

METHODOLOGY FOR DETERMINATION THE COEFFICIENT OF RESISTANCE OF HYDRAULIC SHOVELS DURING MOVEMENT

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ABSTRACT. It was designed a methodology for the determination of the coefficient of resistance of hydraulic one bucket excavators, "shovel" type. The most dangerous positions of the shovel while moving upwards and downwards were examined. The relations to determine the coefficient of resistance were derived. For the methodology design were used the constructions of the hydraulic shovels, type "O & K RH 200 C" and EO-6124.

DYNAMICAL MODELING OF DRIVER SYSTEM OF CONE INERTIAL CRUSHER (KID-300)

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ABSTRACT. The paper describes a synthesis of dynamical model for a driver system of one cone inertial crusher (KID-300). The first step of dynamical modeling is synthesis of three mass rotational model with three degrees of freedom. This model is theoretical approximation to the natural model and driver system of the crusher. The paper presents idealization way, schemes and parameters of the system. One of results presented amplitude – frequency characteristic of the system, when the heaviest parameters are used. Also there is analyzed the starting process of the machine and there is resulted the time of the starting process which is very important for electrical driver check and calculation choice.

EXPERIMENTAL MEASUREMENT METHODIC FOR VIBRATION PARAMETERS OF CONE INERTIAL CRUSHER (KID-300)

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ABSTRACT. In this paper is presented the methodic and technical resources for measurement of vibrational parameters of one cone inertial crusher /КИД - 300/. Methodic and algorithm for processing the data used modern software products - OriginPro. Computer analysis is based on Fast Fourier Transform /FFT/. According to the methodic there are achieved result for amplitude of vibrational movement for crusher housing due to different parameters and adjustments of the crusher working regime. A few amplitude spectrums for translational and rotational degrees of freedom are presented. Presented results are used for choosing and optimization of working regime parameters and readjustments of the machine.

COMPUTING METHOD FOR DETERMINING THE WEAR OF THE DRILLING TOOL

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ABSTRACT. In the practice, the analytical methods are used for predicting the wear of the tool. Predicting the wear is divided into two phases: the development of physical models and calculation by analogy. Empirical models such as mathematical approximations to the experimental results found practical application.

This paper presents a calculation method to determine the wear of drills as a function of the rate of wear and drilling speed.

MATHEMATICAL MODEL WITH THE VARIABLES PARAMETERS FROM THE SHOCK INTERACTION IN THE DRILLING TOOL FROM MINING EQUIPMENT

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ABSTRACT. The shot interaction is a complex dynamic process that is used in various technical systems. Depending on the desired effect, shot can to be work process or additional process, requiring protection of system. The drilling by shot is used to tools from the mining machinery to breaking the rocks.

In this article is proposed a model describing the interaction between the drilling tool monoblock and rocks with different hardness.

WEAR OF THE TRACTION BRACELETS OF THE MINE LOCOMOTIVES FOR UNDERGROUND TRANSPORTATION

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ABSTRACT. Traction bracelets are an element of the kinematic scheme of the locomotive, which is subjected to the most intense wear. Replacement in mining conditions is almost impossible, requiring an expensive and complex repairs. The article discusses the reasons leading to the change of wear intensity depending on the condition of the tracks, the working conditions, the material of the traction bracelets and technology in their construction.

OPEN PIT MINE ATMOSPHERE REMOTE CONTROL SYSTEM

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ABSTRACT. Ventilation of open pit mines with great depth (more than 300m) is hardly controlled complicated process. It depends on several factors – mine location, meteorological conditions, technology, and objects location inside the mine. Asarel mine is a pioneer among open pit mines to install remote control system for CO, NO, NO₂, SO₂ and O₂ concentrations in four stations inside the mine. This paper presents the system, operating in the mine as well as the way of processing and presenting monitored data. Threshold limit values of traced gases concentrations for alarm announcement and accidental planning are analyzed. Some options to utilize the system in the planning process are proposed..

