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MODERN ARMORED VEHICLES IN THE NATIONAL GUARD OF UKRAINE: GENERAL CHARACTERISTIC

Ihor Babenko, Kharkiv

During the period of Ukraine's independence, the armored vehicles of the National Guard of Ukraine suffered many ups and downs. Since 1991, Ukraine has been using tanks of such types as T-80, T-72, T-64 and their modifications, which at that time fully met all the requirements.

In 2014, after the "Revolution of Dignity", Ukraine is heading for Europe. Therefore, all the weapons in the National Guard of Ukraine did not meet all NATO requirements. It was necessary to update the tank fleet in the National Guard.

The latest example of modern design of tanks creation was BM "OPLOT". The BM "OPLOT" has an automatic control system, which, roughly speaking, raises the capabilities of a mid-level driver to manage the tank to the skills of a highly qualified driver. Accordingly, both fuel and vehicle's life are saved.

The "OPLOT" is equipped with a fire control system (FCS) with the PNK-6 complex, it has significantly expanded the capabilities for detecting, recognizing and defeating targets on the battlefield during the day and especially at night. FCS makes it possible to use the entire arsenal of tank weapons and the gunner and commander.

Also the tank is strengthened in principle both front and lateral projections. Dynamic protection of the new generation provides guaranteed protection, non-penetration, withstanding shelling from a distance of 500 m with all types of modern ammunition in the area of the most probable rate of fire.

So, BM "OPLOT" in comparison with T-80, T-72, T-64 exceeds them in combat efficiency in 2-3 times and the most important thing that the tank meets all NATO requirements. And this allows the National Guard of Ukraine occupy a high position in the ranking of the strongest arias in the world.

Key words: automatic control system, weapon, modifications, fire control system, dynamic protection, ammunition, combat efficiency.

УДК 623.454

ANALYSIS OF DRONE DEVELOPED BY LEADING COUNTRIES FOR DEMINING

Oleksiy Babich, Viktoriia Tsokota, Kharkiv

The article considers the problem of mine clearance. According to UN estimates, the total number of mines which are hidden underground reach 110 million in 65 countries. In 2015, about 20,000 people worldwide died and became disabled from mines and improvised explosive devices (IEDs). Ukraine has joined the countries with the largest number of landmines and IEDs in connection with the fighting in the Donbas. In 2016, Ukraine ranked fifth in the world in the number of mine and IEDs casualties and first in anti-trafficking mines.

According to the Ministry of Defense of Ukraine, 2,600 people were injured as a result of landmines and IEDs in the Joint Forces Operation, about 500 of them died. The area of mine clearance is about 700,000 hectares, which requires from 15 to 20 years of demining and about \$ 1 billion.

Experts have concluded that using existing technologies to demine the entire planet will take almost thousands of years and up to \$ 100 billion.

Currently, the world's leading countries continue to work in the direction of demining minefields with drones. According to experts, the drone will perform the task of finding mines and their disposal 20 times faster, which will save the lives of civilians and sappers, as for every 5,000 cleared mines there are one dead and two maimed sappers. In 2017, 59 peacekeepers were killed and 150 were injured during demining.

The following drones and approaches to the detection of explosive devices were analyzed, namely Mine Kafon Drone (Netherlands), "Dragonfly" (Russian Federation), SpectroDrone (Israel), Camcopter (Austria), Cicada (Ukraine) and

conclusions were drawn about the probable requirements for demining drones and what components should be part of them.

Requirements for demining drones: low cost, guaranteed safety for operators, simplicity of design, no need for proof and complex regulation at the place of application, resistance and durability during drone operation, protection against electronic warfare, usability during training and implementation and mobility.

The demining drone should include a drone and a remote control point.

The composition of the drone: reconnaissance and destruction of mines and explosive devices, information and control system, communication and command transmission system, traffic control system, technical vision system for traffic control, topography and orientation system, power supply system.

Key words: mine, demining, drone, improvised explosive devices, sapper, minefield.

УДК 623.486+ 338.2+004.9

**THE USE OF MODERN INFORMATION TECHNOLOGIES TO
IMPROVE THE TECHNICAL SUPPORT SYSTEM OF THE NATIONAL
GUARD OF UKRAINE**

Konstantin Bakanov, Kharkiv

The subject matter of the article is the process of the technical support system of the National Guard of Ukraine in the performance of tasks for the purpose in modern conditions.

The goal of the study is to create a technical support system under the interactive analysis of temporal and spatial indicators of action based on the use of modern information technologies. The tasks to be solved are: to formulate tasks of the support system; to develop structural and functional-logical scheme of the system, the list of external, calculation and control modules; to determinate the volume and format of input and output information for each structural unit and

information buses of the system; to define the format of protocols for information exchange.

General scientific and special methods of scientific knowledge are used. On the basis of a systematic analysis of the existing technical support systems, the main conditions and factors affect its functioning in modern conditions were determined.

The following results are obtained. The synthesis of the structural and logical scheme of the support system in the form of software with modular architecture was carried out.

The main idea of creating the system is the processing of incoming and outgoing information in interactive mode, operational and optimal management of information flows and visualization of the solution for the technical support system. The proposed modular system architecture, a list of external, design and management modules; the scope and format of input and output information.

***Key words:** the technical support, decision support system; modular system architecture; information technologies.*

УДК 35.355

**THE USE OF ENERGY SAVING TECHNOLOGIES IN THE
NATIONAL GUARD OF UKRAINE: EXPERIENCE OF NATO AND
EUROPEAN UNION COUNTRIES**

Denys Bezuglov, Kharkiv

Energy saving is a new stage in technological development, as well as an absolute necessity, considering modern energy prices and ever-increasing environmental requirements.

The main direction in world energy consumptions the use of alternative renewable sources, such as solar, wind, water and biofuels. The use of agro-industrial waste, pellets, as well as re-equipment of gas boilers is also relevant for Ukraine.

The introduction of energy-saving technologies in the military units of the NGU is promising area of research, which sets challenging tasks for the future. However, the preconditions for development this area in Ukraine are quite small, so it is advisable to refer to the experience of NATO and the European Union. The world's leading armies are trying to find ways to use alternative energy sources that would be cheaper than traditional ones.

NATO member countries are constantly evolving in the field of developing alternative energy sources. In 2015, the military explored the possibilities of using non-traditional power sources and energy-saving technologies to increase the sustainability of combat units during the training in Hungary. This training was conducted as a part of the long-term Smart Energy Program – the program of the newest developments in the area of the energy saving.

Annual NATO training «Capable Logistician 2019» demonstrated innovative smart energy technologies with potential to reduce fuel waste and improve operational effectiveness. Some of the technologies tested were modern diesel generators, hybrid power generation units, photovoltaic panels, insulated tents, energy-efficient air-conditioning and LED lights. The participants had to survive various scenarios, such as power cuts, diesel contamination and pollution of primary water sources, which required a smart energy response. As one of the solutions the US military used a portable power generation device – RENEWS (Reusing Existing Natural Energy, Wind, and Solar). It is autonomous power supply system that can be transported in two 30-kilogram cases and includes a wind turbine with additional solar panels, which can power 2-3 laptops. RENEWS is designed to produce up to 300 watts electricity in places of remote operations.

The analysis of the experience of countries around the world in the use of alternative sources of electricity can be useful in creating an autonomous military camp at remote and mobile military facilities in the National Guard of Ukraine.

Key words: *energy saving technologies, alternative energy sources, smart energy, diesel generators, hybrid power generation units, photovoltaic panels, fuel, solar panels.*

**THE WORLD EXPERIENCE OF PUBLIC ADMINISTRATION OF
INNOVATIONS IN THE SYSTEM OF HIGHER EDUCATION OF THE
SECURITY AND DEFENSE SECTOR**

Serhii Bielai, Kharkiv

In the modern world development conditions the emergence of crisis situations is not some new, but rather a permanent phenomenon. The world is moving rapidly towards the realization of a comprehensive economic and technological globalization, but, on this path, for the majority of the population there are significant obstacles in the form of differences in religion, culture and ethnicity. Therefore, the provision of state institutions of the security and defense sector with qualified personnel is timely and relevant for public administration.

At the moment, the system of higher education in general and the sphere of security and defense in particular require the introduction of innovations. Based on the analysis of the experience of advanced countries on the functioning and development of higher education in the security and defense sector, one can speak about the relevance of the implemented scenario modeling.

The mechanisms of public administration of innovations in the higher education system of the security and defense sectors of Ukraine – a set of practical measures, approaches, levers, incentives by which state authorities and local governments influence the higher education system of the security and defense sector of Ukraine with the aim of increasing the adaptive capacity Higher education institutions in the security and defense sector as well as training programs.

The directions of further scientific research will be concentrated on research of mechanisms of state management of innovations in higher education systems of the security and defense institutions.

Key words: *public administration, mechanisms of public administration, innovation, higher education system, security and defence sector.*

**FOOD SUPPLY OF THE ARMED FORCES OF UKRAINE:
CURRENT CHALLENGES**

Dmytro Bihuniak, Kharkiv

The primary aspects of good nutrition are the basis for human physical and mental activity and general condition of human health. That is the reason why food supply issues for servicemen gain special relevance, especially considering that the army is intensively developing and growing, learning to handle new modern weapons, and undergoing more and more trainings with relocation of units to other regions. As armament and military vehicles develop and require considerable physical and psychological input from servicemen, good and balanced food becomes a natural source for recovering these important resources.

The food supply process cannot be improved without knowing scientific fundamentals. For purposes of further development and improvement of food supply for the Ukrainian Army, it is necessary to determine, which scientific areas underlie the food supply process of the NATO armed forces. For this, food supply should be investigated as a phenomenon and a process.

It has been always emphasized food supply, on the one hand, relies upon the science of nutrition that stipulates standards for reasonable and appropriate organization of food for various troops in line with the specifics of their activity. On the other hand, it refers to the economic theory of logistics governing organization, management and optimization of material, information and financial flows, from sources to the final consumer.

Furthermore, food supply for the Ukrainian Armed Forces should be regarded as the major military and economic system, which directly influences operational availability the Ukrainian army.

Key words: *servicemen, food supply system, science of food.*

**IMPROVEMENT OF TECHNICAL EQUIPMENT
OF THE NATIONAL GUARD OF UKRAINE IN THE CONTEXT OF
EUROPEAN INTEGRATION**

Yevhen Chapalda, Odessa

The National Guard of Ukraine is a military formation with law enforcement functions and is part of the system of the Ministry of Internal Affairs of Ukraine. One of the main functions of the National Guard of Ukraine is the protection of public order, ensuring the protection and preservation of life, health, rights, freedom and legitimate interests of citizens. In 2017, the National Guard became a full member of the international organization FIEP (International Association of Gendarmerie and Police with Military Status), which includes more than 20 countries.

Powerful modern special equipment is an indispensable condition for ensuring high mobility of law enforcement officers, which allows to significantly increase the efficiency of the service. This proves the international experience that the Guardsmen inherit from their foreign colleagues, members of the international organization FIEP.

Thanks to the new equipment, the operational capabilities of the National Guard units are being improved. While maintaining public order, they will be able to better perform tasks and respond mobile to various challenges and changes in the operational environment.

In December 2020, the National Guard of Ukraine received 58 specialized operational minibuses CKC-FT3 based on Ford Transit. These cars are made to order of the National Guard, taking into account the modern experience of service and the experience of European countries.

They were distributed in military units stationed in different regions of the state. Currently, cars are used for ensuring public order and preventive patrolling.

Minibuses are equipped with a turbodiesel engine. They have 13 seats and are equipped with an on-board computer, digital radio set, video recorder, light and

acoustic panel, loudspeakers, autonomous air heater, as well as protective grilles of the windshield, windows, headlights and power bumper. The spacious interior of the car allows transporting the necessary equipment.

The use of minibuses with such equipment can significantly improve the mobility and maneuverability of units of the National Guard, to ensure the service of patrol teams that are able to quickly change the area of tasks. Such improvements in technical equipment make it possible to move to a new tactic of preventive patrolling and significantly increase its efficiency.

The decision to grant the status of a full member of FIEP is recognition of the National Guard of Ukraine as a law enforcement structure equal among similar structures not only in Europe but also around the world.

***Key words:** minibus, CKC-FT3, FIEP, technical equipment, patrolling, protection of public order.*

УДК 629.113

FEATURES OF ASSESSING THE PERMEABILITY OF MILITARY VEHICLES DURING COMBAT TASKS IN THE JFO AREA

Pavlo Chernenko, Oleksandr Chumachenko, Kharkiv

The practice of operating military vehicles in the area of the Joint Forces Operation, according to the experience of the Units of the National Guard of Ukraine, indicates the need of using automotive equipment in difficult road conditions.

Therefore, it is very important to have sufficient traffic for automotive equipment. The assessment of the passability of the vehicle is a comprehensive analysis of the design features of vehicle and road characteristics.

According to the analysis of the conducted studies, we can conclude that the soils are divided into three groups: friction (dry sand, dry loose snow at a low temperature), plastic (raw clay and similar soils), mixed. The peculiarity of purely frictional soils is that they are little compacted, and the thrust force when moving them at permissible levels of specific pressures depends only on the vertical load

on the wheel and the amount of friction between the parts that are freely remised relative to each other. At the same time, different types of soils in different states have different bearing capacity, so they perceive the load from the vehicle`s wheels differently. Sandy soils (sand) in most cases in a dry state allows movement with a small hole in the pits of the wheels only those vehicles, in which the specific pressure on the soil does not exceed 1 kg/ cm². High-through put vehicles, which are in service with NGU units, are able to overcome sandy rises up to 15-20 0 due to low tire pressure, and thick raw sand, even by all-wheel drive vehicles of usual passability.

A characteristic feature of the placenta soils is their compaction. The force of thrust sold on the drive wheels of the vehicle when moving plastic soils, does not depend on the vertical load and recognizes the value of the forces that bind the soil particles to each other and the size of the blade of contact of the wheel with the soil. Accordingly, the larger the area of contact of the wheel with the ground, the more connections in the ground resist shear and higher traction reaction of the soil.

Clay soils when changing their humidity can also change the non-existent ability from 5-10 kg / cm². With low humidity, they pass for conventional vehicles and soaked to considerable depth - exclusively for all-wheel drive and the bottom of high-throughput vehicles at low air pressure in tires, in a flowing state - only for tracked vehicles.

In mixed soils, which are the most common, there are both plastic and friction elements, so on such soils the traction force is determined by the magnitude of the vertical load and the magnitude of the contact area of the wheels with the ground.

Thus, the assessment shows that plastic soils with a high content of moisture, bulk, peat masses, etc. are considered difficult for samples of military vehicles.

Key words: maintenance of military vehicles, join forces operation, vertical load, wheel, sandy soil, low tire pressure, automobile of ordinary permeability, off-road vehicle.

INFLUENCE OF MODERN BATTLE'S FACTORS ON PERSONNEL BEHAVIOR AND MORALE

Karina Chukanivska, Kharkiv

Modern battle holds to a higher standard on the personnel behavior and morale. The opinion that only weak in spirit people can break down mentally, get psychological trauma in war is wrong. Almost everyone who is in the zone of modern hostilities suffers to some extent from psychological incapacity. There have been a number of studies in this field; still the mechanism of influence of modern battle's factors on personnel behavior and morale is still not fully clarified.

The purpose of this study is to investigate the connection between modern battle's factors on personnel behavior and morale. In military environment, the following socio-psychological law can be applied: the basis of the proper moral and psychological state of the army is not in itself, but in a society whose interests the army protects.

Using a cross sectional analysis, this study analyzed the Influence of modern battle's factors on personnel behavior and morale from 2014 to 2021. The causes of negative mental states of servicemen are psycho-traumatic factors, which can be conditionally combined into the following groups: personal, physiological, social, situational.

