

OPTIMAL CONTROL STRATEGY OF TRACKED INFANTRY FIGHTING VEHICLE HYBRID POWERTRAIN

Ján DANKO, Vladimír STAŇÁK, Martin BUGÁR

Abstract: The paper deals with the development of optimal control strategy of tracked infantry fighting vehicles hybrid powertrain functional prototype (model). The conditions and requirements for development of hybrid powertrain (HP) to tracked infantry fighting vehicles (TIFV) are presented, which resulted in the requirements of control strategy. Next the concept, structure and optimization of the control system and control strategy for HP operating conditions of TIFV are presented, which are different from road vehicles. Opportunities for further development, optimization and utilization of the proposed control strategy are presented in the conclusion.

Keywords: Hybrid powertrain. Infantry fighting vehicle. Control strategy. Electronic control unit.

BATTLEFIELD MAINTENANCE REGULATIONS IN THE ALLIED COMBAT OPERATIONS

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Abstract: The paper presents battlefield maintenance system during allied combat operations. The mentioned processes are described on the basis of allied policies, doctrines and regulations. A great importance of The Combat Service Support Working Group of NATO Standardization Agency was underlined as a board which contribute to the effectiveness of NATO forces through standardization in the combat service support field. There was a special emphasis on The Maintenance Panel described as well, which is established to develop standardization of maintenance organizations, operations and repair parts systems at the tactical and technical levels in order to improve the effectiveness of NATO forces.

Keywords: Logistics. Allied operations. Combat service support. Battlefield maintenance.

SPECIFICITY OF DESIGN AND ACTION OF THE WEAPON'S JUMP AND RECOIL LABORATORY TEST STAND

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Abstract: Paper presents the specificity of design and action of the weapon's jump and recoil laboratory test stand. This laboratory test stand is able to examine weapon's jump and recoil of the various small arms including technology demonstrators of the new Polish modular rifles (MSBS-5,56) built both in the classic layout and as a bull-pup. Modular rifles and the laboratory test stand were designed and manufactured during a research and development project financially supported by the Polish Ministry of Science and Higher Education from the science funds in years 2007 – 2011.

Keywords: Armament. Firearms. Small arms. Laboratory test stand. Recoil. Weapon's jump.

NOISE LOADING OF CREW AND INDIVIDUALS

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Abstract: The aim of this work is to show the influence of noise loading on the crew (or individuals) of combat vehicles and military technics in the area of grand forces in comparison with noise loading of a personal car, and also of noise loading from automatic assault rifle. The measurements were focused on the detection of noise inside and outside of vehicles while they are at idling and during operation (without shooting). Moreover, measurements were done on self shooting with automatic assault rifles. The result values were then compared. The measurements of this work were made by using 1/3 octave frequency analysis and peak sound levels of noise were also measured through the using of hand-held analyzers of noise type 2250 from Brüel & Kjær firm. Until now was realized an arrangement on decrease noise effect on the operational crew of fighting vehicles (i.e. wearing protective special helmet inter alia as well as for needs of communications). However, the rest of the crew did not protected neither inside vehicles at long-term driving nor at self shooting from automatic assault rifles. Experiences and researches from US army show, that long-term run over threshold noise loading lead unto progressive loss of hearing or tinnitus. At present day as a result of fight in the urban area, let us say close combat fight, is put more emphasis in this area. For the rest of crew are show the advantage to application of the head sets. They are to be used on one side as a protection of hearing against severe influences of noise loading, and other side they can serve as communication facility that make easier communication between commander and individuals.

Keywords: Noise. Measurement. Fighting vehicle. Car. Assault rifle.

OPERATIONAL RELIABILITY DETECTION OF SELECTED MOBILE TECHNOLOGY

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Abstract: The paper explains evaluation method of operation and maintenance of firefighting equipment CAS (car fire-engine) on the chassis of the Mercedes-Benz Atego with fire trucks from the company THT Ltd. Policka in use at Fire Rescue Station in the Moravian-Silesian Region. Probability of failure and failure rate of the vehicle is estimated with using data from the operation and maintenance (failures). Recommendations for improving the data collection concerning the operation and maintenance of vehicles are expressed in the conclusion of the paper.

