

*Baratyuk V.I., Berezenskyi O.I., Gluzdan A.P. Recommendations to senior of border detail on organization of ambush in conditions of combat contact with the enemy*

*In the face of the aggravation of military and political situation border guard units combat sabotage and intelligence, terrorist or anti-state formations in the controlled border area independently or in cooperation with other military units. The results of their operational activity prove the effective use of "ambush" as a form of combat with designated enemy. Along with this, a number of weaknesses have opened, including the question of organization of "ambush" by senior of border guard detail. Therefore, the elaboration of recommendations to senior of border guard detail on "ambush" organization defines relevance and practical significance to study the selected topic.*

*In this article we have analyzed the operational and service activity of border guard units, have revealed general principles on the "ambush" as a way of performing of the tasks by border guard detail, especially concerning quantitative composition of border guard detail and their distribution between the elements of the service order, which may be selected to perform this task.*

*The algorithm of the activity of senior of border guard detail during the organization of "ambush" in conditions of combat contact with the enemy has been worked out and the way of performance by each element separately has been revealed. Each of these instructions is filled with a certain content. Analysis of SBGS units activity in modern conditions gives possibility to formulate them. With some of them the organizers of "ambush" meet while organizing other measures of operational and service activity. We have revealed the most important elements of the organization of "ambush." The first is the reconnaissance. This is a complex and important element of senior of border guard detail activity. During its conducting possible variants of action in achieving of goals have been clarified.*

*Senior of border guard detail organizes and conducts reconnaissance, usually personally with senior elements of the service order. It is held from several positions, in front, on the flanks and in the rear, to predict the actions of the enemy and to take into account the impact of area. As a result of these activities senior of border guard detail takes decision, based on its content. Its version is written in the article.*

*The organization of "ambush" by senior of border detail is finished by setting of order to border guard detail.*

*Materials of the article can be used in the practice of officers who organize service of border guard details at the border, as well as during the training of border guards.*

**Keywords:** *border patrol, ambush, elements of service order, reconnaissance, decision of senior of border guard detail.*

*Hetmanyuk S.P., Adamchuk O.V. Analysis of the main specifications of contactless inspection of vehicles in the context of anti-terrorist filter realization at entry/exit control points on the demarcation line of the temporarily occupied territory of Ukraine*

*The article analyzes the purposefulness and possibility of use of contactless inspection of vehicles in the context of anti-terrorist filter realization at entry/exit control points (EECP) on the demarcation line of the temporarily occupied territory of Ukraine, analyzed the characteristics and parameters for contactless inspection means, their advantages and disadvantages, revealed evaluation criteria of visual performance required for making decisions on individual equipment of entry/exit control points by optimal view contactless product review. Considering the typical entry/exit control point on the demarcation line similar to port of entry or automobile border crossing points, based on their typical destination and control procedures, the factors that influence the automobile crossing points capacity have been analyzed. Contactless inspection means are classified as fixed, mobile, portal and scanning rail system, disclosed the advantages and disadvantages of certain types of scanning systems.*

*The possibilities of scanning systems for playback bright and clear images of objects under certain speed scanning were revealed. The key visual performance assessment criteria directly related to the power source and a scanning speed, defined penetrating, contrast sensitivity and resolution. The analysis of non-contact inspection systems indicate the possibility of accelerating the implementation of control procedures at entry/exit control points, as a consequence - increased border contact function and increased passenger traffic. In the context of rational choice of technology to perform control at entry/exit control points two key aspects were highlighted: 1) high probability of terrorist threats; 2) high intensity social conditions associated with the presence of large queues at entry/exit control points KPVV, hence solving the urgent and controversial task: ensuring a high probability of detection of terrorist activities and of sufficient capacity to implement at entry/exit control points legitimate rights and freedoms of citizens. The above problem is proposed to solve by introducing wider inspection contactless means, and this requires a comprehensive analysis of their effectiveness in specific conditions of entry/exit control points functioning.*

*To that end, the advantages and disadvantages of inspection contactless means such as portal, scanning rail, fixed, mobile scanners and their characteristics were studied. It is offered to substantiate scientific-methodological tool of choice of the latest means of observation at separate entry/exit control points in further studies.*

**Keywords:** *entry/exit control point, border security, control, terrorism, inspection contactless means, inspection contactless means, border control, efficiency, indicator of efficiency.*

*Dmytrenko O. M., Dzyavoruk A. D. Substantiation directions of improvement of border control functional management*

*The article contains the results of the research systems of border control management. The authors defined the main directions of improvement of this*

*system: optimizing the number of administrative structures, the redistribution of functions, reviewing organizational structure subdivisions of the state border, the use of automated systems management and development of decision support systems. The recommendations allow for specific measures in the process of reforming the system of operational activity of the State Border Service of Ukraine in the ways of international communication. These measures are: delegating management functions of some minor other units; introduction of electronic documents between agencies of government; development of software for automation of analytical and reporting functions of management; the rationale for the review of management structures at intermediate levels; specialization of tasks and responsibilities for each of the functional management of border control, in accordance with modern requirements for the organization of the executive power and civil service of Ukraine; develop regulations on the organization and implementation of border control, taking into account the expanded competence and powers of the lower-level managers and direct executors - that is, using the principle of subsidiary; reform of the staff organization units guarding the border, border agencies modeled on the European Union; performance management functions of the State Border Service in plane functions integrated border management of Ukraine. The authors emphasize that any reduction device management, change its functions should be regulated to the extent provided in which personal responsibility for management decisions. It was established that the quality and the functional organization of border control has a direct impact on the efficiency of the tasks the State Border Service at checkpoints across the state border. The strategy of improving the functional management of border controls should be focused primarily on the search for optimal solutions between centralization and decentralization of government functions, due to the need: to respond quickly to changes in the situation at checkpoints across the state border; establish rational links between chains and management at all levels, to minimize the number of degrees of management structure, increase the efficiency of the decisions taken. The scientific use of the results is important in the process of reforming the management system of the State Border Service of Ukraine.*

