Resume

MILITARY TECHNICAL POLICY

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ORGANIZING HYBRID WAR COUNTERMEASURES IN MODERN CONTEXT. TECHNICAL ASPECT

The modern world is in a state of systematic imbalance, instability and chaos. Completely new risks and threats of global character were added to the challenges and threats of the Cold War Almost all military conflicts of the late XX and XXI century did not resemble the classic scenario of fighting. Military operations in the East and analysis of the situations, which preceded these events, lead to the conclusion that Ukraine faced a sophisticated form of war when territory seizure is carried out by criminals, separatist movement which is coordinated by Russia.

Keywords: *hybrid war, countermeasures, military conflict, risk*

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DEFINITION OF THE ARMING PROGRAMS THEORY AS A SCIENTIFIC DIRECTION OF THE WEAPONS THEORY

The necessity and feasibility of the process review, formation of a medium-term arming in a separate theory – the arming programs theory as a subtheory of weapons theory. Arming programs theory and its research direction within weapons theory was formulated. It describes the content of the historical, methodological and practical components of the two theories, as well as characterized by their place in military science. Two objects are considered by relevant theories in the form of a Venn diagram, which shows the extent of their relationship in the defence planning system. We considered the main differences in the field of research of two theories, the main tasks of the arming programs theory and showed their inheritance from the weapons theory. A list of initial data and a list of methods and models for the methodological component of the arming programs theory, which can be obtained from studies of the weapons theory, are presented.

Keywords: *weapons theory, medium-term programs, development of arms, weapons programs.*

ARMORED VEHICLES

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INCREASING PROTECTION OF ARMORED COMBAT VEHICLES FROM 12.7 MM BULLETS B-32 DAMAGE

The paper presents results of numerical modelling of the process of breaking through the protective ceramic elements with a different design. Two types of developed structures have been full-scale tested using ballistic 12.7 mm bullets B-32: a block of ceramic cylindrical elements of the "sphere-sphere" in the polymer block mosaic and a bundle consisting of flat ceramic elements. Ballistic tests have confirmed the effectiveness of protective ceramic elements designed to protect the ACV against 12.7 mm bullets B-32.

Keywords: *armored combat vehicles, ceramic elements, ballistic test, protection*

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INVESTIGATION OF ENERGY-ABSORBING ELEMENTS OF CREW ANTIMINE SEAT OF COMBAT ARMORED VEHICLES

The article presents the results of numerical and physical experiments of load energy absorbing element of crew antimine seat of armored combat vehicles. The comparison and evaluation of the effectiveness of different profiles have been made using the finite element method. Regularities about character of the deformation of energy-absorbing element with different ratios of its height and perimeter to wall thickness were received. Numerical models of physical experiment were checked.

Keywords: *energy-absorbing element, combat armored vehicle, experiment, crew antimine seat*

AIR DEFENSE SYSTEMS

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METHODICAL RECOMMENDATIONS FOR DETERMINING OF THE NUMBER OF SURFACE-TO-AIR MISSILES AND MISSILE PROPULSIONS FOR CHECK FLIGHT- AND FIRE BENCH-TESTS, CONDUCTED FOR SOLVING PROBLEMS OF PRESET INDICES EXTENSION

Analytical models for determining of the number of surface-to-air missiles (SAM) and missile propulsions (MP) for performance check flight- and fire bench-tests for solving the problems connected with preset indices extension are considered. Also recommendations for substantiation the number of SAMs and MPs for tests that account for a priory information about SAM reliability, which obtained from previous extension operations in the form of one-sided lower confidence interval are developed in the paper.

Keywords: *surface-to-air missile, missile propulsion, analytical model, preset indices extension*

UAV

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INFORMATIONAL TECHNOLOGY OF OPERATIONAL CONTROL OF THE STATUS OF SMALL AIRCRAFT BASED ON TIMED PRESENTING OF INFORMATION MEASUREMENT FOUNDATIONS

Article considers development of the informational technology of small aircraft technical condition rating, which based on introducing of control parameters in time intervals.

Keywords: *informational technology, control parameters, time intervals, technical condition rating*

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UNMANNED AIRCRAFT SYSTEMS IN THE ARMED CONFLICTS OF RECENT DECADES

The article analyzes the use of unmanned aircraft systems in armed conflicts of recent decades and the experience of ATO in Donetsk and Luhansk regions.

Keywords: unmanned aircraft systems, repeaters, electronic warfare.

AUTOMATED CONTROL SYSTEMS

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PROPOSALS FOR THE IMPROVEMENT OF THE LOGISTICS SYSTEM OF THE ARMED FORCES OF UKRAINE

Factors that significantly affecting the efficiency of the logistic system performance are considered, ways and means of increasing individual quality indicators of the components of subsystems of the logistics system of the Armed Forces of Ukraine are suggested. Improvement of the management of logistics processes have been analyzed through the use of the latest IT tools, as well as accounting and monitoring technologies for the material flows, technical means for implementation of the technical components of the accounting and monitoring system for material flows, weapons and military equipment have been proposed.

Keywords: *logistics, accounting and monitoring, integrating efficiency indicator of logistics, automation of accounting and monitoring over the availability of the means in warehouses, material flows and mobile objects, barcodes, RF tags, navigation aids.*

NAVY ARMAMENT & EQUIPMENT

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ANALYSIS OF INFLUENCE OF PHYSICAL PROPERTIES OF SET OF BOTTOM BENDS OF SHIP ON DIVISION OF AMPLITUDE AND PHASE OF PRESSURE OF THE SOUND FIELD ON ACTIVE SURFACE OF SHIP AERIAL IN SYSTEM «SURFACE VESSEL-HYDROACOUSTIC STATION»

Coming from the task of the systematized research of descriptions of hydroacoustic armament in the real terms, quantitative researches of influence of physical properties of set of bottom bends of ship on the sound field of the hydroacoustic stations of ships with under keel aerials are conducted.

