РЕЗЮМЕ/ABSTRACTS

Senko V. I., Pastuhov M. I., Makeev S. V., Pastuhov I. F. Analysis of Failure Causes and the Possibilities of Extending Service Life of the Sole Bar of Freight Car Trucks

Load carrying capacity of jaw opening of the axle box of the sole bar of the freight car truck is evaluated and the analysis of the factors determining the causes of fatigue fracture occurrence by most unsafe zones is conducted. The computation of the safety factor of fatigue resistance for three cases of freight car truck and sole bar technical condition after their long operation is conducted.

The results showed that the determining factors of reducing load carrying capacity of sole bars are the condition of passing gravity humps by the freight car and the rate of longitudinal dynamic stresses in them. Technical conditions of car trucks and sole bar casting quality also influence their load carrying capacity since they reduce safety factor of fatigue resistance respectively by 12 and 20 %.

Tarasenko V. E., Yakubovich A. I., Bobrovnik A. I., Golod S. V. Efficiency of Cooling System of Farming Tractor Diesel Engine

The procedure of designing convective heat transfer of diesel engine block allowing for air flow velocity, length of flow and configuration of air profile is presented. The program and major results of experimental study of Belarus-3022DV tractor Diesel engine cooling system are presented. Technical characteristics of the advanced cooling system of the farming tractor are formulated.

Shevchenko S. A. The Analysis of the Influence of Reliability of the Machines of Technological Complex on Probability of Performing Production Task

The methods of defining the probability of inadmissible reduction of products output due to technological complex machine failure are developed. In this connection failure and repair rate is taken into consideration and also the dependence of output reduction on the duration of downtime period for each technological operation.

Popov V. B. Developing Functional Mathematical Model for Adapter Balancing Mechanism for Forage Crop Harvester «Polesye-3000»

Analytical dependencies for geometrical, kinematical and dynamic analysis of the balancing mechanism of the adapter of the forage crop harvester «Polesye-3000» are developed. Theoretical analysis conducted resulted in a more correct analytical expression for defining response on the adapter shoe for various header vertical positions. Some of the expressions obtained can be used as functional borders and optimization criteria for mathematical models of adapter balancing mechanism parametric synthesis.

Rudak E. A., Yachnik O. I. Maksimeneko N. V., Andreev V. V. Calculation of SF Values for Fuel Fission Products of Water Moderated Water Cooled Power Reactor VVER-1000

The recommendations of the International Atomic Energy Agency about determination of not only total activity of radioactive waste but also their nuclide components make urgent the development of methodic procedures in this direction. The representation of the relation between activities of various nuclides (SF values) in analytical form for the reactor VVER-1000 is given in the paper. It is shown that such representation of SF values facilitates the problem of identification of necessary fission products in spent fuel for medium-lived and long-lived radionuclides and the errors occurring in such conditions are negligible.

Khandramai V. L., Solovtsova O. P. Present Day Status of Bjorken and Gross-Levellyn Smith Sum Rule

Four loop analysis for Bjorken and Gross-Levellyn Smith sum rule is conducted with the use of standard perturbation theory and analytical approach of Shirkov–Solovtsov. The review of present day experimental data available for these sum rules is presented and it is shown that in low energy region of quantum chromodynamics an analytical approach has considerable advantages over the standard perturbation theory and enables to reliably obtain numerical values of higher twist coefficients.

Maksimenko A. V., Myshkavets V. N., Shapovalov P. S. Pulse Laser Welding Deposition on Structural Steels by Laser Annular Beams

Laser welding deposition on structural steels by laser beams is considered. Temperature field distribution during material heating by gauss and laser annular beams is determined.

It is shown that that to improve the efficiency of deposition process it is preferable to use laser annular beam.

Shmatov A. A. Forming of Diffusion Ti–Mn Carbide Coating on Steel

For three-component Cr–Ti–Mn system optimization of power mixtures was performed with respect to abrasive wear resistance and microhardness of diffusion carbide coatings produced by high temperature (1100 °C) thermochemical treatment of high carbon steel У8 (0,8 wt. % C). Treatment with optimal compositions of the Ti–Mn powder media enables increasing abrasive wear resistance of steel by 30 as compared with steel without treatment. Optimal Ti–Mn carbide coating has composite microstructure including TiC layer, $(Mn, Fe)_3C$ layer with Al inclusions. New model for forming diffusion Ti–Mn carbide coating on steel is proposed based on thermodynamics and kinetics.