**Keywords:** *management, structure, function, organization, improving, border control.*

**Zhuk S.M. The estimation model of system elements of gathering and obtaining information, data processing of situation in the border guard service division type "b" in forested mountainous terrain»**

*The basic types of offences were distinguished according to the specificity of the operational-service activity and tasks set to the border guard service division type "b" in forested mountainous terrain.*

*As the result of illegal activity data analysis groups of information characteristics of typical offences in the area of responsibility of the border guard service division type "b" were formed. Such information characteristics of typical offences are revealed by the personnel of structural unit of the border guard service division during accomplishing missions in State border protection.*

*It requires the development of the estimation model of system elements of gathering and obtaining information, data processing of situation in the border guard service division type "b" in forested mountainous terrain, that will give an opportunity to the department of the border guard service division to perform calculations with the help of which one can estimate the effectiveness of system elements in gathering and obtaining information, data processing of situation in the border guard service division type "b" in forested mountainous terrain. The problem of the estimation model of system elements of gathering and obtaining information, data processing of situation in the border guard service division type "b" in forested mountainous terrain were not researched in details, while existing methods developed for security and protection of the State border of the USSR nowadays are not effective. The task of this article is to present the estimation model of system elements of gathering and obtaining information, data processing of situation in the border guard service division type "b" in forested mountainous terrain.*

*This model allow the department of the border guard service division to perform calculations with the help of which one can estimate the effectiveness of system elements in gathering and obtaining information, data processing of situation in the area of responsibility in forested mountainous terrain. The result evaluation of weighting coefficients that reflect the opportunities of system elements of information support for revealing of information characteristics of offences allow to solve tasks of choosing rational connection of information elements according to the direction with concrete offence.*

**Keywords:** *the Border Guard Service Division type "B", forested mountainous terrain, border guard detail.*

**Ivashkov Y.B., Ivashkova T.O. *International cooperation and collaboration of the State Border Guard Service of Ukraine on prevention of cross-border crime.***

*The article is dedicated to research relevance of international cooperation and collaboration of the State Border Guard Service of Ukraine on cross-border crime preventing, due to the need for a reassessment of the main issues in the field of national security and protection of the state border of Ukraine.*

*We have generalized analysis of problems' development in modern scientific researches. The position of regulations that govern the issue of the state border security; proceedings of subjects of integrated border management activities on prevention, detection, disclosure (investigation) of cross-border crimes; coordination of the competent state authorities activity on providing of security and transparency of the state border; development of international, border and inter-agency cooperation; providing of immediate organizational, inquiry (investigative) and search operations; providing of preventive measures to prevent crime, especially organized crime and facts of corruption; timely detection and prosecution of persons who have committed offenses have been analyzed. The basic elements of international cooperation and collaboration of SBGS of Ukraine at the border level have been revealed and its main tasks have been found out.*

*The basic forms of international cooperation in the organized crime combating sphere have been analyzed.*

*The basic problems and threats in the field of state security which need solution have been analyzed. We have revealed that serious concern deals with: the growing scale of international terrorism, proliferation of mass destruction weapons and unlawful activities (especially piracy); crisis of international law and international institutions and security systems; Russia's desire to assert as one of the world centers (poles) of force and increasingly aggressiveness of its foreign policy, including the aggressive actions of the Russian Federation in certain regions of Donetsk and Lugansk, the temporary occupation of the Autonomous Republic of Crimea and Sevastopol city; lack of consensus on the Euro-Atlantic area regarding relations with Russia and responding to aggressive acts of its foreign policy; urgent need for implementation of the European standards of border, customs and other kinds of state control of the state border.*

*We have made conclusion that the successful implementation of the rules of the regulations and international agreements would implement European standards of border management, improve international, trans-border and inter-agency cooperation, coordinate the efforts of the authorized state bodies for integrated and flexible response on modern threats in the state border security sphere, and also ensure its openness for conducting of cross-border activities.*

**Keywords:** *national security, border security, international cooperation, normative and legal regulatory support, cross-border crime.*

### ***Krivii I.V. Border Guard Units` readiness designation to the activity in the natural emergencies conditions***

*State Border Service of Ukraine performs the tasks of the state border of Ukraine on earth, sea, rivers, lakes, etc. Border guards will take an active part in the liquidation of the disaster in the event of a sudden emergence at the responsibility area, ensure law and order in the affected areas.*

*The purpose of the article is to analyze emergency situations in Ukraine specific areas and to consider the problematic issues of the State Border Service of Ukraine Units` readiness to the activity in the natural emergencies conditions which are typical for Ukrainian territory.*

*After analyzing civil defence and scientific performance experience works in the life safety field and emergency comparing areas with the physical and geographical conditions of the State Border Service of Ukraine Units` area is made the structure of their impact on the Border guards` operational activities.*

*It is systemized the emergencies impact on the general and special signs. Also it is discovered units` readiness to the activity in the natural emergencies conditions external threats and internal risks of the.*

*The State Border Service of Ukraine Units` readiness to the activity in the emergencies is the ability for action control system, personnel and means border to fulfill the assigned tasks in a specified service time.*

*The main components of the units' readiness for action include the following concepts: levels and criteria.*

*There are individual, collective, management, logistics and general levels divided Units` readiness.*

*Criteria readiness department to function in emergencies are divided into "ready" to function in emergency situations; "Limited ready" to function in emergency situations; "Not ready" to function in emergencies.*

*It is necessary to determine the total level of units` readiness to act as the sum of individual, collective, managerial, logistical levels and the calculation of available forces and means and defining their objectives according to criteria to not lower than "limited ready"*

*The study to determine the possible approach to the task of ensuring units' readiness to act is the operational activity modelling at the natural emergencies conditions which are typical for Ukrainian territory.*

