Power Engineering

In the work we present results of numerical research of erosive resistance of last stage movable blades of powerful wet turbines when changing their parameters by the use of universal mathematical model of erosion. We show that one of the main parameters of the last stage that influences erosive resistance of movable blades is value of gap between wheels increasing of which allows considerably improve erosive resistance of its movable blades. We show that value of gap between wheels increasing of which allows considerably improve erosive resistance of its movable blades is one of the main parameters of the last stage that influences erosive resistance of movable blades.

The comparative estimation massgabarit parameter turbo-alternator is organized with air and with hydrogen system of the cooling. They are brought statistical data, are worded and motivated specificationses, defining importances massgabarit parameter, competitiveness alternator.

Aero- and Hydromechanics in Power Machines

The paper presents the results of numerical research of three-dimensional viscous fluid flow in the flowing part of the vertical axial adjustable-blade (Kaplan) hydraulic turbine on a head to 20 m. Calculations are conducted by means of program complex FlowER-U. The analysis of a flow pattern, energy losses and features of flow in elements of a flowing part is made.

Dynamics and Strength of Machines

The new formulas for transitional functions of electromagnetical vibroexciters are received. The base of these formulas is singularisnal expansion of single spasmodic function.

The method of calculating of the bladings forced vibrations with mistuning by the sector model. The numerical study of the amplitude-frequency characteristics formation of the bladed disk of the steam turbine third stage have been done. The regularities of the influence of shroud mistuning parameters to the formation of the blades frequency-response functions have been carried out.

With application of generalized Fourier's method was made the analysis of the stresses-deformed condition the analysis of tensely deformed status is lead axis symmetric cave-in circular by way of a stamp in transversely isotropic with motionless paraboloid the basis, coaxial axes of a stamp, at absence of friction between a stamp and half-space. The numerical analysis of distribution of pressure between boundary surfaces in the planes parallel to border half-space is lead. The qualitative analysis of pressure is resulted depending on geometrical parameters.

Applied Mathematics

Meshfree methods for solving modeling problems are introduced. The reviews of articles which are devoted to numerical realization based on the using of radial basis functions and atomic

radial basis functions are represented. Integral-differential equations with atomic radial basis functions as the solutions are considered.

Maksymenko-Sheyko K. V. The R-functions method in mathematical modelling of heat exchange at incompressible viscous liquid movement in cylindrical channels with central screw inserts 58

Mathematical models of heat exchange at incompressible viscous liquid movement in cylindrical channels with central screw inserts in curvilinear orthogonal coordinates are built in this paper. The three-dimensional problem is reduced to two-dimensional for a laminar flow in the field of thermal stabilization. The influence of geometrical and physical properties on allocation of a temperature field is investigated by the R-functions method.

Non-traditional Power Engineering

Kanilo P. M. and Kostenko K. V. Anthropogenous and ecological components of global warming 68

Numerous publications including releases of the 15 th UN climatic conference on the so called global warming on the Earth planet have been analysed. It is pointed out at vagueness in forecasting assessments of this phenomenon including lack of analysis in levels of changing movable balance between natural sources of hothouse atmospheric emissions and their drainage. The conclusion is being proved that present-day warming of surface air to a considerable degree is a man-made problem. It is pointed out at necessity of considerable strengthening vector of economy and ecology of economic activity of mankind including as one of the most important, large-scale planting of greenery of the Earth planet.

Red'ko A. A. The rational thermodynamic cycle parameters of a geothermal power plant 76

The design-theoretical research results of the thermodynamic cycle parameters of a geothermal power plant are produced. The numerical results show the efficiency growth and the increase of specific electric energy output in the binary geothermal power plant with several low-boiling working substances.

Materials Science in Mechanical Engineering

Mamaluy A. A., Fatyanova N. B., Shelest T. N. and Dulfan A. Ya. Phase transformations in dispersionly aging alloys 83

The change of structure and physical properties of Cr-Ni-Al alloy during a dispersion aging was explored. The optimum regime of heat treatment was designed for the stability rise of structure and sizes of alloy at preservation of high strength properties. He provides maximum completion of disintegration of a solid solution thus the relative resizing does not exceed $\Delta l/l \sim 5 \cdot 10^{-5}$. The method of further stability rise with formation of a quasi-equilibrium single-phase solid solution was offered thus $\Delta l/l \leq 3 \cdot 10^{-6}$.

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