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HEAT AND POWER ENGINEERING

UDK 621.321

HEAT RUNS RESULTS OF TP-115/125-130-1TP PU TMZ IN CONDENSATION MODE

G.V. LEDUKHOVSKY, A.A. POSPELOV, Candidates of Engineering, N.S. ASTASHOV, I.B. VOLKOV, G.B. KOMISSAR, Engineers

The authors present the heat runs results of Tp-115/125-130-1tp PU TMZ in the condensation mode. The comparison of the final data and the calculation results of a manufacturing plant is carried out.

Key words: steam turbine, heat run, condensation mode.

UDK 621.311

INNOVATIONS IN THERMAL DIAGRAMS DESIGNING OF STEAM TURBINE UNITS, STEAM GAS PLANTS AND EVAPORATOR INSTALLATIONS

A.V. MOSHKARIN, Doctor of Engineering, B.L. SHELYGIN, G.I. DOVERMAN, E.V. ZAKHARENKOV, Candidates of Engineering, T.A. ZHAMLIKHANOV, E.S. MALKOV, Post Graduate Students

The authors carry out the analysis of the modern bundled software on calculating and designing manufacturing schemes and heat engineering equipment of steam turbine units, steam gas plants and evaporator installations.

Key words: manufacturing schemes, steam turbine units, steam gas plants, evaporator installations, designing, calculation, bundled software.

UDK 621.311.22

ANALYZING INFLUENCE OF FEED WATER NOMINAL INJECTIONS INTO STEAM DUCT OF PK-41 BOILER ON EFFICIENCY AND OPERATIONAL RELIABILITY

B.L. SHELYGIN, Candidate of Engineering, S.A. PANKOV, Candidate of Engineering, A.B. MELNIKOV, N.V. BAZEEV, Engineers

The article is devoted to the problem of suitability analysis of refusing feed water nominal injections into steam duct with application of the calculated model of PK-41 boiler. The calculation research of boiler operation without feed water injections in the first parts of its superheater is carried out with variable loads.

Key words: steam boiler, calculation model, heat surface arrangement, furnace waterwalls, convection tube bank, circulation velocity, hydraulic resistance, water temperature, coefficient of boiler efficiency.

UDK 621.187.11

IMPLEMENTATION OF AUTOMATIC CHEMICAL CONTROL SYSTEM ON CHEMISTRY CONDITIONS AT THERMAL POWER STATION

B.M. LARIN, Doctor of Engineering, E.V. KOZULINA, A.B. LARIN, Candidates of Engineering, A.V. KOLEGOV, Post Graduate Student

The article is devoted to the results of industrial tests of automatic chemical control system on chemistry conditions of power drum-type boiler №3 with 13,8 MPa pressure at Ivanovo Thermal Power Stations 3. The authors suggest the comparative analysis of quality data results of heat-transfer agent executed by manual and calculation methods based on the measurements of specific conductivity and pH.

Keywords: chemistry conditions, automatic chemical control, conductivity, phosphates.

ELECTRICAL POWER ENGINEERING

UDK 621.316.925

ON ENGINEERING DESIGN OF GROUNDING RESISTANCE OF TYPICAL SUPPORTS OF ELEVATED PIPELINES

V.K. SLYSHALOV, Doctor of Engineering, Yu.V. KANDALOV, V.D. LEBEDEV, Candidates of Engineering

The authors consider the mathematic models of grounding conductors for carrying out the engineering design of grounding conductors of elevated pipeline systems. The authors estimate the inaccuracy of the approximation formulas and give recommendations for their usage.

Keywords: grounding resistance, electric capacity, elevated pipeline.

UDK 621.311/621.316

ELECTROMAGNETIC BRAKE APPLICATION FOR EPS TRANSIENT STABILITY ON KONAKOVSKAYA STATE DISTRICT POWER STATION

O.N. KUZNETSOV, Candidate of Engineering, N.A. ANTIPOVA, Post Graduate Student

The authors describe the existing methods and tools for improving EPS transient stability. The electromagnetic brake (EMB) application as an instrument for transient stability improvement is suggested. The EMB design is proposed. The authors consider the EMT application for the transient stabilization of generators at Konakovskaya State District Power Station. The technical requirements to EMB parameters are defined.