*It outlines the direction of future research, namely justification given criteria the State Border Service Units' readiness to action at the emergencies, to distribution the personnel and means Border Service and the definition of their optimal tasks.*

**Keywords:** *Border Guard, service activity, natural emergencies, areas of possible threats, unit`s readiness to the activity.*

### **Kulish R. S. Operation algorithm of the chief of border guard service department for working out of proposals while organizing operational and service activity**

*Over the past years, based on the experience of law enforcement border guard agencies of the EU, the Administration of the State Border Guard Service of Ukraine has been making sustained efforts to reform the SBGSU into a modern European law enforcement body.*

*Currently, the main task of the border guards is implementation, within their competence, of the President`s Peace Plan on resolving the situation in the East of the country, including the assignments in the security sector along the frontier line as well as on development of engineer constructions on Ukrainian-Russian border and along the administrative border of the temporarily occupied Autonomous Republic of Crimea.*

*Border guard service department remains the main unit of the State Border Guard Service of Ukraine which carries out operational and service activity at the state border.*

*The article reveals the work of a chief of border guard service department aimed at preparing proposals while organizing operational and service activity for the term of one year.*

*The work of a chief of border guard service department aimed at preparing proposals while organizing operational and service activity for the term of one year at the sector border detachment; has been analyzed; the operation algorithm of the chief of border guard service department for working out of proposals while organizing annual operational and service activity has been elaborated in the article.*

**Keywords:** organization of operational and service activity, border guard service department, operation algorithm.

**Kupriyenko D., Sychevskiy Y. A detailed design of particular personnel training curriculum as a part of national differentiated personnel training curriculum in the sphere of Integrated Border Management (in terms of training the specialists of the State Border Guard Service of Ukraine (SBGSU) in documents checking)**

The peculiarities of detailed design of particular personnel training curriculum (PTC) in the sphere of Integrated Border Management (IBM), based on the competency building and system approaches, are examined in the article. An example of drafting and analysis of the PTC for training the specialists of the State Border Guard Service of Ukraine in documents checking, using an offered method, is presented for better illustration.

Usage of the method has resulted in defining the following: the tasks which are to be fulfilled for reaching the IBM aims at the local level; basic (particular and common) competencies which the personnel should possess for successful fulfilment of the tasks; personnel categories – noncommissioned officers (BG junior inspectors and BG inspectors) and officers (BG senior inspectors and BG division commanding officers) who are responsible for checking the documents at the BCPs.

An analysis of the current personnel training curricula showed, that the competencies on risk analysis, stressful situation localization and violators search at a BCP area, were not developed at the SBGSU Training Center. Thus, a way of handling the problem was offered.

The elements of the basic competencies development system were structured as well as appropriate training forms and methods, lesson types, competency maturity control diagnostic method, time parameters of the process and training means were offered.

Practical implementation of such an approach creates basic conditions for reaching the whole IBM personnel necessary qualification.

**Keywords:** integrated border management, personnel training, detailed design, competency building and system approaches, particular personnel training curriculum.

**Kurashkevych A. P. The problems of determining the probability of conducting sabotage-intelligence operations and terrorist activities in the border detachment's sector of responsibility**

Development of rational approaches to operational, service and combat missions support, combating the expansion of terrorism and counteracting it both on daily basis and in the course of anti-terrorist operations, solving of current problems when executing main task of fighting terrorism under the conditions of performing other tasks of the State Border Guard Service Ukraine, as a special law enforcement agency, determines the need to perform certain functions and tasks, accomplished by a border guard detachment engaged in conducting anti-

*terrorist operations alongside with performing daily functions of the State Border Guard Service of Ukraine under regular conditions which requires to define additional tasks on countering possible sabotage and terrorist activities.*

*That is why there is an urgent need for development of a model of determining the probability of conducting sabotage-intelligence operations and terrorist activities in a sector of responsibility of a border detachment.*

*In view of the set task, which lies in elaborating of the model of determining the probability of conducting sabotage-intelligence operations and (or) terrorist activities in border detachment's sectors (areas) of responsibility, it should be noted that such assessment of probability is vital for taking timely decisions on actions of the State Border Service Ukraine units to prevent negative consequences for national security in the border area.*

*Successful combating sabotage, intelligence and terrorist operations becomes possible with timely detection of the informational signs identifying the places of probable committing of offences by the bodies under observation which is followed by transmission of quality (accurate and complete) information to the headquarters for its further processing and transformation which is required for working out of management decisions.*

*Thus, it is necessary to organize data collection of informational signs about typical and conceivable places for conducting sabotage, intelligence and terrorist operations to identify their probable venues. Basic informational signs of typical probable places (areas) for conducting sabotage, intelligence and terrorist operations have been outlined in the article.*

*The model and algorithmic formulation proposed in the article include the assessment process description of the degree of conformity of the suspected object to the existing facts of illegal actions in other areas that allow to determine probability of conducting sabotage-intelligence operations and terrorist activities in places (areas) of responsibility of state border guard units. The elaborated approach enables the commanders of border units (body) to receive feed-forward information about possible places of conducting unlawful activities; to make adequate decisions according to the situation in order to prevent such activities in the area of responsibility; to take timely measures aimed at prevention of possible negative consequences for national security in the border sphere.*

**Keywords:** *sabotage, intelligence and terrorist operations, operational, service and military activities, state border guard unit (detachment).*

**Lemeshko V.V. "Reasoning of appropriate forms of operational and combat activities to implement the objectives of the rapid reaction border units."**

*The creation of rapid reaction border guard units (new, modern format today: the border commands of rapid reaction, operational and border military commands) was induced by situation that has arisen and now exists in the eastern part of Ukraine. Also the existing conflict may be situated in the range as from full-scale combat actions, and to its complete disappearance. That is why it is important to consider the use of the above units in other parts of the border (the Transnistrian segment, combating of illegal activities on the western border,*

*combating of illegal extraction of amber and other tasks assigned to the State Border Guard Service of Ukraine).*