Thus, for the effective operation of personnel in combat conditions the following is important: high level of motivation; high level of moral and combat qualities; high level of battle performance; military-professional skill; ability to quick adaptation to any combat situation; ability to overcome the influence of negative factors of battle; coherence of military teams, etc. Further studies are needed to establish causal relationships and develop preventative measures.

Key words: *personnel morale, mental state, military environment, battle performance*

**THE CHALLENGES IN THE LOGISTIC COMMAND AND
CONTROL SYSTEM AT BRIGADE LEVEL IN THE NATIONAL GUARD
OF UKRAINE**

Andrii Davydov, Kharkiv

Analysis of the process of managing the logistics of the operational brigade level of the National Guard of Ukraine in performing tasks in the area of the joint forces operation showed that the flow of information about the situation in the rear at the stage of preparation and during hostilities is growing significantly. This, in turn, increases labor costs for analysis, generalization, decision-making and planning of logistics of troops (forces). The nature of modern hostilities requires a reduction in time for their organization. This contradiction is exacerbated by the lack of forces and capabilities, as well as the lack of means to automate the logistics management system, and it is crucial to find ways to improve the system in military units that can maintain their effectiveness to meet current challenges. The timeliness and correctness of the decision to organize the logistics of troops is in most cases a determining factor influencing the effectiveness of the tasks as a whole. When making a decision, it is necessary to perform a significant and time-consuming amount of work, for which it is necessary to have reliable information and scientifically sound methods of calculation. Given the high dynamics of changes in the situation in the areas of implementation of tasks, i.e. time constraints on the development of appropriate response measures, the likelihood of making an inappropriate decision increases.

The accumulated experience in solving the tasks of logistics provides convincing evidence of the prospects for the use of automated support systems for management decisions, which ensure the efficiency and optimality of actions of officials of logistics services.

Therefore, in the interests of optimizing the management and comprehensive solution of the tasks of logistics, all services, units responsible for logistics, it is

advisable to combine into a single automated management system that will ensure the prompt reception and transmission of information between all bodies (units).

Given all the peculiarities of the armed hostilities in modern conditions, we can identify the main contradictions in the field of logistics - between the growing amount of information and the reduction of time available to the authorities to collect, process and bring to the commander (units) the necessary information in order to make a rational and informed decision.

The solution to this contradiction is to significantly increase the efficiency of the process of collecting, processing and proving information (especially information related to security issues, supply planning, etc.), which will increase the efficiency of management as a whole.

Previous studies to improve the effectiveness of brigade logistics support did not take into account such new factors that significantly affect the effectiveness, namely the time periods of tasks and changes in the original data on the implementation of tasks due to uncertainty.

Thus, there is a need to improve the management system for making informed decisions in the organization of logistics of troops through the use of management automation.

***Key words:** management, optimization, complex, solution, tasks, logistics.*

УДК 623.4.01

NATO STANDARDS FOR THE PROTECTION OF THE NGU ARMORED VEHICLES

Taras Derenko, Kharkiv

In the 2000s, there was a significant transformation of views on the functional purpose of the body of the light armored combat vehicle (BBM). The case began to act as a framework with a minimum level of protection, which hung replaceable protection modules with different ballistic and mine properties.

Initially, to meet the requirements for improving the ballistic protection of existing wheeled armored personnel carriers and other BBMs, began to use hinged armor made of steel sheets.

Thus, the evolution of wheel protection of BBM goes through the same stages as tanks and tracked vehicles, but is much more dynamic. The studies of BBM wheels already have reached the limit reducing the influence of weight and there is a need for other technologies of protection. First of all, it is a dynamic and active defense. Dynamic protection is already integrated in the French armored personnel carrier VBCI and the German Boxer, as well as in the American Stryker.

Active protection such as Trophy and Iron Fist (Israel) is currently working in the prototypes Stryker and Pandur-II. Other active protection systems, including the American Quick Kill system, the DIME system with tungsten particles, are also being investigated for possible integration.

The fighting in the eastern regions of Ukraine has once again confirmed that mine protection of modern models of wheeled BBM comes to the fore and should provide protection against the explosion of mines with TNT equivalent of 8-10 kg of trinitrotoluene, ie meet the requirements of levels 3 and 4 STANAG 4569. This achieved by using a "V"-shaped bottom (almost all modern wheel BBM), the use of structures and materials that absorb energy, increasing clearance, reducing welds in the structure of the lower body, installation of additional easily replaceable armored reflectors made of composite materials, steel and other materials.

Modern wheeled vehicles provide for the use of mine seat crew members. These seats are suspended from the ceiling or attached to the sides. Such devices have been tested in the design of the seats of mechanics-drivers of tanks of the III postwar generation.

Key words: *wheeled vehicles, protection, composite materials*

EXPEDIENCY OF THE FOREIGN INSTRUCTORS INVOLVEMENT INTO THE AFU PERSONNEL COMBAT TRAINING PROCESS

Orest Fedechko, Ukraine

Personnel combat training is a crucial element of the unit capability, that's why it is necessary to develop the efficient system of training where all the aspects will be covered.

First, we have to consider that different countries have different combat experience in missions within the framework of UN, NATO programs. That means that some forces are more experienced in the CIED, convoy, combat operations. And we have to remember that sharing experience might increase the level of interoperability and significantly improve the quality of training.

On the base of the International Peacekeeping and Security Center there are deployed two international missions – Joint Multinational Training Group-Ukraine, and operation “Unifier”, which are involved into the AFU personnel training. The instructors from these contingents can share their experience gained in Afghanistan, Iraq, hence teaching the AFU personnel the issues they haven't faced during their service in Ukraine. Moreover, constant interaction with English native speakers reinforces the language acquisition of the Ukrainian personnel, which in its turn enhances the level of unit's capability and interoperability.

On the other side the experience of the AFU personnel obtained in the East of Ukraine may be useful for the foreign contingents as well. Therefore, the involvement of the foreign instructors is about two-way teaching, they both teach and learn something brand new for them, thus improving their military skills.

Moreover, the instructors are involved into the execution of joint tasks and international command post exercises, which teaches the personnel of different countries, different background, experience, and language of communication to work as one team to gain the assigned goals, and consequently improves the level of interoperability, which will help further in NATO and UN missions.

Key words: capability, efficient system, framework, interoperability, interaction, command post exercise.

УДК 343.983.2

**ANALYSIS OF THE APPLICATION OF METHODOLOGY FOR
CALCULATING RESIDUAL COST OF PROPERTY OF THE ARMED
FORCES OF UKRAINE AND OTHER MILITARY FORMATIONS**

Mykola Harbuz, Kharkiv

The Methodology for calculating residual cost of property is used not only by the Armed Forces of Ukraine, but also by others military formations in accordance with the laws on military formations with the purpose of alienation, sale, write-off, lease and disposal of movable military property (medical, aviation, engineering, automotive, communications, etc.).

The procedure for determining residual cost of property, according to this Methodology, consists of two separate stages: the determining of the initial cost of the goods on a given day, and the determining of the total coefficient of wear.

The initial cost of goods on a certain date is determined by multiplying the calculated inflation index for the period since the time of goods production and the cost of the goods at price lists compiled by the support services of the Armed Forces of Ukraine in 2000 - 2001.

The total coefficient of wear, depending on the type of property can take into account the operating time of the product in kilometers (hours), the time spent in operation, the number of major repairs and overhauls and other factors.

As an example of the application of this Methodology determine the initial and residual cost of the saw frame LRV-1 produced in 1975, which is in a working condition, no major repairs or overhauls were carried out. The Methodology calculates the residual cost of the saw frame LRV-1 at 16,888.73 UAH.

According to the specifications the saw frame LRV-1 weighs 8.9 tons, so its cost at the price of secondary resources will make about 50,000.00 UAH. A study of price proposals for the saw frame LRV-1 in the domestic market of Ukraine

reveals that the cost of the saw frame in such a condition makes approximately 260,000.00 UAH, i.e. the true market cost is 15 times higher than the residual cost calculated according to the Methodology.

Today, the saw frame LRV-1 is a morally and physically obsolete piece of military property and that is why it is gradually, alongside with other equipment, is being withdrawn from the provision of military formations, so the sale of such property at prices close to market, while it is still in good condition, not scrap metal, is economically justified.

Therefore, using this example we can draw a conclusion that the specified Methodology needs further improvement.

Key words: residual cost, initial cost, coefficient of wear, inflation index, price list.

УДК 355.67

PECULIARITIES OF CANTONMENT (ACCOMMODATION) OF MILITARY UNITS OF THE NATIONAL GUARD OF UKRAINE IN FIELD

Oleksandr Horban, Kharkiv

One of the priority tasks of (hereinafter - NG of Ukraine) for 2020–2022 is to increase the combat capabilities, first of all, of the military units of the NG of Ukraine to perform the tasks assigned to them. To implement this task requires quality and timely training of NG Ukraine. During combat training, military formations (units) can be located in the field (field exercises, outings, training, long marches, combat coordination). In addition, the deployment of troops (forces) in the field is possible in some other cases, such as: performing tasks during the declaration of a state of emergency, in areas of armed conflict, during disaster relief and natural disasters, as well as during other tasks associated with the presence of troops outside the points of permanent deployment (base). In general, the quartering (placement) of troops in the field should be understood as the placement of units (units, subdivisions), institutions, military educational institutions in the places (camps) allotted to them (camps) with the creation of the

necessary conditions for their daily activities readiness. Thus, the quality and speed of deployment of troops in the field affects the combat readiness of the NG of Ukraine.

The urgency of this issue is due to the need for further development of views on the deployment of troops in the field, taking into account the experience of participation of military units (units) in hostilities in the east of the country. To date, much attention is paid to the study of improving the combat readiness of troops and their training. The main disadvantage of these works, in our opinion, is the lack of research on the deployment of troops in the field and the impact of this issue on the combat readiness of troops. There are separate publications, which consider the main types and characteristics of field dwellings, as well as the basics of military hygiene during the deployment of troops in the field. Summarizing the above, it can be argued that the issue of quartering joints (parts) in the field has not been considered at all lately. Therefore, the purpose of this article is to determine the characteristics of the location of military units in the field.

The general concept of quartering troops as a type of housing and maintenance should be understood as the deployment of troops in certain points (areas), providing them with the necessary land, buildings and structures for housing, combat, technical training, storage of military and special equipment, supplies, economic and other needs. Deployment of troops in peacetime is carried out in permanent and temporary military camps, in separate buildings belonging to the Ministry of Internal Affairs of Ukraine, as well as buildings transferred to the Ministry of Internal Affairs of Ukraine by the authorities for temporary use under lease agreements.

During combat training and combat missions, military formations (units) may be stationed in the field. Such deployment of military units (units) is usually carried out in camps. The rules for setting up camps for the deployment of military units (subdivisions) of the National Guard of Ukraine are set out in Annex 18 to the Statute of the Internal Service (Article 369).

The main purpose of the camp equipment is to ensure the fulfillment of personnel of military units (units) assigned tasks in a certain area (operational area), protection of personnel, weapons, military equipment and logistical resources from means of destruction, combat, logistical and technical support. while performing tasks.

In contrast to the quartering of military units (units) in peacetime, the order of placement in the combat zone has certain features. Under such conditions, the location of the base camp should have natural shelters, usually located no closer than 2-4 km from settlements, near highways.

The location area must provide secret location and reliable protection of units, their sudden collection and maneuver, as well as compliance with living conditions in sanitary-epidemiological terms.

The area of the camp is equipped with a fortification, and the order of placement of units and elements of the camp should provide:

- sustainable management of staff units and dowry forces and means;
- conducting surveillance (intelligence) on the approaches to the base camp and implementation of protection and defense measures in certain areas of the area from threatening areas;
- daily activities of personnel, taking into account combat, sanitary-epidemiological, biological circumstances and weather conditions;
- timely evacuation of the sick and wounded, withdrawal of weapons and military equipment to certain areas (deployment, waiting, etc.);
- possibility of industrial connection to electricity supply and provision of usable water;
- minimize the impact on the personnel of secondary factors in case of man-made and natural disasters (destruction of chemical facilities, flooding, etc.).
- In the combat zone, personnel are usually housed in sheltered (hidden) tents (capital structures) that provide protection from the enemy (direct bullet fire, ammunition fragments, etc.).

Tents (facilities) for accommodation of personnel in the camp should, if possible, go deep into the ground (covered with bags or boxes of sand, reinforced concrete blocks, embanked with soil) and have spare (hidden) exits.

Thus, analyzing the process of deployment of military units (units) in the field, it should be noted that it has certain features.

First, the equipment of the camp should be in such a way as to ensure that the personnel of the military units (units) perform their tasks in a certain area (operational area).

Secondly, it is necessary to ensure the protection of personnel, weapons, military equipment and logistical resources from the means of destruction.

Third, to ensure the implementation of measures of combat, logistics and technical support.

Further research may be related to the study of the relationship between the success of the process of deployment (quartering) of military units (units) in the field and the allocation of allocated financial resources for the deployment of units (units) in the field.

***Key words:** the National Guard of Ukraine, cantonment, deployment in the field, living conditions*

УДК 355.6

PROBLEMS OF INTRODUCTION OF NEW LOGISTICAL SUPPORT IN THE NATIONAL GUARD OF UKRAINE

Oleksandr Herashchenko, Kharkiv

Each country year after year tries to introduce all the more new alternatives for better quality of life of the population in all life support systems. If we take our country, a number of laws and other documents are enacted every day, which to some extent affect the process of governing the state by modernizing it. However when you don't want to experiment with your laws, you can borrow them in other countries. In particular our country isn't an exception and this has an impact on the military formations of the whole state. And the whole problem is whether the army

is ready for these radical changes and whether we will achieve them as painlessly as other European countries. Therefore, I believe that this topic is relevant nowadays to better understand this problem and minimize it as much as possible in our military units, since we are responsible for this system implementation.

The very essence of the implementation of logistics is the country's course to European and American standards to ensure the viability of military formations of the country. I think every military unit of the National Guard of Ukraine has already felt these changes to some extent, although they are not always as expected as they seemed to all of us.

Thus, logistical support is a set of interrelated measures that ensure the activities of the National Guard of Ukraine in peacetime and wartime. There's the following definition of logistics in NATO - it's the science of planning and implementing the movement and maintenance of troops (forces). From my point of view, the definition of logistical support of the Armed Forces of Ukraine given in the Basic Provisions of the Logistics Support of the Armed Forces of Ukraine is formulated in a very general form and does not reveal the specifics and meaning of this type of comprehensive support of troops. Considering the above, I propose the following more appropriate definition of logistics, which is a broad set of interrelated activities related to the planning, control and management of supply, transportation, storage, and other tangible and intangible operations, including transfer, storage and processing of relevant information carried out in the process of ensuring the activities of any military formation of Ukraine in peacetime and wartime.

That is, in general, we implement logistics without abandoning the old principles of logistics. After all, the laws seem to exist, however the changes are not as much as we would like, as other countries implementing these changes in the structure of troops had more favorable conditions (no armed conflicts in the country, more material support for military formations, economic stability, etc.).

Key words: logistical support, relevant nowadays, NATO, Armed Forces, comprehensive support, ensuring, implementing

**FOOD SUPPLY OF THE ARMED FORCES OF UKRAINE:
CURRENT CHALLENGES**

Oleksandr Hribok, Kyiv

Good nutrition makes the basis for human physical and mental activity and general condition of human health. As armaments and military machines develop and require considerable physical and psychological input from servicemen, good and balanced food becomes a natural source for recovering these important resources. That is the reason why food supply issues for servicemen gain special relevance, especially considering that the army is intensively developing and growing, learning to handle new modern weapons, and undergoing more and more trainings with relocation of units to other regions.

The food supply process cannot be improved without knowing scientific fundamentals. For purposes of further development and improvement of food supply for the Ukrainian Army, it is necessary to determine, which scientific areas underlie the food supply process of the NATO armed forces. For this, food supply should be investigated as a phenomenon and a process.

