

Yu. E. KALABUHIN, Y.S. VENTSEL, O.V. OREL. ECONOMICAL EFFICIENCY OF IMPLEMENTATION OF REASONABLE OPERATIONAL LIFE BASED ON THE RATIO OF ANTI-WEAR PROPERTIES OF WORKING FLUIDS.....2

The article contains methods and results of calculation of the economical efficiency based on the use of the ratio of anti-wear properties K_j as an integral performance index of working liquids of hydraulic drives of construction machines (by the example of a grader).

A.V. SAPRYKA. ANALYSIS OF ENERGY SAVING IN THE SERIES TUNED CIRCUIT WHEN APPLYING PULSE AND SINUSOIDAL SIGNAL TO ITS INPUT.....12

The article contains results of the analysis of energy saving in the series tuned circuit of the lighting unit when applying pulse and sinusoidal signal to its input. The article shows that it is reasonable to use pulse supply voltage to get a double voltage at the starting capacitor. In this case, the power consumption of the circuit is less than in case of the sinusoidal signal at the input of the circuit.

E. N. TROYNIKOVA. APPROACHES TO THE OPTIMIZATION OF EXPENSES FOR THE PROVISION OF THE TECHNOLOGICAL SAFETY AT SOME COMPONENTS OF INCREASED ACCIDENT RISK.....16

Technological safety is provided for specific technological manufacturing processes at all components of the railway infrastructure. High accident risk components hold a special place (places of crossings of traffic flows at the same level, hump yards). Safety expenses included into operating expenses for such components depend directly on expenses for maintenance of the equipment providing the safety of the railway infrastructure.

Power engineering

E. G. BRATUTA, O. V. KRUGLIAKOVA, V. V. CHUBAROVA, Y. V. BONDARENKO. DETERMINATION OF THE EFFICIENCY OF THE SPRAY TYPE COOLING TOWER ON THE BASIS OF THE AREA OF SPRAYED WATER DROPS.....20

The article contains the mathematical model of circulating water cooling in the spray type cooling tower created on the basis of the actual area of dispersed liquid. Results of calculations are compared with real experimental data.

O. L. SHPAK, K. V. USCHAPOVSKY. STRATEGIC TASK OF POWER ENGINEERING....26

The article contains the data of the research in the field of a visual simulation model “as is” basing it is possible to sell electric energy to legal entities. The proposed model includes the information about the management structure, necessary resources, scenarios of performance of works, etc. under conditions of the production unit OJSC “Khmelnitskoblenergo”. The model can be used for further optimization of business processes.

Alternative energy sources

N. N. BOLOTSKIH, N. S. BOLOTSKIH, A. S. SOROKOTYAGA. INCREASE OF OPERATING EFFICIENCY OF GAS INFRARED TUBE HEATERS.....32

New proposals on the improvement of structures and the increase of operating efficiency of gas infrared tube heaters are described.

Key words: *infrared heating, tube heaters, burner.*

Ju. V. KURIS. TEMPERATURE CONDITIONS OF METHANOGENESIS AND FLOW DIAGRAMS OF PRODUCTION OF BIOGAS.....39

Temperature conditions of fermentation of organic substances and conditions of active production

ABSTRACT

of methane are analyzed. It is determined that degradation of organic substances during the methanogenesis represents the multistage process during which carbon bonds are destructed gradually by different groups of microorganisms. Organic acids formed under such conditions (except for acetic and formic acids) turn into acetic and formic acids, hydrogen, etc. under the influence of acetogens, a special group of bacteria. During the first three stages (namely hydrolytic stage, acidic stage and acetogenic stage), acetic and formic acids, methyl alcohol, methylamine, hydrogen, carbon oxide and dioxide, ammonia, hydrogen sulphide, phosphorus oxide are being accumulated in the working medium. Methane-producing bacteria have considerably higher requirements for the conditions of their existence than acid-producing ones: they need totally anaerobic medium and require longer time for their reproduction.

Key words: methanogenesis, acetogens, organic acids, hydrolysis.

Ekonomy

Alexander MERHO, Tatyana SALASHENKO. **THEORETICAL AND ANALYTICAL ASPECTS OF EVALUATION OF THE ENERGY COMPONENT OF THE ECONOMIC SAFETY OF THE NATIONAL ECONOMY.....48**

The article contains the description of the methodological approach to the evaluation of the current state of the energy safety of Ukraine on the basis of its gas, oil, coal and oil product determinants. Its strong and weak spots, capabilities and hazards were identified with the use of the SWOT analysis. Prospective directions of improvement of the current level of the energy safety of Ukraine are determined.

Scientific and technical progress and efficiency of production

T. P. PAVLENKO. **CONTACT COMPOSITIONS FOR HEAVY CURRENT AUTOMATIC CIRCUIT BREAKERS.....59**

The article contains the analysis of a new type of electrical contacts, so called "pseudo-liquid metal contacts" (PLMC) that combine properties of solid and liquid metal formulations of the compositions. These electrical contacts are recommended to be used in main contacts of heavy current automatic circuit breakers instead of solid series-produced samples containing silver.

Yu. S. KURSKOY. **FEATURES OF MEASUREMENTS IN REAL DYNAMICAL SYSTEMS.....64**

The necessity of creating special metrology approaches for measurement and measurement results analysis in real physical, biological and social nonlinear dynamical systems are demonstrated in the article. The measurement and analysis models are created on the basic principles and concepts of the dynamical chaos theory. The entropy analysis is used for research the measurement of dynamic variables in nonlinear dynamical systems. It is demonstrated the need to improve the generally accepted approaches to the expression of uncertainty in measurement for evaluation of measurement results in real nonlinear dynamical systems.

V. K. RUDNEV, V. N. SUPONEV, V. I. OLEKSYN. **REAMING OF HORIZONTAL HOLES BY MEANS OF CUTTING RINGS.....72**

The calculated characteristic for the determination of the force of resistance of soil to cutting by means of cutting rings during the hole reaming after its preliminary shaping by the method of the static puncture is constructed.

Key words: hole reaming; soil puncture; force of resistance of soil to cutting by means of cutting rings.