P_{1i})\cdot(1-P_{4i}) +$$
$$+P_{2i}\cdot P_{4i}\cdot(1-P_{1i})\cdot(1-P_{3i}) + P_{3i}\cdot P_{4i}\cdot(1-P_{1i})\cdot(1-P_{2i}) +$$
$$+P_{1i}\cdot P_{2i}\cdot P_{3i}\cdot(1-P_{4i}) + P_{1i}\cdot P_{2i}\cdot P_{4i}\cdot(1-P_{3i}) +$$
$$+P_{1i}\cdot P_{3i}\cdot P_{4i}\cdot(1-P_{2i}) + P_{2i}\cdot P_{3i}\cdot P_{4i}\cdot(1-P_{1i}) + P_{1i}\cdot P_{2i}\cdot P_{3i}\cdot P_{4i} =$$
$$= P_{1i} + P_{2i} + P_{3i} + P_{4i} - P_{1i}\cdot P_{2i} - P_{1i}\cdot P_{3i} - P_{1i}\cdot P_{4i} -$$
$$- P_{2i}\cdot P_{3i} - P_{2i}\cdot P_{4i} - P_{3i}\cdot P_{4i} + P_{1i}\cdot P_{2i}\cdot P_{3i} + P_{1i}\cdot P_{2i}\cdot P_{4i} +$$
$$+ P_{1i}\cdot P_{3i}\cdot P_{4i} + P_{2i}\cdot P_{3i}\cdot P_{4i} - P_{1i}\cdot P_{2i}\cdot P_{3i}\cdot P_{4i} =$$
$$= \sum_j P_{ji} - (P_{1i}\cdot P_{2i} + P_{1i}\cdot P_{3i} + P_{1i}\cdot P_{4i} + P_{2i}\cdot P_{3i} + P_{2i}\cdot P_{4i} + P_{3i}\cdot P_{4i}) +$$
$$+(P_{1i}\cdot P_{2i}\cdot P_{3i} + P_{1i}\cdot P_{2i}\cdot P_{4i} + P_{1i}\cdot P_{3i}\cdot P_{4i} + P_{2i}\cdot P_{3i}\cdot P_{4i}) - P_{1i}\cdot P_{2i}\cdot P_{3i}\cdot P_{4i} \le 1 \quad , \qquad (5)$$

where $P_{ji} = \dfrac{\Delta N_{np\ ji}}{N_{0i\ np}}$ – probability of elimination of *j* by battle facilities of the troops in composition $N_{0\,j}$ units in an operation by *T* duration in twenty-four hours even one battle means of *i* as an opponent from present $N_{0i\ np}$ units.

As see from (1), value

$$P_{np_i} = \frac{\Delta N_{np\ i}}{N_{0i\ np}} = \frac{\sum_j \Delta N_{np\ ji}}{N_{0i\ np}} = \frac{\sum_j P_{ji}\cdot N_{0i\ np}}{N_{0i\ np}} \le 1$$

does not exceed 1 at any sizes $0 \le P_{ji} \le 1$.

In general case, unlike (5),

$$P_{np_i} = P_c\cdot(\sum_{j=1}^{r} A_{ji}) = f(P_{ji}),$$

where $P_c\cdot(\sum_{j=1}^{r} A_{ji})$ – probability of sum of compatible events A_{ji}, each of that is related to possibility of elimination of *j* by battle facilities of the troops with probability P_{ji} of battle facilities of opponent of *i* as from present $N_{0i\ np}$ units for an operation by duration of *T* of twenty-four hours.

Probability $P_c = P_{np\,i}$ (5) is determined by a alternating line from the r members of row, each of that contains the sum of possible products of elements P_{ji} ($j = \overline{1,\ r}$, $i = \overline{1,\ v}$) for n = 1, 2, 3, 4, ., r .

Thus amount of *n* products of elements P_{ji} in every member of row is determined the through the number of connections C_r^n from *r* to *n*, where *n* = 1, 2, 3, 4, … , r :

$$C_r^n = \frac{r!}{n!\cdot(r-n)!} .$$

Will mark also, that it is concerning (5) possible to consider an event

$$(1-P_{1i})\cdot(1-P_{2i})\cdot(1-P_{3i})\cdot(1-P_{4i}),$$

that consonant with events in (5) creates the complete group of incompatible events, probability of that equals 1. It is possible to consider in this case, that probability of unelimination $(1-P_{np\,i})$ all forces and facilities of the troops of battle facilities of *i* as an opponent for an operation by duration of *T* of twenty-four hours during influence on them of battle facilities of all types of opposing troops will equal:

$$1-P_{np_i} = (1-P_{1i})\cdot(1-P_{2i})\cdot(1-P_{3i})\cdot(1-P_{4i}),$$

from, where $P_{np_i} = 1-(1-P_{1i})\cdot(1-P_{2i})\cdot(1-P_{3i})\cdot(1-P_{4i})$ or in more general case for a calculation $P_{np\,i}$ next to (5) it is possible to use and such dependence:

$$P_{np\,i} = 1-(1-P_{1i})\cdot(1-P_{2i})\cdot(1-P_{3i})\cdot(1-P_{4i})\cdot\ldots\cdot(1-P_{ji})\cdot\ldots =$$
$$= 1-\prod_{j=1}^{r}(1-P_{ji}) = P_c\cdot(\sum_{j=1}^{r} A_{ji}) = f(P_{ji}) \quad . \qquad (6)$$

4. As see, considered algorithm of application of the forces and facilities of all types in obedience to fig. 3 contains the more possible variants of the use of the forces and facilities in comparing to the similar algorithm (fig. 2). About it testifies and that a calculation of probability $P_{np\,i} = \sum_j P_{ji}$ concordantly (2) is the partial case of calculation of probability $P_{np\,i}$ concordantly (5)(6).

Therefore in future necessary amount $\Delta N_{np\,ij}$ of the destroyed battle facilities of *i* as an opponent for period of *T* of the battle operating under present $N_{0i\,np}$ units but taking into account influence on them from the side of battle facilities of all types in composition N_0 units opposing troops for an achievement by them value $\theta^{вим}$, unlike (1), will be calculated thus:

$$\Delta N_{np\,i} = N_{0i\,np} \cdot \beta_{np\,i} \cdot T = N_{0i\,np} \cdot P_{np\,i} = N_{0i\,np} \cdot \left[1 - \prod_{j=1}^{r}(1 - P_{ji})\right] =$$

$$= N_{0i\,np} \cdot \left[1 - \prod_{j=1}^{r} e^{-\frac{R_{1ji} \cdot n_{ji} \cdot N_{0j}^{вим} \cdot (1-\beta_{nj})^T}{N_{0i\,np} \cdot (1-\beta_{npi})^T}}\right] =$$

$$= N_{0i\,np} \cdot \left(1 - e^{-\frac{1}{N_{0i\,np} \cdot (1 - \frac{P_{npi}}{T})} \cdot \sum_{j=1}^{r} R_{1ji} \cdot n_{ji} \cdot N_{0jp}^{вим} \cdot (1-\beta_{nj})^T}\right), \qquad (7)$$

and common amount ΔN_{np}, unlike (4), taking to account that

$$P_{1ji} = f(N_{0j}^{вим}, N_{0i\,np}) = 1 - e^{-\frac{R_{1ji} \cdot n_{ji} \cdot N_{0jp}^{вим} (1-\beta_{ni})^T}{N_{0inp}(1-\beta_{npi})^T}} = 1 - e^{-\frac{R_{1ji} \cdot n_{ji}}{\alpha_{ji}} \frac{(1-\beta_{nj})^T}{(1-\beta_{npi})^T}},$$ and

$$\Delta N_{np} = N_{0np} \cdot \beta_{np} \cdot T = \sum_i N_{np\,i} = \sum_i \beta_{npi} \cdot N_{0inp} \cdot T = \sum_i P_{npi} \cdot N_{0i\,np} = P_{np} \cdot N_{0\,np} \le N_{0\,np},$$ and

also (6), and losses of the troops and opponent, twenty-four hours of battle actions of connections (parts, subdivisions) or battle facilities of all types inflicted for period of *T* from present $N_{0\,np} = \sum_i N_{0i\,np}$ units opponent must be not less from a value $\Delta N_{np}^{вим}$ for an achievement $\theta^{вим}$:

$$\Delta N_{np} = \sum_i \Delta N_{np\,i} = N_{0np} \cdot \beta_{np} \cdot T = \sum_i \beta_{npi} \cdot N_{0inp} \cdot T = N_{0np} \cdot P_{np} = \sum_i \Delta N_{np\,i} =$$

$$= \sum_i P_{npi} \cdot N_{0i\,np} = \sum_i N_{0i\,np} \cdot \left[1 - \prod_{j=1}^{r}(1 - P_{ji})\right] =$$

$$\sum_i N_{0i\,np} \cdot \left[1 - \prod_{j=1}^{r} e^{-\frac{R_{1ji} \cdot n_{ji} \cdot N_{0jp}^{вим} \cdot (1-\beta_{nj})^T}{N_{oi\,np} \cdot (1 - \frac{P_{npi}}{T})^T}}\right] =$$

$$= \sum_i N_{0i\,np} \cdot \left[1 - e^{-\frac{\sum_{j=1}^{r} R_{1ji} \cdot n_{ji} \cdot N_{0jp}^{вим} \cdot (1-\beta_{nj})^T}{N_{oi\,np} \cdot (1-\beta_{npi})^T}}\right] =$$

$$= N_{0\,np} - \sum_i N_{0i\,np} \cdot e^{-\frac{\sum_{j=1}^{r} R_{1ji} \cdot n_{ji} \cdot N_{0jp}^{вим} \cdot (1-\beta_{nj})^T}{N_{0i\,np} \cdot (1-\beta_{npi})^T}} \ge \Delta N_{np}^{вим} = N_{0\,np} \cdot \frac{\delta П}{N_0 \cdot \beta_0' \cdot T} =$$

$$= N_{0\,np} \cdot (1 - \frac{1 - \theta^{вим}}{\beta_0^{'} \cdot T}) \ , \quad (8)$$

where $P_{np\,i}$ – probability of elimination all forces and facilities of the troops of battle facilities of *i* as an opponent for an operation during compatible influence on them of forces and facilities of all types of opposing troops it is determined duration of *T* of twenty-four hours concordantly (5), (6) with taking $P_{1\,ji}$:into account

$$P_{np\,i} = 1 - \prod_{j=1}^{r}(1 - P_{ji}) = 1 - \prod_{j=1}^{r} e^{-\frac{R_{1\,j\,i} \cdot n_{j\,i} \cdot N_{0\,j}^{вим} \cdot (1-\beta_{n\,j})^T}{N_{0\,i\,np} \cdot (1-\beta_{np\,i})^T}} =$$

$$= 1 - e^{-\frac{1}{N_{0\,i\,np} \cdot (1-\beta_{np\,i})^T} \cdot \sum_{j=1}^{r} R_{1\,j\,i} \cdot n_{j\,i} \cdot N_{0\,j}^{вим} \cdot (1-\beta_{n\,j})^T} \ , \quad (9)$$

then

$$1 - P_{np\,i} \cdot e^{-\frac{1}{N_{0\,inp} \cdot (1-\beta_{npi})^T} \cdot \sum_{j=1}^{r} R_{1\,ji} \cdot n_{ji} \cdot N_{0\,j}^{вим} \cdot (1-\beta_{nj})^T} \ ; \quad (10)$$

average daily for period of *T* in twenty-four hours of battle actions relative losses β_{npi} of battle facilities of *i* as an opponent as a result of influence on them from the side of all battle facilities of opposing troops for an achievement values $\theta^{вим}$ are determined by them concordantly (3).