Food supply, on the one hand, relies upon the science of nutrition that stipulates standards for reasonable and appropriate organization of food for various troops in line with the specifics of their activity. On the other hand, it refers to the economic theory of logistics governing the organization, management and optimization of material, information and financial flows, from sources to the final consumer.

Furthermore, food supply for the Ukrainian Armed Forces should be regarded as the major military and economic system, which directly influences the operational availability the Ukrainian army.

Key words: *food supply system, servicemen, science of food*

ANALYSIS OF MATERIAL AND TECHNICAL SUPPORT AS A KEY LINK OF MILITARY LOGISTICS

Oleksandr Hrytsenko, Kharkiv

The transformation of market relations in Ukraine affected almost all business entities, including law enforcement agencies of the Ministry of Defense and the Ministry of Internal Affairs of Ukraine.

The main task of survival of these structures in conditions when the market has not been formed yet, but planned the economy is destroyed, there is a creation and implementation of a mechanism to ensure the viability of military units and units of the Ministry of Defense and the Ministry of Internal Affairs of Ukraine as a whole. The leading place in the structure of such a mechanism is occupied by military logistics and associated with the system of logistics, which is why the analysis of these processes today is a very important task.

Logistical support is a type of logistics aimed at meeting the needs of military units and units in armaments, military equipment, ammunition, fuels and lubricants, food, property, medical, technical property and other material means. It includes the recovery, receipt and creation of inventories of material assets, their accounting, storage, issuance, replenishment of losses and expenses, sending and transportation to consumers, as well as maneuvering stocks of material resources. Technical support - a set of measures from providing troops with weapons, equipment of all kinds, missiles, ammunition, bringing them into a state of combat readiness, maintaining them in combat readiness, evacuation of weapons and military equipment on repair companies, rapid renewal and return to service.

For the effective implementation of its combat activities, each military unit today is simply obliged to implement a logistical approach. At the same time the last endowed with the rights of a legal entity for today.

Accordingly, for law enforcement agencies it is advisable to modernize centralized supply of fuels and lubricants, food, property, medical and technical

property at the expense introduction into the daily activities of modern logistics technologies and tools in such functional areas as delivery, warehousing, storage and distribution of material resources.

The shortcomings of the legal regulation do not allow military units to carry out their financial and economic activities normally and require their prompt elimination.

To improve military logistics, modern logistics systems and technologies should be introduced, namely:

- Materials Requirements Planning;
- Distribution Requirements Planning;
- Optimized production technologies;
- Just-in-time;
- Kanban.

The methods of material flows management should be used on the basis of introduction of new information technologies. Massive development and use of information technology, the creation of modern communication technologies has strengthened the understanding that high efficiency in the management of material flows in chain "purchase - production - distribution - sales" can be achieved through information flows management.

Key words: logistical support, logistics, military person, supplies, military unit

УДК 351.86

**PROCUREMENT PROCEDURES FOR DEFENCE PRODUCTS UNDER
THE STATE DEFENCE ORDER USING MODERN EURO-ATLANTIC
APPROACHES**

Anton Hultiayev, Kyiv

At present we often wonder why most procedures for procurement of defence products, works and services under the state defence order are classified and not open for public as in leading NATO (EU) countries and the United States.

This issue has been addressed by the expert community, media observers and volunteers for a long time.

To address this discrepancy we conducted an analysis of existing systems in Ukraine and in leading NATO (EU) countries and the United States.

Thus, in Ukraine, public procurement in the field of defence is carried out according to the following legislative acts (until December 31, 2020):

- Law of Ukraine № 922-VIII of 25.12.2015 “On Public Procurement”;
- Law of Ukraine № 464-XIV of 03.03.1999 “On State Defence Order”;
- Law of Ukraine “On Specificities of Procurement of Goods, Works and Services for Guaranteed Provision of Defence Needs”;
- Law of Ukraine № 3856-XII of January 21, 1994 “On State Secrets”.

These laws regulate the procedures for acquisition of defence products using open competitive procedures. If the procurement of products, works and services is a state secret, it is carried out using restricted competitive procedures.

The EU countries apply the following directives on public procurement in the field of defence for restricted and open procedures:

- Directive on Public Procurement in the Public Sector (Directive 2014/24/EC of the European Parliament and of the Council of 26 February 2014 on public procurement);
- Directive on Defence Procurement (Directive 2009/81/EC of the European Parliament and of the Council of 13 July 2009 on the coordination of procedures for the award of certain works contracts, supply contracts and service contracts by contracting authorities or entities in the fields of defence and security).

Legislative framework for defence acquisitions in the United States:

- Federal Acquisition Regulation (FAR);
- Defense Federal Acquisition Regulation Supplement (DFARS).

Based on the analysis of public procurement systems for defence products of the EU, USA and Ukraine, we can make the following conclusions:

1. Defence procurement systems in Ukraine and in leading NATO countries are similar.

2. In NATO countries, non-classified armaments procurement may be subject to certain restrictions on transparency when this threatens the state security interests.

Resulting from work of specialists of the Ministry of Defence of Ukraine on this issue, along with assistance of foreign advisers of NATO and the United States, on July 17, 2020 the Law of Ukraine "On Defence Procurement" was adopted, which provides harmonization of Ukrainian defence procurement legislation with the Directive 2009/81/EC in accordance with the EU-Ukraine Association Agreement. This Law resolves the contradictions in society regarding the openness of procedures for the procurement of defence products, works and services under the state defence order and takes effect on January 1, 2021.

Key words: procurement procedure, defence products, state defence order, defence procurement, defence acquisition.

УДК 355

THE PECULIARITIES OF LOGISTICAL SUPPORT OF COMBAT OPERATIONS OF TROOPS (FORCES) DURING THE JOINT FORCES OPERATION IN EASTERN UKRAINE

Andrii Kapeliushok, Kharkiv

The military aggression of the Russian Federation in Ukraine revealed certain shortcomings in the organization of logistical support of combat operations of troops (forces).

Currently, the Ministry of Defense of Ukraine is working to create a Logistics Doctrine of the Armed Forces of Ukraine that will meet NATO standards. The Logistics Doctrine should take into account the peculiarities of the organization of logistics of troops (forces) in conflict situations, in particular, during the operation of the Joint Forces (JFO) in eastern Ukraine. In addition, the experience of other states involved in local conflicts must be taken into account.

At the present stage of their development, the principles and rules of logistics are widely used in the armed forces of America, Canada, Norway,

Germany, and France. Logistics in this case is the accumulation and distribution of state resources, which are allocated for military purposes and to provide the armed forces. A key element of the military logistics of foreign armies is logistics. It includes a set of measures aimed at:

- accumulation of the established norms of stocks of material means and timely maintenance by them of military units and divisions;

- storage and maintenance of these means in a condition that ensures their timely readiness for combat use

- modernization of samples of armaments and military equipment and their timely updating;

- replenishment of material resources instead of damaged, used and lost in the course of combat missions.

The main problematic issues faced by the military logistics authorities in local conflicts are:

- uncertainty and complexity in the organization (planning) of logistics. This is due to the fact that the nature of hostilities in local conflicts is less predictable than in conventional methods of hostilities, when known in advance areas of hostilities, routes of delivery and evacuation, calculated the probable scope of security tasks, etc;

- non-standard methods of action and distribution of forces and means of logistics. In contrast to large-scale operations, where regular armed forces are involved and the methods of action of the units are mostly formalized, subdivisions of various security structures and formations are involved in local border conflicts, and the methods of combat operations are more diverse.

Thus, the characteristics and specifics of the logistics of local conflicts, the use of forces and means of technical and logistical support also depend on the spatial characteristics of hostilities, the tasks of units, the state of armaments and military equipment. As well as the availability of stocks of material resources that were created (prepared) in peacetime.

The system of repair and restoration of damaged weapons and military equipment also needs special consideration.

The experience of use and efficiency of repair units requires the introduction of urgent measures in the Armed Forces of Ukraine to build a system of training for the operation and repair of weapons and military equipment, increase their number, capacity and quality of training.

Thus, the analysis of shortcomings and problems should contribute to a better understanding of the gaps between the existing and desired results in the field of logistics.

***Key words:** logistics, logistics system, organization of logistics, local conflict, armaments and military equipment, JFO.*

УДК 341.123:327

INTRODUCTION OF NATO STANDARDS IN LEARNING A FOREIGN LANGUAGE

Oleh Karpenko, Kharkiv

Active restructuring of the National Guard continues in Ukraine in order to professionalize and improve the military. This assumes higher requirements for improving military training including the growing importance of the knowledge of foreign languages by military personnel at a high level, allowing the use of professional skills of our military personnel at the international level. Knowledge of the language is the necessary parameter for involving the military in peacekeeping missions. At the same time, this provides an opportunity for Ukrainian soldiers and officers to participate in international missions that take place on the territory of Ukraine and abroad and allows academic officers to participate in development of world military science, publishing their scientific achievements in various foreign publications, and becomes an integral part of career growth. Not being able to speak the NATO prime language of communication can be considered a real barrier for any military participant in international missions.

Ukraine joined the STANAG-6001 (which is standardized military agreement) training program for military personnel in 2001.

In modern conditions, the problem is in the professional readiness for missions in peacekeeping units and military exercises at different tactical levels. Such conditions are set for military personnel and increased requirements for communication opportunities with representatives of other countries. To train military personnel for participation in such events, all military universities of Ukraine conduct courses for intensive language training providing opportunity to military personnel to improve their knowledge of a foreign language.

Key words: *condition, military, NATO, Ukraine, language, STANAG-6001.*

УДК 355.65

THE WAYS TO IMPROVE THE NUTRITION STANDARDS FOR MILITARY PERSONNEL

Volodymyr Kobyliatskyi, Kharkiv

Servicemen in the stationary conditions are fed according to the general military norm №1. It has a set of products that has been updated since 2002, but is not perfect and needs improvement.

Regarding the shortcomings of the diet №1 we can highlight:

- quite a large amount of bread baked from a mixture of first-grade rye and wheat flour and first-grade wheat flour;
- lack of fermented dairy (milk, yogurt, cheese) products.

Based on the experience of NATO countries, 90% of Western servicemen have a glass of milk in the morning menu and add yogurt and cheese to their diet. These products are also included in the nutrition standards for dairy products do a lot of good for health of NGU servicemen, but not in the everyday norm.

The benefits are multiple, here some of the arguments.

Milk is an excellent source of calcium and many other useful vitamins and trace elements. Milk is a delicious drink that perfectly complements other foods. Milk is affordable and well preserved.

Milk is good for bone health. To get the average daily amount of calcium, just three glasses of milk a day. In addition, a lot of calcium is found in other dairy products: kefir, yogurt, some types of cheese. Milk protein is absorbed from milk very easily, not as from meat or other protein foods.

Milk has a mild diuretic effect, thus lowering blood pressure. The amino acids tryptophan and phenylalanine contained in milk have a calming effect on the nervous system and have a mild soporific effect. Heartburn is usually a symptom of high stomach acidity. Milk reduces the acidity of gastric juice, so a glass of drink helps with heartburn.

Cow's milk contains more than 20 vitamins. It is the most relatively deficient in vitamin B2 (riboflavin). This is the main vitamin of energy metabolism: it converts fats and carbohydrates into energy, as well as improves the condition of the skin.

Milk is a natural anabolic. Half an hour after consumption, it causes a surge in the formation of proteins in the body. Due to this, if you drink it, you can build muscle mass

Summarizing the above, we can conclude that the daily diet of servicemen of the National Guard of Ukraine is high in calories, energy and has the necessary food to perform combat missions. However, it is worth paying attention to the proposed improvements to the nutrition standards.

Key words: *nutrition standards, milk, yogurt, cheese, diet.*

УДК 355.6

METHOD OF CALCULATING COMPENSATION FOR UNCLAIMED PROPERTY

Ihor Kolomiets, Bakhmut

The methodology for calculating compensation for unclaimed property is used not only by the Armed Forces of Ukraine, but also by other military formations in accordance with the laws on military formations.

The procedure for determining the value of unclaimed property according to

this Methodology consists of two separate stages: determining which item of the employee is released for a certain month and determining the number of items to be issued.

Servicemen who retire or retire voluntarily may receive tangible property that was not received during their service, or monetary compensation for it, based on the purchase value of such property.

The procedure for payment of monetary compensation is determined by the resolution of the Cabinet of Ministers of Ukraine dated 16.03.2016 №178 «On approval of the Procedure for payment to servicemen of the Armed Forces, National Guard, Security Service, Foreign Intelligence Service, State Border Service, State Special Transport Service, State Special Communications Service and information protection and the Department of State Protection of monetary compensation for the value of unclaimed property».

Persons who have been discharged from military service in reserve or retired and are not provided with property security norms are allowed to transfer property in accordance with the security norms in the amount of monetary compensation that belonged to the day of signing the release order.

Upon dismissal from military service of officers, ensigns (midshipmen), as well as sergeants, soldiers and sailors who served under a contract for non-compliance, due to systematic non-compliance with the terms of the contract, sentencing to imprisonment or restriction of liberty for by a court verdict that has entered into force, the value of items of property issued to them, the terms of which have not expired, is withheld, taking into account depreciation, and settlements are made in case a serviceman does not receive property, the right to which occurred during service.

In the case of early dismissal of officers, ensigns (midshipmen), and servicemen who served under contract due to redundancies, illness and other unprotected cases above, therefore, the condition is not carried out. Therefore, using this example we can draw a conclusion that the specified Methodology needs further improvement.

Servicemen are provided with material property that was not received during the service to which they were entitled, or they are paid monetary compensation at the prices in force at the time of release.

Monetary compensation instead of real property to be issued is paid on the basis of a certificate of the value of the issued real property, which is issued by the real service of the military unit, based on the purchase value of these items.

At the beginning of each year, the Department of Public Procurement and Supply of Material Resources of the Ministry of Defense of Ukraine provides the list of items with the determination of procurement value to the Central Administration and then to the military units.

In accordance with the above, compensation for property is issued on the basis of a certificate of the number of unclaimed items in the order of the commander of the unit under which the serviceman is released.

In accordance with the above, compensation for property is issued on the basis of a certificate of the number of unclaimed items in the order of the commander of the unit under which the serviceman is released.

Key words: *quantity of uncollected items, cost, purchase prices, price list.*

УДК 623.4

ARMORED RECOVERY VEHICLE “LION”

Artem Korchevny, Kharkiv

With the course of active hostilities and the use of heavy equipment in the East of Ukraine, the issue of evacuating and towing faulty, damaged wheeled military equipment in combat conditions became acute.

Since most of the equipment of the Armed Forces of Ukraine consist of Soviet-made equipment (which was in a hurry reactivated and sent to the zone of the joint forces operation), it constantly required repair and maintenance. It is for this purpose that Ukraine has developed its own armored repair and recovery vehicle "Lion". In terms of its characteristics, it is much more superior to its Soviet

counterparts. Also, one of the main indicators is that the Ukrainian design completely lacks components of Soviet and Russian production.

"Lion" was created on the basis of the T-72 tank, equipped with a winch with a cable with a working length of 200 meters. Electric welding equipment allows you to work in the field. In addition, the vehicle has a boom crane with a lifting capacity of 12 tons for assembly and disassembly of assembly units, in particular, tank towers, engines, gearboxes, road wheels, and the like. Thanks to the reinforced engine, "Lion" develops a speed of up to 60 km / h. The vehicle is capable of operating in the air temperature range from -40 to +40. The crew consists of 3 men. The machine gun is in service with the NSVT (KT-12).

Despite all its characteristics, the "Lion" is a pretty noticeable target for the enemy during the evacuation of damaged, burnt and stuck equipment on the battlefield. To solve this problem, you can additionally install the Tucha system on the ARV. It is designed for setting up aerosol smoke screens to smoke areas of the terrain for camouflage purposes. Its installation will not in any way affect the characteristics of the vehicle, but at the same time, it will make it less noticeable during combat operations.

