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### **Balanced Weapon**

**General definition of the problem.** In studies of the methodology of the development of weapons systems, parts and units, armed forces as a whole the term “balanced” is often used. The correctness of the conceptual apparatus used while substantiating the prospects of weapons systems development, promotes a common understanding of the essence of research by professionals, and provides the substantiation of the criteria and indicators. At the same time today the term generally used definition of this concept is not even explained, and given explanations (definitions) are common, sometimes controversial and overlap with other terms.

**Analysis of recent studies and publications used in the course of research.** The problem of balanced weapons was researched in the scientific works of R. A. Chervinskyi, V. M. Burenko, A. V. Zhuravliov, V. V. Baskakov, A. V. Muntianu, Yu. A. Pechatnov, R. H. Tahyrov. But there is no accurate definition of “balance” concerning system of weapons, unit or branch.

**The purpose of the article** - to analyze the existing definitions of the term “balance” in relation to the sample (system) of weapons, unit, branch, the armed forces as a whole at different stages (development, production, operation) and to develop a coherent position regarding its use.

**The main material of research.** In peacetime conditions of modern period of military-economic confrontation is carried out, especially when dealing with the market of weapons and military equipment. At the present stage of the confrontation of states in this area is constantly growing and worse. The resulting contradictions between competitors are solved using various forms and methods of influence.

Typically, the parties resolving conflicts there are used forms and methods of action that differ from those used in armed conflicts a little: information-psychological, political-diplomatic, economic, force demonstration, armed struggle.

In publications, speeches we often hear the term “balanced”. The authors try to characterize it with a wide range of concepts, from a sample of weapons to the armed forces as a whole. “Balanced”, according to the explanatory dictionary of Ushakov means commensurate with, coordinated.

The dictionary of Russian synonyms provides with one more definition - aligned, balanced, coordinated, commensurate with.

The dictionary of T. F. Yefremov finds the definition of “balance” as a word that defines:

1. Equilibrium.
2. Art body to maintain balance when performing exercises on different equipment or hold in equilibrium miscellaneous items.
3. A certain ratio - usually in quantitative terms - parts, parties of any phenomenon, process, any activity etc.

Looking into the current edition of Dictionary “Great Soviet Encyclopedia”, Dictionary of the Russian language of S. I. Ozhegova, N. Yu. Shvedova, we find a similar disclosure sense of the word.

According to its organizational structure, goals, list of tasks weapon systems, any component of the Armed Forces (hereinafter – weapon system – WS) can be described as a functional system that does not contradict with the existing definition of such systems. The development of a functional system takes place in two stages: development programs (plans) of WS and their implementation. Managing these processes is the content management program target of WS and it is based on the following program principles:

- integrity of the system;
- complexity;
- limited objectives of the program (plan) and the number of simultaneously implemented programs (plans);
- consistency;
- focus on specific needs;
- hierarchy of accounting systems;
- planning by stages of the life cycle;
- optimization program (plan) [1].

In particular, such formulations are associated with this term-nom as “in general, as balanced development of WS is directly related to the solution of a number of challenges for rational allocation of resources allocated by the state for the technical equipment of the Armed Forces ... The balance of WS involves the ability to perform tasks in all conditions and solving warfare, i.e. their “equal power” resistance during the military operation”. In these formulations the concept of “balance” is revealed through the concept of “rational allocation of resources” and “resistance during the military operation” [2].

The analysis of monograph of Professor A. V. Zhuravliov shows that the term “balance” is used synonymously with the term “proportionality”. This problem of balancing elements and subsystems in WS is seen as the need to determine the optimal proportions of development. Its solution is aimed at a selected distribution of resources between subsystems (elements) in which the maximum was reached to end the impact of using the system as intended. In this approach, system balance is identified with its efficiency.

The article of V. V. Baskakov offers to use index of balancing WS of the Armed Forces on the quantitative and qualitative composition of shock, defense and support means of number of samples (complexes) grouped into three categories: prospect, modern and old. This interpretation of the balance of WS of

the Armed Forces is rather simplified and prevents its use in research on this issue. In addition, the ratio of long-term, modern and old armament is the result of the synthesis of rational option weapon systems (the property) rather than a specific, defined directive, objective function (restriction) [3].