Thus, basic dependences $\Delta N_{np\,i} = N_{0i\,np} \cdot P_{np\,i}$ (7) are got, $\Delta N_{np} = \sum_i \Delta N_{np\,i} = \sum_i P_{np\,i} \cdot N_{0i\,np}$ (8) that is expressed through probability $P_{npi} = \frac{\Delta N_{np\,i}}{N_{0i\,np}} = \beta_{np\,i} \cdot T$ (5), (6) elimination forces and facilities of all types of the troops in an operation by duration of *T* in twenty-four hours of one battle means of *i* as an opponent from present $N_{0i\,np}$ units, and also through probability $P_{ji} = \frac{\Delta N_{np\ ji}}{N_{0i\,np}}$ of elimination of *j* by battle facilities in composition $N_{0\,j}$ units the troops in an operation by duration of *T* of twenty-four hours even one battle means of *i* as an opponent from present $N_{0i\,np}$ units.

For the receipt of more assured value $N_0^{вим}$ it is relatively N_0 possible in $P_{ji} = \frac{\Delta N_{np\ ji}}{N_{0i\,np}}$ to accept $\beta_{np\,i} = 0$ (3), that is why $P_{ji} = \frac{\Delta N_{np\ ji}}{N_{0i\,np}}$ written down thus:

$$P_{ji} = \frac{\Delta N_{np\ ji}}{N_{0i\,np}} = 1 - e^{-\frac{N_{0\,j\,p}^{вим}}{N_{0i\,np}} \cdot R_{1\,j\,i} \cdot n_{j\,i} \cdot (1-\beta_{n\,j})^T} = 1 - e^{-\frac{R_{1\,j\,i} \cdot n_{j\,i}}{\alpha_{j\,i}} \cdot (1-\beta_{n\,j})^T} \ , \quad (11)$$

where $\alpha_{ji} = \frac{N_{0i\,np}}{N_{0\,j\,p}^{вим}}$ – correlation of opposing parties after *i* and *j* by battle facilities. Then (9) will purchase a kind:

$$P_{np\,i} = 1 - \prod_{j=1}^{r}(1 - P_{ji}) = 1 - \prod_{j=1}^{r} e^{-\frac{R_{1\,j\,i} \cdot n_{j\,i} \cdot N_{0\,j}^{вим} \cdot (1-\beta_{n\,j})^T}{N_{oi\,np}}} =$$

$$= 1 - e^{-\frac{1}{N_{0\,i\,np}} \cdot \sum_{j=1}^{r} R_{1\,j\,i} \cdot n_{j\,i} \cdot N_{0\,j}^{вим} \cdot (1-\beta_{n\,j})^T} \ . \quad (12)$$

Thus, a calculation $\Delta N_{np\,i}$, ΔN_{np} comes true, as be shown in (11), (12) only on the basis of own parameters ($R_{1\,ji} \cdot n_{ji} = k_{ji} \cdot T$) of the real battle facilities of certain types of the troops.

Conclusions. Thus, a mathematical model (8) is offered one of key in the general algorithm of realization calculations. This model gives an opportunity to define the necessary amount of battle facilities of opponent, that must be destroyed for the achievement of the set size of the unscrewed loss of the troops and providing of necessary level of their battle-worthiness $\theta^{вим}$ in an operation by duration of T of twenty-four hours.

Such approach will give an opportunity to attain the ultimate goal of research - to ground rational (optimal) battle composition of ЗС of Ukraine through the size of the unscrewed loss of the troops (forces) in an operation.

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The article came to the release 02.02.2017

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Математична модель визначення потрібної кількості знищених бойових засобів противника для досягнення заданої величини відверненого збитку своїх військ в операції тривалістю *T* діб

Резюме. У статті розкрито зміст однієї з математичних моделей, яка використовується під час обґрунтування раціонального (оптимального) бойового складу Збройних Сил України через величину відверненого збитку своїх військ в операції (бойових діях).

Ключові слова: модель, імовірність, бойові засоби, бойовий потенціал, втрати, відвернений збиток.

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Математическая модель определения необходимого количества уничтоженных боевых средств для достижения заданной величины предотвращенного ущерба своих войск в операции продолжительностью *T* суток

Резюме. Раскрыто содержание одной из математических моделей, которая используется для обоснования рационального (оптимального) боевого состава Вооружённых Сил Украины через величину предотвращенного ущерба своих войск в операции (боевых действиях).

Ключевые слова: модель, вероятность, боевые средства, боевой потенциал, потери, предотвращенный ущерб.

UDK 519.85 004.42

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Suggestions to improve the process of using a balanced scorecard to assess the state of functioning of the military structures

Resume. The article analyzes the process using a balanced scorecard to evaluate the functioning of the military structures of the Armed Forces of Ukraine and on its basis developed the proposals for its using.

Keywords: the system of balanced scorecard, condition of functioning, the process improvement.

Raising of problem. The main goal of the military reform is the creation in the short term qualitatively new Armed Forces European-style, professional and mobile, well-equipped and trained, able to adequately respond to modern threats to national security in the military sphere.

Exposition of basic material. Ways to achieve goals may have different views on its implementation. Also this contributes to difficult foreign policy situation, conducting anti-terrorist operation in eastern Ukraine, frequent changes in leadership of the Armed Forces of Ukraine and different levels of training. All these factors can cause a situation where there is a need for selection and use of a balanced scorecard (BS) functioning military organization (structure).

However, there are a number of approaches to the choice of strategy management organization (structure), including marketing strategies. In most cases, the choice of strategy is subjective, and there are a number of matrix models that take into account only two factors, but the choice of strategy requires a comprehensive, systematic approach is just such a balanced scorecard.

Balanced Scorecard greatly enhances the strategic planning process, making it more real. For this reason, the development on the formation and use of the concept in the management of military organization (structures) are very promising value and deserve attention from researchers and practitioners.

However, there may also situations where Balanced Scorecard may not apply. This raises the pertinent question of how to assess the situation and indicated signs of this condition, which is a tool used to address this issue and how to use it.

Accordingly, the main purpose of the article is to provide proposals for the improvement of the use of balanced performance of the military organization (structure) of the Armed Forces of Ukraine.

For successful implementation of the strategy developed military organization (structure) should be that every official working in accordance with the set her task. Thus, the issue of monitoring and evaluation rather difficult task because while it is resolving wish to rely on any reliable tools. One of the modern and perhaps one of the most common is the Balanced Scorecard. She implemented just to bring strategy to every employee through a set target for his performance and by monitoring their implementation to ensure the implementation of the strategy.

At the same time, it is possible when the Balanced Scorecard can not be used. Based on the experience of implementation, the following factors as Balanced Scorecard is not required:

crisis (financial, strategic, any other);
lack of trust between levels of government;
strategic uncertainty;
small scale businesses;
weak financial and management accounting;
lack of initiative of employees;
lack of public information field.

Thus, the above factors are not allow to use the Balanced Scorecard as a "dogma" and approach to evaluating the effectiveness of the organization (structure) of a resourcefully and creatively. Currently, in the world practice is the effective use of monitoring systems as "substitutes" Balanced Scorecard. With their help almost any organization able to cope with the problem of control, without the balanced scorecard, and using other, simpler systems or using it in a "truncated" version.

Some of these systems claim to universality, as well as take advantage of the previous maximum and can solve a set of problems (including strategic planning, coverage of all areas of modeling, analysis faktnyy plan, motivation, etc.). However, to achieve some other goals is universal system is not optimal alternative. You need other programs that specialize in solving specific problems.

That is, using a balanced scorecard is not a prerequisite to enhance the functioning of the organization. In each case requires an individual approach to the choice of evaluation, which may depend on the external and internal conditions of the organization.

Conclusions. Thus, the immutable tenets that use the Balanced Scorecard is not no use. Standard solutions lead to standard results, and in order to deal with the unique issues often necessary to seek its own way. It is not necessary to rebuild the balanced scorecard system completely. But it is important to understand that the prospects for which will be formed indicators may be several. An important than their number and name, and then they will be collected figures for critical management organization (units) which will provide a comprehensive qualitative snapshot of the processes.

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The article came to the release 11.11.2016

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Пропозиції щодо удосконалення процесу використання системи збалансованих показників для оцінки стану функціонування військових структур

Резюме. У статті проведено аналіз процесу використання системи збалансованих показників для оцінки стану функціонування військових структур Збройних Сил України та на його основі розроблено пропозиції щодо її застосування.

Ключові слова: система збалансованих показників, стан функціонування, удосконалення процесу

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Предложения по совершенствованию процесса использования системы сбалансированных показателей для оценки состояния функционирования военных структур

Резюме. В статье проводится анализ процесса использования системы сбалансированных показателей для оценки состояния функционирования военных структур Вооружённых Сил Украины и на его основе разработаны предложения по ее применению.