Keywords: Reliability in operation. Technique operation. Service of technique. Failure probability. Failure rate.

RELIABILITY OF FINDING THE MOST BENEFICIAL ROUTE

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Abstract: When using spatial data and information in decision making is a complex knowledge of the characteristics essential for evaluating the reliability and accuracy of decisions. Using the method of value analysis and mathematical modelling is possible to create a comprehensive system for evaluation of spatial data usability. Based on the input characteristics of the used spatial data and databases, quality characteristics and their changes can be calculated with the help of analytical methods. A comparison of the quality improvement or modification of databases is possible to optimize both the overall usability, and costs incurred on its security.

Keywords: Reliability. Decision making process. Mathematical modelling. Spatial data. GIS. Quality assessment. Utility value.

HOLISTIC ANALYSIS OF THE MILITARY DISTRICT UNITS DISASTER RELIEF EFFORTS

František BARTKO

Abstract: The author of the article focuses attention on preparation process, logistic support and real performance of tasks concerning disaster relief [1]. The article is based on the experience of the 2010 flood relief efforts and it focuses on the tasks performed by the Zvolen military district units. It discusses particularly the issues of crisis communication between local, communal and regional crisis response teams and the military district commander.

Keywords: Emergency. Floods. Readiness. Crisis response team.

CRISIS SITUATIONS THE MUNICIPAL TEAM MANAGEMENT APPROACH CRISIS – OVERVIEW OF THE PROBLEM

Antoni KRAUZ, Antoni OLAK

Abstract: It the short profile of problems of threat present world in put article was executed was in formulation of critical situation called out with the man's activity and the working the strengths of nature. It the different forms of threats were exchanged was on what present can be subject man. Management was have self - characterized critical according to different authors in this in legal formulation. It the principle was introduced was and the requirements of present of critical management. It the structure, task was has talked over was as well as the functioning the Communal Centre and the Team of Critical Management. It the form was described was and the character of work of team to critical matters on rung the populaces.

Keywords: Critical situation. Critical management. Communal centre critical management. Team critical management.

THE EVALUATION OF AIR QUALITY IN MILITARY VEHICLES

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Abstract: The optimization of environment inside of military vehicles, make it possible long- time activity in the comfortable climatic conditions. The mathematic model which was proposed, make it possible to observe the air contamination in the vehicle in consequence of carbon oxide increase, whose source is a respiration of persons.

Keywords: Microclimate of vehicle. Air contamination. Air quality simulation. Carbon dioxide.

CHANGE IN SHAPE OF FRACTURE SURFACE OF C15E MATERIAL AFTER HEAT TREATMENT

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Abstract: Toughness is resistance of a material against failure (fracture). Opposite property of material is called fragility. Surface on which the fracture occurred gives us an idea about the specimen material properties. In terms of energy required to break the specimen one can say that the fracture is ductile or brittle, in terms of fracture surface appearance one can distinguish plastic fracture or brittle fracture. Achieving the marginal state depends on the dynamics of damage accumulation, which is a function of sub-structural and structural state of the material, technological characteristics of production, of external loads, environment and time of action of these factors. The paper discusses the changes in the shape of fracture surface for impact bend tests depending on the steel heat treatment.

Keywords: Toughness. Hardness. Material chemical composition. Heat treatment. Fracture surface.

A METHOD OF CONTROLLING THE TOPOLOGY OF AERIAL REPEATERS NETWORK TO IMPROVE STRUCTURAL INFORMATION CONNECTIVITY OF WIRELESS AD HOC NETWORKS

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Abstract: In this paper we define the structural information connectivity of wireless ad-hoc networks, which takes into account not only the structural connections, but also ensure information exchange between a given pair of sender-recipient. To quantify the degree of structural information connectivity suggested two indicators: the capacity of the network and k-connectivity. Proposed a method for controlling the topology of the network overhead of aerial repeaters to improve each of the proposed indicators.

Keywords: Wireless ad hoc network. Unmanned aerial vehicle. Connectivity. Topology control.