Keywords: *surface vessel-hydroacoustic station, hydroacoustic armament, sound field*

PRODUCTION, UTILIZATION, MODERNIZATION, MAINTENANCE

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USAGE OF THE MATHEMATICAL TOOLS OF REFLEXIVE GAMES FOR DECISION MAKING WHILE DEVELOPING AND SUBSTANTIATING RATIONAL MANAGEMENT STRATEGY OF PRODUCTION PROCESS, MODERNIZATION AND REPAIR OF WEAPONS AND MILITARY EQUIPMENT

The article deals with the problems of development and improvement of information management processes with the help of reflexive games during production, modernization and repair of weapons and military equipment samples. Formation of information flows, their exchange while making decision for the stages (cycles) of works during procurement open procedures (bidding) and services.

Keywords: *decision making, mathematical tools, production, modernization, repair, procurement*

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RELIABILITY ASSESSMENT OF SPECIAL COMMUNICATION DIAGNOSTIC MEANS WITH ACCIDENT-CAUSED AND BATTLE DAMAGES

The article describes the evaluation of the reliability of the diagnosis of special communication means with the accident-caused and battle damage. The functional dependence of the values of objects' indicators of reliability diagnosis with multiple defects on the repair conditions, the quality of diagnostic and metrological software has been obtained and examined.

It has been determined that the received minimum required value of probability of a correct assessment of measurement outcome specifies the number of bits of digital or analogue accuracy of measuring instruments, meeting all the requirements for maintainability of special communication means, with the minimal cost.

Practical guidance on grounding the requirements for metrological maintenance of objects with multiple defects repairs is also formalized in the form of flowcharts. The results received should be used in the development of diagnostic and metrological support of the existing and future special communication means design in order to meet requirements for maintainability at minimum cost.

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METHODOLOGICAL ASPECTS WORKING MODELS BUILDING OF MANIFOLD MILITARY TECHNICS ON BASIC OF SIMILARITY GRAPH THEIR CONSTRUCTIONS

In the article the methodology for the analysis of structures of heterogeneous machines using graphs is working. The variety of classifications of engineering systems based on the features differentiating between different designs of machines, resulting in a trend analysis revealed construction machines in conjunction with the processes in which they are involved. Analysis of structural schemes variety of weapons systems indicates that machinery, differing in their functions, graphs have similar structural schemes, resulting in structurally similar systems are described by the same differential equations, but the parameters of these equations depend on the operating conditions of machines. The similarity of graph design scheme makes it possible to use the same type of study mathematical models that require only debugging select appropriate input parameters to determine the mathematical model. The article is written to design certain types of mechanisms using graphs; resulting schema obtained that exhibit a high degree of kinship. In particular, marked a significant similarity between the conveyor to accommodate and feed shoot and automatic loader tank gun. Somewhat less resemblance (though some commonalities available) observed between brakes recoil cannons and drive the main boom lift armored repair and recovery techniques. An example of the similarities machines and power plant. Examples using graph structures an affair coordinates to illustrate their structure and relations between the coordinates in the graph. In the case of oscillating processes in the research drives of machines that include an electric motor that through a belt drive coupled with a reduction gear, which in turn is connected to the shaft is running beat formulated a mathematical model of the problem. The results of numerical studies of mechanical processes, obtained after the correction of mathematical models describing the work of machines and power plants that are integral elements of the complex military equipment.

Keywords: *constructions of mashing and mechanisms, military systems, constructive schemes graphs, structures-similarity systems, differential equations, equations parameters, functioning machines conditions*

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JUSTIFICATION OF MODELLING METHOD OF OPERATION PROCESS OF THE TROOPS' WEAPONS AND MILITARY EQUIPMENT RECOVERY SYSTEM

The paper proposes a method of modelling based on an integrated approach, which is based on the construction and study of a mathematical model of an operational readiness support system of weapons and military equipment of troops. A mathematical model has been developed taking into account all possible sets of external factors that affect the system, which is typical for wartime conditions, first of all taking into consideration

factors that cause damage of weapons and military equipment and spur increase in demand for ammunition and component spares kits.

Keywords: *operational readiness support system, weapons and military equipment, damage, modelling method*

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DEVELOPMENT OF NEW TECHNOLOGIES FOR RESTORATION OF BARREL TANK AND ARTILLERY GUNS

The analysis of issues related to destruction and failure of the barrel, the possibilities of repairing the artillery and tank shells in Ukraine. The technology and materials that can improve the performance of restored barrels.

ШАНОВНІ АВТОРИ!

Оскільки пріоритетним завданням науково-технічного журналу «Озброєння та військова техніка» є входження до двох найавторитетніших у світі реферативних баз даних Scopus та Web of Science, редакція вводить нові (додаткові) вимоги до оформлення статей.

Додаткові вимоги до списку літератури («References»)

Список літератури повинен включати мінімум 10 джерел. Із них не менше 3-х джерел мають бути іноземні (латиницею).

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Містити не менше 150, але не більше 300 слів.

Коротко повторювати структуру статті (цілі й завдання дослідження, методи, результати, висновки).

Не містити посилань на літературу та абревіатур (якщо це можливо).

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