Ключевые слова: система сбалансированных показателей, состояние функционирования, операционная эффективность, усовершенствование процесса.

UDK 355.40(477):380.13:001.8

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The methodical approach for explaining the rational variant of ensuring of the Armed Forces of Ukraine by new samples of military technique in the modern conditions

Resume. In the article offered approach near the choice of variant of providing the new standards of military technique for the equipment of the Armed Forces of Ukraine taking into account influence of row of system factors. As a method of evaluation of variants, there is the offered method of analysis of networks (AHP-process).

Keywords: methodical approach, military technique, Armed Forces of Ukraine, method of analysis of networks (AHP-process), anti-terror operation.

First stage. The definition of each of these factors groups (clusters) indicators, which will be evaluation and appropriate alternatives. These groups may include:

The possibility of domestic industry with the production model, as the closed cycle, and in cooperation with the enterprises of other countries:

• no (B). The state has never produced such samples W and no industrial capacity to generate their production;

• Limited (O). The state is the industrial capacity to produce such samples BT, but they need some additional equipment or conversion;

• existing (H). In the State industrial capacity available for production design.

The possibility of state funding for development and production, procurement etc. of samples:

• absent (Bi). The state is not able to finance not only the development but also the production of samples;

• Limited (Rev.). The state can fund the production of a limited number of samples, or purchase their parts abroad and partly provide other options (lease, co-production);

• sufficient (D). State funding may exercise in full of the sample VT.

Availability of production of like or similar samples BT in other states:

• absent (from). In other countries, there is no such production of samples (although prototypes or prototypes may be);

• modernization (M). In other states made modernizing of samples for proving their tactical and technical characteristics of the sample to the level, which is necessary to provide the Armed Forces of Ukraine;

• Creation (C). In other states, created and tested a new model VT.

Scientific and technical potential of the state can provide development, testing and use of the new model BT:

• availability of construction department (KB). In Ukraine there are design offices (schools), staffed by specialists and test base for the development of samples;

• Availability of trained professionals (F). In Ukraine, there are no design offices but there are experts and test base for the development of samples;

• availability of testing facilities (Wb). In Ukraine, the only available test base for the new model.

The impact of the new model BT to changes in the nature of warfare:

• little (not). New sample VT slightly affect the nature of warfare, improving some fighting qualities of old samples;

• a significant (Su). New sample BT will affect the character of the armed struggle and will

require appropriate retooling of other technical systems;

• Indigenous (K). New sample BT would change tactics or strategy of armed struggle.

Among the alternatives, which should be considered in the study, may include:

• development and subsequent production of the new model in Ukraine (P);

• jointly with other countries to develop and manufacture a new model in Ukraine (St);

• Purchase of a new model abroad (C);

• Production of the new model in Ukraine under license (L)

Second stage. Building a network of defined groups and alternatives. This network may include direct and / or inverse linking between clusters and ties among the clusters.

Third stage. Implementation of expert assessments in each cluster for paired comparisons between them and obtain the normalized priorities.

Fourth stage. Carrying out of calculations.

Fifth stage. Analysis of the results and drawing conclusions. In some cases, the result can be ambiguous (as for instance, when the priorities mentioned alternatives are almost identical).

Conclusions. The approach to achieve a number of military-technical policy, namely:

describe the output from the conditions on financing, production, procurement and other components that contribute to ensuring the Armed Forces of Ukraine new samples W;

consider such important factors as the influence of the military-technical policy of other countries on the development of BT and changes in the armed struggle;

use both qualitative and quantitative assessment of the characteristics of conditions for BT Armed Forces.

The Armed Forces of Ukraine will use needed applying this approach to the assessment of different samples BT in the short and medium term, taking into account, above all, financial capacity of the state.

Further researches advisable to devote to the development of methods for certain military-technical areas. In particular, in terms of the antiterrorist operation in such areas include - development of communications technology, improved telecommunications, means of combat at night, anti-tank and artillery systems and automotive engineering.

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The article came to the release 31.01.2017

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Методичний підхід до обґрунтування раціонального варіанта забезпечення Збройних Сил України новими зразками військової техніки в сучасних умовах

Резюме. У статті запропоновано підхід до вибору варіанта забезпечення новими зразками військової техніки для оснащення Збройних Сил України з урахуванням впливу ряду системних факторів. Як спосіб оцінювання варіантів запропоновано метод аналізу мереж (AHP-process).

Ключові слова: методичний підхід, військова техніка, Збройні Сили України, метод аналізу мереж (AHP-process), антитерористична операція.

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Методический подход к обоснованию рационального варианта обеспечения Вооружённых Сил Украины новыми образцами военной техники в современных условиях

Резюме. В статье предложен подход к выбору варианта обеспечения новыми образцами военной техники для оснащения Вооружённых Сил Украины с учетом влияния ряда системных факторов. В качестве способа оценивания вариантов предложен метод анализа сетей (AHP-process).

Ключевые слова: методический подход, военная техника, Вооружённые Силы Украины, метод анализа сетей (AHP-process), антитеррористическая операция.

UDK 004.9:005.95

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Order of evaluation of official activity of servicemen in a special period

Resume. The order of evaluation of official activity of servicemen is offered in battle conditions and practical recommendations are presented in relation to drafting of attestations on inferior servicemen after a stay in the zone of anti-terror operation (ATO).

Keywords: model of the functional state, preparation and evaluation of servicemen, psychological state, annual evaluation, attestation card.

Raising of problem. Within the framework of six past waves of mobilization in 2014-2015 on military service 210 thousand persons were attracted. Three waves were conducted in 2014, and three in 2015.

Seventh wave was pre-arranged on May-June and October-November, 2016. However, on beginning of 2016 more than 23 thousand Ukrainians signed a contract on service in the AF of Ukraine and other power subdivisions, which gave an opportunity not to declare the seventh wave of mobilization. The state did not yet declare complete abandonment from mobilization or appeal, but from the end of the last year subdivisions complete contracters. President of Ukraine underlined thus, that within the framework of duty appeals it is planned to attract servicemen with experience, those, who passed urgent service already, participated in an anti-terror operation on the East of country, participated in battle actions and has military experience. The volumes of set will depend on those battle parts that need completing, and political situation, in a region [1].

On results the conference of guidance of the Ukrainian power structures, chief of the General staff AF Ukraine underlined: by "Priority of skilled politics of the Armed Forces of Ukraine this year continuation of process of forming of army on professional basis must become due to the quality completing of permanent officer positions". He marked that good performers are "enough in AF of Ukraine, but it is a few, we lack in leaders. Skilled work must be sent to the search of leaders and forming of leader internals". A necessity for such changes is dictated by that the Ukrainian army from the last year is completed mainly contracters, by people, majority from that is had education, vital and professional experience. For two years of war in the Donbas were contracted from 85 thousand servicemen. The quantity of servicemen of urgent service in the AF of Ukraine folds now only 10% [2].

Thus, the important tasks of skilled management in the conditions of the special period are:

stop of outflow of skilled specialists from AF of Ukraine, that have an experience implementation of tasks in the zone of realization of anti-terror operation;

an accumulation of reserve of candidates is for promotion, that is able qualitatively to carry out duties after higher positions in the conditions of conduct of battle actions;

completing of organs of military management of AF of Ukraine by a quality personnel, with the present smell of powder, able to execute the specific tasks of military service in the conditions of the special period.

For the decision of the higher marked tasks, it is expedient to lean against the results of evaluation of personnel in the conditions of the special period. Taking into account, that in a special period of evaluation of official activity of servicemen and their attestation it is not envisaged normative acts, an urgent necessity is development of "*Instruction of evaluation of official activity of servicemen in a special period (battle conditions)*", where the order of realization of evaluation of official activity of serviceman must be explained in a special period.

Analysis of the last researches and publications. In the open sources, sufficient amount of works, for example [3-5], sanctified to

the questions of psychological preparation of servicemen for the successful conduct of battle actions.

In [3] the question of the psychological state of servicemen and factors are examined in detail, that he is determined in the conditions of battle activity, methods of self-regulation and increase of the psychological state. In-process [4] the worked out going is near organization and realization of psychological preparation of servicemen. Looks of soldiery psychologists to maintenance of general, having a special purpose and special psychological preparation, and also psychological model of modern fight considered in [5].

Questions, that touch an order the evaluations of servicemen in battle conditions, lighted up fragmentary.

The aim of the article is a ground of approach in relation to development and use of order of evaluation of official activity of servicemen in battle conditions.

Exposition of basic material. The evaluation of results of official activity of serviceman comes true by means of estimation on criteria and text of evaluation description.

In the conditions of peaceful life on results an evaluation and attestation of servicemen (annual evaluation, periodic attestation and independent evaluation) there is an evaluation card to the second division of that estimation is driven on the criteria of official activity, and in the third is text of evaluation description and suggestion of direct chief. Thus, it is possible to assert that the model of the functional state of servicemen (after categories) for the terms of peace-time exists already. Structurally she can be given in the kind brought around to fig. 1.