15 YEARS OF SLOVENIAN ARMED FORCES' PARTICIPATION IN MULTINATIONATIONAL OPERATIONS AND MISSIONS

Alojz ŠTEINER

Abstract: The Slovenian Armed Forces have been involved in multinational operations and missions with the UN mandate and under the auspices of the UN, NATO, the EU or OSCE for fifteen years. Slovenian contribution also has some specifics deriving from the two decade long development of the Slovenian Armed Forces up to the present moment. From the initial dispersion and involvement of individuals and groups, the contribution has gradually developed to low-level tactical units. In 2007, for the first time an entire battalion was deployed abroad. It should be specifically stressed that multinational operations and missions are an important and efficient tool for the transformation of the armed forces, integration to allied structures and multinational force structure, and the provision of interoperability in a military area.

Keywords: Multinational operations and missions. Slovenian military contribution to multinational operations and missions. Characteristics of Slovenian contribution to multinational operations and missions.

ASPECTS IN OBTAINING NEW MULTI-LAYER STRUCTURES USING NONCONVENTIONAL METHODS

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Abstract: This paper sets out to treat some aspects related to the employment of the welding by explosion mechanism in obtaining new metal structures used in special industries, such as chemical industry, aeronautics, mechanical engineering, and may find application in the defense industry.

Keywords: Multilayer structures. Nonconventional methods.

DESIGN TELEMaintenance IN THE ARMY OF THE CZECH REPUBLIC

Jan FURCH

Abstract: In this article the author describes particular maintenance systems used in the past, some of which are used also at present. The basic maintenance systems include maintenance after use, preventive maintenance with predetermined intervals, and conditioned-based preventive maintenance - predictive maintenance. These maintenance systems were continuously improved and new ones were added – so called computerized maintenance management system, reliability centred maintenance, and total productive maintenance. The article further describes new methods of performing the maintenance based on so called proactive maintenance with using so called telemaintenance, which may be simply explained as remote-controlled maintenance.

Keywords: Telemaintenance. Maintenance. Corrective maintenance. Preventive maintenance. Predictive maintenance. Computerized maintenance management system. Reliability centred maintenance. Proactive maintenance.

TECHNICAL CONDITION DETECTION OF AIR TANKS IN THE ARMY OF THE CZECH REPUBLIC

Jan FURCH, Josef GLOS, Ondřej RAZÝM

Abstract: The aim of the paper was to make a methodology used for performing the air tank inspections of combat and special vehicles in the Army of the Czech Republic. The main asset of the methodology is introducing a suitable ultrasound gauge which would be able to take measures without removing a coating. After taking a lot of measures and comparing single gauges accuracy we came to a conclusion that the most convenient device is the DM 4 DL ultrasound thickness gauge. This device is suitable namely for finding out the wall thickness of non-dismountable air tanks.

Keywords: Technical condition of air tanks. Air tank inspection.

THERMAL STRESS SOLUTION OF A VEHICLE BRAKE SYSTEM

Vlastimil NEUMANN, Štefan ČORŇÁK

Abstract: Paper is focused to thermal stress (running) of the vehicle brake system, because the brake system function affects the vehicle safety. One of basic parameters, which affect brake system function, is brake fluid quality. Brake fluids on the glycol base are one of the most extended brake fluids. Because, these fluids are hygroscopic, is necessary to observe process of the brake thermal stress and running.

Our research is focused to creating mathematic model of the brake and simulating the brake conditions. At the first it was created simplify mathematic model and made experiment. Created simplify mathematic model of the wheel-brake disk of the vehicle correlates with experimental measuring data.

Outputs from the simplified simulation are starting data for the complex wheel-brake disk model creation and for simulation. For its finalization is necessary to make next experimental measuring of others input and reference data.

Keywords: Heat transfer. Breaks. Simulation.

FRENCH EXAMPLE ON THE MECHANISM OF ORGANIZED METAL THEFT WITHOUT FRONTIERS

Gábor ERDEI

Abstract: The author has used French examples highlighted in the context of organized crime. The danger and the threat of criminal organizations have grown significantly. They are not properly regulated and controlled. Economic enterprises may be found behind the organized groups in which the qualified business and financial market enterprise are related to the crime. One of the economic aspects of organized crime is the illegal metal trade which continues to represent challenge and danger.

Keywords: Organized crime. Social processes. Lack of capital. Illegal, or not properly regulated and controlled enterprises. Tax laws. Money laundering. Organized crime groups. Asset statements required.