*Based on this article we need to justify appropriate forms of operational and combat activities on implementation of the objectives of the rapid reaction border units.*

*The advisable forms of operational and combat activities will be: border guard service; operational and search activities; special measures; participation in special (border) operations; combat according to the possibility of a sudden change in the situation on exacerbation of the military and political situation on the state border and the need to fulfill the tasks assigned to border units of rapid response, to implement the functions of law enforcement, special, defensive nature.*

*The main way of operational and combat activities of border units of rapid response is the simultaneous use of complex capabilities of these units and their capacity to consistently threatened areas in case of a proactively and reliable information in order to detect in time and suppress of violations of legislation on border issues.*

*The information basis for the justification of appropriate forms of operational and combat activities in performing of the tasks assigned to border units of rapid reaction (realization of functions of law enforcement, special and defensive nature) is the existing theoretical achievements, results of departmental analgesic activity and experience in performing of the tasks by units of the State Border Guard Service of Ukraine at the eastern part of the state border. However, issues related to forms of operational performance (operational and military) activities of border units in conditions of the tasks performing related with the situation that characterizes the aggravation of the military and political situation on the state border were not examined, and the existing made for conditions of security and protection of the state border in the USSR. That is why we have characterized the main forms of operational and combat activities to implement the objectives of the rapid reaction border units.*

**Keywords:** *operational and combat activities, border units of rapid response, security and defense of the state border.*

### ***Mahas H. A. Analysis of information that circulates in the current system of collection and processing of situational data of the state border protection units***

*The article analyzes the information that circulates in the system of collection (extraction) and processing of situational data of the state border protection units. Experience of border agencies of the European states on the organization of daily monitoring of the situation and rapid responses to its changes shows that without the introduction of advanced information technology it is difficult to create an effective system for collecting and processing of information flows. Implementation of this problem, as seen, is possible only on the basis of a detailed analysis of the information received by the unit of the state border, and on this basis - improvement of data collection and processing of conditions as a key subsystem of management decisions adoption.*

*The results of analysis of information that continually comes to the state border protection unit shows about its significant amount and variety (diversity). Large flow of information requires from the state border protection unit leadership proper organization of activity with the information. The today realities are such that the advantage of the results of any activity has and will have a more informed subject. Collection and generalization of information allows to compare, to select the necessary amount of information required in the preparation of management decisions. Detailed and constructive analysis of the main elements of the situation allows the leader to predict its further development, to take appropriate and informed decision, to organize work to achieve positive results.*

*On the other hand a big workload of border protection unit leadership by information flow is signalized. From the large number of incoming information not all information has the proper value, not all information has a corresponding impact on the functioning of the border protection unit and not all information causes necessity to change external conditions of afforested unit functioning.*

*There is a contradiction between the established organizational structure and retardation of management methods (procedures) of processing of their information and forming of elements of the decision; between the great potential of communications and information systems for collecting and transmitting of information and opportunities of staff for its processing.*

*Thus, summarizing the above mentioned, we can conclude that at this stage of the reform of the State Border Guard Service of Ukraine, work with information in the system of collection (extraction) and processing of information has statistically and accounted character, that is, the algorithm of the identification of information on the occurrence of situations in the area of responsibility of state border protection unit exists, but there is no method of information processing, which in turn leads to errors during important management decision-making.*

*The corporate computerized information systems operating in border protection unit don't provide their main purpose, namely to organize information coming from different sources, to choose the optimal solution from possible solutions, depending on the parameters that are filled in the information system. These automated information systems don't enable to provide decision options, to perform modeling of border protection unit actions and the choice of model actions.*

**Keywords:** *information, system of collection and processing of situational data, the state border protection unit, the operational and service activity.*

***Mazur V. Yu., Farion O. B. Operational and investigative activity of border guard units as a means of combating illegal armed formations in the area of anti-terrorist operation***

*The issues connected with study of the role of operational and investigative activity of border guard units as a means of combating illegal armed formations in the anti-terrorist operation area have been covered in the article.*

*Based on the analysis of criminal activity in Luhansk and Donetsk regions of Ukraine the factors of terrorist activity have been summarized. It has been*

*determined that specific feature of terrorist activity is creation and existence of criminal organizations and illegal armed formations armed with firearms, explosives and other weapons, possessing means of sabotage and military equipment and which are controlled neither by society nor by the state.*

*The attention is focused on operational and investigative activities in the light of representing the mechanism for combating terrorism in operational and combat activities of law enforcement agencies of Ukraine in the area of antiterrorist operation.*

*A generalized mechanism of operational and investigative activity of border guard units in the field of collecting (gaining) and processing intelligence information related to activities of illegal armed formations in the area of anti-terrorist operation has been presented taking into consideration the study of scientific modern approach to terrorist activity counteraction.*

*A number of analytical methods have been considered which enabled to conduct a comprehensive analysis of systematic information about the activities of illegal armed formations. These methods include statistical analysis; analysis of the areas of illegal activity, analysis of relations and events, content analysis, analysis of situation development, descriptive analysis, geographical analysis of resources allocation (distribution), analysis of identifiers, analysis of telephone connections and analysis of channels of illegal cargo transportation across the demarcation line between controlled and uncontrolled territory of Ukraine.*

*The result of analytical study – illegal armed formations' telephone connections diagram in the area of anti-terrorist operations – has been presented. This analytical product of operational and investigative activity enabled us to establish the relationship between people and organizations involved in illegal armed formations activities; to detect common criminal signs of suspects who answered the monitored calls; to track and locate certain criminals.*

*The scientific approach proposed in the article allows using all possible options of operational and investigative activity of border units as effective means for combating illegal armed formations in the area of anti-terrorist operations.*

**Keywords:** *operational and investigative activity, illegal armed formation.*

**Maltsev A. Y. *Analysis of the functioning of the State Border Guard Service of Ukraine management system.***

*Military aggression at the large area of the south-eastern border of Ukraine forced to see the basic approaches to security and protection of the state border, which in turn affected the functioning of the management system of the State Border Guard Service of Ukraine at all organizational levels.*