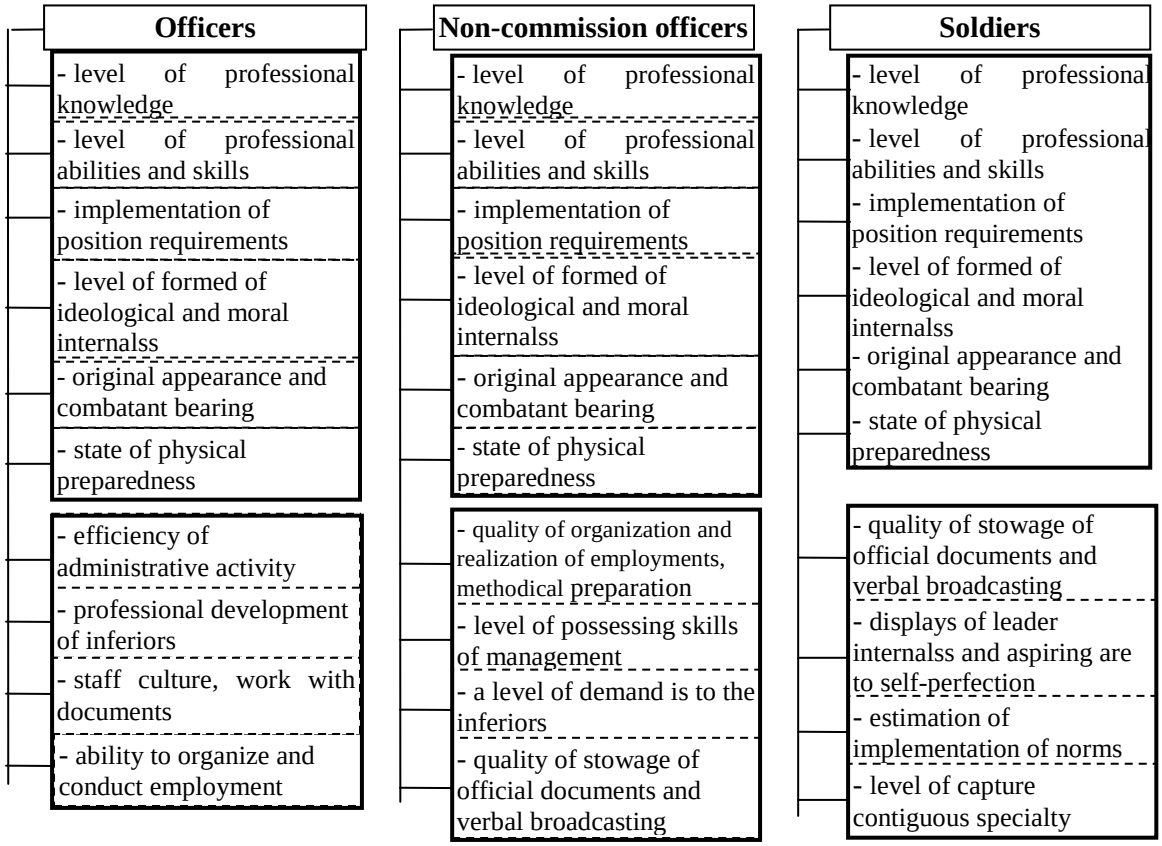

Fig. 1 - Model of the functional state of servicemen

The analysis of model of the functional state of servicemen allows to do next conclusions:

- the estimation of different categories of servicemen on the criteria of official activity has general constituents - base preparation can be conducted after typical methodologies;

- further preparation of servicemen after categories must use the special methodologies.

In article [6] offered approach to the design of critical situations, basic maintenance of that is construction of structure of critical situations on certain signs and taking into account of features of zone of conflict (zones of ATO). Depending on the source of origin, critical situations are divided into the situation of natural, ethnogeny, military and socio-political character. The actions of servicemen in relation to overcoming of the marked situations must be exhaust on preparatory collections of mobilizational reserve.

With an account maintenance of model of

credible critical situations, basic attention at forming of the adequate functional state of servicemen it follows to spare to the increase of level of professional knowledge, professional abilities and skills and formed of ideological and moral internalss.

The common use of model of credible critical situations and functional state of servicemen for the estimation of official activity of servicemen (fig. 1) allows deciding row of partial tasks that arise up at forming of order of evaluation of official activity of servicemen in a special period:

to work out the additional sub criteria of evaluation of official activity after constituents: level of professional knowledge, level of professional abilities and skills and level of formed of ideological and moral internalss;

to ground the additional general articles of studies;

to ground the additional separate articles of studies.

In the article [7] the algorithm of work of skilled organs was worked out for the evaluation of official activity of servicemen in battle conditions that consists of three blocks:

studies and primary attestation;

measures that is conducted during the stay of servicemen in battle conditions;

final measures.

Leaning on the higher marked results of researches [6, 7] it is possible to offer the order of evaluation of official activity of serviceman in the special terms, namely:

the first stage is an analysis of results of evaluation of implementation of official duties by an inferior personnel on results studies (preparations) in an educational center (ground);

the second stage is an accumulation of information about implementation of official duties by inferiors, directly, in battle conditions;

the third stage is a stowage of attestations on inferior servicemen after a stay in the zone of ATO.

The feature of the first stage consists in that the preliminary estimate of actions of serviceman is conducted in educational centers, grounds, educational establishments. Limit nature of terms and saturation of the program of studies requires the perfect study of features of inferior servicemen from commanders (instructors). On grounds control employments are conducted after the basic articles of the combat training (the fire, tactical, special, flight and marine education, driving of fighting machines and cars, is medical and others like that) and individual preparation of servicemen is estimated. During employments the control and test firing on that estimate teaching of personnel is conducted, and their commanders - methodical mastery in realization of measures of the combat training.

On the *second stage* data accumulate about the actions of inferior servicemen in the special terms, what such form as "supervision" that comes true by a direct chief is used for.

A supervision can be systematic, permanent and unsystematic (episodic).

But also in that, and in another case it is planned and comes true in a certain sequence, namely:

the aim of supervision is clearly determined;

his object and object (situations that allow to get necessary information) are specified;

basic tasks are formulated, a kind or method of supervision is specified;

the determined location prepares for a supervision and his time is determined;

procedure of fixing of results of supervision is developed;

collection of information (own supervision) comes true;

treatment and analysis of the got information come true.

The evaluation of official activity in a special period it is expedient to conduct after the simplified procedures and rules, namely: to estimate activity of servicemen after three or by four criteria:

three criteria of estimations: “yes”; “no”; “not appraised”;

four criteria of estimations : “well”; “satisfactorily”; “not satisfactorily”; “not appraised”.

A criterion is not "appraised" is used in the cases of impossibility of reliable estimation the commander of actions of inferior.

The estimation of activity of servicemen can be conducted on indexes that are erected in Table 1.

The third stage of evaluation of official activity of servicemen in a special period comes true after the rotary press of parts (subdivisions) or liberation of serviceman from rows ЗС of Ukraine. This procedure is needed for the account of data in relation to the further passing of military service for skilled servicemen or for the grant of corresponding data in military registration and enlistment office in relation to exempt servicemen.

The “Evaluation card” and “Attestation description” must become the result of evaluation of actions of serviceman that is worked off by a commander on results implementation of official activity in a personal period.

Table 1

№	Index	Criteria of estimation
1	Degree of realization of the put task and adequacy of her perception.	“well”; “satisfactorily”; “not satisfactorily”
2	The as far as formed skills of actions are in the forecast terms.	“well”; “satisfactorily”; “not satisfactorily”
3	As far as developed sense of collectivism.	“well”; “satisfactorily”; “not satisfactorily”
4	Degree of psychological compatibility.	“well”; “satisfactorily”; “not satisfactorily”
5	Percent of the positive states (getting up, battle excitation, decision).	Estimated at implementation of the personal tasks
6	Percent of the negative states (disturbance, fear, alarm, uncertainty).	Estimated at implementation of the personal tasks
7	Character of reactions is on information about future actions.	“adequate”; not “adequate“
8	Possibility of opposition to informatively-psychological influence.	“well”; “satisfactorily”; “not satisfactorily”
9	Ability to render primary medicate at poisoning, wounds, kilning and others like that.	“well”; “satisfactorily”; “not satisfactorily”; “not appraised”/“yes”; “no”; “not appraised”
10	Ability to find out poisonous substances on industrial building.	“well”; “satisfactorily”; “not satisfactorily”; “not appraised”/“yes”; “no”; “not appraised”
11	Degree of capture of protecting from hazardous substances midair, water methods, soil.	“well”; “satisfactorily”; “not satisfactorily”; “not appraised”/“yes”; “no”; “not appraised”
12	Degree of capture of fire-prevention defence methods.	“well”; “satisfactorily”; “not satisfactorily”; “not appraised”/“yes”; “no”; “not appraised”
13	State of physical preparedness.	“well”; “satisfactorily”; “not satisfactorily”

Approaches are at a study and estimation of activity of every serviceman in a special period, the list of evaluation points is taken away coming from that, as far as successful and effective were battle actions in times of stay in the zone of ATO.

The order of evaluation of official activity of serviceman in battle conditions can be given as represented on the fig. 2.

In an order to execute the task of the second stage, namely, accumulation of information about implementation of official duties by inferiors, directly, in battle conditions, the commanders of all grades must pass certain preparation, where basic attention it follows to concentrate on the study of methodical recommendations in relation to the evaluation of servicemen in battle conditions and analysis of essence of additional indexes of evaluation. The stowage of attestations on inferior servicemen after a stay in the zone of ATO (third stage) too needs separate interpretation.

It follows marks also, that experience of conduct of battle actions showed that the psychological state of servicemen, them moral readiness to the conduct of battle actions, was one of main constituents of alertness of troops to the battle actions. Taking into account it, it is possible to assert the evaluation of morally-psychological internalss of servicemen about a necessity.

At this time there is not methodical soil in relation to the evaluation of psychological readiness of serviceman personally and to the collective on the whole to implementation of tasks in extreme terms. On the view of authors, exactly on the decision of this question it is expedient to give mind profile scientific establishments during realization of **further researches**.

Conclusions. The offered order of evaluation of official activity of serviceman in battle conditions envisages realization of certain organizational measures from the side of organs of skilled management:

adaptation of the existent system of evaluation of personnel is to the terms of the special period;

organization of studies and attestation of personnel are in educational-educational centers and grounds;

preparation of commanders and chiefs of all grades to implementation of tasks in relation to the evaluation of official activity of serviceman in battle conditions.

The practical value of the implementation of these tasks consists in the improvement of methodology and grant of practical recommendations in relation to realization of evaluation of official activity of servicemen in a special period, determination of their rating and stowage of reserve of candidates for promotion in a special period that will give possibility more effective to assign officers for positions, especially to the organs of military management.

