

- Lukach L. M., Reznikov S. Yu., Shubenko A. L., Babak N. Yu. and Rogovoj M. I.** Reconstruction of base mine steam-boiler room in mini thermal electric central in the conditions of integration with gas piston power-station .....3

*The results of technical economical estimation of decisions are presented on the reconstruction of mine steam-boiler room, where it is set the steam-boiler of KE-25-14TC in mini thermal electric central. In this boiler mine methane and intermediate product of enriching from Donetsk coal of brand of G is burned. At a reconstruction mini thermal electric central is integrated with powerful mine power-station on a base gas piston engines. It is retained that on mini thermal electric central it is expedient to set the steam condensation turbine of T-12-1,2/0,2 with the managed introduction of a heating system selection with pressure of steam 0,2 MPa by power 12 MWt.*

- Levchenko E. V. and Suhinin V. P.** New from experience of removal of frequency subzero vibration of turbines .....12

*Results over of removal of frequency subzero vibration of rotors of turbines are brought on the basis of new method, cardinally different from accepted until now in practice of planning and exploitation. Approbation of the offered method in operating terms showed his reliable efficiency.*

- Sheludyakov L. O. and Sushko A. Ye.** Systimatization of geometrical parameters of profiles of water wheel blades in axial flow hydraulic bulb turbines .....18

*Statistical data on the geometric parameters of profiles of water wheel blades in axial flow hydraulic bulb turbines designed for heads of 5 to 22 m have been treated. The parameters vs. head dependences have been obtained. This allows defining the geometric parameters of hydraulic bulb turbine blades for a preset head value.*

#### Aero- and Hydromechanics in Power Machines

- Khomylev S. A., Reznik S. B. and Yershov S. V.** Effect of airfoil loading condition on turbine cascade efficiency .....25

*The numerical results of flow investigation are presented for four high loaded turbine cascades. The cascades under consideration differ in stagger angles and trailing edge bending angles. It is shown that the pattern of loading distribution along airfoil influences substantially on cascade efficiency. Numerical analysis is performed with solver FlowER. Guidelines are developed for geometrical parameters of cascades with small inlet angles.*

- Rusanov A. V. and Kosyanov D. Yu.** An implicit method for numerical integration of the hyperbolic equation on unstructured grids .....30

*An implicit non-iterative method for numerical integration of the hyperbolic partial derivative equations on unstructured grids is presented. The original splitting by the spatial variables and eigenvalues is suggested. Several test problems have been solved.*

#### Heat Transfer in Engineering Constructions

- Strokov A. P., Levterov A. M. and Avramenko A. N.** Development three-dimensional final element models non-stationary thermalelastic stress the piston of the tractor diesel engine .....38

*Results of settlement research of non-stationary fields of temperatures and stress the piston of a tractor diesel engine are resulted. Efficiency use samples in an edge of the chamber of combustion (CC), as way of decrease in stress of the piston with the chamber of combustion such as CNIDI is appreciated. It is shown, that due to an arrangement samples in edge CC along a line of action of the maximal stress and symmetrically concerning fuel torches it is possible to lower stress of edge CC in 10 times.*

- Sudarev A V., Khalatov A. A. and Sudarev V. B.** Increasing the efficiency and decreasing the steel intensity of gas turbine tubular air heaters on the base of using the passive methods of heat exchange intensification ..... 47  
*Heat exchange intensification is the main technique of increasing the heat exchanger efficiency which application not only will ensure a high extent of regeneration ( $E = 0.8-0.85$ ) for the air heater, but, also, enable development of the standardized elemental basis that will allow implementation of the heat exchanger mounting using standard components suitable for wide power range GTEs.*

*Applied Mathematics*

- Kochurov R. and Avramov K. V.** Models of nonlinear parametric vibrations of cylindrical shells ..... 55  
*The models of nonlinear parametric vibrations of cylindrical shells with four degrees of freedom are investigated. Donnel's non-linear shallow-shell theory is used. To obtain a finite degree-of-freedom model of shell motions the Bubnov-Galerkin method is applied. The dynamical systems are analyzed by multiply scales method.*

- Zaytceva T. A. and Kuzenkov O. O.** Numerical and quality analysis of ethnogeny influence machine industry from environment ..... 62  
*In the work the mathematical model of ethnogeny influence from heterogenic level of population of flora and fauna is researched. Model is present from system of differential equation. System's stationary point and stationary gypper-plane is researched. The classification of bifurcation gypper-plane, on two- and three - dimensional bifurcation diagram is research. The type of square bifurcation curve and gypper-plane is identification. Program application of numerical analysis of subpopulation differential model dynamic is developed.*

- Kolodyazhny V. M. and Lisina O.** Meshfree methods in the physical processes simulation problems ..... 67  
*The reviews of articles are representing which had been devoted to development of meshfree approaches to the numerical methods for solution of the boundary value problems for the partial differential equations of the different physics processes modeling. The chronological overview of the meshless methods is presented. The meshfree scheme of the algorithm based on the particles method is described*

*Optimization Problems in Mechanical Engineering*

- Prishchepo A. A. and Izmalkov V. B.** Gas-pumping unit's efficiency indicators definition in conditions of the input information incompleteness..... 75  
*The gas-pumping unit efficiency indicators determining problem under conditions of incomplete input information is considered. The influence of the gas pressure and temperature loss at the inlet and outlet of the compressor plant are analyzed. On the basis of statistical methods for data traffic control logs and automatic control of gas pumping units, pressure and temperature losses are estimated.*