The monograph of A. M. Moskovskiy offers that the concept of “balancing of WS (military-technical system)” should be viewed in several ways:

structural - as in the presence of elements (subsystems), principally able to enforce different types of subtasks that regard the essence of task;

component - as presence in the system (consisting of subsystems) of samples (components) in an amount that provides the optimal functioning of the system;

functional - as a consistency level of the components according to the principle “in quantities as it is necessary to fulfill the purpose”;

dynamic - as consistency on the terms creation of components on the principle “when it is necessary” [4].

It is necessary to consider the dynamism not only as a consistency on the timing of creation (this is characteristic of the system during its creation).

In the textbook on efficiency of balance principle is seen as a method to account of uncertainties in the synthesis of complex system for different operating conditions: “The principle of balance can be formulated as follows: when choosing a rational option designed element for a given system must take into account is that there are many options and conditions of use, in which the whole system is able to perform its task”. Also there is a practical field of usage of the principle balance model of conditions of application of complex system. This states that the model is constructed according to this principle and provides a sense equal power of elements of designed system on a possible counteraction [5].

Thus, approaches to definition of balanced WS did not disclose its contents adequately. It would allow us to generate a list of relevant criteria and indicators. At the same time the aim of analyzed definitions (explanations) confirms partial identification of balanced weapons systems of “rational system adopted by the criterion of “efficiency - cost – realization”.

To develop a coordinated position on the content of this concept then turn to the references listed in the definition of the term “balancing” and related concepts to it.

In Encyclopedia balance is explained as “equilibrium” and as “quantity ratio between the parties of any activity which should balance each other” [6].

The economic dictionary revealed the content of these concepts. “Balance means a general concept that reflects the method of study of various economic phenomena by comparing and contrasting indicators describing various aspects of them. Mostly “balance” is the form of equity.

The system of equations (balance ratios, balance equations) which satisfy the requirement of proportionality of two elements: the presence of the resource and its use (for example, the production of each product and the need for it). Compliance is understood either as equity or as adequacy of resources to meet the needs (and thus, the presence of reserve). While describing the economic system as a whole it means a system of equations, each of which expresses a balance between the

demand generated by economic entities, the number of products and aggregate demand for these products” [7].

From these definitions it is clear that the term “balanced system” means balancing according to particular signs of some parts of the system. Typically, signs appear as aggregate economic or financial indices.

According to the reference book balance is component of “system stability”, which also includes the following properties: strength, resistance to external influences, stability.

According to the structural complexity and heterogeneity of weapons systems A. V. Muntianu, Yu. A. Pechatnov, R. G. Tahyrov suggested entering several levels of consideration of the term “balance”:

level of weapon system as a whole - as balancing the value are volumes of financing of WS realization, balance criterion is the correspondence of the solution levels of tasks by means of arms subsystems; the level of arms subsystems - as balancing of values are the amounts of finances for the development of functional arms components (eg, shock, defense, information-management and other means), balance criterion is the ratio of levels of problem solving by means of functional components of weapons subsystems.

At each selected level the balanced values should be some volumes of finances, and balance criterion should be oriented towards the level of solving of tasks [7].

At the achieved stage of development of methodology the substantiation of prospective WS designed in the strict sense of balanced WS (based on the balanced model) is difficult. This is a broad, multi-purpose CO AP, its high structural scale, functional diversity elements, technical and technological complexity of their creation. These factors do not allow us to determine with the required accuracy balance coefficients for these levels of detail CO and thus form a fairly representative and reliable model of the book. The peculiarity of this model greatly complicates its use, volatility balance sheet ratios, as well as difficulties associated with formalized their representation, depending on the level of funding for military purposes.

It is substantiated by broad, multi-purpose WS of the Armed Forces, its high structural scale, functional diversity of elements, technical and technological complexity of their creation. These factors do not allow us to determine with the required accuracy of balance coefficients for these levels of details of WS and, thus, to form the representative and reliable model. The peculiarity of this model greatly complicates its usage; volatility of balance coefficients, as well as difficulties associated with formalized their representation depending on the level of funding for military purposes.