*Analysis of the conditions of preparation and implementation of the operational and service performance of the State border indicates that the protection of the state border can be effective only in the presence of a well-organized management system, conformity with its capabilities and readiness to activity by the possibilities of border protection detachments (border units) and the conditions in which the protection of the state border is performed.*

*Therefore, there is an acute task of modernizing of management systems, equipping it with modern technical facilities, development of effective management models by detachments and other border units of the state border.*

*Management System of the State Border Guard Service of Ukraine can be represented as functionally and hierarchically interconnected management units, control points and management tools.*

*It has a complex, specific structure and in contrast to the command and control system of troops is constantly in action (tense). A large number of constituents and subsystems are involved in its functioning every day; there are links and dependence between them affecting the construction of the system as a whole and its separate subsystems, as well as the principles of their functioning.*

*Specificity of the system is stressed by the fact that it needs to process and transmit a large amounts of information. The large volumes of information circulate in the various subsystems of management system for all areas of operational and service activity of border agencies; define the foundations of its construction and development.*

*The structure of the State Border Guard Service of Ukraine management system has been revealed, analysis of the functioning of individual elements of the management system has been performed, its specific features, which in turn made it possible to form major problem areas of management activity of border agency have been determined.*

**Key words:** *management system functioning, management system structure, management units, management tools, management points.*

***Martynyuk V.P. The analysis of information needs of management bodies in the decision-making process on the issues of state border protection***

*This article discusses the information needs of management bodies in the decision-making process for the protection of the state border. Modern conditions of activity of bodies of management of border guard service, which are respectively characterized by: a substantial increase in the volume of information which comes to them; complexity and dynamism of the situation that causes the necessity of expediting management decision making regarding the use of mobile forces and means and their implementation; increasing the number of parameters of the situation and factors that affect them, and the limitations of existing scientific and methodological apparatus for their simultaneous examination; increasing the number of control objects, the variety and complexity of tasks that they are entrusted with. This causes the need for a reliable and effective information management system that would meet the needs of protection of the state border and ensure reliable and accurate information with the required quantitative and qualitative parameters, in the correct amount, and at a certain time.*

*To ensure these requirements the analysis of the functioning of information systems in the decision-making process. Decision making is an integral part of the process of the organization's operational action for the protection of the state border is a Central element of administrative activity of the chief, of staff and other*

*management bodies of the border guard detachment in relation to which all others can be considered as auxiliary.*

*Decision making is a complex “ integral ” processes for the design of variants (alternatives) of action units and selecting among them the optimal (best), which allows to reduce the gap between the existing and the desired level of protection of the state border. The essence of the decision lies in the fact that, in accordance with the situation that develops, to determine the subsequent plan of action of forces and means of border patrol, the tasks of the structural units, their interaction, and administration. The goal of decision making involves solving problems and tasks that make up the content and sequence of actions of the chief and of the authorities at any level. This result allows to conclude that the prediction in the sphere of protection of state borders has always been of crucial importance. As the development and improvement of management structures of bodies of state border protection it should be noted that problems of information support of the needs of governments in the decision-making process for the protection of the state border is and always will be home. However, as the analysis shows, in current conditions, the intuitive predictions do not give accurate and objective information about what, and under what conditions may occur in the future.*

*A significant portion of the results of forecasting (27%) cannot be used as input information for decision making. The content of the forecast does not allow the head of the body of state border protection see more clearly picture of the future situation than without them, and requires further research and development of appropriate recommendations.*

**Keywords:** *information needs, facilities management, decision making, information, ways deistvy capabilities.*

***Mykhailyshyn O. O. Recommendations for the state border guard service of ukraine on training of personnel acting as a part of special operations forces in a built up area***

*The issues of combating sabotage and reconnaissance groups as well as illegal armed formations have been continuously in the focus of researchers' attention. However, it should be noted that deployment of border units as a part of special operations forces for combating sabotage, reconnaissance and illegal armed groups during anti-terrorist operation has its own peculiarities and thus requires a profound study.*

*Carrying out of combat missions in built up areas has a number of distinctive features. In order to reduce casualties it has been suggested by the author to use sudden, intelligent and active search against sabotage, reconnaissance and illegal armed groups based in built up areas.*

*All the activities aimed at finding and eliminating sabotage, reconnaissance and illegal armed groups should start, if possible, with conducting reconnaissance of the built up area. Corresponding peculiarities of preparing and conducting reconnaissance in built up areas have been presented in the article.*

*Search operations procedures in built up areas have been revealed in the article. Much attention is paid to the peculiarities of the actions of military personnel in built up areas when organizing the search for sabotage and reconnaissance groups as well as illegal armed formations. The guidelines for the soldiers during the assault of buildings occupied by the enemy have been outlined.*

*The author proposes to subdivide the training of personnel of border guard units to operate as a part of special operations forces into two stages: preliminary and immediate preparation, providing their contents.*

*Thus, the changes in the troops' actions that have emerged during the armed conflict in the Eastern Ukraine, enabled us to scrutinize and identify the trends of development as well as, based on that, to suggest contemporary views on deployment of troops in the process of working out of the regulations; to implement them in combat training and to continue finding the ways to bring the state of troops (forces) in line with the current requirements.*

**Keywords:** *border units, combat against illegal armed formations, sabotage and reconnaissance groups, built up area.*

**Prokopenko E. V., Mul D. A. *Mainstreaming the likely challenges and threats to Ukraine's national interests in the sphere of security***