Keywords: electrical power system, transients, transient stability, electromagnetic brake, short circuit.

UDK 621.3.084.2;621.316.925

DIFFERENTIATE MEASURING CURRENT CONVERTERS FOR RELAY PROTECTION AND AUTOMATICS IN HIGH-VOLTAGE POWER NETWORKS

G.E. KUVSHINOV, Doctor of Engineering, A.N. KOZLOV, Yu.V. MYASOEDOV, Candidates of Engineering, Yu.A. ANDREENKO, I.A. BOGODA'KO, Engineers, A.S. ZINKEEVA, Post Graduate Student

The article contains the description of structural variations of differentiate measuring current converters. The authors consider the factors of inaccuracy in measurement, as well as the ways of negating restrictions.

Key words: differentiate measuring current converter, structural variatins, restrictions, compensation.

ELECTROMECHANICS

UDK 621.538

EDGE EFFECTS RESEARCH OF MAGNETIC FIELD ACCORDING TO NONLINEAR PROPERTIES OF MAGNETIC MATERIALS BY USING MATHEMATICAL SIMULATION

S.M. PERMINOV, Candidate of Engineering

The author presents the research results of magnetic field near the edge of the pole in the pole – gap – magnetically conductive shaft system, received with the mathematical simulation method. The author proves that there is the strength burst of the magnetic field near the edge. The author develops the dependences of strength distribution of the magnetic field in the area near the edge. The influence of geometric characteristics of the material and the saturation of the pole on the value of nonuniformity of the field are analyzed.

Key words: heavy gradient magnetic field, edging effect, mathematical simulation.

UDK 621.9

RESEARCH OF MECHANICAL, PHYSICAL, AND CHEMICAL PROCESSES ON CONTACTING SURFACES OF MINERAL AND CERAMIC CUTTING TOOL

D.A. BEKTASHOV, Candidates of Engineering, A.A. KRAPOSTIN, Post Graduate Student

Mechanical, physical and chemical processes on contacting surfaces of mineral and ceramic cutting tool are investigated. The authors demonstrate pictures of contacting surfaces and concentration-response curves of microprobe research.

Key words: turning operation, cutter blades, mineral ceramic.

UDK 621.9.01

IMPULSE MAGNETIC UNIT FOR HARDENING OF CUTTING TOOLS

V.A. POLETAEV, Doctor of Engineering, M.G. MARKOV, E.V. KRASILNIKYANTS, Candidates of Engineering, A.S. ORLOV, Engineer

The authors consider the scheme of impulse magnetic unit for hardening cutting tools and their components. The operation principle of the basic components of impulse magnetic unit is described as well as its basic technical specifications.

Key words: impulse magnetic treatment, durability, cutting tools, power module, control unit, solenoid.

AUTOMATION CONTROL SYSTEMS

UDK 004.45:62-52

SOFTWARE COMPONENTS OF MANIPULATOR ROBOT

V.V. TYUTIKOV, Doctor of Engineering, E.V. KRASILNIKYANTS, Candidate of Engineering, A.A. VARKOV, Engineer

The authors consider the software architecture features of manipulator robot control system. The approaches to realization of system software of manipulator robot control system are described.

Keywords: manipulator robot, control system, software.

UDK 621.313

DEVELOPMENT OF ROTOR FLUX OBSERVER OF ASYNCHRONOUS MOTOR ON THE BASIS OF TWO-DIMENSIONAL CONVOLUTION FUNCTION

A.P. BURKOV, E.V. KRASILNICKYANTS, Candidates of Engineering, A.A. SMIRNOV, Post Graduate Student

This article is devoted to the issues, associated with observer construction for monitoring the values of rotor magnetic vector magnitude and angular deflection of induction motor oriented on two-dimensional convolution on temporal and spatial actual parameters. The interrelation of induction motor breakdown torque and rotor characteristic time and transportation lag is shown. The scheme of rotor observer on the basis of gage rotor position and stator current is shown.

Keywords: asynchronous motor, distributed system, impulsive admittance function, nonstationary component.

