RESUME

MILITARY TECHNICAL POLICY

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EXPERT SUPPORT OF DECISION-MAKING IN DETERMINING PRIORITIES OF WEAPONS AND MILITARY EQUIPMENT DEVELOPMENT

The analysis of the existing methodology of complex consideration of expert and parametric assessments while determining the priorities of weapons and military equipment development and equipping the Armed Forces of Ukraine is carried out. The problems of its practical implementation are highlighted and the directions for improvement are identified, including the introduction of weight coefficients for parametric and expert private priorities. For the expert component of this methodology, a new hierarchy tree was developed, the new criteria of the expert assessment and the composition of hierarchy levels to support the process of priority setting while substantiating the arms programs were grounded, which includes four groups of the weapons system and sixteen tasks within these groups. The sequencing of the process of determining the priorities of weapons and military equipment development during the expert evaluation was developed. The formulas of determining expert private priorities for the development of weapons and military equipment are obtained for each group of the weapons system. The ways of taking into account the dynamism of the process of implementing the arms program in determining the priorities of weapons and military equipment development are defined.

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

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EXISTING CHALLENGES OF PRISING FOR MILITARY PRODUCTS AND APPROACHES TO SOLVING THESE PROBLEMS

Mechanisms of pricing for military purposes are analysed in accordance with the current normative and legal base of Ukraine. The disadvantages are identified in existing pricing algorithms. It is proposed to implement a number of measures and introduce the legal rules necessary for the construction of a pricing system, taking into account the positive experience of developed countries with market economies.

Keywords: pricing, military products, regulatory norms, market economy.

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UNITED STATES SECURITY ASSISTANCE PROGRAMS, THEIR IMPACT ON THE U.S. SHIPBUILDING INDUSTRY AND IMPLICATIONS FOR UKRAINE

Based on the open sources, article analyses the U.S. policy and execution of arms transfers to other states as a tool of the foreign policy; defines naval arms share in this process; tries to evaluate how distribution of the

naval armament, assets and equipment produced in the U.S. supports its world-wide influence and prestige as a maritime nation; and analyses Ukrainian interests in receiving ships (vessels) from the USA in frames of Security Assistance Programs.

ARMORED VEHICLES

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THE PROBLEMS OF MANUFACTURING WELDED ARMORED HULL OF DOMESTIC ARMORED VEHICLES

The paper presents the results of the analysis and systematization of the main causes that lead to defects in the welded hull of light armored vehicles by weight and determine the main directions of their prevention. It was shown that the problem of improving the quality and providing the appropriate level of ballistic and mine resistant of welded armored hull is complex, connected with the weldability of steel used in the production, organization and equipment of welding production and the structural features of buildings of domestic armored vehicles. The analysis of these factors allowed us to formulate directions for overcoming the problem, which, in addition to scientific decision, basically requires managerial and organizational decisions.

Keywords: military armored vehicles, armored steel, welding defects

RADIO-TECHNICAL FACILITIES

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MATHEMATICAL MODEL OF COMPLEX RECOGNITION OF AIR RADIOEMITTING OBJECTS BY A GROUP OF SIGNAL PARAMETERS OF THEIR ON-BOARD RADAR AND COMMUNICATIONS MEANS IN SYSTEMS OF RADIO ELECTRONIC MONITORING

A structure, algorithms, principles of construction and use of imitation-mathematical model of recognition of air objects by the parameters of emissions of their on-board radio electronic means are presented for the systems of radio electronic monitoring in case where the alphabet of recognized classes of objects and dictionary of their signatures are large. It is shown that a model allows to realize the frequent reiteration of process of recognition of radioemitting objects by a group of signal parameters of their on-board radar and communications means, to change interactively simulation terms and to get the estimations of probability of recognition depending on procedure of making decision, size and composition of alphabet of recognized classes of objects, composition and measurement accuracy of signatures, completeness and reliability of a priori databases and other factors.

Keywords: imitation-mathematical model, air object, source of radio emissions, emission parameters, algorithm of recognition, alphabet of classes, dictionary of signatures, radio electronic mean, communications mean, efficiency of recognition.

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COMMUNICATION INTELLIGENCE MEANS OF THE RUSSIAN FEDERATION

The paper examines tactical level mobile communication intelligence complexes of short- and ultra-short wave ranges and signal intelligence, which are used by the Russian Federation. Over the past decade, a wide range of electronic intelligence complexes has been manufactured and put into service. They are developed and manufactured exclusively by Russian organizations and enterprises. Russian Federation is moving to the development of multifunctional automated complexes that combine the functions of electronic intelligence, electronic warfare and control, which makes it possible to increase the efficiency of their use.