However, for each subsystem arms can be generated (based on the developed models, the experience of experts or statistics) level range of funding thresholds which with sufficient reliability meet the minimum required level and solve their problems. At the minimum level of the task proposed to understand a level below which the presence of weapons subsystem consisting of CO is

inappropriate, and the desired level of the job - a level above which mostly -ve violation strategic stability.

Then some (according to the specific arms subsystem and research tasks) values are given to each weapon subsystem within existing funding levels and ranges defined by rational criterion “efficiency - cost – realization” options for their construction. Integration (in various combinations) of generated rational choices of each arms subsystem into single system allows us to create balanced variations of WS as a whole. Further evaluation of balanced options for generalized criterion “efficiency - cost – implementation” allows us to select the most promising WS. Similar arguments can be applied to other levels of detailization of proposed levels of this concept.

Thus, summarizing the above mentioned data, we can formulate the following specifications which reflect the essence of the concept of “balanced WS”, balanced is WS which all subsystems at a certain time rational (in some cases are optimal) according the criterion “efficiency - cost – realization” and able to perform their tasks in all conditions and conduct military operations at the level which is not lower than the minimum.

This rational (best) version of prospective WS is generally defined on the set of existing balanced options using the generalized criterion of “efficiency - cost – realization”.

Internal balance of system can be defined as correspondence of all subsystems (factors).

External system balance should be seen as correspondence of it in the role of subsystem of higher level, correspondence of opposite side analogue.

Today the balanced system, sample etc. is a starting point for changing the balance in a favorable direction for us. For disturbance of this balance towards cheaper along with better characteristics in the construction phase, simplifying operation while maintaining the characteristics for superiority over the enemy at a lower cost, etc.

**Conclusions.** So, firstly, any weapon system, usually the subsystem itself consists of several subsystems (factors) that define its operation at a given level and a given plane.

Secondly, it is necessary to consider the system from both sides internal and external.

Thirdly, the internal balance or balancing is seen not only from the usual position of “efficiency - cost – realization” (creation stage), but also by its effective use of “technical condition - support – maintenance”, “specifications - specifications of probable enemy” (exploitation stage).

Fourthly, any change of any component that determines the state of weapons violates state balance.

Presented specifications do not contradict with the main contents of the term “balanced system of arms” and give the correctness of the conceptual apparatus in this research.

In the future, it is advisable to analyze the dynamics of change of “balance” on a specific weapon sample (unit, the Armed Forces) at different stages of

development and operation and the analysis to determine the forecasting methods of further development and improvement of armament (unit, the Armed Forces).

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### ***Berezenskyi O. I. Principle features of law violations and activities of “Border Patrol” at their detection***

Studying of service experience of border details and the basis of informative features of law violations enabled to summarize and structure the sequence of the border details “Border Patrol” on prevention or stopping of violations.

**Keywords:** *border patrol, basis of informative features, types of law violations.*

### ***Halaniuk Ya. S. Organization of operation and investigative activity within the State Border Guard Service of Ukraine***

The article touches upon the essence, elements and stages of organization of operation and investigative activity of operation and investigative units at all levels of the structure of the State Border Guard Service of Ukraine. It peculiarities, role and significance within the system of organization of operation and service activity of organs (units) of protection of the state border of Ukraine.

**Keywords:** *operation and investigative activity, operation and investigative unit, organization of operation and investigative activity, state border, state border protection.*

### ***Hetmaniuk S. P. Grounding and estimation of indices of effectiveness of the border crossing subsystem of border control system***

The article deals with the problem of border control system analysis in terms of disclosure of its components, which is the base for border control components grounding. The implementation of border control components relies on the border

crossing subsystem of border control system. The term “integrated index” is defined, as well as partial and integrated indices of border crossing subsystem of border control system are distinguished through the detailed separate border control component. The mathematical dependencies, which can be applied to calculate the numerical values of the indices that will enable objective estimation of border control components.