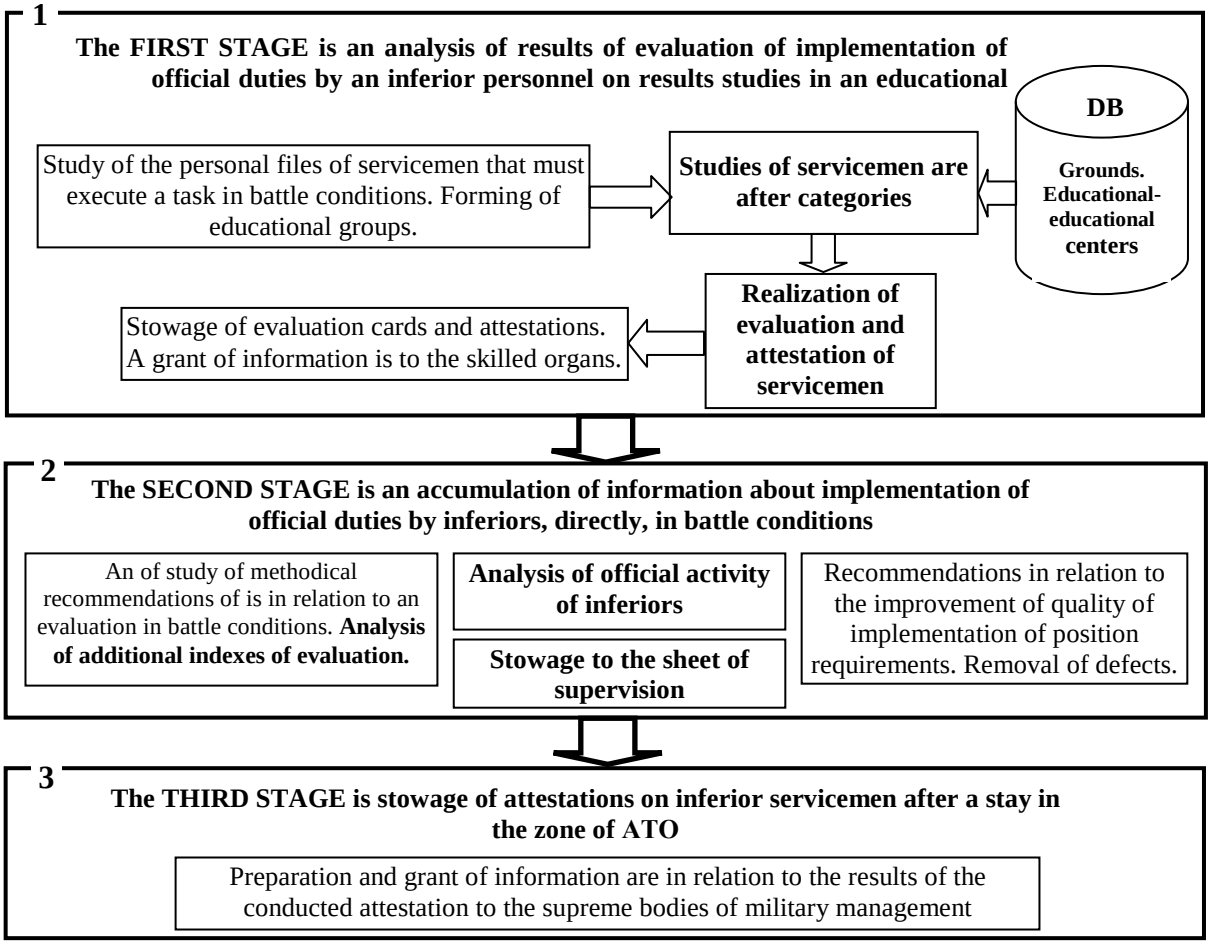

Fig.2 An order of evaluation of official activity of serviceman is in battle conditions

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The article came to the release 27.01.2017

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Порядок оцінювання службової діяльності військовослужбовців в особливий період

Резюме. Запропоновано порядок оцінювання службової діяльності військовослужбовців у бойових умовах та надано практичні рекомендації щодо складання атестацій на підлеглих військовослужбовців після перебування в зоні антитерористичної операції (АТО).

Ключові слова: модель функціонального стану, підготовка і оцінювання військовослужбовців, психологічний стан, щорічне оцінювання, атестаційна картка.

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Порядок оценивания служебной деятельности военнослужащих в особый период

Резюме. Предложен порядок оценивания служебной деятельности военнослужащих в боевых условиях и представлены практические рекомендации относительно составления аттестаций на подчиненных военнослужащих после пребывания в зоне антитеррористической операции (АТО).

Ключевые слова: модель функционального состояния, подготовка и оценивание военнослужащих, психологическое состояние, ежегодное оценивание, аттестационная карточка.

УДК 358.1

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Further development of the principle of massing missile troops and artillery, their shock and fire in key areas

Resume. This article is devoted to the further development of the principle of massing missile troops and artillery, their shock and fire in the most important areas allowing for the internal military conflicts recently, based on the study of functional and organizational chain system fire destruction of the enemy given sequence of functional tasks (in theory Boyd) individual subsystems fire destruction of the enemy.

Keywords: rocket troops and artilleries, fire destruction of the enemy, the principle of massing.

Formulation of the problem. The analysis of combat employment of missile troops and artillery in military conflicts recently indicate some problems that significantly reduce the extent to which the capacity of missile troops and artillery fire on enemy defeat. Especially distinctive are these problems to internal armed conflicts. These problems include - lack of effect of the concentration of artillery fire on areas of major concentration of effort (in defense) and breakout areas (in attack), the need to increase the cost of ammunition to achieve the required degree of destruction of the enemy. The mentioned problems caused by the increasing mobility of objects for destruction, the degree of dispersal of enemy objects, increase the security of objects of the enemy.

In general, the practice of combat use of missile troops and artillery during the fire destruction of the enemy there was some discrepancy between the need to respect the massing (concentration) missile troops and artillery, their shock and fire in the most important areas (the principle of massing) and the need be dispersed missile troops and artillery strikes and fire them for maximum impact on the enemy.

The extent of a problem. The analysis of recent research and publications dedicated to raise the issue of the implementation capacity of missile troops and artillery on enemy fire destruction show that the vast majority of opinion prevails that the principle of massing losing its relevance especially in internal armed conflicts. However, it should be noted that the very essence of the principle is mutual reinforcement means the aggregate impact to a limited area or designated sites, which has not lost its relevance.

Thus there was an urgent need for rethinking and further development of the principle of massing. **The purpose of the article** is the further development of the principle of massing missile troops and artillery, their shock and fire in the most important areas allowing for the internal military conflicts recently.

Presenting of the main material.

The analysis of combat employment of armed forces in military conflicts recently show that the structure of the armed forces and their military formations become more flexible ability is acquired transformed under the influence of negative factors and conditions, keeping the potential for further action. Thus, to overcome this enemy must ensure such an impact on him that over time will not exceed response time enemy. In other words, all of the necessary amount of influence (in general - fire effects) should make the time until the enemy did not change its structure and (or) military order. It is generally quite a challenge, because after structure changes and (or) military order should be further exploration of the enemy, plan the order of influence on it, which generally corresponds to the theory put forward by John Boyd in 1995.

If the present missile troops and artillery in terms of functional connections, you may find that most of its structural elements belonging to certain groups with certain features. That surveillance functions - intelligence capabilities, evaluation and decision - management capabilities; action - the capability to fire exposure enemy.

That is, considering the missile troops and artillery targeted as a complex system might argue that their opportunities to influence the enemy fire determined meanwhile subsystem that has the slightest possibility to implement its functions. However, application of the law to the smallest fire conditions influence the enemy needs to be clarified to take account of the specific process. Identify opportunities subsystems enemy fire exposure is complex, so often have to make the decision to fire under uncertainty. Therefore, in

determining the capabilities of subsystems enemy fire exposure must consider not only their ability to implement their functions, and (especially in the face of uncertainty) the degree of exposure of objects of a subsystem.

Overall, based on the functional suitability of each element of the armed forces of missile troops and artillery might argue that the concentration of exposure in one of the subsystems fire exposure enemy will lead to a significant reduction in its capacity as a whole, concentrating effect on subsystem with the least opportunities, besides minimizing costs (ammunition, operating time) to achieve superiority over the enemy.

Conclusions.

So in the article the further development of the principle of massing missile troops and artillery, their shock and fire in the most important areas allowing for the internal military conflicts recently. The essence of the appointed development is to focus efforts missile troops and artillery fire on impact on those subsystems enemy, who are the lowest possible, or the most explored.

In general, the further development of definite principle to take account of the very essence of massaging - mutual reinforcement effect of fire exposure. Furthermore season to view principle approaches to ensure the stability of the system fire destruction of the enemy and their troops, after taking into account the uneven impact of the enemy to enemy fire destruction subsystem may determine the need for capability to perform the tasks.

Overall, further research should be devoted to rethinking the theoretical and methodological principles of combat employment of missile troops and artillery fire during the destruction of the enemy, as one of the main components of fire destruction of the enemy.

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The article came to the release 22.02.2017

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Подальший розвиток принципу масування ракетних військ і артилерії, їх ударів і вогню на найважливіших напрямках

Резюме. Стаття присвячена подальшому розвитку принципу масування ракетних військ і артилерії, їх ударів і вогню на найважливіших напрямках з урахуванням особливостей внутрішніх воєнних конфліктів останнього часу, що ґрунтується на дослідженні функціонально-організаційних ланцюгів системи вогневого ураження противника з урахуванням послідовності виконання функціональних завдань (за теорією Бойда) окремими підсистемами вогневого ураження противника.

Ключові слова: ракетні війська і артилерія, вогневе ураження противника, принцип масування.

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Дальнейшее развитие принципа массирования ракетных войск и артиллерии, их ударов и огня на важнейших направлениях

Резюме. Статья посвящена дальнейшему развитию принципа массирования ракетных войск и артиллерии, их ударов и огня на важнейших направлениях с учетом особенностей внутренних военных конфликтов последнего времени, основанный на исследовании функционально-организационных цепей системы огневого поражения противника с учетом последовательности выполнения функциональных задач (по теории Бойда) отдельными подсистемами огневого поражения противника.

Ключевые слова: ракетные войска и артиллерия, огневое поражение противника, принцип массирования.

UDK 621.396

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Analysis of quality of http-service depending on the carrying capacity of radio channel

Resume. To the article the results of row of experiments that confirm adequacy of the offered analytical expression of dependence of change of quality of http-service from the carrying capacity of radio channel are driven.

Keywords: quality of service, http-service, method of expert estimations, carrying capacity.

Formulation of the problem. To ensure a good functioning of wireless networks there is meaningful to provide continuous monitoring of the quality of its information services.