Ovsiannik A. V. Critical Heat Flux and First Boiling Crisis on Non-Isothermal Finned Surface

Heat exchange during boiling on heat release non-isothermal finned surface is considered in the paper and also first boiling crisis conditioned by the transition from bubble boiling to film boiling.

Design relations are obtained for determining critical parameters (temperature drop, heat flux density and heat transfer coefficient) during first boiling crisis for the finned surface.

Zalizny D. I., Novikov M. N., Khodanovich N. M., Shutov A. Y. Methods of Numerical Calculation of Non-Steady Thermal Processes in Power Cable Insulation

The methods of numerical calculation of non-steady thermal processes in power cable based on Runge–Kutter method are proposed in the paper. Experimental studies of heat processes in the cable with insulation of cross-linked polyethylene are conducted showing that the methods need improving. After finishing the methods can be used at the stage of designing power supply systems as well as in power cable operation.

Kolesnik Y. N., Ivaneychik A. V., Kuzero A. M., Rabkov A. N. Efficient Control of Consumer Electric Loads with Piecewise-Continuous Consumption Characteristics in the Conditions of Undetermined Production Program

The possibility of efficient control of consumer loads in the condition of undetermined production program are considered in the paper. During operation mathematical models of the equipment electric power consumption are obtained and also efficiency functions for determining minimum electric power consumption and minimum power inputs for predicted volume of production. Optimum operating conditions for production equipment operation are determined.

Komnatny D. V. Calculation of the Field of Microstrip Buried Transmission Line by the Method of Equivalent Electrodes

The paper deals with the developing the method of calculating electrostatic field in printed circuit boards with buried strip transmission lines. Such methods are necessary for calculating linear capacitance of transmission lines and then for analyzing signal transmission by the lines.

It is proposed to calculate the field by the equivalent electrodes method. Allowing for inhomogeneity of medium is accomplished by the method of electrical images. The method of formation of the system of charge images and recording this system in a table form is proposed in the paper. This enables to control the correctness of the images and detect the source of error. The results of numerical experiments are described which prove that the method of equivalent electrodes has small error. The error can be reduced by means of increasing the number of mirror images.

Patsei N. E., Priduho V. T., Popov V. B. Designing and Simulating the Operation of Automation Systems for Controlling and Metering Electric Power for Industrial Purposes

The methods of computer aided design of automated systems for metering and controlling electric power for industrial purposes are proposed in the paper. Operational models of the automated systems for controlling and metering electric power for industrial purposes are presented for the stages of conceptual and detail design and the methods of definig design approach for each of the stages are described. A model used in simulating the performance of the system to evaluate its serviceability is also described. The results of structural-parametrical synthesis and analysis of the operation of the newly created system are presented.

Bielinskaya Y. V. Contradictions of Monetary Policy of the National Bank of Ukraine at the Stage of Recovering from Economic Depression. Part I. Inefficiency of Antiinflationary Policy and the Problems of Bank System Development

At the stage of recovering from economic depression the basic problem of realization of monetary policy is the contradiction between the necessity of reducing inflation rate and the demand for extended economic development financing. It is shown that the difficulties of lowering the inflation rate in Ukraine are connected with specific character of inflation factor complex which predetermine inadequacy of antiinflationary tools for the character of the inflation. It is revealed that the absence of financial support of real sector of economy and concentration of bank activity on the operation with their own problems create prerequisites for developing inflation processes in future.

Bolomchuk B. V., Dragun N. P. The Study of Internal Factors the Level of Diversification of Industrial Enterprise Activity

The paper deals with quantitative analysis of the influence of internal factors on the level of diversification of industrial enterprise activity. Two balanced panels are used including data on 9 machine building and food enterprises of Gomel respectively for the period of 2004–2008. Basic method of analyzing is regression analysis by panel data. The results obtained are original in several respects. It is established that taken as the conditions of increasing the level of diversification of the activity of food enterprises under study all three groups of internal factors considered are equally important including volume and qualitative characteristics of available production resources, efficiency of their use, and also available possibilities of increasing resource base. For machine building enterprises mainly two groups of factors are of importance including volume and qualitative characteristics of available production resources and efficiency of their use. It is established that working capital deficiency is one of the main factors preventing from diversification of the activity of food enterprises. Internal factors for the enterprises under study are also determined contributing to increasing the level

of horizontal and vertical diversification, diversification of markets and the degree of simi-larity of the of the kinds of activities performed in the present market conditions.