The armed conflict in the Donetsk and Luhansk regions attracted attention of the command of the armed forces of Ukraine to the tasks and problems that arise in the course of modern military operations. The solution to one of these problems is the Ukrainian "Lion".

***Key words:** armored recovery vehicle, evacuation, characteristics, the Armed Forces of Ukraine*

УДК 355.351

**PROBLEMS OF EVACUATION OF THE SPECIAL CONTINGENT
IN CASE OF MAN-MADE DISASTER EMERGENCY SITUATIONS**

Oleksandr Kosyak, Kharkiv

Every day in the world there are thousands of events in which there is a violation of normal living conditions and activities of people which can lead to death and significant material losses. Such events are called emergency situations.

Depending on the origin of events that may cause emergency situations in Ukraine, the following types of emergencies are determined, as: man-made, natural, social and military.

A significant amount of human, material and technical resources should be involved in the emergency area. Prevention of emergency situations, disaster relief operations, maximum reduction of losses and damages have become a national problem and one of the most important tasks of the executive authorities and management at all levels.

The National Guard of Ukraine is prescribed a special role in eliminating the consequences of emergency situations. According to the analysis of the legal framework regulating the employment of the National Guard of Ukraine units and formations in the man-made disaster relief operations, the priority is given to the organization and implementation of evacuation measures.

According to the analysis of the chemical situation on the territory of Ukraine, a large number of chemical industry enterprises are concentrated in Zaporizhia, Dnipro, Cherkasy and Ivano-Frankivsk regions where penitentiary institutions are located. According to operational calculations (possible accidents on chemical industry enterprises will lead to the man-made emergency situations), two to five penitentiary institutions can be located in the chemical contamination area at the same time. Due to this the National Guard of Ukraine will take part in organizing and carrying out the evacuation of the special contingent of 1,500 to 3,500 people from the penitentiary institutions.

Currently, the schemes (calculations) of evacuation of the penitentiary institutions are available in military units of the National Guard of Ukraine; they provide the number of personnel involved and means for the evacuation of a certain number of special contingent, traffic routes, destinations, time indicators. At the same time, these schemes (calculations) provide for evacuation from a

certain penitentiary institution. However, the existing evacuation schemes (calculations) do not take in consideration a situation when it will be necessary to evacuate a special contingent from several penitentiary institutions located in the man-made disaster emergency zone simultaneously.

The above mentioned information determines the need for developing a scientific and methodological apparatus to justify and develop a rational action plan for the evacuation of special contingents from several penitentiary institutions simultaneously, which will allow the National Guard of Ukraine command and control elements to quickly make decisions on the organization and implementation of evacuation measures.

Key words: *man-made disaster emergency situations, penitentiary institutions, chemical companies.*

УДК 355.55

ANALYSIS OF THE SYSTEM OF PLANNING AND ORGANIZATION OF LOGISTICS

Yuriy Kovalchuk, Kharkiv

As a result of the analysis of the organization of functioning and development of systems of logistics, a number of steady tendencies are defined, covering:

- centralization of planning and organization of logistics at the level of the main governing body; introduction of a territorial system of support for military units, regardless of their affiliation to a particular type of troops;
- reduction of intermediate links of support, concentration of the main efforts in the central, territorial bodies and directly where expenses of material and technical means are carried out – in divisions;
- automation of material flow management processes;
- introduction of outsourcing - transfer of a number of logistics functions to civil contractors;
- constant growth of the volume of tasks on material support of troops.

Based on the analysis, it was determined that the system of planning and organization of logistics should have structures for tasks related to logistics (as it is defined), technical, medical, transport, to ensure the deployment (accommodation) of troops. It is also possible to perform certain tasks related to engineering support, radiation-chemical and biological protection and communication.

Thus, the analysis shows that in peacetime the basis of the logistics system should be a stationary component of forces and means:

- in the Center and at the operational level - joint supply centers, warehouses, bases;
- at the tactical level - a stationary base of military units that perform the tasks of logistics of troops on a territorial basis (regardless of subordination).

During the strategic deployment, the stationary component of the forces and means of logistics provides the task of logistics of troops on a territorial basis and deploys the mobile component of forces and means of logistics (brigades, logistics regiments). Its main task is implementation of a set of pre-planned measures for the logistics of troops during their readiness to perform the tasks assigned and the creation of groups of troops in certain operational areas, to ensure the implementation of state defense tasks and deployment and logistics.

In the future, both mobile and stationary components of logistics forces and means of logistics should be used during operations.

The presence of a mobile component of forces and logistics of the Center and operational units (brigades, logistics regiments) makes it possible to disperse stocks of material resources, echelon them in the depth of operational construction of troops, increase their survivability, mobility, significantly accelerate their supply to consumers. In our opinion, the main problematic issues in the organization of logistics are the following:

- lack of a unified system of planning the transportation of material resources and transport;
- inconsistency of the terms of readiness of military units and logistical support institutions with the terms of readiness of combat military units;

- the absence of security units in the rear units (institutions);
- the need to review and normatively determine the amount of maintenance and the order of separation of stockpiles of missiles, ammunition, fuel and lubricants, food, material and other military equipment, taking into account the methods of application and combat missions.

Thus, taking into account the best practices of logistics of the leading states, its analysis and creative application will allow a gradual transition to a modern, unified and integrated logistics system, while not losing control of the military support system and preventing financial losses. and material resources.

***Key words:** systems of logistics, support, strategic deployment, mobile component of forces, stationary components of logistics.*

УДК 355.66

**THE ANALYSIS OF CHARACTERISTIC FEATURES OF
MATERIAL SUPPORT OF COMMISSIONED OFFICERS OF THE
NATIONAL GUARD OF UKRAINE**

Maksym Kravchenko, Kharkiv

Material support is as important in a logistics area as others. The commissioned officers of the National Guard of Ukraine are equipped with uniform, gear and equipment, which are constantly being improved and changed.

Subject to the Order of the Ministry of Internal Affairs of Ukraine from 07.06.2017 No. 475 «On the material support of the National Guard of Ukraine» in the case of promoting a military officer to the rank of Major General, he/she is provided with all the items of property of the established standard due to the norms for general officers, and the property obtained during his previous rank is not included in such provision

Those commissioned officers who did not receive anything in the previous military rank before the date of conferring the military rank of Major General, have options whether to claim it or to receive other items that do not exceed the value of the unclaimed property.

In case of promotion of the officer to a military rank of colonel he/she is issued a headgear with calculation of term of operation (wearing) from the date of assignment the military rank colonel.

Alongside with the headgear, the colonels are given a collar, if the term of operation (wearing) of the previously issued winter coat has not expired. In the future, the winter coat is issued to colonels with a collar for the period of operation (wearing), determined by the norms of supply.

Due to the fact that the National Guard of Ukraine is a relatively new formation, logistics support (including clothing support) is constantly changing and evolving. Providing officers with uniform and other types of clothing is a very important component of the material support of the National Guard of Ukraine as a whole. The aim of this paper is to conduct analysis of current situation in material support provision of officers of the National Guard of Ukraine and determine the ways for its improvement.

The introduction of new innovative technologies is necessary at the present stage of development of logistics systems of the National Guard of Ukraine.

The transition from maintaining paper accounting documentation to electronic will greatly simplify the procedure of accounting of clothing services for clothing property in the units of the National Guard of Ukraine.

***Key words:** National Guard of Ukraine, logistics, material support, officers, the National Guard of Ukraine*

УДК 35.355

INTERNATIONAL COOPERATION AS A FACTOR OF IMPROVEMENT OF ACTIVITY NATIONAL GUARD OF UKRAINE

Dmytro Kravets, Kharkiv

Cooperation of the National Guard of Ukraine with law enforcement agencies and similar foreign military formations from different countries plays an important role in everyday life activities of this law enforcement agency, and also affects the development of organizational activities and staffing.

Among the main forms of such cooperation that contributes to the improvement of work and modernization of the NGU in today's realities, we can distinguish the signing of international cooperation programs, holding joint meetings, and joint exercises.

The National Guard of Ukraine is a relatively young structure, but it has a wealth of experience in international cooperation as well as international projects and trainings. International projects and trainings include:

1. Twinning project «Implementation and development of quality management» (ref. 2008/164-748), 2008—2010.

2. Twinning project «Contribution to improvement of the system of public order protection» (ref. Ua10/enp-pca/jh/28), 2012-2013.

3. The NGU and Romanian gendarmerie joint projects: «Strengthening the institutional capacity of the National Guard of Ukraine», 2014 — 2015, «Supporting the development of the National Guard of Ukraine», 2016 — 2017, «Technical assistance for consolidating the National Guard of Ukraine», 2018 .

4. Project of Ukrainian Physical Nuclear Security system inclusion to the structure of the global Physical Nuclear Security system, 2015 — 2019.

5. Annual international military exercises «Rapid Trident», «Sea Breeze».

6. European Union Police Service Training (EUPST), 2011 — 2013, 2016 — 2018.

7. Joint trainings «Fearless Guardian – 2015».

8. International exercises «RoGendIntEx».

Cooperation with international organizations goes on in the following areas:

1. Cooperation within FIEP association;

2. Cooperation with NATO;

3. Participation in Multinational Joint Committee;

4. Cooperation with EUAM (European Union Advisory Mission).

Summarizing, we can conclude that the international cooperation is an important vector of the NGU activity and we must adopt the foreign experience to

reach the highest level of combat readiness, proficiency and compatibility with partners.

Key words: international cooperation, Twinning project, joint trainings, international trainings.

УДК 623.4

THE MISSILE “SHIELD AND SWORD OF THE COUNTRY”

Oleh Kryzskyi, Kharkiv

Rocket artillery is actively used in modern conflicts. Almost all of the MLRS created in the post-war period are in service with different national armies and even illegally armed groups. Currently, both sides in the armed hostilities in eastern Ukraine are quite actively using MLRS.

According to The Potomac Foundation, about 85% of all sides' casualties are caused by artillery. This is more than during the positional battles of the First World War.

The intensity of the artillery fire was also overwhelming. At the very beginning of the war, the Ukrainian army tried to minimize the use of artillery in densely populated urban areas. This is recognized, among others, by Russian military analysts. The purpose of the artillery fire was to destroy enemy manpower and equipment from a long distance and overcome the resistance of both self-proclaimed republics - Donetsk and Luhansk. According to a study by The Potomac Foundation, the MLRS are mostly used for strikes. It was for this purpose that the idea arose of creating a qualitatively new Ukrainian design of MLRS – Vilha M.

The Vilka M is a new multiple launch rocket system (MLRS) developed by the State Kyiv Design Bureau “Luch” in collaboration with other public and private Ukrainian defence companies. The MLRS can destroy infantry, armoured, and soft-skinned targets in concentration areas of artillery batteries, command posts, and ammunition depots. It is ten times more accurate than the ageing MLRS platforms in service with the Ukrainian Army.

The Vilkha M system is based on the Soviet-era BM-30 Smerch heavy MLRS. Each system is manned by a crew of four and is capable of firing missiles in single or salvo modes.

The launch mass of each 300mm Vilkha missile is 800kg. The MLRS is capable of destroying the enemy targets located at a distance of 130km.

The system can fire 12 missiles in just 45 seconds and engage the targets with a circular error probability (CEP) of less than 30m.

Each rocket is powered by a solid motor and can be attached with different types of warheads. It also features an inertial correction system, which enables the angular stabilisation of the rocket during the boost and flight phases.

The Vilkha M has become a good example of creating a new high-tech model of weapons in a very short time. Only two years passed from the first launches of mass-scale models of the tactical missile in March 2016 to the state tests with volley launches of "Alder" in April 2018. Given the complexity of development, this is an extremely good indicator. It is now extremely important that, after state tests, mass production of new high-precision missiles of tactical destruction begins at no less rapid pace. Because in the future, this will be a key component of strengthening the missile shield and sword of the country. Actually, this is the mission for the Vilkha M.

Key words: *artillery, rocket system, conflict, shield and sword, development.*

УДК 623.4

WHOSE ARMOR IS STRONGER?

Danil Kutonov, Kharkiv

With the beginning of the war in the Donbass, Ukrainian defense industry engaged in the production of new wheeled armored vehicles. Some samples - already in service, others are actively state avenue test. Some researchers figured out which armored vehicles get into the troops of Ukraine and which ones the best armies of the world use.

The latest development of the "Ukrainian Armored Vehicles" manufacturer, a specialized armored vehicle "Warta-Novator", was presented in 2017.

The armored vehicle was developed specifically for the needs of the National Guard of Ukraine. The manufacturer emphasizes: "Innovator" is made taking into account modern requirements for the equipment of special units.

The manufacturer also claims that the vehicle is equipped with additional options that provide speed, off-road and impenetrable armor. Now "Innovator" passes special tests.

Let's call this vehicle a base vehicle. If we talk about it as a combat vehicle, it allows you to attach the top module. If we talk about a patrol vehicle, it has a sufficient load capacity.

The previous version of the Guard was released in 2015. It successfully passed the state test - and a year later ten such vehicle were purchased by the Ministry of Internal Affairs of Ukraine for the special unit "Cord".

It's a completely different class of vehicle. This vehicle is a combat vehicle. It is a highly mobile combat vehicle for special forces.

The analogue of the new "Guard-Innovator" is now produced for the United States Armed Forces. Oshkosh Defense armored vehicles have similar characteristics. But Americans have special wishes for producers because of the fighting in the desert, in the mountains and at sea.

Key words: *NGU, speed, off-road, armored vehicle, manufacturer, war.*

УДК 365.55

IMPROVING THE DIET OF MILITARY PERSONNEL DURING THE COVID-19 PANDEMIC

Olexander Lisin, Kharkiv

Diet is an important factor in maintaining the health of servicemen, enhancing resistance to stress and fatigue from to physical activity, which in turn will lead to their high combat effectiveness. Special standards of food rations have been developed, both in Ukraine and abroad, which meet the basic requirements

for the nutrition of servicemen. Provision of servicemen with food is carried out according to the approved regulations and standards concerning military diet.

However, in the context of a coronavirus pandemic, the military must pay more attention to a healthy and safe diet, and ensure that all measures are taken into account.

During coronavirus pandemic, the organization of military nutrition requires other approaches, restrictions, and rules. First of all, meals should be provided in compliance with safety norms under the following conditions:

- servicemen must eat strictly on schedule;
- the distance between the tables should be at least 1.5 m;
- there should be no more than 4 people at one table.

Replacement products should offer sufficient amounts of vitamins and minerals. Cannot be considered full-fledged substitutes for products of animal origin products of plant origin. For example, the best water-soluble vitamin C is found mainly in fresh vegetables, and fat-soluble vitamins A, D, and E in animal products.

In addition, during the pandemic, the servicemen who are constantly performing combat missions need more vitamins. Whole grain products are extremely useful for the proper functioning of the body. Different types of porridge contain vitamins and trace elements (especially selenium and zinc). To prevent the virus, servicemen should eat oatmeal, buckwheat and barley. Add fruits or berries to make the porridge more delicious.

The most useful are products that contain lacto - and bifidobacteria. They are not only required for the good condition of the gastrointestinal tract, but also enhance the immune system. According to the results of numerous research studies, thanks to probiotics, the Covid-19 symptoms are reduced: cough, fever, nasal congestion. For best results kefir, yogurt, sour cream, cottage cheese, should be added to daily military diet.

Breakfast should include a cold appetizer, a meat dish with cereal or vegetable garnish, bread, butter, rennet cheese, sugar and tea. For lunch, the main

part of the food is planned cold snack, first and second courses, compote, pastries, bread. It is recommended to plan dinner with a fish dish with garnish, bread, butter, sugar and tea.