SIMULATION STUDY OF AERODINAMIC PARAMETERS OF AN AXIAL FAN

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ABSTRACT. The results obtained using the simulation study and the results obtained from a real testing of an axial fan are compared in the report.

PARAMETERS OF INDIRECT CONTACT IN LV IT NETWORKS, WITH HIGH HARMONICS

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ABSTRACT: The dependencies of voltage in indirect contact, the current through the person and the power in the defective area in stationary and mobile mining equipment connected to the electrical power network with an isolated neutral, containing high harmonics was phased out. The increased risk, which depends from the amplitude-frequency spectrum of harmonics and the need to limit the risk are commented.

LOADING MODES OF POWERFUL TRANSFORMERS WITH STEPPED REGULATING VOLTAGE

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ABSTRACT: Parameters that are typical for the different working modes are examined. The results from the studies in existing asymmetry in the characteristics of the transformers and the position of the stepped regulators are shown. After the analysis, based recommendations for the optimal choice of stepped regulators of the transformers in mode of parallel operation are given.

EQUIVALENT SCHEME OF A THREE-PHASE CIRCUIT WITH AN INSOLATED NEUTRAL, WHEN CALCULATING THE CURRENT FLOWING THROUGH THE HUMAN BODY AT THE TOUCH OF ONE OF THE PHASES, AT LARGE CONDUCTIVITY RATES OF THE INSULATION

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ABSTRACT. This report presents an equivalent scheme, with which it examines the correlation between the current that runs through the human body from the resistance of the insulation of this phase towards which the touch has occurred. An equation is derived, allowing for current to be determined when running through the human body at the touch towards a three-phase circuit with an insulated star center, at random values of the active insulation resistance and capacity of the network.

ANALYTICAL METHODOLOGY FOR CALCULATING ASYMMETRY OF CURRENTS IN THREE-PHASE ELECTRICAL SYSTEMS

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ABSTRACT. In this report, a problem is examined throughout the literature, where another analytical approach for determining the formula of asymmetry of currents is being proposed. The final result is more convenient for practical use. An equation is derived for determining the phase of the voltage vector with reverse order.

TRANSISTOR NONLINEARITY AUGMENTATION METHODS

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ABSTRACT. Transistor nonlinearity is an important parameter, considering its energy efficiency. Nonlinearity is represented by the output current change to input voltage change. Its study includes analyses of elements with new constructions and new materials on the following criteria: change step of input voltage, threshold voltage value and leakage current in state "off". The paper presents Tunneling field effect transistor (TFET), 3D-transistor (Fin-FET), dual-gate transistor, graphene "barristor" – GB, phototransistor with graphene and quantum dots and phototransistor with organic molecules. The aim is inclusion in students' book.

STATUS AND PROSPECTS OF THE LED LIGHTING IN BULGARIA

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ABSTRACT. The report summarizes data from about 850 LED luminaires measured for 3 years. Detected is to increase the light yield in time. Separately examined for internal and street luminaires. Summarizes the prospects, problems and frequent errors in their construction.

Keywords: LED, luminaire, current, voltage, power, light output

INFLUENCE OF LIMITATIVE CONDITIONS IN OPTIMIZING THE LIGHT DISTRIBUTION OF STREET LIGHTING

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ABSTRACT. Due to specific visual task in street lighting, light distribution has a major impact on the efficiency of the luminaire. Using MATLAB to solve problems for optimal light distribution. Presented a 3D visualization solutions.

Keywords: Optimization, LED, luminaire, light distribution.

PREVENTION, MODEL SELECTION, METHODS AND TECHNICAL MEANS FOR MEASURING INTERNAL CORROSION OF UNDERGROUND PIPELINES

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ABSTRACT. The report identifies the main factors that influence the development of internal corrosion. It summarizes the trends in development of equipment for measuring of this corrosion. On the base of the trends it was made the conclusion that the main work of scientists is directed to the development of devices for diagnosing around the whole diameter of pipeline, determination of the size of the cracks and the development of mobile robotic systems. There were proposed criteria for comparing of different methods and on this base are recommended ultrasonic and eddy current principle as appropriate to the specific environment in the inside of the tubes.