**Keywords:** *border control, partial index, integrated index, border crossing subsystem, border control system.*

**Huliak O.V., Demianchuk B. O. The method of the potential evaluation of quality of peacekeeping force training centre**

The article suggests the method of determination of opportunities of peacemakers’ training based on the multifactor model for evaluation of quality of peacekeeping force training centre by totality of quality indices/ the method is an instrument for comparison of alternative centres by mean of considering predicted results in the process of optimization of deployment of peacekeeping forces.

**Keywords:** *peacekeeping forces, grapho-analytic method, evaluation of potential.*

**Demidchik F. A., Bozhko S.V. Determination of the fortification equipment nature on positions of objective safeguards units during the survey.**

The article touches the recommendations on survey of group task performance during survey of objectives, fortification equipment requirements on positions of objective safeguards units, calculation technique in gun-port holes of firing installations, and labour-taking task performance of fortification equipment.

**Keywords:** *fortification equipment, fortified installations.*

**Diomin O. M. Balanced armament**

In the researches on the methodology of weapon systems, units and subunits development management of the armed forces is often described as balanced one. The existing definitions on different stages (development, production, operation) have been analyzed, a new approach on the use of the term was proposed.

**Keywords:** *weapon system, balanced system, technical equipment.*

**Zhuk S. M. Methodical principles of evaluation of efficiency of tasks performance by border guard divisions in mountain and wooded terrain**

The article touches upon the substantiation of methodical principles of evaluation of efficiency of realization of operation and investigative tasks by border guard divisions in mountain and wooded terrain owing to efficiency criterion.

**Keywords:** *border guard division, mountain and wooded terrain, operation and investigative activity, efficiency evaluation.*

**Kashtelyan S. A. Main approaches on determination of national interests of Ukraine in border guard sphere and directions of its realisation**

New approaches on determination of national interests of Ukraine in border guard sphere are generalized in article. New directions of State border guard service of Ukraine in realization of national interests of Ukraine in border guard sphere are determined.

**Keywords:** *national security, national interests, border space.*

**Kulish R. S., Ivashkov Y. B. Recommendations for the chief of the border detachment on the improvement of the activity algorithm concerning the model construction of the operative-service activity of the border guard division**

The analysis of the models used in the operative-service activity of border guard division has been revealed in the article. The recommendations for the chiefs of the border detachments concerning the improvement of the modelling process of the operative-service activity at the sector of the border division have been worked out.

**Keywords:** *model of operative-service activity, border guard unit, division of border service.*

**Kurashkevych A. P. The model of prediction of effectiveness of the state border protection on the area of responsibility of the border service division of type “B” taking into account the variants of organization of information support**

The model of prediction of effectiveness of the state border protection on the area of responsibility of the border service division of type “B” taking into account the variants of organization of information support is worked out. It allows to estimate the effectiveness of implementation of tasks of the basic forms of operational and service activity (border service, border control, operational search activity) to identify illegal activities in the area of responsibility of division.

**Keywords:** *model, information and analytical support of operational and service activity, border service divisions.*

**Lobanov A. A., Kyrylenko V. A. Algorithm of determination of priority tasks of the system of maintenance of military security**

The article deals with the wide range of priority tasks of the system of maintenance of military security; the technique of determination of priority tasks of the system of maintenance of military security based on main tasks.

**Keywords:** *military security, maintenance system, functions, tasks.*

**Lutskiy O. L. Influence of the mountain-wooded area on organization of operative and service activity on the area of responsibility of state border unit**

The analysis of mountain-wooded area influence on organization of operative and service activity of state border unit has been revealed in the article. It describes factors and new modern approaches of organization of operative and service activity which influence upon border detachment considering indicated geographical location.

**Keywords:** *mountain-wooded area, border unit, operative-service activity.*

*Mazur V. Yu., Farion O. B.* **The formation of optimal management solution for the use of force and means of operation and investigative unit of the border guard division**

Based on the analysis of management of decision-making the tools for the formation of optimal management solution for the use of force and means of operation and investigative unit of the border guard division have been offered.

**Keywords:** *management solution, operational forces and means.*

*Mysyk A. B.* **Model of situational management of operation and service activity of state border protection**

The article touches upon the results of system of support of decision-making on application of forces and means in the structure of state border protection. The principles of application of situational approach in the system of integrated border management have been worked out. The choice of methods of identification of situation parameters and classification has been substantiated. The recommendations for centers of service management have been elaborated.