Therefore, the quality of food for servicemen in a pandemic needs special attention. Dishes should be healthy and tasty. Proper nutrition should also include cooking a variety of foods, which is achieved by skillful selection of dishes.

***Key words:** diet, pandemic, healthy meals, vitamins, whole grains, lacto - and bifidobacteria, quality of food, combat readiness.*

УДК 341.123:327

CHECKPOINT LOGISTICS IN JOINT FORCES OPERATION

Kostiantyn Lisnyi, Mariupol

The purpose of the study is to describe features of the checkpoint logistics based on current Joint Forces Operation (JFO) in the eastern part of Ukraine and to find the ways to improve a materiel supply.

The objective is to learn the methods of materiel supply for personnel of National Guard of Ukraine, who performs their duties on the checkpoints.

The core objective of the study is to get the best logistics methods for checkpoint supply.

We use both theoretical and practical methods, based on real situation in Joint forces operation in the eastern part of Ukraine. Research and calculations of the research were done according to the real materiel supply of the checkpoint, situated in Mariupol outskirts, Donetsk region.

In current situation Armed Forces of Ukraine and the National Guard of Ukraine don't have joint logistics bases and logistics based on their own military units deployed in JFO permanently. In fact, all military and law enforce organizations have their own budget and logistics. This system shows us some disadvantages. For example, it doesn't allow responding effectively in fast changing environment.

The conclusion of the research is to improve the cooperation between all

military and law enforcement organizations, which take part in JFO. This method of cooperation may require legislative changes.

Key words: National Guard of Ukraine, logistics, checkpoint, Joint Forces Operation, materiel support

УДК [159.9.07+331.461]:355.1(466)

**ABILITY FOR “ENDURANCE (SELF-CONTROL)” IN THE
MILITARY PERSONNEL OF THE NATIONAL GUARD OF UKRAINE**

Anastasiia Lyman, Ukraine

Modern warfare operations take place under unstable, uncertain, complex and ambiguous conditions, accompanied by physical and psychological overload, limited satisfaction of the physiological needs of the military, etc. Under such conditions, military personnel of the National Guard of Ukraine (hereinafter - NGU) must be careful, organized and prudent to perform their duties well and prevent hit into a situation that will lead to injury and loss of colleagues.

Investigating the peculiarities of the psychological readiness of NGU servicemen to take risks in daily and combat activities, the staff of the research laboratory of moral and psychological support of military combat activities of NGU determined that one of the important components of psychological readiness to perform military-combat tasks (hereinafter - MCT) in risky conditions is “endurance (self-control)”. “Endurance (self-control)” – is the ability of a serviceman of the NGU to refrain from impulsive, reckless actions, to show organization, discipline, caution. That is, a serviceman must act in such a way as not to get into a situation of imminent threat if possible, but at the same time it is imperative to fulfill the combat mission assigned to him.

It is due to this ability that the necessary advantage of the so-called “struggle of motives” in the serviceman is created between the desire to avoid performing a MCT in extreme conditions and “motivation from obligation” - the need and obligation to obey the orders of commanders or superiors, and in special, combat conditions, often to take risks.

The formation of “endurance (self-control)” is ensured by the constant education of the serviceman's own discipline, responsibility, development of self-control, awareness of the social significance of professional tasks (MCT) and the importance of conscientiously performing their functional duties.

Further study of the problem of servicemen psychological readiness for risk will allow to increase efficiency of professional activities of the NGU personnel under health- and life-threatening conditions.

Key words: risk, risk perception, psychological readiness for risk, endurance, self-control, military personnel, National Guard of Ukraine.

УДК 623.4

WAYS TO IMPROVE FIELD ARMAMENTS WITH THE HELP OF PROTECTIVE ENGINEERING STRUCTURES SUCH AS "GABION"

Denys Lyvandovskyi, Kharkiv

The protective elements such as "Gabion" are used to enhance the security storage of weapons and ammunition in warehouses outside the point of permanent deployment of units, points of storage of damaged and faulty weapons, faulty and damaged equipment before their further transfer to repair facilities for further resumption during hostilities, while performing service and combat missions outside the point of permanent deployment of units, as well as in order to reduce the time for the deployment of such facilities and points.

During the hostilities in some districts of Donetsk and Luhansk regions, a very important issue arose for cases of storage of weapons and ammunition in warehouses outside the point of permanent deployment of units, faulty and damaged equipment transportation for their further recovery at various distances from areas of hostilities, which sometimes can happen within a distance of several hundred meters from the front line, and can be detected by unmanned aerial vehicles (UAVs), which are very actively used by sabotage and reconnaissance groups of the enemy.

To counter and protect materiel against various threats in the context of modern hostilities, there is a need to develop new ways to arrange such warehouses and storage facilities. For the deployment of such warehouses and items, it is proposed to use protective elements such as "Gabion". This will help address a number of important issues:

1. These places can be used not only as warehouses for storage of ammunition and weapons, but also as points of combat supply for the issuing of ammunition; as points for issuing and storage weapons and ammunition from the supply authorities and their subsequent distribution to units directly on the front line of defensive or offensive operations; as storage points for damaged and faulty weapons, faulty and damaged equipment, for their further transfer to repair bodies, for the purpose of their further restoration.

2. Such structures can be assembled anywhere and in any structure.

3. The equipment of such positions, as a place for storage of weapons and ammunition in the ground, does not require the use of additional materials (wood, bricks, nails, etc.), and will require some land plot in which to dig this protective structure.

4. It is easily and quickly deployed on the ground. To do this, use a fastening system for quick disassembly and assembly.

5. When installing such a protective structure in the open, it will be easy and quick to mask, either with a camouflage net, or improvised materials.

6. Power supply and lighting can be carried out by means of the generator or lamps on storage batteries.

7. Such structures can be made immediately from non-combustible fabric and one that is not exposed to harmful chemical or biological and climatic stimuli.

8. Such places can be equipped in several layers both on the slopes and on the mountains.

Key words: *protective elements, storage, Gabion, ammunition*

PROBLEM ISSUES OF THE FIRE SAFETY SYSTEM IN MILITARY UNITS (DIVISION LEVEL) OF THE NATIONAL GUARD OF UKRAINE

Olexiy Mamon, Kharkiv

According to the Code of Civil Protection of Ukraine of 02.10.2012, which once ammended the Law of Ukraine "On Fire Safety", the concept of civil protection is a function of the state aimed at protecting the population, territories, environment and property from emergencies by preventing such situations, eliminating their consequences and providing assistance to victims in peacetime and during special periods.

As of November 1, 2020, there were 92,516 fires and 94 emergencies in Ukraine. It should also be noted that rescue teams saved the lives of 4,567 people during emergencies, fires and other dangerous situations. Therefore, the relevance of this problem is beyond doubt.

The National Guard of Ukraine as a military formation with law enforcement functions was created on the basis of the Interior Troops of the Ministry of Internal Affairs of Ukraine on March 13, 2014, which raised the issue of fire safety at subordinate National Guard of Ukraine facilities. The modern approach to ensure fire safety has to be carried out with consideration of the distribution of authority of labor protection and fire safety in the ranks of the National Guard of Ukraine.

The issue of creating a regulatory - legal and logistical base of the National Guard of Ukraine on fire safety remains open, and mainly the regulatory aspects of the Ministry of Internal Affairs and the State Emergency Service of Ukraine are used, the specifics of fire safety in the main tasks of the National Guard of Ukraine are not taken into account and not defined.

Currently the introduction fire units (namely fire platoons, fire teams) with the appropriate fire - rescue equipment in the headquarters of military units is facing a lot of challenges: there are no specially equipped places for deployment

fire rescue units (in fire depots) as well as corresponding fixed equipment (in boxes with equipment).

Unfortunately, the vast majority of firefighting equipment is stored in open areas, under canopies, or in parks with equipment at a considerable distance from the location of personnel of fire and rescue units, but for permanent combat readiness they should be stored in separate fire depots with heating boxes with air temperature not lower than +10 degrees Celsius. Therefore, due to the lack of special facilities and the lowering of the ambient temperature, the possibilities of fire units to prevent emergencies are reduced.

To address this issue, there is usually a need to allocate estimates, both for the construction of fire depots and for the completion and re-equipment of existing buildings (structures, premises, etc). As a basis, we can take into account the experience of the already established system of fire safety of the Armed Forces of Ukraine for the construction of appropriate training facilities and improving the regulatory and legal component in ensuring fire safety of the National Guard of Ukraine.

Key words: *fire safety, firefighting equipment, fire depots.*

УДК 355.141-514.1

WAYS TO INCREASE EFFICIENCY OF STATIONARY MILITARY CLOTHING REPAIR SHOPS

Vadym Mendrin, Kharkiv

The repair shop is designed to carry out medium repairs of property, as well as to re-size the uniform for conscripts. Medium repairs of military clothing and footwear are carried out, as a rule, in stationary military repair shops, which are organic to military units and formations. If necessary, the medium repair can be performed in the field conditions the personnel by the capabilities and means of mobile repair. The size of the repair shops depends on the total strength in units and is determined by their Table of Equipment.

The repair shops organize their work under the direction of the chief of the clothing supply service of the military unit. He or clarifies the scope of repairs for the planned period, assesses the capabilities of the workshops and, if necessary, takes measures to increase the number of the staff.

In addition to repairing clothing, military repair shops provide assistance to units in resising uniform when issuing it to servicemen. Medium repair of clothes is requires the use of sewing machines and is characterized by replacement small details of clothes and making various types of patches. The following main types of work belong to is considered to be medium repair of clothes: replacement of unfilled hangers, loops, flaps of pockets, a leaf in pockets of overcoats; replacing torn or damaged seams; overlay or sewing patches; stitching around low sleeves of overcoats, jackets warmed, and other uniform. Simultaneously with the implementation medium repair operations, all minor repairs are performed.

So, what are the ways to increase the efficiency of repair shops?

First of all, Ukraine should adopt the experience of more developed armies on the example of NATO countries, it is possible to invite their specialists in clothing supply service to provide quidance and directors or ideas for improving the efficiency of capabilities work our forces and means.

Secondly, it is necessary to try to keep up with modern technology, namely to move towards the automation of production processes, repair of things. That is, to reduce the burden on staff, transfer it to a variety of automatic machines witch reduce the possibility of human influence and thus increase the capacity and workload of the repair shop.

Today, a variety of technologies are evolving so rapidly and in a such number of ways that it cannot help but improve and reduce the burden on people, provide that the military actively implement these same technologies.

Conclusion: the implementation of combat and humanitarian training plans, combat readiness and combat capability of a military unit depend on the timely and high-quality implementation of tasks to meet the needs of military units in various material means, including property. Therefore, the military level of the material

supply system, its strengthening and proper organization of work should be constantly given much attention.

Key words: National Guard of Ukraine; logistics; Repair shop; officers of the National Guard of Ukraine

УДК 623.4

DEVELOPMENT AND DESIGN OF A REVOLVER FOR SPECIAL UNITS OF THE NATIONAL GUARD OF UKRAINE

Mikhail Mikhailishin, Kharkiv

The purpose of this work is to analyze the role of a revolver for special units of the National Guard of Ukraine to help them achieve better performance of special missions.

Throughout the history of the development of small arms, designers around the world have sought ways to create a powerful and convenient weapon for self-defense. From a heavy single-charge pistol with a flintlock and capsule lock, they moved to modern multi-charge pistols and revolvers.

Revolvers and pistols have many common properties that stem from their purpose, and differ only in the structure of parts and mechanisms. A pistol in the broadest sense of the word is a firearm that is held with one hand when firing. A revolver is essentially a pistol, but with such a characteristic design feature that determines its right to its own name. This feature is a rotating drum (from the English “revolve” - to rotate), in the chambers of which are placed cartridges.

The main difference between a revolver and a pistol is the presence on the axis of the drum, which rotates and serves as both a magazine and a chamber. The number of chambers in the drum ranges from 2 to 9. Loading the drum with cartridges is done manually.

The main requirement for a weapon is constant combat readiness, because refusal, delay or delay in firing can lead to tragic consequences. This is due to the fact that revolvers are in the first place among police and "civilian" weapons, having an undeniable advantage over self-loading pistols.

Regarding the combat use of the revolver, its main advantages and qualities are simplicity of construction and use, which in turn must ensure compliance with the following requirements:

- it should be simple and easy to disassemble and assemble the weapon;
- it should be easy and convenient to produce the weapon in combat when necessary or to bring them to combat mode;
- it should be simple, convenient and cheap to restoring the fighting qualities of weapons after damage or wear in a limited time with the use of conventional equipment and tools.

Structurally, revolvers are divided into only a few really different systems. The difference is mainly related to the different methods of extraction with several groups of such systems standing out:

- alternate extraction system, usually with an extractor mounted on a revolver;
- simultaneous extraction system with opening the revolver frame;
- the system of simultaneous extraction when the drum is thrown aside.

The latter of these systems is the most widespread, and it is mainly used in the latest revolvers.

The most common revolvers are 7-9 mm caliber, but there are also large-caliber revolvers (12.3 mm). For the purposes of self-defense and special tasks, as a rule, pocket-fitted revolvers caliber 5.45 mm are used.

Most modern revolvers have trigger mechanisms which are self-cocked (double action). This allows you to make a shot (if the cartridge is in the chamber) without first lifting the trigger – by pressing the trigger.

There are two common types of revolvers. The first type includes revolvers with alternate extraction, without extraction devices; with the extractor constantly ready for action; with an extractor hidden inside the axis of the drum.

The second type includes revolvers with simultaneous extraction, a drop-down frame and folding drum.

There are many new and improved models of revolvers, such as the RSA, the Strike, the Colt, Smith and Wesson, the Ruger, the Taurus, and many other systems in service with many military and police units in different parts of the world.

Key words: revolver, pistol, extractor, drum, weapon, combat readiness.

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SUBSTANTIATION OF THE INTRODUCTION OF METROLOGICAL SERVICE IN THE NATIONAL GUARD OF UKRAINE

Vadym Mudryk, Serhii Podoliaka, Kharkiv

With the start of the Anti-Terrorist Operation in 2014, and today the Joint Forces Operation in the east of our country, the National Guard of Ukraine (NGU) has been entrusted with additional tasks, including participation in the implementation of territorial defense tasks (participation in measures to end armed conflicts and other provocations at the state border, as well as supporting the operations of the Armed Forces of Ukraine (AFU) in crisis situations that threaten national security in a special period), which forced the Cabinet of Ministers of Ukraine to make significant changes to the Law of Ukraine "On the National Guard of Ukraine".

Thus, in the period from 2014 to 2020, in accordance with the Law of Ukraine "On the National Guard of Ukraine", the NGU held:

- equipping with modern military radio communication systems, tactical-level military intelligence, including unmanned aerial systems;
- equipping the fleet of aviation units with the latest and modernized samples of aviation equipment, taking into account certain tasks, needs and priorities;
- modernization of the information and communication network and communication system of the National Guard control points, as well as the creation of an automated system for ensuring the management of forces and means;
- procurement and equipping of military units (units) entrusted with the functions of public order protection, protection of nuclear facilities, nuclear

materials, radioactive waste, other sources of ionizing radiation of state property, protection of important state objects, the latest and modernized weapons, special means and equipment;

- introduction of the latest technologies into the system of professional and psychological selection of candidates for military service;
- introduction of modern technologies for the provision of medical care and treatment of patients in accordance with the standards of medical care, clinical protocols and other industry standards in the field of health care;
- introduction of new programs of special and combat training of servicemen, reservists and units of NGU, modern means of training personnel and training of units (combat simulation system, etc.) and others.

Thus, the National Guard of Ukraine replenished with the latest weapons, special means and equipment, improved the level of equipping units with modern military digital radio communication systems. APC-4 (and its modifications), APC-3E (and its modifications), armored combat vehicles KOZAK, SPARTAN, VARTA, KOGUAR, etc. appeared on the NGU equipment. Reconnaissance units were equipped with modern aircraft complexes of tactical level. The equipment of medical equipment has significantly improved; modern gym complexes have appeared.