*In the article the scientific approaches in assessing the challenges and threats to Ukraine's national interests in the sphere of security. In order to guarantee their level of security, it is necessary to assess and predict current and potential threats, no matter how small they may be, and in a timely manner to provide a wide range of necessary measures in the political, economic, social and other areas of government activity in the ratio of the entire spectrum of means of influence. Particular attention should be paid to the analysis of conceptual views, documents and practices in the field of foreign policy and military activities of the United States, China, Russia. Threats to national security of Ukraine and its allies in the defense sector are increasingly becoming integrated. In itself, the division of threats to military and non-military becomes largely conditional, since the latter, under certain circumstances can be transformed into the military. You must select a separate block military-political risks and challenges that could potentially become a threat to use military force against Ukraine. Namely: open interference in the internal affairs of Ukraine by the Russian Federation aimed at the violation of the constitutional order, territorial integrity and sovereignty of Ukraine, internal socio-political stability and the rule of law; counteracting the formation of collective security with the participation of Ukraine; unresolved issues of state border delimitation in the Black and Azov Seas, incomplete legal registration of the state border of Ukraine with Russia, Belarus and Moldova; attempts to destabilize Russia by the socio-political and economic situation in Ukraine, as well as provoking separatist sentiments in the areas densely populated by national minorities in Ukraine; targeted information (information-psychological) effect using modern information technologies aimed at fostering international image of Ukraine as artificial, unstable state, unable to progressive social and economic development, and to destabilize the internal socio-political situation, interethnic*

*and interfaith relations in Ukraine or some regions and areas where national minorities; the activities of foreign intelligence services, military units, organizations and international criminal hacker groups and individuals with the use of modern information and communication technologies to destructive impact on the operation of automated systems of state and military control, committing illegal acts regarding public information and telecommunication systems, critical facilities information infrastructure; actions of other states on a complication and slowing economic development of Ukraine; proliferation of weapons of mass destruction and their means of delivery, terrorism, organized crime, trafficking in arms and ammunition, illegal migration.*

*One of the main problems, in our opinion, is to restore control over the state border within the Donetsk and Lugansk regions of Ukraine, as well as preparedness for its protection within the temporarily occupied territory after the restoration of the territorial integrity of Ukraine.*

**Keywords:** *threat, security, national interests and security of the state border, the military security.*

***Soiko O. V. Complex protection of identification documents based on the principle of maximum efficiency of security features.***

*Security documents can be classified based on their values. The risks of falsification of the documents determine which security level (category) should be assigned to the documents.*

*A choice of protection mechanisms (types) and their combination depends on documents category. Knowing the procedures of how for the complex protection of identification documents is calculated and how to select a security features matrix based on the principles of their maximum efficiency make it possible to investigate the documents specifically, considering the priority of their security features on the second line control at the BCPs.*

**Keywords:** *types of security features, categories of the documents, complex protection, security features matrix.*

***Som O.B. The State Border river area protection system analyses***

*Last time at the State Border there appear the problems which demand to find effective counteractions. It is determine in the Border Guard Service of Ukraine Development Strategy the near (till 2017) and far (till 2020) perspective.*

*In the article it is revealed the State Border river area protection system as one of the gathering (obtaining) and situation data handling system elements, also river area State Border protection formation peculiarities.*

*One of the reaching the aim direction is the State Border river area protection system modernization and forming continuous observation there, also providing its integration to the common-state automatic State Border river and sea area protection system, information connection development with the Sea Military Force of Ukraine.*

*State Border Service Units activity operative-service results in 2014-2015 testify about the shortcoming row in the State Border river area protection.*

*Condition dynamic development demand from the State Border protection units` chief the quick real situation determination of the above-mentioned system, all-sides estimation its effectiveness function and, if it is necessary, in-time its activity correction.*

*The State Border protection units chief and the units` work for the State Border situation estimation and analysis has to be qualitative and constant, and henceforth must be accounting in the State Border protection forming. But, except the mentioned tasks, the State Border protection units chief and units have to account while their work the row of the inter-connecting factors which are exist and namely influence on the operative-service activity organization at the river area.*

*The proposed State Border river area protection system would give the possibility to appoint criteria and indexes, which characterize State Border river area protection system, and to work out the State Border river area protection system model formation methods.*

**Keywords:** *system of protection, coverage of surface situation.*

### **Trembovetskiy O.G., Lazorenko O.V. Regional armed conflicts conditions beginning analysis and Frontier Department tasks in case of their rise**

The article is devoted to the separate approaches studying to the regional armed conflicts phenomena determination. The conditions, reasons and their peculiarities appearance are characterized. The research importance considers that armed conflicts influence on the Frontier Service organs and units operative-service activity and State national interests defense. The State Border defense system improvement necessity, accounting military constitution, demands to concretize Frontier Service Department tasks proceeding from Ukraine National security threats in modern conditions, searching and finding the State Border protection effective forms and methods.

Basing on scientific sources analysis, regional armed conflict is the armed conflict between two or more countries, which concerns the situation at the certain region and mostly happens by the strait or indirect assistance of the great states or with the international character military-political assistance corporations. None of regional armed conflicts is similar with another. It is always characterized by its own peculiarities as of the origin reasons, means and conflict sides` membership also as to the circumstances peculiarities. It is presented the regional armed conflicts classification, which is based on such widespread and tested criterions as: means, sides` structure which takes parts in conflict, geographical scale, continuation, etc.

It is also determined the regional armed conflicts peculiarities in the East of our State, among which are: the direct proximity to the Russian Federation Border, sabotage activity, aggressive media-psychological attacks, financed by the special services, mass-sabotage "peace" inhabitants demarches, different units army forces, coercive and law structures use, including Frontier Service Department, etc.

It is characterized the regional armed conflicts variants origination and defined the reasons of their wide-spreading. Basing on the theoretical-

methodological approaches analysis to the regional armed conflicts, it is studied their peculiarities of nowadays.

According to the practical experience and demands, which are made Frontier Service Department responsibility, it is also defined the realizing tasks for the State Border Protection units in the case of armed collisions.

It's also defined that the regional armed conflicts development specification and peculiarities accounting have to render their origin assistance and improve their mechanisms prevention and neutralization.