UDK 621.314

SIMULATION MODEL OF UNIFIED SHIP ELECTRIC POWER STATION BASED ON EXPLOSION ENGINE WITH ALTERNATING FREQUENCY ROTATION OF SHAFT

O.S. KHVATOV, Doctor of Engineering, A.B. DARYENKOV, Candidate of Engineering, I.S. SAMOYAVCHEV, Post Graduate Student

The authors present the description of the functional and structural schemes of unified ship electric power station based on the explosion engine with alternating frequency rotation of shaft. The results of simulation for unified electric power station of ship are discussed.

Key words: unified electric power station, explosion engine, synchronous generator, synchronous motor, frequency converter.

COMPUTER SCIENCE AND INFORMATION TECHNOLOGIES

UDK 004.414

SIMULATION AND ANALYSIS OF POWER SUPPLY SYSTEMS OF TERRITORIES BY USING INFORMATION ZONING AND AGGREGATION METHODS

S.V. KOSYAKOV, Doctor of Engineering, A.M. SADYKOV, Post graduate student

The authors consider the approach to models realization for the analysis of space structure of power supply systems of the urbanized territories on the basis on aggregation methods of the areas information and zoning foundation, and the realization results of software simulation and the analysis of power supply structure systems of territories with GIS-application.

Key words: 3D-modeling, zoning, information aggregation, geoinformation system.

UDK 004.31

OBJECT-EVENT MODEL OF DATA INTEGRATION IN INFORMATION SYSTEMS OF MUNICIPAL GOVERNMENT

E.R. PANTELEEV, Doctor of Engineering, E.B. IGNATEV, Candidate of Engineering, A.L. ARKHIPOV, Post Graduate Student

The authors discuss solution to the data integration problem in the municipal governance systems based on event-based interaction of service-oriented architecture components. Fundamental components of this architecture, relation model, and scripts of their cooperation are defined. An example of its implementation is included.

Key words: geographically-distributed technical systems, distributed database, integration, service-oriented architecture.

ECONOMICS

UDK 336.77

SCIENTIFIC AND RESEARCH ISSUES OF CREDIT MONITORING IN RUSSIAN AND FOREIGN RESEARCHES

I.A. ASTRAKHANTSEVA, Candidate of Economics, E.A. ARDASOVA, Applicant

The article is devoted to the main areas of credit monitoring research. The conclusions of the Russian and foreign researchers working on this issue are discussed. The areas for further analysis of the credit monitoring mechanism and ways to improve this process are revealed.

Keywords: credit monitoring, delegated monitoring, rating agency, rate of interest, firm value, credit contact.

UDK 338.24

INNOVATIVE DEVELOPMENT PROSPECTS OF THE RUSSIAN FEDERATION ECONOMY

N.V. KLOCHKOVA, Doctor of Economics, V.O. BERDICHEVSKAYA

The article considers the current state of innovation development of the Russian Federation economy. The authors define the basic concepts of the innovative economy and the prospects of its development.

Key words: innovations, innovative infrastructure, innovative economics.

UDK 338.24

DEVELOPMENT OF INFORMATION MODEL FOR ASSET MANAGEMENT OF TERRITORIAL DISTRIBUTING CORPORATION ON EXAMPLE OF FEDERAL GRID COMPANY OF UNIFIED ENERGY SYSTEM

L.I. ABROSIMOV, Doctor of Engineering, A.G. CHERNOV, Post Graduate Student

The article is devoted to the system of informational indicators for solving the problems in management of territorial distributing corporation, which is presented as a multidimensional vector. It allows us to collect, to keep, to search, and process the data. The article is supplied with the results of functioning analysis of Federal Grid Company of Unified Energy System.

Key words: informational model, asset management, reliability characteristics of assets functioning, performance evaluation of functioning, specification of asset parameters, asset management strategies, risks of technological disturbances.

UDK 330.111.64; 339.13.012.42

DISTRIBUTIVE RELATIONS AND CORRECTING MARKET MECHANISM

E.E. NIKOLAEVA, Candidate of Economics

The article considers the deformation of distributive relations as one of the most significant factors of complexities and difficulties of economic life in the economy of Modern Russia. The author emphasizes that the distributive relations disturbances occurs under the influence of objective process of the correcting role of the market deformed as regards to public inquiries, requirements, purposes, problems on the basis of which there are economic relations, proportions, laws.

Key words: distributive relations, a correcting role of the market, price, profit, competition.