The increasing requirements for bandwidth network channels between clients and servers are actually. This occurs for various reasons:

- improving the productiveness of client computers;
- increasing the number of users on the network;
- the emergence of applications which are working with multimedia data stored in files with the large sizes;
- increasing the number of services operating in real time.

Thus the question of quality distribution capacity with dynamic growth requirements of the network. The situation is complicated by the fact that we need to have different technological solutions to ensure the specified quality of service to the organization highways network and connection servers to connect one desktop clients are very different.

Analysis of key studies and publications. Analysis of the quality of information services offered in mobile radio networks, research results presented in the International Telecommunication Union ITU-T G.1030, G.1020 and R.800.

The process of evaluating the quality information services in mobile radio networks, presented in the works of Russian researchers as Oliferf V.G. [1] Ivanovf A.V. Postikovf S.D., Sokolovf I.V. [2] Komashynskoho V.I., Maksimov A.V. [3]. Shakhnovich I.V. studied the problem of modern wireless technologies. Komashynskyy V.I., Maksimov A.V. consider the foundations of modeling systems with mobile radio packet of information in a systematic view.

Leading foreign scientists who researched this problem are Morgan Kaufmann [4] John Willy [5] and others.

The majority of scientists who were developing on this issue believe that quality functioning of modern mobile radio networks requires new methods and algorithms for quality research information services.

The article goal reflects of the quality depending http - service capacity of the network as an analytical expression.

Presenting main material. Thus there is a need to describe the following values for describing processes in information networks.

The value of *QoS* is completely subjective concept, which is a cumulative effect of satisfying the customer server and applies to all kinds of services. The main parameters that impact on the value of *QoS* include: capacity, availability and value dips, interference, frequency response.

The question of evaluation capacity networks that use random access method CSMA / CD, is not obvious because there are several different parameters. First of all, we should mention three linked index such that characterize network performance ideally - in the absence of collisions and in the transmission of on and on stream of packets separated only interval between packages of IPG: maximum packet length, maximum speed packet transmission efficiency use of physical transmission speed network and a communication session.

Fig. 1 shows the dependence the network usage rate time, offered that the proposed load (offered load), the current request for bandwidth increases linearly. Initially, measure network utilization also increases linearly, but then the competition for ownership transfer creates collisions environment and the figure reaches the maximum (full load point on the graph). With further increasing load indicator proposed use of the network begins to decrease, especially after the sharp point of saturation. This “poor” area of the network. It is believed that the network works well

if the proposed load index and high network utilization.

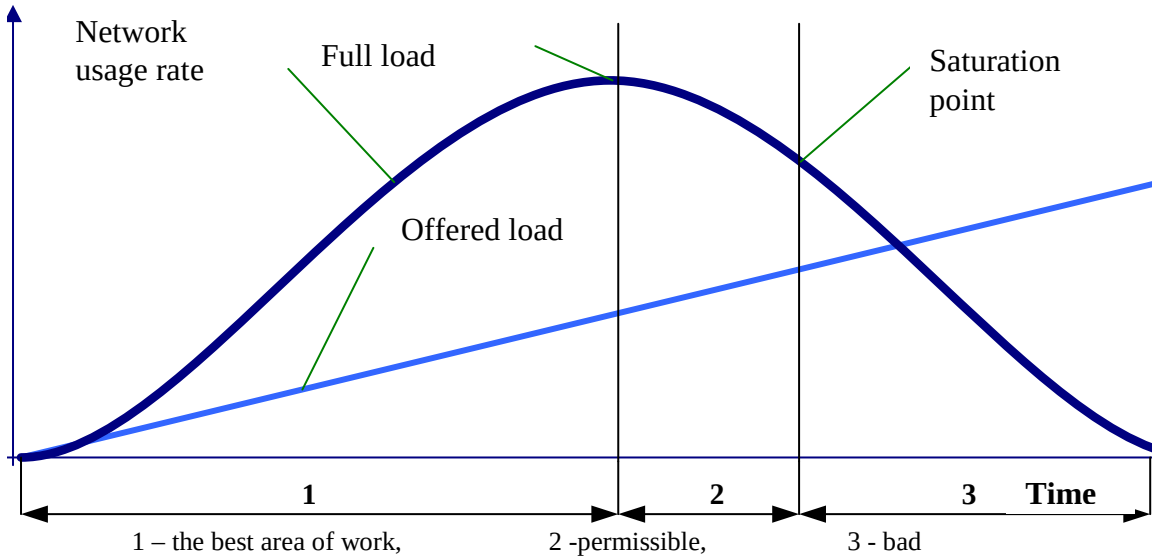

Fig 1. Dependence the network usage rate on the time during increasing load linearly

Some authors suggest using for the widespread notion of "overload" (overload) networks based on Access Method CSMA / CD the following definition: network overloaded if it can not run at full load for at least 80% of the time (assuming that while a stream at least 20% of network usage rate unacceptably low due to collisions). After saturation point comes the "fall" (Ethernet collapse), as proposed increasing workload significantly exceeds the capacity of the network.

Almost all of the listed above parameters make some impact on the value of the probability of error in the network, and therefore the quality of the service network.

Therefore, there is urgent to explore the impact these characteristics on the change the value QoS as its component and method of expert evaluations (MOSS). Since the main criterion of performance http-service mobile network is the value of time is appropriate to describe using mathematical expressions depending MOSS values and the probability of errors as a function of time session. Total time matching between the conversation and the quality of the network formed by the minimum (Min) and maximum (Max) time conversation and using logarithmic interpolation between these extreme values time session. These experiments show that during the conversation, which is less than 2 seconds results in maximum MOSS = 5, while the minimum value MOSS = 1 to obtain communication session lasting 155 seconds. If we substitute MOSS = 5 for time communication session = Min = 1 and MOSS time for conversation = Max, get the relationship:

$$MOSS = \frac{4}{\ln\left(t_{\min} / t_{\max}\right)}\left[\ln(t) - \ln(t_{\min})\right] + 5, \quad (1.1)$$

where t – communications time:

Max - the maximum communications time;

Min - the minimum communications time.

For the long-term experiment regression has view:

$$MOSS = 5.72 - 0.936\ln(t) \quad (1.2)$$

It was chosen the value p = 3 * 10^{-4}, MSS = 1200, RTT = 0.08, C = 0,866, which is averaged value of spending in the research.

Since bandwidth is nothing but transferred data per unit time, then dividing this amount to get Patek seirednyu long after mathematical transformations formula:

$$BW = \frac{RTT \times \sqrt{p}}{MSS \times C}, \quad (1.3)$$

where BW - transferred data per unit time;

MSS - maximum segment size;

RTT - average transmission time in both end;

C - constant, which takes into account the impact on losses in the ASA strategy;

p - the probability of packet loss.

Then analytical expression for http - service from bandwidth has view:

$$MOSS = 5{,}72 - 0{,}936\ln(t). \quad (1.4)$$

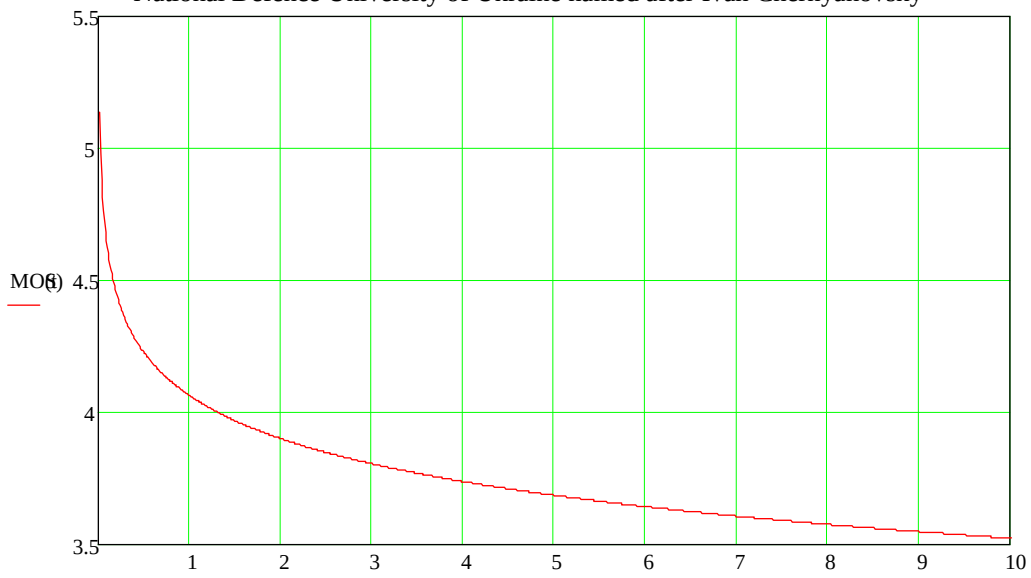

Fig. 2. Dependence of quality http - service depending on channel bandwidth

Conclusions. Considering the facilities and services which in principle is the result, flow stages of

their life cycle reflected as relevant spirals quality allowed to present a quality system as a complex of organizational structure, resources, methods and processes to ensure the quality of facilities and services for them life cycle.

Herewith, considering the complexity and diversity of processes and operation of the facility providing services to establish their interdependence of the mathematical models that describe the most important functional and non-functional properties of these processes. It is shown that the resulting models allow approaching the optimization of distributed information systems both in terms of their quality and position of the required quality of services provided.

Comparing the results of mathematical models and experimental data in the study, it is possible to conclude that the use of limited data may get close to matching the impact the external factors on the value of service quality.

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The article came to the release 03.03.2017

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Аналіз якості http-послуг залежно від пропускної здатності радіоканалу

Резюме. У статті приведено результати експериментів, спрямованих на підтвердження запропонованого аналітичного виразу залежності зміни якості http-послуг від пропускної спроможності радіоканалу.

Ключові слова: якість обслуговування, http-послуги, метод експертних оцінок, пропускна здатність.

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Анализ качества http-услуг в зависимости от пропускной способности радиоканала

Резюме. В статье приведены результаты ряда экспериментов, которые подтверждают адекватность предложенного аналитического выражения зависимости изменения качества http-услуг от пропускной способности радиоканала.

Ключевые слова: качество обслуживания, http-услуги, метод экспертных оценок, пропускная способность.