**Keywords:** *system of support of decision-making, situational method, work of service management centers.*

*Moldavchuk V. S.* **Substantiation of directions of evaluation research and forecasting of socio-political environment for decision-making for service-combat activities**

The article touches upon the determination of direction of assessment and forecasting of socio-political circumstances for making decision regarding fulfillment of special antiriot operation.

**Keywords:** *socio-political environment, evaluation, forecasting.*

*Muzyka V. P.* **Development of algorithm of service activity of center of management of border guard organs**

Based on the analysis of organization of service activity of center of management border guard organs and problems of organization of carrying out routine activities of border guard unit the algorithm has been developed enabling to ensure efficient influence on operative and service activity of border guard unit and accomplishment of main task – service management.

**Keywords:** *algorithm, service management center, routine activities, system of collecting and processing of data on situation.*

*Panov V. H., Sytnik O. V.* **Methodical approach to the evaluation of the system of extraction and processing of intelligence information on engineering environment**

The article highlights recommendations for the introduction of the collection and processing of operational intelligence data at operation and service activity of the chief of engineering services for assessment of the situation and covering area

of the state border by military forces and at planning and application of units of engineering troops.

**Keywords:** *engineering intelligence system, system.*

**Rozum I. Yu. Implementation of the applied cryptography in the system of military management in interests of classification of military communication networks**

The article there considers the possibility of implementation of the applied cryptography in relation to introduction of asymmetric algorithms of enciphering and cryptography with open key in the system of military management with the purpose of classification of military communication networks.

**Keywords:** *system of military management, cryptography, classification of military communication networks, theory of comparisons, algorithms of enciphering.*

**Servatiuk V. M., Karpenko V. V., Pechorin O. M. On some approaches to design of documents of direct planning of implementation of high-mobility assault troops**

The article concerns recommendations on changes of the content of documents of direct planning of implementation of high-mobility assault troops during counteroffensive operation of operative grouping of troops (forces). As the result it enables to consider their possibilities and peculiarities as air assault and airborne components of operation and to take measures of their thorough implementation planning.

**Keywords:** *operation, high-mobility assault troops, efficiency of implementation planning.*

**Servatiuk V. M., Mostova K. V., Kukin I. V. Some approaches to evaluation of activity of border guard units**

The article offers scientific approach to implementation of new system of evaluation of operation and service activity of border guard organs and subordinated border guard divisions.

**Keywords:** *activity evaluation, efficiency, activity results, border security, activity quality, quality management.*

**Sychevskyi Y. O. Analysis of stealing of vehicles as transborder problem**

In the article the state of the problem of stealing of vehicles in the world has been analyzed. The countries-suppliers, countries-recipients and main geographical directions of transferring of stolen vehicles have been determined. The schemes of illegal import of vehicles into Ukraine with possible avoiding of appropriate customs and border registration have been described.

**Keywords:** *vehicles, stealing.*

**Farion O. B. Tools for determination of type of threats to border security in the process of criminal strategic analysis of operation and**

### **investigative unit of the regional directorate of the State Border Guard Service of Ukraine**

The article concerns instruments by means of which a criminal analyst of operation and investigative unit based on the analysis of the events occurred in the area of the regional directorate of the State Border Guard Service of Ukraine can specify the type of threat to border security.

**Keywords:** *threat to border security, strategic criminal analysis.*

### **Shalimov Yu. Yu. Principles of application of logistics within the State Border Guard Service of Ukraine**

The article concerns of substantiation of characteristics of the system of supply of the State Border Guard Service of Ukraine as a subsystem of logistic system of the agency (by the example of food supply) and determination of main principles and tasks of logistics within the system of supply of structural organs of the State Border Guard Service of Ukraine.

**Keywords:** *system of logistics supply, organs of the State Border Guard Service of Ukraine.*

### **Yakimiak S. V., Sannikov S. H., Radzhapaksa Y. K. Analysis of tasks and features of employment of forces (troops) of Sri Lanka Naval Forces for providing of security of economic activity of the state at sea in modern conditions**

The authors have conducted the analysis of roles, missions and tasks of Sri Lanka Naval Forces, their capabilities and current system of implementation of tasks performed by forces (troops) of Naval Forces in the conditions of threats in the region of the Indian Ocean.

