

Complex Problems of Power Systems Based on Renewable Energy Sources

DRAGANOV B., SYROVATKA M. (Kyiv). **Solar hydrogen generation system.**

Fundamentals for hydrogen production based on PV modules have been suggested. The efficiency of solar concentrators use has been emphasized.

PUKHOVYI I. (Kyiv). **Independent cold-production in summer for continental climate based on solar energy and natural ice use.**

There have been considered options for absorption solar refrigerators and refrigerators fed by PV converters and have got ice. The ice was prepared in winter. There have been analyzed calculations and experimental studies of reducing heat flows into the fridge, locating ice in the freezing chamber for compensator cooling.

KOCHKOV I., KOCHKOV O. (Kyiv). **Digitally and impulsively controlled charging device.**

There has been developed a scheme for a digitally controlled charging device. This device can charge storage battery. Basic coefficients to define charging rate subject to digital scheme parameters have been shown.

LUDANOV K., DESHKO V. (Kyiv). **Methods of joint determination of glass optical characteristics.**

The article contains a well-known method of determining the absorption coefficient and a new method of joint determination of glass optical properties: light absorption coefficients and the reflection of light. In the well-known method the absorption coefficient is determined on the basis of measuring the capacity of two glass samples of different thickness. Within the framework of the known method along with light absorption the article suggests also determining the reflection coefficient. In the suggested method it appeared enough to perform capacity glass measurements of samples of one thickness.

Solar Energy

BEKIROV E., KHIMICH A. (Simferopol). **Calculation algorithm and analysis of natural circulation in a solar collector.**

There have been considered natural circulation in hydraulic circuit of a solar collector. There was built a mathematical model of natural circulation based on mass and energy conservation law as well as the equation of compressed liquid flow that considers pressure losses over tension in the pipes of a hydraulic circuit. Basic collector parameters in stationary state have been determined: liquid speed and temperature rise up during single flow in the collector pipes. It has been revealed that circulation speed rises up with temperature growing up in accumulation tank thus resulting in temperature drop down. Heat carrier flow in collector pipes has been evaluated and its dependency over absorbed radiant flux has been determined. The flow rise amounts to 0,3-0,6 kg/hour for every additional 100 W of radiant flux. The flux rises up by 25% when the temperature in accumulation tank increases by 10°C.

GAEVSKYI O., VRESHCH O., MELNYK O. (Kyiv). **Analysis of shading effect over wind turbines in serial-parallel connection.**

There has been proposed a scheme for calculating the current-

voltage characteristics (CVC) of series-parallel connections of photovoltaic modules (FM) working under various local radiation conditions. The initial data for this scheme are being the parameters of the FM and bypass diodes apart from solar radiation intensity. This calculation can be applied for current-voltage and power characteristics analysis of the photovoltaic power plants with different shading distribution.

STUDENETS V., PASICHNYI V., PTUKHA A. (Kyiv). **Basic parameters of a test prototype "offset solar concentrator – Stirling engine"**

There has been considered solar energy conversion into mechanical energy on a test stand "offset solar concentrator-Stirling engine". The calculation principles have been suggested and the analysis of basic parameters of stand components has been performed.

SHKIL Yu. (Dnipropetrovsk). **Statistics evaluation of incident solar radiation over Ukraine.**

Based on satellite meteorological historical data there have been revealed a dominant function type of density distribution of incident solar radiation over the territory of Ukraine. The parameters for average annual location of solar energy density over unit area horizontal surface have been determined.

KYRPATENKO I., KUKHARCHUK I. (Kyiv). **Using optimizing regulators on solar PV-converters batteries in energy grids.**

The article considers mathematical models of a system "PV-converter battery-active load", "PV-converter – electrochemical accumulator". Programs that can evaluate optimizing regulators efficiency in such systems have been suggested.

NAKASHYDZE L. (Dnipropetrovsk). **Basic demands to energy active enclosures.**

There have been considered basic demands that allow ensuring efficient operation of energy active enclosures being the important component of engineering energy supply facilities.

Wind Energy

TUCHINSKYI B. (Kyiv). **Mathematical models of some optimizing tasks for wind turbines disposition.**

The article presents a mathematical model for power load losses of a wind turbine being shaded by another wind turbine. There have been built mathematical models for two optimizing tasks that allow wind turbines disposition. Experimental evaluations have been made.

PAVLOVSKYI V., LUKYANENKO L., STELYUK A., GONCHARENKO I., LEN'GA O. (Kyiv). **Stochastic modeling for wind farms operation modes.**

The paper raises the issues of stochastic modelling for wind farms (WF) and increasing overall WF share in covering load curves. One of the main problems arising during WF operation is the need to ensure enough active power potential at heat power plants that would further balance the power caused by stochastic wind farm operation. Thus the article aims at developing principles to evaluate possible range of power variations at wind farms.

Hydroenergy

VIKHOREV Yu., SOLOVYOV P. (Kyiv). **Problems in Ukrainian small hydro power demand national coordination.**

Today Ukraine utilizes no more than 8% of its small hydropower economical potential. Reconstruction of abandoned small hydropower plants was initiated by domestic investors and with no state support. Interest and concern in developing this energy sector has got a tendency for growing up. However there appeared a need for coordination and solving a range of factors that can further influence national economical interests.

Geothermal Energy

VASYLCHENKO M. (Kyiv). **Studying gas lift efficient utilization during water pumping out off the well.**

The article analyses links between basic parameters of gas lift performance. The achieved results get compared with data in technical literature. There have been built dependencies of air-to-water mixtures lift, compressor power and gas lift efficiency over air mass fraction in the emulsion. The dependency pattern

corresponds to physical conception about gas lift operation of geothermal wells.

BIOENERGY

BUDKO M., GRYTSAI A., DIDKIVSKA G. (Kyiv). **Heat transfer in over-esterification reactor of periodical performance with evenly distributed heat sources of variable intensity.**

There have been presented an approximate method to solve heat conduction tasks with internal evenly distributed heat sources of variable power. This variable power occurs when defining temperature mode of periodical reactors in over-esterification of plant oils into biodiesel fuel. There have been presented results of evaluated analysis for reacting mixture temperature dynamics over time period and reactor capacity.

KUZMINSKYI E., SHCHURSKA K., SAMARUKHA I. (Kyiv). **Fuel cells I. State-of-the-art.**

The review considers state-of-the art, classification and short description of fuel cells nowadays.

МІЖНАРОДНИЙ ІНВЕСТИЦІЙНИЙ БІЗНЕС-ФОРУМ З ПИТАНЬ ЕНЕРГОЕФЕКТИВНОСТІ ТА ВІДНОВЛЮВАНОЇ ЕНЕРГЕТИКИ
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