УДК 330.322.54

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Evaluation of the effectiveness of social investment: theoretical and applied aspects

Resume. Growth of volumes of investments is analyzed in a human capital. Investigational aspects of production, with which the CPLD investments in this capital. Certainly a role of investments is in human capitals in activation of investment activity of economy of country.

Keywords: investment, human capital, employment, unemployment, social efficiency of investments, management investments in the human capital.

Formulation of the problem. Potential components of economic growth are the high technical level of fixed assets, quality of material resources, the availability of information and financial resources. However, as you know, turn them into a capital that is able to bring the company profit can only group of workers.

According to research many domestic and foreign scientists, insufficient education and training of managers at any level of enterprise management reduces the efficiency of the company. For example, S. Strumilin noted that literacy increases productivity by 24% and secondary education - 67% [6].

Analysis of recent research and publications. The question of evaluating the effectiveness of investment in human capital occupied an important place in the works of such renowned local scientists as D.P. Bohynya, A.S. Halchynsky, O.D. Hudzynsky, O.A. Hrishnova, E.A. Libanova, M. I. Hromov and others**.** Among foreign scientists this issue repeatedly reported in the study by G. Becker, O.Borodina, T.Shults, B.Veysbrode, J. Mintser, Lee Hansen. A great contribution to the development of social assessment of efficiency of investment in human capital made Mark Blaug, S. Bouls, Yoram Ben Poret, Richard Leyard, J. Psaharopulos F. Welch, B. Chyzvik etc.

The purpose of the article. The goal of this research is to analyze increasing investment in human capital; research aspects of production, which are associated with investment in human capital; defining the role of investment in human resources to stimulate investment as a whole.

Presentation of the main material. Transformation changes characterized by a significant increase in investment in human capital, which includes knowledge, skills, motivation, used in the production of goods or services. The main forms of investment in human capital should be allocated such as spending on education, health, training, etc. to the manufacturing process. Today the human capital is seen as a source of high income in the future. This investment in the capital as related to the economic and social side of the production process. The social side is the employees and economic - owners of means of production. Determining the socio-economic efficiency is closely related to the interests of both employees and its owners. The combination of these interests is achieved through meeting the needs of workers, which is the main source of wages. According to the Central Statistical Office and the Vinnytsa region, the share of wages in total monetary income is today 37 - 41% [4].

Another factor is the wage rate nature of the relationship between managers and employees. This drew attention B. Geyets, who notes that wages in the social market economy, formed as a result of agreements between employers and workers [1, p.10].

Increasing real wages may increase productivity with a corresponding total savings materialized and living labor.

In these conditions the average wage in Ukraine is actually set at the official subsistence level. Thus, in 2012 the cost of the consumer basket in Ukraine totaled 1095,00 UAH per month, and wages – 1134,00 UAH [4]. In 2016 the minimum wage in Ukraine ranged from UAH 1378,00 in January-April, to 3200,00 UAH in December. The value of consumer basket based utilities for working Ukrainian was 2230,00 UAH, and for pensioners – 1862,00 UAH [5]. In terms of the effectiveness of the company, salary is item of expenditure, the growth of which leads to lower profitability, which is unacceptable in a market economy. But for employees, it is a source of

satisfaction of vital needs. So important is the combination of the interests of owners of the company and its workers. Socio-economic efficiency of enterprises in this regard should be based on a reasonable ratio of the rate of growth of wages and profits.

In modern conditions of operation of domestic enterprises, in the presence of different ownership high wage set by workers who are capable of innovative development company. The basis of this method is the use of economic incentives work, not moral and psychological. That is, the priority is wealth that can be purchased with money. This shows the economic benefit of owners of capital, which lies in the fact that wages, working conditions are improved if not observed while profit growth, thus they tend to reduce labor costs. This indicates that the economic component is dominant over the social, which in turn leads to social injustice and needs to determine the nature of social efficiency, system of indicators, evaluation criteria.

According to the analysis of socio-economic condition of the domestic industry, interest in work caused by the need to meet needs rather than the desire for self-development rights. It should be noted that as the social impact is the material and spiritual needs of employees. But not all needs can be met, reducing the real social effect [3]. In current circumstances the priority is to obtain social benefits and economic outcomes are seen as a means of achieving them. This requires a new approach to social and economic development of the company. The economic literature of recent years put forward the thesis that high social effectiveness with those businesses that do not violate social standards. These standards are the requirements for more favorable conditions of life of employees. They include wages, working conditions and living conditions. This requires the development of measures to improve the efficiency of enterprises with socially acceptable and reasonable nature. The above demonstrates the need to improve the efficiency of social enterprise, is the material and spiritual needs of employees, giving them opportunities for the full development [3]. This requires a systematic approach based on the use of appropriate criteria, factors and indicators of social efficiency of the company. Among the factors that may contribute to the comprehensive development workers should include: job security; increasing the degree of creative content and its intellectualization of labor; opportunities for professional growth and career advancement; possibility of increasing the income of workers of the enterprise; participation in management; create a normal moral and psychological climate in the team; increasing the educational level of workers and the possibility of training and professional development; providing benefits to family members of workers. In terms of the need to move industry to innovative Ukraine changing nature of work, increasing its work, which enables intelligent, creative development of employees. Implementation of corporate relations, increase of the joint stock companies in the total number of industrial enterprises increases the opportunity to participate in production management, allowing you to make a profit by purchasing shares and participation in the distribution of the resulting profits now.

At the present stage of economic development, the importance of creating a favorable moral and psychological climate in the team, which provides structural social and labor relations covering economic, psychological and legal aspects of the relationship employees in the course of employment and enterprise managers with subordinates. Good moral and psychological climate contributes to high end enterprise performance.

In order to ensure the full development skills workers will need to meet their needs. Analysis of the literature indicates that these conditions meet requirements such as adequate income, is not fully consistent with the possibility of personal development. Great value, from a social point of view, is training and retraining of personnel in the company. For example, in Japanese industrial corporations that are manufacturing, educational and social systems, workers engaged in learning at universities around the world [2].

The logic of the struggle for survival in a competitive environment requires the management and changes its investment strategy. Its implementation should focus on: the availability of highly skilled professionals who are integrated into the production system; continuous enrichment of knowledge and training of workers; flexible work organization and management.

An important development is the concept of investment management, which will provide favorable conditions for the implementation of all the potential to achieve the objectives of the enterprise. In this case, the necessary mechanisms achieve this goal through the development of socio-economic and socio-psychological methods. Among the social and psychological aspects of investment activity in the enterprise should determine the following: the stability and future development; implementation of socio-economic development programs; create a system highly motivating work.

In the process of industrial innovation important role stimulate investment. It is necessary to solve two problems:

- timely and sufficient to attract the necessary investment;
- directions justify their effective use.

These areas every enterprise has its peculiarities and taking into account the conditions of its operation. They are directed to the future development of the company and sent to the technical upgrading of production, creation of market infrastructure and social infrastructure development. Besides, each company puts the task of ensuring financial stability, the development of scientific, technical and productive capacity, investing in investment by financial instruments with high liquidity.

According to the study, investment of domestic enterprises is mainly their own funds, which may adversely affect the socio-psychological climate in the team due to the diversion of certain social costs [1].

Among their sources of investment occupy the largest share of depreciation and income, which is held by the company after taxes. Therefore, the most important indicator of investment in the company is operating process within which formed profits. This requires an acceleration of capital turnover due to rationalization of material and cash flows of the company.

Implementation of investment in the company is determined by the attachment of investment resources aimed at increasing the production of products that are in demand in the market. In terms of the current shortage of investment resources, serious attention should be given to effective use of own funds that have a large degree of liquidity. This includes working capital of the company.

Identifying trends of the investment processes in enterprises indicates that the share of investment in technical upgrading of enterprises in recent years, rising slightly. This rate of growth in business's state-owned significantly lower compared with companies with collective ownership.

In addition, investment companies have a close relationship with the previously established scientific-technical and industrial potential of enterprises. This trend may strengthen positive positions that achieved in Ukraine's economy in recent years, indicating a need for enhanced investment, increasing its social consequences. This applies, above all, the need to create new jobs in enterprises by developing promising areas and industrial restructuring.

Providing balance of all kinds of resources for investment activities should be based on increasing the proportion of own funds, finding opportunities to use budget funds to implement priority programs and the use of mixed financing investment projects.

Conclusions. Transformation characterized by a significant increase in investment in human capital, which includes spending on education, health, training, etc. to the manufacturing process. This investment in this capital related to both economic and social aspects of production. Determining the socio-economic efficiency is inextricably linked to the interests of employees and its owners. And in modern conditions the priority is to obtain social benefits. Investment in human capital contributes to stimulate investment in the company and is in the present conditions of long-term factor for competitiveness and survival of businesses.

Areas for further research. We believe that further and more detailed study require issues related to the comparison of the costs of the individual during the formation of his own intelligence and specific human capital and profits, which he should receive in the future, and to study the relationship between level of education and wages in Ukraine.

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The article came to the release 02.03.2017

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Оцінка соціальної ефективності інвестицій: теоретичний та прикладний аспект

Резюме. Проаналізовано зростання обсягів інвестицій у людський капітал. Досліджено аспекти виробництва, з якими пов'язані вкладення в цей капітал. Визначено роль інвестицій у людські ресурси в активізації інвестиційної діяльності економіки країни.

Ключові слова: інвестиції, людський капітал, зайнятість, безробіття, соціальна ефективність інвестицій, управління інвестиціями в людський капітал.

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Оценка социальной эффективности инвестиций: теоретический и прикладной аспект

Резюме. Проанализировано увеличение объемов инвестиций в человеческий капитал. Исследованы аспекты производства, с которыми связаны капиталовложения в этот вид капитала. Определена роль инвестиций в человеческие ресурсы в активизации инвестиционной деятельности экономики страны.

Ключевые слова: инвестиции, человеческий капитал, занятость, безработица, социальная эффективность инвестиций, управление инвестициями в человеческий капитал.

UDK 629.7.001.5

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Forming of military-technical politics of the former USSR

Resume. The features of military-technical politics of the former USSR are considered in the article. The best results of scientific and technical activity that were got in a period are presented, when the system of defensive order was based on programmatic-having a special purpose planning, and scientifically-methodical providing of military-scientific accompaniment of developments of armament and military technique – on the normative documents of scientific organizations of the Military industrial complex and Armed Forces.

