

Kanuk G. I., Omelchenko L. N., Mikhayskiy D. V. and Fokina A. R. The problems of increase of single power of turbines of the nuclear power plants

The feature of work of turbines on moist steam is considered. Measures on providing of reliability and economy of running part of turbines of the nuclear power plants are analyzed. It is shown that at the number of turns of rotor 1500 turn/min the achievement of single power of turbine aggregate is possible 1000 MW and higher with a substantially greater economy and reliability, what at frequency of rotation 3000 turn/min.

Kovalev S. F., Lipovy S. V., Ovcharenko M. S. and Papchenko A. A. The results of experiments on studying the working process of the multi-use of heat-machine - hydraulic mill

The directions of the work in the exploration and study of the grinding process with the use of water in the context of energy-saving technologies described. For realization of the process grinding with the use of water proposed hydraulic mill as a branch of the multi-use of heat-generating unit. Ways of research of the machine identified. The first results of the physical experiment.

Heat Transfer in Engineering Constructions

Pogribnyi M. A. and Vuets O. E. The research of the temperature fields during the tempering with the heating of high-frequency currents using mathematical modeling

This paper presents the possibilities research of forecasting thermal processes by temperature fields simulation during the heating of high-frequency currents (HFC) with the heat treatment (tempering) details of machines and mechanisms. The technique for constructing the temperature fields on the bodies model of various geometrical shapes and composition, which are the prototype of the real products, with the help of MatLab is developed. The comparison of the influence of heating time, the sizes and chemical composition of the material on the temperature distribution on the cross-section of the products is given. The nomograms, which allow to determine the necessary technological parameters of the heat during the high-speed tempering of HFC are plotted.

Tsakanyan O. S., Goloshchapov V. N., Kravchenko O. V. Free-convective air movement in the vertical channel with discrete heat sources

It is studied of free-convective air movement in the vertical plane of the channels, which has an entrance and exit. The second (cold) wall is made isothermal. The effect of bandwidth and power sources on the thermal regime of the plate, found the distribution of local heat transfer coefficient on the surface of the plate. Noted that the rate of heat transfer is closely linked to the formation of the flow structure in the vertical channel.

Dynamics and Strength of Machines

Myagkohleb K. B. Damping and stiffness of the electromagnetic vibration stand with a reactive mass

Presented a method to determine the coefficients stiffness and dissipation of elasticity in the electromagnetic vibration table (EMVT). A generalized depending on the stiffness and damping coefficients of the mechanical and electromagnetic parameters EMVT. Are considered scheme EMVT reactive mass

Gnitko V. I., Ogorodnyk U. E. and Strelnikova E. A. Mathematical modelling of fluid-structure interaction for energy machine units

The method of evaluating the dynamical characteristics of fluid-filled shells of revolution subjected to short-time impulse loads is proposed. The method relies on determining the fluid pressure from the system of singular integral equations. The coupled problem of the theory of elasticity is solved by using combination of finite and boundary element methods. Differential equations of transient problem are solved numerically by Runge-Kutta method of 4th and 5th order.

Avramov K. V., Mikhlin Yu. V., Romanenko V. N. and Kireenko A. A. Steady self-sustained vibrations of structures with two-side flowing of potential gas stream

Thin-walled structures with geometrical nonlinearity flowing by potential gas stream are analyzed. The method for stability and bifurcations analysis of such systems is investigated. The basis of this approach is solution of the singular integral equations with respect to aerodynamic derivatives of the pressure drop. Using the Bubnov-Galerkin method, the nonlinear dynamical system with respect to the plate general coordinates is derived. The combination of the shooting technique and continuation method is used to analyze bifurcations and stability of the self-sustained vibrations.

Yanchevsky I. V. Investigation of non-stationary vibration of batch piezoelectric radiator by method of finite elements

Results of finite-element modelling of transient deformation of batch "longitudinal-bending" piezotransducer, submerged in boundless ideal compressible liquid environment, are presented. Influence of the acoustic environment on transducer's deformations is investigated at various laws of change in time of electric signal, brought to its electrically-conductive compositions.

Applied Mathematics

Solovey V. V., Zevin L. I. and Inkulis V. V. Risks assessment during operation of objects of gas transmission system's infrastructure

The article presents a method for evaluating risks related to operation of complex dangerous technical objects, such as gas transmission system of Ukraine. A specialized object-oriented approach is proposed for solving the problem of calculating probabilities of emergencies in systems containing large number of interacting elements. Practical application of this approach allows for speeding up the development of domain-specific instruments for defining and analyzing risks that improve the technogenic and ecological safety of gas transmission system operation.

Sheludko H. A. and Ugrimov S. V. Modification of the family three-point iterative method for refinement of simple roots of monotonic nonsmooth function.....

The localization of the root of a convex function by discrete three-point methods is considered. The analysis of existing free-derivatives methods is carried out. Modifications based on the simple procedure of "rapprochement" of the characteristic points of the Lagrange-Hermite are proposed. The idea of rapprochement is implemented numerous schemes and confirmed by numerical experiments on a representative set of test functions with different structures. It is found that due to this procedure can relatively easily improve the efficiency of conventional search localization tools.