**Keywords:** *Naval Forces, missions, operations, national interests*

### **Yasko V. A., Kyrylchuk Yu. F. The use of automation management for making of argueded decisions regarding engineering support**

The article highlights the feasibility and necessity of automation controls for timely informed decisions on the organization of engineering support of combat actions; and outlines the recommendations on the organization of work for the chief of engineering services while planning engineering support using automation control.

**Keywords:** *combat actions, engineering support.*

### **Androshchuk O. S. Multiobjective model of decision-making on emergency response by border guard units**

The article concerns the design of model of decision-making on emergency response by border guard units in the area of their responsibility. The model makes for allocation of resources for carrying out activities on emergency response in the area of responsibility taking into consideration the peculiarities of emergency possibilities of existing strength and capabilities.

**Keywords:** *emergency, model, decision-making, state border protection.*

*Basarab O. K.* **Experimental verification of scientific and methodical apparatus of improving the efficiency of the telecommunications system of the State Border Guard Service of Ukraine**

The article presents the results of experimental verification of scientific and methodical apparatus that improve the efficiency of telecommunications system of the State Border Guard Service of Ukraine. The stages of the experiment are described. The numerical indicators of the developed scientific and methodical apparatus are presented.

**Keywords:** *experiment, efficiency, telecommunications systems, information and telecommunication systems, access.*

*Borovik O.V., Borovik L.V., Traskovetska L.M.* **Features efficiency of evaluation of wireless devices and telecommunications**

The paper analyzes the essence of the method of evaluating the effectiveness of radio devices and telecommunication facilities through the application of graph-analytic charts in terms of a possible formalization. Carried formalization allowed to test the hypothesis application this method. The study concluded that the limited possibilities of the method of semigraphical charts to evaluate the effectiveness of such systems.

**Keywords:** *method semigraphical charts, radar devices and telecommunications, efficiency, hypothesis evaluation.*

*Volokh O. P., Henik V. M.* **Principles of the information support of functioning of management system of technical condition of engineering equipment**

The article discusses the elements of subsystem of information support of the automated system of control of technical state of engineering equipment with individually adjustable frequency and volume of services; and determines the necessary conditions for the functioning of this system.

**Keywords:** *engineering equipment, management of technical conditions.*

*Heraskin V. M., Bozhok A. M., Rusnak V. M.* **Design of running gear for military caterpillar machine**

The article deals with a new running gear of caterpillar machine with improved dynamic characteristics owing to the rise of level of ride quality and accuracy of its adaptation to ground.

**Keywords:** *caterpillar machine, running gear, ride quality.*

*Darmoroz M. M.* **Scientific and methodological foundations of effective technical means border in solving the integrated border management**

On the basis of scientific and methodological basis to ensure the effectiveness of means border application developed mathematical model of their operation. In the developed model implemented in the existing operating system hardware Border temporal and structural redundancy, given the promising

strategies for maintenance and repair. The mathematical model makes it possible sound performance management hardware Border in solving the integrated border management.

**Keywords:** *efficiency of technical means of border protection, the mathematical model of the operation of technical means of border protection, advanced strategy of technical maintenance, temporal and structural redundancy.*

*Kyrylenko V. A., Hashchuk M. P., Skripkar O.V.* **Substantiation of choice of method of target programming for optimization of fleet composition of special transport vehicles**

The article presents the results of substantiated choice of method of target programming for multicriteria optimization of fleet composition of special transport vehicles of border guard divisions based on the principles of application of specific additional information on consequences of making previous decisions about the fleet composition and expert evaluation of these consequences.