Keywords: military-technical politics, scientific and technical committees, armament and military technique, research works, system of research organizations, system of providing scientific.

Raising of problem is conditioned the necessity of generalization of experience of the developed countries on questions forming military-technical politicians, organizations of the system of planning, order and implementation of research and research design works, on a military subject.

Analysis of the last researches and publications. The problem of forming of military-technical politics of the former USSR a bit publications are sanctified to, as these materials carried the closed character is outweighed. Some publications appeared already after disintegration of the USSR, greater part of materials of the article is based that is why on experience of her authors.

The aim of the article To systematize experience of forming of military-technical politics of the former USSR with the aim of his using for the improvement of structure of military industrial complex and military-technical politics of Ukraine.

Exposition of basic material. In the article is forming experience systematizes military-technical politics of the former USSR with the purpose of its using for the improvement of structure of military industrial complex (MIC) and military-technical policy (MTP) of Ukraine.

In Soviet Union forming question MTP and development of armament and military technique (AMT) accepted on more high party and state levels. All organizational and directive work in this direction was carried out by the special organ – Military industrial commission of Presidium of Council of Ministers of the USSR on military industrial questions, which was headed a chairman in the grade of vice-chairman Government that provided sufficient efficiency of work of MIC and authoritativeness of the decisions accepted by it.

Directly training materials, which were directed to substantiation and development of program documents on development of arms, was the Ministry of Defence (General staff of the Armed Forces (AF), office of the Deputy Minister of Defense for armaments – chief of armaments) in collaboration with the offices of commanders-in-chief and main staffs of the armed forces, the commanders and staffs of the troops.

The basic volume of works was directly executed the managements of order and scientific-technical committees of types of AF and branches of troops in the close cooperating with scientific-research establishments (SRE) and higher educational establishments of Ministry of Defense.

On the basis of analysis of military experience, tendencies and prospects of development of facilities of attack of opponent, strategic possibilities of country, and taking into account positions of the Military doctrine and conception of building of AF guidance of type of AF, branches of troops, departments of order of armament and military technique and scientific and technical committee, was form the list of tasks in relation to development of type of AF and creation of perspective standards of AMT with necessary descriptions.

Based on this was created the plan of the advanced study of branch of AF, which contained both a section which had a military orientation (military building and others like that) cleanly and military-technical section, was developed.

Dignity of such organization of work was that the interrelated problems of soldiery, military-scientific and military-technical questions were examined within the framework of the unique a

document – plan of the advanced study, which accorded all commanding branches of troops, chiefs of leading managements and services. A plan became firmly established commander-in-chiefs the type of AF after the giving of chief of main staff and deputy of commander-in-chief from an armament.

In this period of acceptance of all basic research works (RW) which was executed SRE and more high soldiery educational establishments (HSEE) of type of AF, carried out commissions, in the complement of what necessarily the representatives of main staff, interested branches of troops, were included type managements of the main staff. Therefore, acceptance of results of researches, as a rule, it took place in sharp and of principle discussions, that allowed to find the most rational decisions of difficult questions.

In addition, a main staff, management of main staff sort of troops and ordering managements, came forward the customers of scientific researches on the sort of the activity, that substantially promoted objectively researches which was SRE and HSEE.

A key role in drafting and realization of plans of the advanced study was played by scientific-technical committees. They were completed the experimental specialists of managements and services of central vehicle and troops, leading scientists of SRI, HSEE, research (proof-of-concept) grounds, which had, as a rule, graduate degrees and ranks.

The decision of such basic tasks depended upon scientific-technical committees:

scientific ground, forming and lead through of unique MTP in AF on the basis of programmatic having a special purpose methods of planning of development of OMT;

development of basic directions of development of AMT of type of AF and their concordance with a main staff and managements, that they were ordered;

development of projects of sections of the program of armament, plans of NDDKR, from creation of AMT and development design-engineering to reserve in defensive industry, their concordance with management;

a ground and development of projects of tactfully-technical requirements (TTR) is on vanguard projects from creation of perspective and modernization of existent standards of AMT, task of vanguard projects (including on competitive principles);

scientifically methodical guidance by organization and lead through of scientific researches in SRE of type of AF;

estimation of current status and prognostication of development of military economy and military production;

development of projects of plans and tasks organizations of Academy of sciences, higher school and industry;

development of plans of the advanced study of type of AF, and preparation of suggestions is in the Perspective plan of the advanced study of Ministry of Defense;

organization of realization of results of scientific researches of SRE of type of AF, the Academy of sciences, higher school and industry, is in troops and perspective developments of AMT;

leadthrough of examination of scientific and technical level of a major standards of AMT on all stages them life cycle.

Coordinating scientific and technical advices on which the most essential results of complex research works and possibility of their realization were examined in the perspective standards of armament were formed in the types of AF.

Overall the integral system of the advanced study was formed in every type of AF. Presence in it, except for departments, which order, such organ, as a scientific-technical committee, provided the exception of possibility of concealment of negative or other information and any abuses.

As a future user of new armament, exactly a commander-in-chief in full presented a role and place of new technique in troops, at the conduct of battle actions was interested in acceptance of necessary for troop's decisions.

Obviously, that the undoubted plus of the existent system were its transparency and presence of the first persons, of the high-quality standards of armament interested in a receipt. To advantages it follows to take and possibility of collective vision on the prospects of development of AMT.

Failing was weak co-ordination at inter specific level, as a result sometimes standards of AMT, which decided bring together a task.

Thus, it is possible to draw **conclusion**, that the best results of scientific and scientific-technical activity were got in a period, when in the types of AF this direction was managed by the scientific-technical committees by a way military-scientific accompaniment of development of MIC of the state and all stages of life cycle of armament and military technique the Research institutes. The system of defensive order was based on to programmatic having a special purpose planning that, going out from the tasks of types of AF, and scientifically methodical providing military-scientific accompaniment was based on the normative documents of scientific establishments

of MIC and AF. Generalization of experience of the developed countries on questions forming military-technical politics, on a military subject it remains organization of the system of planning, order and implementation of research and research-designer works, the scientific and applied issue of the day, which is expedient to devote subsequent researches.

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The article came to the release 12.01.2017

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Формування воєнно-технічної політики колишнього СРСР

Резюме. У статті розглянуті особливості формування воєнно-технічної політики колишнього СРСР. Показано, що найкращі результати наукової та науково-технічної діяльності були одержані у період, коли система оборонного замовлення базувалася на програмно-цільовому плануванні, а науково-методичне забезпечення воєнно-наукового супроводження розробок озброєння та військової техніки – на нормативних документах наукових установ Військово-промислового комплексу та Збройних Сил.

Ключові слова: воєнно-технічна політика, науково-технічні комітети, озброєння та військова техніка, науково-дослідні роботи, система науково-дослідних установ, система забезпечення наукових досліджень.

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Формирование военно-технической политики бывшего СССР

Резюме. В статье рассмотрены особенности военно-технической политики бывшего СССР. Представлено наилучшие результаты научной и научно-технической деятельности, которые были получены в период, когда система оборонного заказа основывалась на программно-целевом планировании, а научно-методическое обеспечение военно-научного сопровождения разработок вооружения и военной техники – на нормативных документах научных организаций Военно-промышленного комплекса и Вооружённых Сил.

Ключевые слова: военно-техническая политика, научно-технические комитеты, вооружение и военная техника, научно-исследовательские работы, система научно-исследовательских организаций, система обеспечения научных исследований.

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In accordance with the Decree of the higher attestation Commission of Ukraine № 7-05/1 from January 15, 2003 scientific articles should contain the following elements:

- **problem statement** in general view and its connection with important scientific or practical tasks;
- **analysis of recent researches and publications** which initiated solving this problem and relied upon by, the allocation unsolved aspects of general problem which the article is devoted;
- **the purpose of the article** (setting tasks);
- a statement of **basic research material** with full justification of scientific results;
- **conclusions** and prospects for further research development in this direction;
- the **annotation and key words** are placed after the title of the article.

The article should follow the conventional terminology. All abbreviations and new terms must be disclosed by the author.

The title, list of authors, title, abstract (no more than 40 words), keywords (7 words) should be prepared in three languages: Ukrainian, Russian and English.

The size of the article including tables, figures and references should not exceed 10 pages A4.

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Between the value and unit of measurement put a non-breaking space (Ctrl + Shift + spacebar).

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ARTICLE TEMPLATE

УДК 628. 8 - ***Times New Roman кегль – кегль 12 пт***

Бунін В. В., д.т.н., професор[1]; - ***Times New Roman кегль – кегль 14 пт***
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Матрична модель OLAP-систем (*font size 14 PT bold*)
Матричная модель OLAP-систем
Matrix model of OLAP-systems

Резюме. Розглянуті особливості матричних моделей … (***кегль 12 пт***)
Ключові слова: модель, OLAP система, інформаційні технології.
Резюме.
Ключевые слова:
Resume.
Keywords

Statement of the problem. Numerous research works aimed at solving the problems of decrease in power consumption of pneumatic conveying systems. ...

Analysis of recent researches and publications. In works [1, 2] considered the applied methods ...

The purpose of the article. Improving the efficiency of manufacturing operations for ...

Presentation of the basic material. The author proposes the use of analytical methods of search for optimal regime ...

1 spacing

$$\sum_{p=1}^{N^2} X_{n_k}^{pk}$$

1 spacing

where $\sum$ *- Times New Roman 18 font;*
X *- Times New Roman 14 font;*
N ; pk; p=1; n *- Times New Roman 10 font;*
$_k$; $_2$ *- Times New Roman 8 font.*

Conclusions. ... The most effective by criterion of minimum cost of resources was...

Directions for further research. Refinement of indicators for ...

ATTENTION! When you run the figures and formulas, it is prohibited to use the graphic objects, frames and tables.

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Information about authors – the surname, the name, the patronymic (in full); position; institution; degree; academic status.

Scientific publication

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: Rubidaylo A.
Technical editors: Zotova I., Levshenko O.
Computer typesetting: Rubidaylo A.
Correctors: Uvarova T., Andriianova N., Vorona T.

Published 26.12.2016 . 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