It should be noted that the complexity and peculiarity of such replenishment by the material and technical means of NGU consists in their unspeakability of tasks inherent in NGU, the use of modern new technologies. Such samples include unmanned aerial vehicles, tanks, anti-tank missile systems, fire control systems, medical equipment, polygraphs, radio communication means that work on new encryption algorithms, etc. So, as you can see, the improvement and equipping of NGU units with material means affected all types of comprehensive support. One of the types of technical support is metrological support (MZ).

As you know, the Ministry of Foreign Affairs is a set of measures aimed at achieving unity of measurement and reliability of control of parameters of military measurement objects in the Armed Forces of Ukraine, other military formations.

So, today there is a contradiction between the requirements of the guiding documents and the existing state of affairs in NGU. That is, at present, there is no metrological service in the organizational and staff structure of the NGU.

The problematic issues of the Ministry of Foreign Affairs include the lack of systematization of the activities of the Ministry of Education and Science in NGU, namely, keeping records of all measuring equipment (FTA) and means to be validated in the military unit, which are on delivery, ensuring their verification, calibration, repair in due time. Today, the heads of labor protection services or persons, performing the duties of a metrologist in units, military units, compounds of the NGU keep records and conduct periodic verification, calibration only those measuring equipment and devices, units, nodes (subject to verification), which pose an increased danger to human life and health (pressure gauges in high pressure boilers, high voltage devices, refueling speakers, etc.), as well as periodic verification of passing devices (meters) , electricity, water, gas supply. For example, in the conditions of supplying the latest samples of weapons and military equipment, the accounting of devices subject to verification is incorrect, especially for means of electromagnetic radiation (laser rangefinders, laser missile maintainers, speed meters, night vision devices, optical sights, etc.).

The problematic issues should also include the lack of qualified specialists in the ministry of internal affairs, who would be representatives of the NGU and participated in the acceptance tests of the weapons and military equipment, FTA, introduced the latest technologies and methods of diagnostics and control, which would significantly improve the quality of products from manufacturers. The latest examples include a Mortar of ukrainian production of OAO "Mayak Plant" M120-15 "Molot", which was created on the basis of the Soviet mortar 2B11. It was due to the lack of full quality state tests that its damage occurred during its use in the JFO area, which led to injuries and death of servicemen.

It is important to organize the activities of metrological support during the use of military equipment, devices and means subject to verification and calibration in the area of the Joint Forces Operation (fire control system APC-4E,

APC-3, ATC "Stugna-P", etc.), namely, a metrological laboratory that would allow promptly carry out metrological maintenance of the main important components of the military units, units or groups.

Accordingly, the creation of a metrological service in NGU is relevant due to the lack of a general systematic approach to summarizing the results of analysis and evaluation of the state of measuring equipment, equipment to be measured, especially, their repair and use in the conditions of the Joint Forces Operation and the intensive flow of new samples of weapons, special means, military equipment, repair equipment.

Key words: combat conflicts, national security, law enforcement function, threat, command and control, professional and psychological selection, APC, NGU, AFU.

УДК 355.4

WHY THE ARMORED PERSONNEL CARRIER BTR-4 IS SO SPECIAL?

Hennadii Novyk, Kharkiv

Armored personnel carrier BTR-4 is a combat four-axial, floating vehicle with wheeled formula 8x8. It has weapons, armor protection and equipped with landing places. The crew consists of a commander of the vehicle, a driver, an operator of the combat module and motorized shooting. The vehicle is designed to transport personnel of mechanized units of ground forces and their fire support in combat and is able to perform its functions around the clock in areas of warm and cold climate, regardless of the time of year and weather, when operating on roads with different coatings and in off-road conditions.

APC has a high mobility and is able to follow the tanks, to overcome trenches and water obstacles. To conduct combat calculation of fire from personal weapons (submachine guns and machine guns), the body of the vehicle is equipped with the hatches of the combat compartment.

The layout scheme is classical at the front of the control department (seats of the mechanics driver and commander); in the middle of the engine and

transmission compartment; in the fodder part of the combat and landing department. There is a passage from the control department, which allows the commander and the driver to leave the APC through the stern door in emergency situations. This layout allows you to transform the combat and landing compartment without changing the layout solutions by propulsion and transmission to create a wide family of vehicles. The carrying capacity of the chassis of the armored personnel carrier allows to install additional armor protection against automatic low-caliber guns.

In the exit from the amphibious there are double doors (in the BTR-4MV). In addition, hatches are placed on the roof of the amphibious compartment, in the boards and upper hatches are made slaughterhouses for firing with personal weapons.

Individual seats of paratroopers are attached to the roof of the landing compartment and can be located along the sides opposite each other or in the center of the car toward the sides. Seats are quickly removed, allowing the landing compartment to be transformed into various tasks, including cargo transportation.

Depending on the established combat module, the APC can hold from 7 to 10 people.

BTR-4E is in service of the Armed Forces of Ukraine (Order of the Ministry of Defense No. 489 of July 24, 2012) and the National Guard of Ukraine.

Also, the Armed Forces and the National Guard supplied vehicles on the basis of BTR-4, in particular medical, repair and evacuation.

Key words: *vehicle, cargo, APC, BTR, AFU, NGU.*

УДК 35.355

**INTRODUCTION OF THE MODERN MODELS OF ARMAMENT
OF THE US ARMED FORCES INTO THE UNITS OF THE
NATIONAL GUARD OF UKRAINE**

Olexandr Onyshchenko, Kharkiv

Today, the units of the National Guard of Ukraine use modern Ukrainian military equipment and weapons in the performance of combat missions, which compete with world-class models of armaments and military equipment, but there is a problem that NATO countries are one step ahead in this area, in particular the United States.

The USA Army arsenal is designed to suppress enemy positions, free up movement for friendly troops, assault far-away targets and neutralize fortified structures and vehicles. Consider the basic examples of armament of the United States Armed Forces:

M4/M4A1 CARBINE

The M4 carbine is the standard weapon for brigade combat teams. It is lightweight, mobile and adaptable and can be mounted with a M203A2 grenade launcher, M320A1 grenade launcher or an M26 modular accessory shotgun system. The M4A1 is the fully automatic variant of the M4. It also comes equipped with an ambidextrous fire control and a heavier barrel that provides a sustained rate of fire.

M24 SNIPER WEAPON SYSTEM

The M24 sniper weapon system is a 7.62mm bolt-action, six-shot rifle that chambers 7.62 x 51mm M118 long-range ammunition. It has a day optic sight with 10-x magnification and adjustable focus, metallic iron sights, deployment kit, cleaning kit (rifle and optic), soft rifle carrying case, optic and system cases, operator's manual and an optional bipod.

M14 7.62MM ENHANCED BATTLE RIFLE

The M14 7.62mm is a rack stock M14 rifle with an enhanced aluminum billet stock, Mark 4 tactical scope, and cantilever mount. With its new adjustable buttstock, cheek rest and M4-style pistol grip, the rifle is effective in close quarters combat and in the squad designated marksman role. This rifle can be returned to its original configuration with no permanent modifications.

XM2010 ENHANCED SNIPER RIFLE

The XM2010 is equipped with a fully adjustable right-folding chassis system featuring a monolithic MIL-STD 1913 optic mounting rail, MIL-STD 1913 accessory rails, and accessory cable routing channels. The shooter interface can be tailored to accommodate a wide range of shooter preferences and its folding stock provides flexibility in transporting the weapon during operations.

Summarizing the above, it should be said that the National Guard of Ukraine should adopt the experience of the US Armed Forces in the field of defense and jointly develop the newest models of weapons.

Key words: sniper rifle, the National Guard of Ukraine, modifications, weapons

УДК 623.4

IMPROVEMENT OF INITIAL BULLET VELOCITY

Dmytro Pakosh, Kharkiv

The development of automatic weapons is the most common issue for every country in the world. Every country wants to be equipped with new weapons. But designing a new weapon takes a lot of time and money, so it is easier to improve a part. Thus, designers came to a conclusion to increase muzzle velocity. Initial velocity - the speed of the bullet at the muzzle of the barrel at the moment it leaves the bore. By changing this parameter we can achieve a longer range or a higher killing power of the bullet. In order to increase muzzle velocity it is necessary to increase:

- 1) the weight of the bullet
- 2) the weight of the powder load
- 3) the shape and size of the powder grains
- 4) barrel length
- 5) the friction between the cartridge and the barrel
- 6) charge density

The longer the barrel of a firearm, the longer the time the powder gases act on the bullet and the higher the muzzle velocity is. Powder shape and size have a

significant influence on the velocity of the powder charge and therefore on the muzzle velocity of the bullet. They are selected accordingly during the design of the gun. Charge density is the ratio of the mass of the charge to the volume of the cartridge case when the bullet is inserted (the combustion chamber of the charge). If the bullet is too deep seated, the loading density increases considerably, which can lead to a pressure jump when firing and consequently to a barrel burst, so such cartridges must not be used for firing. As the loading density decreases (increases), the muzzle velocity increases (decreases).

Our world has experienced many wars already. With the advent of firearms, people began to fight over long distances while inventing personal protective equipment. This led to new research on how to increase the penetration power of the bullet (projectile). There was also an arms race, which led to new warriors. At the moment, the development in the field of new weapons is at a high level.

Ballistic enhancement is one of the most important components of a firearm, as it increases the bullet's range, killing power and muzzle velocity.

Key words: *bullet, muzzle velocity, ballistics, weapons, barrel.*

УДК 811: 378

**ENGLISH LANGUAGE AS ONE OF THE MOST IMPORTANT
FACTORS IN THE DEVELOPMENT OF THE
ARMED FORCES OF UKRAINE**

Pavlo Pavlyk, Lviv

The main aspect of English language proficiency in the Armed Forces of Ukraine is Ukraine's desire for Euro-Atlantic integration. Learning English is an important step in bringing the Ukrainian army closer to NATO standards. Language proficiency is an important factor in reforming and developing the Armed Forces of Ukraine.

Today, language proficiency is becoming an integral component of professional competence, setting the military education system the task of helping troops implement Euro-Atlantic standards and achieve the interoperability with the

Armed Forces of NATO members. This will ensure effective communication when participating in multinational operations, exercises and other international cooperation activities. Therefore, perfect knowledge not only of the native language, but also of a foreign language, is a necessary prerequisite for both professional and personal development.

In the last few years, in order to achieve an effective result, language classes for servicemen have been conducted regularly having become an integral part of the general training system. The main principles of language training determine the modern system of views regarding the efficiency improvement in learning foreign languages by personnel.

The purpose of the main principles is to determine the current strategy, promising areas of development and improvement of the language training system, aimed at the professional level of knowledge of foreign languages in accordance with NATO standard STANAG 6001.

To learn and master the English language, the command of the Armed Forces came to the conclusion to train personnel in two stages until 2030.

The first stage (until 2025) envisages the continuation of measures to develop and strengthen the system of language training of UAF personnel, including the organization of foreign language learning in military units in the system of individual training of officers, sergeants and privates under contract. Introduction and dissemination of the use of distance learning courses in foreign languages.

The second stage (until 2030) provides for the gradual introduction of the requirement of mandatory professional proficiency in English by the personnel of the Armed Forces of Ukraine when promoted to positions related to the use of a foreign language in official activities.

Summing up, we can conclude that proper and high-quality completion of all the stages in the Armed Forces by 2030 will increase the number of military units and formations compatible with the relevant military units of NATO member and partner countries.

Key words: proficiency, continuation, language, Euro-Atlantic standards, UAF, NATO

УДК 658.7

IMPLEMENTATION OF LOGISTICAL SUPPORT IN THE ARMED FORCES ACCORDING TO NATO STANDARDS

Serhii Shalamai, Kharkiv

The Army could be modern and capable of action at "adequate speed", response and mobility in resource allocation if it has advanced logistical support, the way it is done in NATO armies. There are no doubt that the Alliance is setting the right and successful examples to follow. Ukraine has also publicly stated that for its Armed Forces it will build a system of logistical support for the army that is necessary, even in spite of the prevailing military threats.

Military activity requires a certain amount of weapons, special equipment, vehicles, personnel, fuel, medicines, supplies, uniforms, ammunition and more. And to meet these needs, we need a system for purchasing, supplying, storing, repairing, maintaining, controlling the operation, utilizing surpluses, planning and carrying out military transportations, as well as servicing military facilities housing and military infrastructure. This is the considerable amount of important functionality that military logistics takes on.

Currently, the Armed Forces also have established the Main Logistics Department, and now the stage of its acquisition is underway. In the process, the strategic and operational functions of logistical support for military management are being demarcated, as well as the adoption of the NATO supply class system. That is, there is a confluence of rear logistics and arms support into a single clear structure. This is how structural standardization on the NATO model occurs - this will be the result of the merger of the Logistics and the Armed Forces. Instead of the Soviet-based algorithms and technologies of the irreversible security system, modern military service is coming to the security sector. The pinnacle of the

phased process is effective logistical support, capable of supporting all components of the defense forces.

The General Staff of the Armed Forces of Ukraine is currently developing draft guidelines for logistical support, lower-level guidance documents. By the end of 2020, new logistical management bodies need to be formed, capacities and capabilities expanded, specialized professionals trained, management automated in this area, and NATO-based regulatory frameworks established. In particular, we are talking about the automated processes of control and accounting of weapons and military equipment, property, missiles and ammunition, logistics.

Since 2016, the automated logistics management system has been implemented in the Armed Forces with the support of partner countries. It has developed a logistical information system for accounting and movement of material resources, the transfer of the prototype, which is planned in the near future. An automated system of codification of military property was also introduced.

The AFS Logistics Officers acquire an important practicum by participating in the NATO logistical exercises and, together with their foreign counterparts, to solve multilevel planning tasks and to ensure the formation, coordination, and relocation of units to task areas. Testing and developing collective logistics solutions, evaluating the interoperability of logistics systems, services and equipment in current and future operations will also be of interest.

All future logistics mechanism is being worked out within the limits of the experiment. Its results will reveal the possibility of creating a logistics network at the operational level. These are stationary storage facilities for stockpiling weapons, military equipment, missiles, ammunition, supplies, deployment of an autonomous field camp. And also about brigades of logistics of operational command, capable to deploy mobile elements in the field and to provide timely transportation of material means, repair of equipment.

The goal of the MoD leadership is to achieve full compatibility with NATO, including in terms of logistics by the end of 2020, is quite possible. The main thing is not to lose pace and not to stray from the chosen course.

Key words: the Armed Forces of Ukraine, logistics, compatibility, NATO standards.

УДК 355

UPGRADE OF WEAPONS AND MILITARY EQUIPMENT - THE WAY TO CAPACITY OF THE ARMED FORCES OF UKRAINE

Ihor Shamro, Kharkiv

The armed conflict taking place today in Eastern Ukraine has shown the true combat effectiveness of the Armed Forces and other military formations and their ability to carry out their tasks to protect the state.

The main topical issue is the study of the impact of maintenance and recovery processes on the effectiveness of the management of the technical condition of military equipment. There are a number of main problems, namely: maintaining the technical condition of military equipment at the appropriate level and, if necessary, its timely restoration. Therefore, the search for ways to improve the level of management of the technical condition and restoration of military equipment will ensure its further effective use for its intended purpose, both in peacetime and in combat.

The Armed Forces of Ukraine has a fairly large number of military equipment, which includes all technical means that are designed to ensure combat operations and military training. Military equipment also includes machinery, equipment, devices and equipment of the rear, means of evacuation, maintenance, repair and measuring equipment for military purposes.

The systems of repair and restoration of damaged military equipment need special consideration. First, the problem of effective implementation of measures to restore military equipment is associated with a significant amount of work that must be carried out on large areas and have short time constraints, and most

importantly to do so with a large number of damaged samples of military equipment. In addition, there is currently a lack of repair units and spare parts stocks. Second, the insufficient number and capacity of mobile repair units and units to evacuate damaged equipment from the battlefield.