FORECASTING THE LOAD THROUGH NEURAL NETWORK ENGINE THAT POWER SAG MILL

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ABSTRACT. In this paper, in order to predict the load on the engine which drives the SAG mill are trained neural networks. Conclusions are made concerning the opportunities to predict the performance parameters of the engine in real-time on the base of neuromorphic macros. The results of the study indicate that the multilayer perception with 10-20 knots in the hidden layers produces the best results.

ANALYSIS OF MIDDLE VOLTAGE ELECTRICAL GRIDS WITH ISOLATED NEUTRAL GROUNDING IN MINES

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ABSTRACT. In the current paper are led analytic equations for voltage with zero successions, voltages compared to earth and earth fault current in grids with isolated neutral grounding. There are simulated graphical relationships between voltage with zero succession and earth fault current, at different capacities to ground and active insulation conductivity phase to ground in mine middle voltage electrical grids 6kV. In analysis is led relation between earth fault current and magnitude of transition resistance to ground.

MOVEMENT OF PARTICLE IN A VERTICAL CYLINDRICAL HOUSING OF CENTRIFUGAL-ROLLER MILL IN THE CYLINDRICAL COORDINATE SYSTEM

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ABSTRACT. Equations are derived for the motion of ore particle in a vertical cylindrical housing of centrifugal-roller mill in the cylindrical coordinate system. In order to solve the nonlinear differential equations we provide an iteration method. A detailed algorithm is described for determining the trajectory, the components of the relative velocity and acceleration. To better imagine the process it is illustrated on two block diagrams.

Key words: centrifugal – roller mill, behavior of the particles, method of Runge-Kutta.

STUDY OF EQUILIBRIUM SYSTEM OF THREE UNITS WITH A MATHCAD

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ABSTRACT. Specific task is solved with the MathCAD package as originally received the analytical expressions of the right sides of the system of eleven independent equations on the unknown, and then introducing the output data are derived and corresponding numerical results.

DYNAMICS OF VIBRATION MACHINES WITH AN ECCENTRIC VIBRATION GENERATOR

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ABSTRACT. A one- and a two-mass model of vibrating machines with an eccentric vibration generator are studied. The differential equations of motion are derived and solved analytically. The relations between the machines' parameters at which the drive remains unaffected by forces are determined.

THERMODYNAMIC PECULIARITY OF THE NATURAL VENTILATION OF OPEN PIT MINES

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ABSTRACT. Dust generation and its dispersion has been the major concern in ambient air quality in deep cavities such as open cast mines. The meteorological conditions within the deep open pit mines are significantly affected by temperature (stability) and roughness conditions which ultimately generate complex dispersion phenomenon including separation of atmospheric boundary layer, recirculation, resuspension and settling of dust. The determination of the internal ventilation regime within the open pit is a complex process as the driving natural wind system will change subject to diurnal and seasonal changes in its strength and direction, which are dictated by the local wind systems and the differential heating of the earth's surface by the sun. In this paper are presented the results from the simple thermodynamic model of the dynamic of open pit ventilation systems. The model can simulate the diurnal change of the solar radiation that take place during the day and the release of this energy during the evening and night as natural ventilation.

RESEARCHING OF OPERATING MODES OF DOUBLY FED AC ELECTRIC MACHINE

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ABSTRACT. On laboratory setup consisting of coupled induction motor with wound rotor and DC machines have been tested different modes. Attempts were made in the power of the stator, the rotor and bilaterally. Powered is controlling the speed of rotation of the asynchronous motor by feeding the stator from the grid and the rotor of the inverter. Taken are characteristics of the system and determine the main parameters for selecting the inverter to power the rotor with variable frequency.