**Keywords:** regional armed conflicts, National security, armed threat, operative-service activity.

*Balytsky I. I., Lysyi M. I., Polishchuk V.V. **Methodology of preparation and carrying out field tests of border guard pilotless aviation complexes***

*Constantly increasing interest of military and civil consumers to small-sized unmanned aerial vehicles involves a continuously increasing number of organizations to their design and production. In this regard, the great topicality has acquired the methodology of preparation and carrying out of field tests of border protection pilotless aviation complexes, which will allow to carry out correct check of compliance of the declared characteristics required by the State Border Guard Service of Ukraine concerning pilotless aviation complexes, and also to save time and funds for tender selection of the best samples.*

*Thus, it is necessary to consider that in the conditions of economy of financial means on design and flight tests, they become one of the most labor-consuming stages, which is connected with material expenses, and large volume of completions. Therefore, flight test techniques of unmanned aerial vehicles that make it possible to detect drawbacks, methodology of preparation for tests are especially topical when carrying out tender purchases. As an object of research the process of preparation for tests of small-sized unmanned aerial vehicles is considered in the work.*

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*The article considers provisions of methodology of preparation to field tests of border protection pilotless aviation complexes with short flight duration, and that will allow to conduct selection of means, which meet demands the most.*

*Process of preparation has to be the initial stage of process of field tests of pilotless aviation complexes and, proceeding from economic feasibility, have to include such components: remote control of the basic possibilities of the complex; control of the basic tactical performance on the base of the producer; implementation of organizational measures for carrying out of the field tests of pilotless aviation complexes on the training range of the State Border Guard Service of Ukraine.*

*The basic provisions of the methodology have been revealed: definition of the general provisions of the field tests process; completing flights programs; definition of requirements to material support of tests, registration of the reporting; justification of the list of tactical and technical requirements to pilotless*

aviation complexes; development of the methodology of carrying out flight tests of pilotless aviation complexes.

**Keywords:** test, pilotless aviation complexes.

**Borovik O. V., Borovik O. V., Darmoroz M. M. Optimization characteristics queuing system**

In the study of operations often have to analyze the work of original systems, called queuing system (QS). Examples of such systems can serve as a point of crossing the state border, the system operation of means of border protection and so on. The random nature of the flow of applications, and in general, and the length of service leads to the fact that the QS typically is a random process. In order to determine recommendations for the rational organization of the process and requirements for intelligent queuing system, it is necessary to examine a random process occurring in the system, and describe it mathematically.

Research and installing QS relationship between the nature of the application flow, number of channels, their performance, and the rules of QS success (performance) service was the attention of many researchers. It investigated the stochastic process that takes place in the QS. In the various QS, this process may be different. For many of them, including the border crossing points, as well as for operating systems technical security facilities abroad, this process can be a Markov random process with discrete states and continuous time.

Ensuring a sufficient level of efficiency of the queuing system is largely dependent on resources. And as this relationship usually is not directly but indirectly, it issued unobvious purpose resource that optimize efficiency QS. This is what makes the urgency of the task performance optimization QS.

The work staged performance optimization problems queuing system, an algorithm that can be used for solving them, and by analyzing the mathematical methods that implement the individual steps of the algorithm reasonably conclude feasibility of establishing specialized information systems, making it possible to optimizing performance.

**Keywords:** queuing system, system specifications, optimization, mathematical methods, algorithm.

**Dabichev I.V. Influence of ignition timing on the performance of the engine is equipped with modern system of fuel injection**

One of the operational factors that affect the working process of combustion in spark-ignition engines is the ignition angle  $\theta$  (deg). The optimum ignition timing is determined for each type of engine on the brake test stand, and it is known that the deviation angle from the optimum ignition timing leads to a shift of the indicator diagram relative to the upper dead point and increasing the heat losses. In laboratory tests the engines of the National Transport University carries out activities designed to reduce environmental pollution by toxic substances of exhaust gases and fuel consumption of petroleum origin wheeled vehicles. Between them, promising is the use of modern electronic system of fuel injection and

*exhaust after treatment on cars in service with petrol engines. For comparative studies using common carburetor engine 4F7,6/6,6, which is equipped with modern electronic system of fuel injection distributed feedback type "LH-Motronic". Process the results of research in high-speed and load conditions of the engine 4F7,6/6,6 with different power systems from the values of angles ignition timing of the engine with carburetor system determines the value of new angles ignition engine equipped in conditions of modern electronic fuel injection. Conducting research performance engine 4F7,6/6,6 with different power systems and new angles ignition speed and load conditions.*

*Experimental research engine with various system of feed have shown that changing the base ignition timing angles in the program control engine fuel injection system contributed to decrease in of fuel consumption on characteristics of idling by 11%, the specific fuel consumption average and loading ( $n=2000 \text{ min}^{-1}$ ) characterization of the injection system decreased by 5%. Engine power of the fuel injection system at full load increased by 6,6%.*

**Keywords:** *indicators of work the engine, angles of ignition timing, system of injection of petrol, carburetor system.*

#### **Ivanov A.V. A determination of the rational structure of information and telecommunication systems**

*In the article investigates questions develop a method for determining the composition of the rational information and telecommunication systems.*

*Analysis of factors influencing the functioning of the components of information and telecommunication systems (further – ITS), building communication and automation systems and different levels of management affect the importance of telecommunications equipment, components ITS, integrated use of communication and automation, constant readiness of their to use, clear organization of interaction of capabilities, performance, continuity, efficiency and secrecy management.*

*All this has points to the fact that the present provision of the necessary tools of communication and automation (ITS components) do not fully meet the requirements of the management of the situation in different conditions, especially when performing tasks on the border threatening directions.*

*It is natural put forward task efficiency communications and determination of rational structure of ITS components to achieve their compliance increasing operational performance and operational requirements of combat management subordinate agencies and departments of the state border.*