The experience of use and efficiency of repair units requires the introduction of urgent measures in the Armed Forces of Ukraine to build a system of training for the operation and repair of military equipment, increase their number, capacity and quality of training.

Thus, the main shortcomings of the management of the technical condition of military equipment at present are the imperfection of the processes of maintenance and restoration of military equipment that provide it.

Analysis of recent research shows that given the economic and political conditions in the world, it is advisable to introduce, develop and modernize the Armed Forces with samples of new generation military equipment, which are the basis of their combat potential. New generation design solutions are based on advanced technical advances in microelectronics, robotics, communications and information technology. The main directions in the procurement and equipping of the Armed Forces with military equipment are aimed at strengthening the strategic component and increasing military capabilities with an emphasis on strike and reconnaissance complexes, development of mobility and interoperability of military equipment aimed at interaction and cooperation with military coalition partners.

Key words: ways to increase; cooperation; development, analysis; ways to increase; software; main problems; Armed Forces.

УДК 623.41-1

THE NEED TO DETERMINE AND RATIONALIZE MILITARY AUTOMOTIVE EQUIPMENT LIFE IN UKRAINE ARMED FORCES

Volodymyr Sharapa, Kyiv

The current quality condition of automotive equipment in the Armed Forces of Ukraine is characterized by a rapid reduction of their technical suitability. Generally, 90% of the total number of military automotive equipment (MAE) of the Armed Forces of Ukraine have been in operation for over 24 years. Thus, at the beginning of the Russian aggression on the territory of Donetsk and Luhansk regions, the Armed Forces of Ukraine had only 57.2% of serviceable MAE.

The MAE legacy the Armed Forces of Ukraine got from Soviet times is mainly represented by UAZ-469, GAZ-66, ZIL-131, UrAL-4320, KamAZ-4310, KrAZ-255, MAZ brands of various modifications.

Since the beginning of the Russian aggression against Ukraine in 2014, the Armed Forces of Ukraine have been furnished with new and modern MAE, such as KRAZ-5233, 6322 and MAZ-5316, 5317.

This article points to the contradictions between the existing technical condition of the MAE and their technical requirements set in the regulatory documents of the Ministry of Defense of Ukraine; between the existing and the assigned MAE service life; between the existing and required MAE technical condition ($K_{etc} = 0.75$ and $K_{rtc} = 0.85$); between the designated MAE service life before discarding (18 years) and their upgrading.

The purpose of the research is to rationalize MAE service life.

The outdated theoretical framework for rational MAE service life substantiation and the demand for the development of modern scientific and methodological instruments cause controversies in theory, and highlight the need for the improvement of the substantiation method.

In view of the aforesaid, the research objectives are to analyze external and internal that influence MAE operation; to brush up the MAE service life substantiation techniques; and to justify recommendations on rational service life of MAE in the Armed Forces of Ukraine.

In analyzing external and internal factors which influence MAE technical condition we consider climatic, operational, maintenance and repair factors as an

external impact; while wear, physical aging, corrosion and obsolescence as an internal impact.

The research in existing rational MAE service life methods and techniques showed that further development of this scientific area should be relied on applying mathematical statistics, solving the problems of nonlinear extremum and dynamic programming as the most promising research techniques in this field.

The problem-solving is expressed by uptime percentage as the integrated reliability index; obsolescence period, obsolescence coefficient, upgrading period, upgrading deadline, upgrading coefficient limits as MAE durability indicators.

They will help find the track to getting the substantiated rational MAE service life solution and to specifying planned obsolescence, obsolescence coefficient, upgrading and upgrading deadline for MAE pieces.

Key words: *military automotive equipment, life, upgrading, service life, maintenance, repair.*

УДК 623.437

**CREATION OF A FUEL CONSUMPTION CONTROL SYSTEM USED
TO PROVIDE VEHICLE IN THE NATIONAL GUARD OF UKRAINE
FORMATIONS**

Oleksandr Shumakov, Kharkiv

The armored vehicle of the National Guard of Ukraine is the heart, in the middle of which, instead of blood, fuel flows. But it is not always used for its intended purpose. It sometimes happens that some military officials may use fuel to refill their personal pockets.

What can be done to avoid this shameful phenomenon? Create a fuel consumption control system used to provide automobile and armored vehicles of the National Guard of Ukraine. This system will neutralize all scams and will improve the logistics of units.

Today, fuel for military equipment is written off with the help of waybills, which record the odometer readings of a particular vehicle. If you artificially

change the relevant readings of the odometer then the documents can be falsified data. This allows you to write off fuel costs as if on legal grounds. In some places there are larger-scale abuses. For example, if military personnel are involved in fuel fraud, the waybill may contain completely false information, and the waybills themselves may be regularly issued on equipment that may not be used at all and may be technically unusable.

It is proposed to create a system of fuel consumption control, which consists of strict accounting of fuel that is actually used on the route. It is proposed to install a fuel flow meter for each unit of equipment. This equipment works as follows: fuel is fed from the tank through the filter, the meter - fuel flows meter and the separator directly into the engine and this is the main cycle of work. Of course, at the same time in a circle of circulation in fuel tubes, certain remains are formed. They return to the separator, which separates air from the fuel, and return them to the circuit of the engine so that they do not pass through the meter - fuel flow meter again. The reading of the flow meter - fuel flow meter, which takes into account the amount actually consumed by the engine fuel, gives a special tracker. The tracker can be read via an external connection. It will record exactly how much fuel has passed through the system and has been spent on the overall operation of the equipment. Fuel consumption data will be displayed on an external screen, which will be installed in the cab of the car so that no one could influence it in order to make any changes to the operation of the device. The principle of operation of the fuel control system will be to compare the data of the meter - fuel flow meter and the actual odometer readings. Installation of automobile and armored vehicles of the National Guard of Ukraine does not require significant funds and will increase the efficiency of logistics.

Key words: *National Guard of Ukraine; armored vehicles, consumption, fuel*

УДК 355.6

**ANALYSIS OF THE FEATURES INFORMATION FLOWS
MANAGEMENT OF LOGISTIC PROCESSES OF THE UNITS OF THE
NATIONAL GUARDIAN DEPARTMENTS OF UKRAINE**

Oleh Shumeiko

Complications of market relations, increasing competition, increasing the speed of material flows, reducing inventories leads to the need to create or modify existing logistics systems. Each logistics system is focused on the organization and management of flows. By the nature of the objects, logistics flows can be material, transport, financial, energy, human, information, and so on. The last plays a special integrative role in logistics systems, which follows from the definition of information flow as a set of circulating messages in the logistics system and between the logistics system and the external environment needed to control and manage logistics operations. As a result, effective logistics of the National Guard of Ukraine is possible only by managing the information flows of logistics. In these conditions the task of the analysis of features of management of information streams of logistic processes of divisions of National guard of Ukraine appears very actual.

The parameters of the information flow of logistics processes of units of the National Guard of Ukraine, which may act as objects of management are: source, direction of movement, speed of delivery, reception, information processing, quantity and the quality of information processed and provided by unit of time. However, the features of information flows in logistics systems of various scales have significant differences, which are primarily related to their goals and criteria.

Micrologistics systems are formed on the basis distribution cycles of units of the National Guard of Ukraine and are designed for management and optimization material and accompanying flows in the process supply and marketing. Goals and criteria of micrologistics systems: minimization of general logistics costs, maximizing the volume of sales of finished products, the fullest satisfaction of the needs of servicemen, fulfillment of terms of orders and increase of the level of

logistics service. Unlike micrologistics, macrologistics systems are created at the level of territorial or administrative-territorial formation, to solve tasks at the command level of the National Guard of Ukraine.

In the macrologistic system, information is considered as a product of consumption along with material objects, which is an important prerequisite in the definition of the main tasks of the information flow management.

In modern logistics systems of units of the National Guard of Ukraine the volumes of information, the speed of its change have increased, the boundaries between individual information flows are being erased, access to information is expanding. However, the existing problems in collecting accurate, operational and reliable information, the weak development of communication systems, the lack of information support does not contribute to the rapid adequate response of the logistics system in accordance with market requirements. Insufficient development of information infrastructure causes significant disparities between the source of the information product and its consumption. Therefore, information flows management in modern logistics systems of different levels should first of all promote coordination of directions of movement of the information, speed of transfer and reception of the information, its volume and size of carrying capacity of communicative structures or the path of flow movement.

***Key words:** logistics, information flows, logistics systems, military unit, information base.*

УДК 355.658

THE WAYS TO ENHANCE NUTRITION OF SMALL MOBILE GROUPS IN FIELD CONDITIONS

Oleksandr Stupnytskyi, Kharkiv

Successful performance of assigned tasks by National Guard of Ukraine units in peacetime and wartime, possible only if the food service has modern technical means. Mobility and reliability - these are the words determine the requirements when it comes to food service facilities.

NGU units, which have been active in the last 6 years in active hostilities, have replenished the fleet of technical field equipment of the food service.

Technical means used in National Guard of Ukraine divisions in the form of special purpose vehicles, trailers, semi-trailers, modules and must fully meet all the needs of personnel in the field.

To meet the requirements for technical means of food service, as well as the requirements of international standards, Ukraine industry develops and implements new technical means with improved characteristics.

Analyzing the market situation in the US, Germany and Russia, we understand that Ukraine has sufficient resources, scientific and technical potential and production capacity of industry to introduce new models of technical means of food service that will fully meet the needs of troops and create competition with leading countries NATO members.

Accordingly, in order to create a new, more modern technical means, we need to take into account all the advantages and disadvantages of existing technical means of cooking in the field, namely:

- the technical means must be completely mobile;
- they must meet the requirements of DSTU and ISSO;
- they must have an extended service area but at the same time must be compact and easy to operate;
- if necessary, a tent-warehouse is required to expand the service area and the keep the module itself in a constant technical readiness mode;
- it requires a small number of personnel to operate them, not more than 3 people;
- they are self-contained and have their own power generator;
- must have capabilities to prepare of the required amount of food for the required amount of personnel on mission;
- they must be safe to use;
- must have a minimum cost of fuel and other consumables;

- must provide long-term work of all knots, units, details and devices and also timely elimination of malfunctions;
- the material used must be corrosion-resistant;
- rapid removal of equipment from storage;
- operation of all parts and units at a temperature from -45°C to $+50^{\circ}\text{C}$, which will allow the use of technical means in different climatic conditions;
- they must provide for enough room for storage of cooked meals;
- they must have disguise properties;
- they must have a set supply of water (without replenishment) for cooking for 3 days, etc.

Taking into account all these advantages and disadvantages, we have developed our own technical means for cooking in the field - Mobile Kitchen MK - 50, which is designed for cooking in the field in isolation from permanent locations for small groups based on MAZ car module.

To organize food in the field, it is necessary to equip military units and units with special equipment, in this connection today a development of new and improvement of existing technical means of food service is carried out.

The following are the main directions of development of technical means of food service:

- increase mobility of technical means by replacement a base of installation on perspective, more passable and economic chassis of automobile equipment;
- unification of the basic chassis of technical means of food service, development of modular systems and apply the principle of interchangeable parts.

Key words: *National Guard of Ukraine, NATO, technical means, organize nutrition, food service.*

УДК 351.743

THE TRAINING OF FUTURE OFFICERS OF THE NATIONAL GUARD OF UKRAINE FOR PERFORMANCE OF ASSIGNED TASKS

Dmytro Trobiuk, Kharkiv

In recent years the NGU has completely changed the system of personnel training, taking into account the experience of the United States and Canada. The experience of developed countries in modern conditions can help to improve the effectiveness of training of future officers of the National Guard of Ukraine.

Reproduced in 2014, the NGU, which became the successor to the Interior Troops, went through a difficult period of revival of military units and their reorganization, to ensure the effective performance of their functions in the current armed conflict.

The main task of training of future officers of the NGU is to ensure a high level of professionalism, readiness to perform assigned tasks. At the same time, the complexity of the economic and political situation, the growth of organized crime, corruption, group and mass illegal activities, environmental protection in the East, increasing social tensions have complicated the nature of tasks solved by units of the NGU.

The growing responsibility for the lives and health of subordinates necessitates the need to find ways to improve the system of training cadets as future officers. It means that the success of the tasks, assigned to the NGU, largely depends on the level of their competence and readiness, ability to make and implement the right decisions, to quickly and correctly navigate in difficult situations of service and combat activities.

In recent years, training of the NGU has been aimed at developing the functional qualities of military authorities, taking into account their purpose and features of combat missions and improving the professional level of all categories of servicemen.

In today's conditions, the reform of the NGU has not lost its relevance, but this dynamic process is hampered by some negative factors.

Among them: long-term uncertainty at the state level of the concept of law enforcement reform, lack of consistency of views on the future of law enforcement in the representatives of different parliamentary factions under the influence of political interests and preferences. The objective reason for the slowdown in the

process of reforming the NGU is the lack of a sufficient financial base in the global financial crisis. In addition, there are new challenges to the training of future officers of the NGU, such as spreading of the COVID-19 pandemic, which must be taken into account.

Ukraine has become a full member of the Association of Police and Gendarmerie of Europe and the Mediterranean as a military institution (FIEP). It allows to implement the experience of law enforcement agencies of Europe in the system of combat and special training of the NGU, to bring the legal framework in line with existing international agreements, facilitates the exchange of information and experience in such areas as service organization, human resources, new technologies and logistics.

In conclusion, it is necessary to say, that the process of training of future officers determines their ability to effectively perform the tasks assigned to them, and to manage units in the performance of combat missions. The process of forming the skills of future officers of the NGU is a painstaking and dynamic process. It requires a constant increase in training requirements not only during training, but also directly during the performance of assigned tasks.

***Key words:** National Guard of Ukraine (NGU), Interior Troops, military unit, future officers, training, assigned task.*

УДК 355

HISTORY OF THE COSSACK ARMORED VEHICLE DEVELOPMENT

Bohdan Vasylkovskyi, Kharkiv

Kozak is a prototype of a Ukrainian armored vehicle manufactured by "Praktika". Built on the chassis of the Iveco Daily 4x4, its weight is 5.5 tons. It was created in 2009, was shown at exhibitions, but was not in demand by the security forces of Ukraine.

Body - The armored vehicle has the usual layout with the front location of the engine, the control compartment in the middle and the cargo compartment in the stern of the machine. The body of the armored vehicle is welded, made of steel

armor plates located at an angle. Armor provides protection from small arms fire. The bottom of the passenger module is double, its lower part has a V-shape to increase mine resistance. Additional protection against an explosive wave is created by the batteries and a fuel tank placed in a double floor. To reduce the risk of injury in the event of an explosion, all seats have seat belts and a damping system (they are attached to a special frame suspended from the sides). The bottom of the car can withstand the explosion of a 3 kilogram mine.

The car can be booked up to level 3 STANAG 4569 or 4 STANAG 4569.

The turret installation on the roof of "Kozak" can be installed: 7.62-mm machine gun KT-7.62 with ammunition in 2500 rounds, or 12.7-mm large-caliber machine gun KT-12.7 with ammunition of 500 rounds, or 30-mm automatic grenade launcher AGS-17 with ammunition of 100 grenades, or 40-mm automatic grenade launcher UAG-40 with ammunition of 87 grenades.

BBM "Kozak" is the latest development of Ukrainian scientists of the NGO "Practice". The 5.5-ton Kozak is based on the Iveco Daily 55S18W 4x4 all-wheel drive chassis with a 3.0-liter Iveco F1C (Euro-4) four-cylinder turbodiesel engine with 176 horsepower at 3,200-3,500 rpm (400 Nm at 1,250-3,000 rpm). min) and 6-st. The ZF6S gearbox can carry a 4-ton trailer. It can climb hills at an angle of 35 degrees. In addition, the production of BBM "Kozak" on the chassis of GAZ-66 and GAZ-53 with the replacement of the power unit with a diesel engine.