Keywords: communications intelligence, signal intelligence, mobile complex, station, radio source, radar station, frequency range.

MILITARY AIRCRAFTS

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TRENDS AND PROSPECTS OF THE DEVELOPMENT OF JET TRAINER AIRCRAFT

A study of the trends in the development of jet trainers for the last more than 70 years has been carried out. Flight-technical characteristics of almost all serial jet trainers created since the late 40s of the last century to the present time are considered and analysed. Thus, the resulted collection included 38 types of aircraft equipped with turbojet engines. The classification of jet trainer aircrafts into three development generations is proposed and the characteristic features of each generation are formulated. Based on these characteristics, the first generation includes 14 types of jet trainer aircrafts, created from the late 40's to the mid-60's. The most indicative and mass representatives of this generation are T-33As of Lockheed, created on the base of combat aircraft T-80, French SM-170 "Magtster, T-37V (S) "Tweet" of Cessna and Czechoslovak L-29 "Dolphin".The second generation consists of 20 types of jet trainer aircrafts, created after the mid-60s until approximately 2005, which currently constitute the basis of the world fleet of aircraft of this type. The most indicative representatives are the American jet trainer aircraft T-38 Talon, Czechoslovak jet trainer aircraft L-39 Albatros and various modifications of jet trainer aircraft Hawk of the British company BAE Systems. The third generation is represented by 4 types of serial jet trainer aircrafts, adopted by different countries in the last decade. This is a South Korean T-50, a Russian Yak-130, an Italian M-346 and a Chinese L-15. Prospects for the development of jet trainers are associated with the expansion of the production of existing third-generation jet trainer aircrafts, as well as the expansion of their type. New promising jet trainer aircrafts participating in the US Air Force T-X competition for the procurement of 350 jet trainer aircrafts for basic and advanced flight training are considered.

Keywords: trainer aircraft, performance data, aircraft development generations

AIRCRAFT ARMAMENT & FACILITIES

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NUMERICAL SIMULATION OF GAS DYNAMIC PROCESSES IN THE SUBSONIC RING-TYPE INLET DUCT OF THE TURBOPROP ENGINE

The flow process of the working fluid in the duct of the gas turbine engine is extremely complicated and insufficiently studied. There are lots of features of flow motion in the subsonic inlet duct of the gas turbine engine.

This article is devoted to the development of a method for aerodynamic flow simulation in a subsonic ring-type inlet duct of the turboprop engine, which is based on the using of the commercial software ANSYS. To estimate the accuracy of the numerical simulation results, a comparison of the resaved and experimental data is made. An example of practical application of the developed methodology is considered.

Keywords: gas turbine engine; gas-air duct; mathematical model; numerical simulation; software complexes; air propeller; computational methods; air inlet duct.

COMMUNICATIONS MEANS

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METHOD OF DETERMINING SEQUENCE OF CHECKING PARAMETERS AT MAINTENANCE OF MILITARY COMMUNICATION MEANS AS A STATE

The article describes a method for determining the sequence of test parameters during maintenance of military communication means as the essence of which is to account for the metrological reliability of measuring instruments in determining the sequence of measurements of military communications means parameters for its maintenance.

Proposed improvement method known additional consideration metrological reliability index, such as the probability of failure of measuring instruments in the field. This allows reasonably choose the types of measuring instruments to upgrade existing designs or create advanced hardware technical support module type.

The obtained results should be used in the methods of justification of the sequence and the number of minimum required parameters for the metrological maintenance of military communication equipment, which is important in field conditions, especially during warfare.

PRODUCTION, MODERNIZATION, MAINTENANCE

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APPLICATION OF THE METHOD OF CONVOLUTION WHILE SIMULATING FAULTLESSNESS MODEL OF MILITARY EQUIPMENT

The article proposes an option of using the method of reduction while modelling the faultlessness equipment including military one provided that different laws of the time distribution of the components are used.

Keywords: reliability measures, laws of distribution, chart of reliability, reliability function, elements of system

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DEVELOPMENT OF THE STRUCTURE OF REQUIREMENTS TO REPAIRABILITY ARMAMENT AND MILITARY TECHNIQUE ON THE BASIS OF SYSTEM ANALYSIS OF PROCESS OF THEIR REPAIR

In the article the issues of substantiation of structure and classification of requirements to repairability of military vehicles, their classification, as well as classification of repair processes on the basis of their system analysis for the further development of requirements to repairability of different types of armament and military equipment have been considered.