**Keywords:** *vehicles, formation of composition of vehicle fleet, border guard service, additional information, decision-making.*

*Kolos O. L.* **Mathematical model of functioning of the system technical maintenance of engineering armament machines under the conditions of their intensive application**

The article touches upon the substantiation of expediency of application of planned devices of engineering armament by means of theory of hourly reserving with the purpose of maintenance of its reliability at the necessary level in cases of their intensive exploitation. For the quantitative estimation of influence of process of organization of functioning of the system of technical maintenance in accordance with the offered model of the system of technical maintenance on the change of level of reliability of technique the mathematical model of calculation of coefficient of the technical use of machines of engineering armament is worked out taking into account not ideal but the real possibilities of using of everyday outages of devices as reserve for their technical maintenance.

**Keywords:** *technical maintenance, devices repair, engineering armament.*

*Mandryk Ye. V., Hryb K. V.* **Ways of improvement of exploitation and constructive parameters of automobile tires**

The article represents the construction of automobile tires of different modifications, the analysis of stages of development of construction of automobile tires and the determination of prospective directions of their improvement.

**Keywords:** *tire, noise, noise intensity, noise pressure, amplitude speed fluctuations.*

*Mandryk Ye. V., Solomianyi A. S.* **Ergonomic support of organization of road traffic**

The article formulates the task of ergonomic evaluation of characteristics of process of training of person to drive a vehicle that is opposed to existing estimations considers mutual connection and mutual dependence of states and characteristics of components of system “person-vehicle-road situation”. Besides the article stipulates for main principles of ergonomic estimation: principles of objectivity, mutual connection, generality, and timeliness. The author offers tests developed by scientific and pedagogical staff and their technical maintenance for evaluation of state of readiness of future drive in different climatic conditions.

**Keywords:** *driving a vehicle, professional training, ergonomic estimation, process of training of person.*

**Perig V. M. The problems justify the use of genetic search for the solution of rational construction of telecommunication systems for special purposes.**

*The analysis of the solution of this optimization problem. The general approach to its solution using genetic methods.*

**Keywords:** *genetic search, telecommunication system for special purposes, optimization.*

**Podolian O. Yu., Kachkovskiy V. T. On the problem of determination of transport capacity of vehicles of border guard units**

The article describes the need for systematic replenishment of vehicle fleets of border guard units with new models stipulates for the necessity of resolve of problem of formation of technical requirements to them and evaluate the effectiveness of their operation. One of the most informative indicators of the suitability of the vehicle for use in border units is appropriate to determine its transport capacity.

**Keywords:** *vehicle, border guard unit, operating conditions, technical requirements, effectiveness of operation*

**Poliakov A. P., Nahachevskiy V. Y., Koroliuk D. L. Peculiarities of Forecasting of Further Development of Automotive Machines of the Armed Forces of Ukraine**

The article deals with the peculiarities of application of methods of scientific and technical forecasting of development of automotive machines that contribute to more qualitative determination of prospective samples of vehicles and substantiation of qualitative and quantitative composition of armament and military vehicles of the Armed Forces of Ukraine according to the needs and economical possibilities of the country.

**Keywords:** *forecasting, methods, automotive machines, designs.*

**Sivak V. A. Method of substantiation of composition of aggregates and systems to be diagnosed for providing of safety of vehicles**

The article concerns the formalization and essence of method of substantiation of composition of aggregates and systems to be diagnosed for

providing of safety of vehicles, basis of which is made by the criteria of dependences between the structure of number of details, knots and aggregates, and number of algorithms of their state control.

**Keywords:** *operating safety, diagnostics.*

*Sinkevich V. M., Blinnikov G. P.* **Optimization of ware-house works in the State Border Guard Service of Ukraine**

Mechanization and automation of ware-house works promotes safety of labour and gives a considerable economic effect. Optimization of ware-house works is possible at application of the movable shelvings, pilers, automated storages. Application of the many-tier shelvings and piler, management of which is carried out by computing device allows to execute work in the automatic mode.

**Keywords:** *optimization of ware-house works, movable shelvings, pilers.*

*Traskovetska L. M., Borovyk L. V., Borovyk O. V.* **Automatization of mathematical methods of expert evaluation**

The article characterizes the method of rank correlation and evaluation of obtained information, developed algorithm and program of determination of factors influencing upon the studied object and verification of conformity and accuracy of expert evaluation.

**Keywords:** *rank correlation, concordance coefficient, algorithm, expert evaluation, standardized rank table.*