Tires are bulletproof, with bulletproof inserts. High-profile diagonal tires from GAZ-66 are installed on the released samples. As an option, the installation of the lower radial tire "Michelin" size 225/100 R16.

The vehicle is equipped with a radio station, navigator (GLONASS + GPS), radiation reconnaissance wire and chemical reconnaissance, video recorder with rear view camera and climate control unit, ABS system and improved sound and thermal insulation. A parktronic was also installed on the first model. As bulletproof glass blocks 56 mm thick do not open and muffle sounds from the outside.

Key words: Construction, ammunition, car, Kozak, Practice, Iveco F1C.

**INTEGRATION OF THE FOREIGN LANGUAGES LEARNING IN THE
AFU AS AN ESSENTIAL STEP TO IMPLEMENTATION OF NATO
STANDARDS**

Oleh Voznyi, Ukraine

Learning English is an essential step for the Armed Forces of Ukraine for the integration to the NATO, and to achieve the necessary level of interoperability. Integration into the international process is based on the acknowledge of the language, which is spoken and understood by the international community.

First, integrated English learning helps the personnel to learn the target language in the context of their vocational environment. As far as there are different military branches which use very special terminology to denominate their equipment and activities, therefore there's a necessity to integrate the language learning into the everyday training program of the personnel. Moreover, one more crucial factor is the use of the language instructors of the semi-branches, who are acquainted with the specification of the very branch or service.

The inability of the language instructor with general specialization or even a civilian teacher to go deep into the terminology of a very specific branch (e.g., artillery, engineers, CBRN, armor) leads to decreasing of the effectiveness of the language learning. Moreover, the insufficient understanding by a teacher/instructor of the vocational terminology and processes which their students face during their everyday routine ruins the teacher's authority and negatively impacts on the students' motivation to learn the target language.

Indeed, integrating the language learning into the everyday personnel training will definitely increase the capability of the AFU personnel to cooperate and interact with the foreign contingents involved into the training program, understand the documents, guidance, doctrines and publications. Furthermore, it will help to avoid misunderstanding when using help of the language assistants and facilitate the process of implementation of the NATO standards.

Key words: integration, interoperability, implementation, vocational environment, terminology, language assistants.

УДК 336, 355

**INTERNAL CONTROL SYSTEM
IN THE MINISTRY OF DEFENSE OF UKRAINE**

Denis Yanutin, Kharkiv

In the past three years, audits in the Ministry of Defense revealed more than 1 billion losses. The numbers are striking. For comparison, there are about 1000 apartments for soldiers and their families. All materials about the violation have already been sent to law enforcement agencies. But these are only the losses that have been identified, and only by the audits, that is why the real numbers are bigger. And the problem is that you can react to things that happen endlessly, year after year, and nothing will change.

NATO member states have internal control and risk management systems for that. Potential problems (risks) are regularly identified and measures are taken to minimize them (internal control).

The purpose of such a system is to complete the mission in the most efficient, effective and economical way. Optimize the use of resources and keep them safe from loss, damage, illegal or inefficient using, to prevent potential breaches.

The problem of the Ministry of Defense system in previous years is that even when such risks were identified, they did not respond to them properly. That is why risk management and internal control have been determined among the priorities of the Ministry of Defense in order to achieve anti-corruption goals.

In total, up to 1,000 risks have been worked out. Once elaborated, the most critical ones will form the basis of the Risk Management Plan, which will meet the objectives of Ministry of Defense set out in the Cabinet of Ministers' Action Program. The heads of the units are responsible for eliminating the risks, each unit has an internal control manager. In the future, the system of internal control should

be put in place in all agencies and organizations subordinated to the Ministry of Defense. By the end of 2020 there should be first tangible results.

Of course, building such a system will take time. And the biggest problem is that while new institutions are being built, the ministry must continue to perform its tasks and fix everything and at the same time is unreal. However, it is necessary to create a system in advance because our goal is to prevent the loss of lives, resources and reputation, and not just to react to what has already happened.

***Key words:** the losses, the audits, the risk management systems, the risks, the Risk Management Plan, the internal control.*

УДК 355

MODERN IMPROVEMENT OF THE BATTLE TANK YATAGAN

Viktor Yekimov, Kharkiv

The Yatagan tank is the result of improving the T-84 tank and adapting it to the requirements of NATO standards. It is equipped with a 120-mm smoothbore gun and an automatic loader located in the aft compartment of the turret.

The Yatagan tank is assembled from Ukrainian-made components, although it is envisaged (at the request of the customer) to install systems from foreign manufacturers.

The tank is equipped with powerful weapons, an automatic loader, its armor provides an exceptionally high degree of protection against modern weapons; its fire control system allows the crew to carry out combat missions, both day and night, in any weather conditions; The power plant is capable of operating in a wide range of temperatures in various terrain, including mountainous areas with an altitude of up to 3000 m. A wide range of additional equipment can be installed on the tank.

The main goal of the development is to install a 120 mm NATO standard cannon in a tank, for which unitary shots of various types are placed in an automatic loader at the rear of the tower (22 shots) and the rest are mechanized in the hull.

The hull has anti-cannon, combined and shielded armor protection using a complex of built-in reactive armor.

In terms of mobility, the Yatagan tank is similar to the T-84 tank.

The Yatagan tank has a fire control complex for the Oplot tank, adapted to the new weapons. Its main feature is to ensure the possibility of launching a 120mm rocket through the gun barrel.

Key words: *improving components, modern weapons, crew, power, tank.*

УДК 355.6

TO THE STREAMLINING OF LOGISTIC SUPPORT SYSTEM OF THE ARMED FORCES OF UKRAINE

Yurii Yuriev, Kyiv

Generalized experience of structurization of the systems of the logistic providing of Military powers. Grounded principles of improvement of organizational and functional structure of the logistic providing are in the context of joining of Ukraine to NATO.

Within the logistics system of the Armed Forces, its main function is realized - logistical support of the Armed Forces. Logistics support of the Armed Forces is a function that is implemented by the authorities, logistics units and equipment for the benefit of troops and is expressed in the implementation of logistics (supply), technical support, transport and infrastructure operation, as well as selected aspects of health care. Logistics support of the Armed Forces is a set of closely related procedures, as well as the activities of logistics bodies and units, which are aimed at the proper organization of the logistics system, efficient use of transport network and vehicles, as well as providing troops with everything they need for living and conducting operations of various types during peace, crisis and war. It consists in coordinating, planning, organizing, stimulating and controlling the use of various means of supply, as well as the implementation of a wide range of specialized and household services. The purpose of the logistical support of the Armed Forces is to meet the needs of troops in the means they need to live and

conduct military and extra-military operations, and to ensure the ability of human resources, as well as weapons and military equipment to conduct hostilities.

Today, not enough attention is paid to the study of the theoretical foundations of logistics services for the Armed Forces of Ukraine. At the same time, the situation in neighboring Poland is much better. In particular, in Poland the essence of logistics of troops is expressed in the preparation of properly directed and located spatially material, technical, medical and 336 transport potential, as well as providing opportunities for their rational use (while extensive use of local logistics infrastructure) to create conditions for effective operations of different kinds.

Logistics is implemented using military and civilian capabilities. Civilian means are planned to be used when it is operationally, economically justified and possible in the existing legal conditions. Summarizing the subject structuring of military logistics, we give a brief description (taking into account NATO doctrine).

The process of supplying troops is an integrated process that includes:

- physical movement of supply supplies;
- information flows that determine the serviceability and effectiveness of physical processes.

The scope of physical movements of supplies includes:

- attraction;
- accumulation;
- storage;
- rotation and distribution;
- evacuation and use of local supplies;
- use of military booty.

A special form of physical movement is logistics services and household services designed to supply troops.

Logistic information flows in the field of supply cover such processes as:

- forecasting;
- planning;

- rationing;
- accounting;
- reporting;
- control.

A specific category of information flows in military logistics systems are logistics orders, directives and reports, which act mainly at the junction of the supply system and the management system.

For use by all member states of the North Atlantic Alliance, the definition of logistics contained in the Union edition STANAG 2406 (standardization agreement) is mandatory, which defines logistics as the science of planning and implementing regrouping of troops, as well as keeping them ready. The scope of logistics includes such activities as:

- design, development, involvement, storage, distribution, operation, use and evacuation of weapons and equipment;
- relocation, evacuation and hospitalization of staff;
- involvement, construction, maintenance, use and management of military facilities;
- involvement and provision of logistics services.

The doctrine of the NATO Armed Forces very clearly imposes on all NATO member states and bodies a common (Allied) responsibility for the effective logistical support of the multinational military operations of the NATO Armed Forces. At the same time, the full independence and autonomy of individual national formations and the means in their possession are emphasized, until they are formally transferred to the NATO commander. With regard to significant differences in the organization and equipment of NATO's national Armed Forces, a full understanding of the provisions of the logistics doctrine and its overall coherence with the main, national defense doctrines of individual Allies is essential.

Logistics in the Armed Forces of Ukraine should be perceived as a theory and practice of ensuring their functioning. Given the wide range of functional

coverage of logistics, it is advisable to strictly conceptualize the construction of military logistics with an appropriate organizational structure.

Based on the generalization of world historical experience, it is necessary to consider reasonable the construction of military logistics on the basis of the macro-logistics system, the main purpose of which is to provide logistics to the Armed Forces of Ukraine.

Structuring the logistics system of the Armed Forces of the country based on the experience of NATO countries will optimize the structure of the logistics system, its hierarchy, internal and external dependencies. The formation of meaningful characteristics of these dependencies requires the continuation of research on the identification of goals and objectives of the structural elements of the logistics system of the Armed Forces.

The current preconditions for the functioning of the country's Armed Forces pose many new challenges for logistics, in particular in the context of joining NATO. This is:

- organization of logistical support of components operating in all forms of multinational joint forces;
- implementation of logistics activities within multinational logistics;
- organization of supplies, as well as the provision of logistics services within the support of the host state;
- organization of logistical support of airmobile troops and rapid reaction forces.

Key words: *Armed Forces of Ukraine, NATO Armed Forces, civilian capabilities, national defense doctrines of individual Allies.*

УДК 355

THE IMPORTANCE OF MAINTAINING THE SAME TYPE OF AUTOMOTIVE EQUIPMENT IN THE NATIONAL GUARD OF UKRAINE AND ITS IMPROVEMENT

Oleksandr Zghodko, Kharkiv

The current state threatens the sovereignty and territorial integrity of Ukraine, especially the ongoing aggression of the Russian Federation, requires the introduction of the necessary ways to counter them, improving approaches to forming views on improving military equipment is one of the main tasks of the National Guard of Ukraine.

Unification of the main classes of combat vehicles and development of combat systems based on them according to the optimal options for ensuring the basic tactical and technical requirements taking into account the modularity of the structure.

The National Guard of Ukraine should also refrain from the same type of automotive equipment and the interchangeability of their spare parts to ensure a reduction in the repair time of damaged samples. Thus, it is necessary to hold a tender for the purchase of one row of automotive equipment and different capacities:

- development of a light multi-purpose vehicle and its modifications (4×4 wheel formula with a load capacity of 0.75-1.5 tons) both for the transportation of personnel and small loads, and for the installation of weapons;

- development of vehicles with a wheel formula of 4×4 and 6×6 with a capacity of 2-4 tons;

- development of vehicles with a wheel formula 4×4 , 6×6 , 8×8 with a loading capacity of 6-25 tons;

It is also necessary to replace vans, which are widely used for the installation of military equipment, various equipment, means of maintenance and repair of weapons and control and inspection equipment for container bodies. At the same time, it will make it possible to quickly replace the chassis of the car, reduce the number of cars in the location at the points of permanent deployment, increase the service life of the equipment.

In conclusion, the use of advanced technologies in the design of advanced models of vehicles will reduce the equipment weight and significantly improve the

basic tactical and technical characteristics and performance properties of the samples, will save the lives of their crews.

Key words: National Guard of Ukraine, combat vehicles, combat systems, military equipment, robotic cars, development, interchangeability.

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THE PROS AND CONS OF THE UNIFORM IN THE NATIONAL GUARD OF UKRAINE IN COMPARISON WITH OTHER COUNTRIES IN THE WORLD

Denys Zhidko, Kharkiv

The combat uniform of any country is formed under the influence of natural factors, historical traditions, technical progress, development of means and methods of armed hostilities, tendencies of the army fashion. At the same time, the newly created field uniforms must meet certain requirements to perform protective, camouflage, status, identification and utilitarian functions. This functionality is most effectively tested in combat environment. Syria has become one of such modern world "testing grounds". The experience gained in Syria can be used in the process of designing Ukrainian combat uniform.

Since the revival of the National Guard, several models of military uniform have changed. But currently the main color of everyday and special uniform of military units and law enforcement units, as well as diplomatic corps and consulate security units is blue.

For the rest of the military units and subdivisions – the color of uniform is olive. A new special uniform in "Predator" color has been developed and approved for the special purpose units of the National Guard. The color of the headgear in the National Guard of Ukraine has changed from crimson to blue. The emblem, beret badge and cockade of the National Guard of Ukraine is a golden radiant eight-pointed star, on top of which there is an image of a grenade with a flame in the mountains.

As for the practicality and convenience of this type of clothing, the material from which it is made and the way it is sewn, it does not meet all requirements. In the cold season, the uniform freezes and becomes hard, and in summer it is too hot in this uniform. After several washings, the color of the uniform fades.

Thus, it can be concluded that the material from which the field uniform is made for servicemen of the National Guard of Ukraine needs to be improved or even replaced with another, more practical in use and more comfortable in wear, and preferably made of natural ingredients.

Key words: the National Guard of Ukraine, Syria, military uniform, practicality

УДК 623.4

THE WAYS TO DIGITALIZE THE CALCULATION OF ESTIMATED QUANTITY OF AMMUNITION

Bohdan Zinkov, Kharkiv

To ensure combat and special training of personnel, the Chief of the Armaments Service fills in the form on ammunition claim – “Application for the quantity of ammunition required for combat training of the unit of the National Guard of Ukraine for a year” (Annex IX. №41), which is one of the main documents of the Armament Service of estimate- and-apply type. It estimates the quantity of ammunition that is required for all combat and special training activities carried out by a given military unit during a calendar year.

With the beginning of the armed aggression by the Russian Federation in 2014, combat and special training of servicemen and units in the NGU have gained much more significance and attracted more attention than ever. Since 2014, the National Guard of Ukraine has created many new units with different purposes, with various structures according to the Table of Organization and Equipment and specific tasks.

According to the schedule for a calendar year a large number of units that differ in their purpose and in specific tasks conduct marksmanship drills of whole units as well as of each serviceman individually, which makes the estimation of the quantity of ammunition for combat and special personnel training complicated. Therefore, to facilitate this process, we analyzed the ways to develop an algorithm for estimating the required quantity of ammunition using modern electronic means of calculation.

For development e-applications for ammunition calculation, we offer to use formulas in Excel spreadsheets which will speed up the calculation of the required quantity of ammunition, as you only need to enter the number of personnel, and the program itself will calculate the number of ammunition based on the pre-set parameters. Besides, the creation of a database will facilitate the exchange of data regarding the estimated quantity of ammunition with other military units and the supply authority.

As a result of the research, we believe that the digitalization of such document, based on application of modern electronic means of calculation, will speed up and increase efficiency of the work of the Chief of the Armament Service in calculating the quantity of required ammunition. Such system will even allow to combine several levels of approval of this application, and to control the quantity of ammunition in the military unit in “real time”.

Key words: *the National Guard of Ukraine, weapons, ammunition, Excel, electronic form.*

ЧЕТВРТА НАУКОВО-ПРАКТИЧНА КОНФЕРЕНЦІЯ

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