*In accordance with the methodology for complex systems research, which is a system management authority of the State Border Service of Ukraine, evaluation of its effectiveness on all aspects that characterize it, to make a whole is not possible.*

*Therefore, there is necessity of using such indicators, with reasonable accuracy would describe the components of ITS in question.*

*At present has arisen is an urgent need to address important for the effective functioning of the system of scientific problem - determining the necessary*

*components of rational structure of information and telecommunication systems, particularly in the design of software and hardware complex and specialized information and telecommunication of hardware.*

*The research showed that the resulting method provides for determining the optimal composition of components in the structure ITS systems "Gart", which is an integral part of their work and linked to the work of all the integrated ITS.*

**Keywords:** *information and telecommunication system, rational composition, rational park of, optimal composition, volume of information, procedure.*

### ***Rachok R.V. Analysis of geographic information systems in the State Border Guard Service of Ukraine***

*The State Border Service of Ukraine solving problems of state border protection with using information and telecommunication systems. An important element of many modern information and telecommunication systems is a geographic information system. Some information and telecommunication systems of the State Border Service of Ukraine use information with geo-referenced. This led to the widespread use of GIS in information and telecommunication systems of the State Border Service of Ukraine. However, much of the capacity of these systems is not used. The need to improve the efficiency of solving problems with the use of software and hardware of the State Border Service of Ukraine determines the relevance of search approaches to rational use of geographic information systems. To this end, the article analyzed the use of GIS in information and telecommunication systems of the State Border Service of Ukraine.*

*Information-telecommunications system "Gart-17" is the basis for the implementation of GIS technology. The core of the system is a server, which is implemented using software geographic information system ArcGIS. ArcGIS is world's leading GIS software. This server used in solving problems in other information and telecommunication systems. However, mainly GIS used for solving the task of storing and visualization of cartographic data and information with geo-referenced. Features ArcGIS for geo-modeling in software and hardware complex of the State Border Service of Ukraine currently not implemented.*

**Keywords:** *geographic information systems, information and telecommunication systems, geo-modeling.*

### ***Sivak V. A. Methods of officials of engineering department of organization management SBGU safe operation of vehicles***

*A sufficient number of regular modern vehicles is used in the course of performing the operational tasks of the departments and agencies of the State border service of Ukraine. Safety of their operation became a topical issue which has not been conceptually justified yet.*

*The aim of the article is to outline the nature and content developed by the author and the proposed methodology of officials of the engineering department of organization management SBGU safe operation of vehicles.*

*The article describes the structure and specificity of the developed and the proposed method, the essence of which is to identify and phased implementation of measures to assess, forecast and prevention of losses and accidents during the operation of vehicle and implement periodic monitoring of their technical condition on the major modes of technical operation.*

*The scientific novelty of this technique is determined by a complex use of methods of analysis of the emergency situation, predicting possible events and accidents, the method of deep rapid diagnosis and method of sampling of technical state fleet of vehicles, as well as the method of assessment of the security process operations of the maintenance and recovery vehicles.*

*And implementation of the proposed method will use a comprehensive approach to manage operational safety vehicle on all major modes of operation in technical units and SBGU, and develop practical recommendations to improve the system of technical operation of vehicle taking into account aspects of operational safety.*

**Keywords:** *methods, safe operation, vehicles, management.*

### **DEFENCE OF AVR MICROCONTROLLERS SOFTWARE**

*So-called Internet of ofthings became a major trend in the consumer technique of the last time. Clever televisions, wall outlets, bulbs, machines, scales. Problems into that the producers of IP- of chambers ran before now become actual for almost any devices round us. Before every developer (or by the team of developments) of electronic technique sooner or later a question appears about the protection of rights on intellectual property.*

*In the article the questions of defence of authorial koda are examined in the modern microcontrollers of AVR from breaking and undesirable research. Built-in facilities of defence and methods of counteraction to automatic and interactive дызасемблерам are considered. The novelty of the offered methods consists in the use for the mechanism of defence of architecture of commands and addressing of programmatic memory of microcontrollers of AVR software, that allows effectively to counteract to automatic and interactive дызасемблерам.*

**Keywords:** *microcontroller, defence of software, disassembler, memory of the programs.*

### **Chesanovskii I. I., Sobchenko V. A. Development of the mathematical models of the Thermal Mobile Complex subsystems reliability as for the different operating strategies**

*One of the essential elements of the system detecting violation of the border is the use of means of border protection. In recent years, the major powers of the world engaged in intensive improvement of advanced technologies in electronics, automation, on the basis of which created modern appliances, systems and systems for the protection of their frontiers. Practice shows that the current model of state border protection requires greater use of innovative technical security border such as thermal imagers, modern radars and signaling means.*

*According to the concept of the State Border Guard Service of Ukraine 2015 border guard units equipped with modern means of border protection. However, maintaining the efficiency of technology requires huge expenses. Therefore, an important issue is to improve the existing operating systems to provide the required level of reliability engineering in a limited funding.*

*According to the manufacturers` recommendations, mobile thermal imaging systems operating in the agencies and subdivisions of border protection is carried out according to the routine preventive strategy. It provides the required level of reliability in the specified conditions of use. However, due to the heterogeneity of operating conditions, the reliability of mobile thermal imaging systems does not meet the requirements for the most samples for a number of complex reliability indexes. This means that the proposed strategy needs revision or adaptation to the operating conditions, which makes the need to search the best scientific or rational approaches in the organization of the operational measures main types.*

*In this scientific article the new approach to the reliability analysis of mobile thermal imaging systems is suggested. This involves the complex decomposition into subsystems taking into consideration the tactics they use. According to the different operating strategies of individual subsystems some mathematical models of their reliability have been worked out. With the help of the designed models the analysis of the influence on the reliability of the system parameters of mobile thermal complex maintenance subsystems on reliability has been conducted.*

**Keywords:** *reliability, complex technical systems, mobile thermal imaging complex.*