ABSTRACTS

Theoretical electrical engineering and electrophysics

SHYDLOVSKA N.A., SAMOILENKO V.G., KRAVCHENKO O.P. (Kyiv) **Analytical method of nonlinear discharge circuits research**

An algorithm of an approximate solution formation of a nonlinear differential equation which describes processes in a nonlinear discharge circuit is proposed. Special features of the processes taking part in the circuit depending on what of the elements is nonlinear are analized.

ROZOV V.Yu., PELEVIN D.E., REUTSKY S.Yu. (Kharkiv) **Parameters optimization of the systems of stationary distortions compensation of a geomagnetic field in apartments**

A method of parameters optimization of the simplest single-component systems of biotropic distortions compensation of a geomagnetic field by the criterion of maximum efficiency of compensation in working space of the operative personnel based on the Levenberg-Marquardt algorithm is proposed.

Conversion of electric energy parameters

OLESCHUK V., PRUDEAK R., SIZOV A. (Kishinev, Moldova), GRIVA G. (Turin, Italy) **Hybrid vehicle drive with synchronously modulated dual inverters**

Analysis of operation of propulsion electric drive system with asymmetrical six-phase induction motor, supplied by the battery and fuel cells, has been performed. Power conversion part of the drive includes two neutral-point-clamped inverters, controlled by algorithms of synchronised pulsewidth modulation (PWM), providing both continuous phase voltage synchronization and common-mode voltage cancellation in the system.

Electromechanical energy conversion

PODOLTSEV A.D., KOZYRSKY V.V., PETRENKO A.V. (Kyiv) **Analysis of dynamic processes in a single-phase electromagnetic linear generator of a reciprocal motion**

A simulink-model for analysis of dynamic processes and efficiency of power conversion in a single-phase electromagnetic linear generator of a reciprocal motion is elaborated. It is shown that for a sinusoidal voltage of a generator idling it is necessary to carry out a rotor oscillation with an amplitude equal to the half of a pole step. The terms of optimum co-ordination of a generator with a resistive load and use of capacity for reactive power compensation in a load circuit are considered.

Electric power systems and installations

KOSTEREV N.V., DENISJUK P.L., LITVINOV V.V. (Kyiv) **Determination of priority of methods of static stability increase of a load center with asynchronous motors in the conditions of multicriterion choice**

The task of choice of optimum from an engineering and economic points of view sequence of application of methods of a static stability increase of load centers with asynchronous motors depending on a postemergency state heaviness is solved. As the real methods of a static stability increase the following ones were examined: change of a turn ratio of a transformer, adjusting of excitation current of synchronous motors (jacks), adjusting of reactive power flows by means of a reactive power source which belongs to a load center (capacitors battery) and disconnection of irresponsible users. A number of high-quality requirements, presented in the form of such optimization criteria as reliability, high speed, economy and minimization of a risk of a technological process violation was presented for estimation of the methods efficiency. A vector of the best alternatives created by the principle of dominance is the result of an optimization task solution of a

multicriterion analysis. For determination of weighting factors of the criteria importance the method of paired comparisons (Saati method) was used.

BONDARENKO V.E, TCHERKASHINA V.V., BARBASHOV I.V., TCHEREMISIN N.M., LINNIK E.M. (Kharkiv) **Analysis of the state and prospects of increase of electric power transmission increase by air-lines of alternating current in Ukraine**

For estimation of electric energy transmission efficiency and value engineering the article proposes a modern approach of priority decisions acceptance at the stage of air-lines designing in the conditions of market relations.

DEMOV O.D., PALAMARCHUK O.P. (Vinnytsa) **Adjustment of input reactive power of users taking into account economic stability**

It is suggested to conduct computation of input reactive power taking into account economic stability of an optimum solution of reactive power compensation task. It permits to adjust input reactive power of some consumers only and to diminish expenses for implementation of this adjustment at new consumers connection.

Electrotechnological complexes and systems

VASETSKY YU.M., MAZURENKO I.L. (Kyiv) **Geometrical parameters of electromagnetic systems for high-frequency induction heating of metallic tapes**

For obtaining of estimations of geometrics of electromagnetic systems of high-frequency induction heating of metallic tapes methods of research are used. Inductors in the form of current contours of flat and spatial configurations are analyzed. The conducted computations confirmed correctness of the obtained geometrics of the inductors for provision of even emission of thermal energy along the tape width.

KARLOV A.N., KONDRATENKO I.P., RASCHEPKIN A.P. (Kyiv) **The method of electrodynamic forces computation in cylindrical crystallizers under the action of the combined traveling fields**

The method of electrodynamic forces computation in liquid metal under the action of the combined traveling fields depending on the embodiment and circuits of a scrambler windings connection was elaborated.

Information-measuring systems in power engineering

MAZMANYAN R.O. (Kyiv) **Wavelength characteristics of the ordered samples of a random uncorrelated signal**

The ordered samples of a random uncorrelated noise with a zero mean («white noise») are considered, the formulas of auto-, mutual and cross-spectral concentrations of power for the elements of sliding ordered data samples are obtained.

BORSCHEV P.I., OBODOVSKY V.D. (Kyiv) **Correction of procedure errors of parameters measurements of power equipment at commercial frequency**

The procedure errors of electric values measurements at power equipment diagnostics conduction caused by both influence of external disturbances and spurious parameters of metering circuits are considered. Mathematical expressions for automatic computational updating of the indicated errors in the combined selective measuring devices of electric values at commercial frequency are based.

NOVIK A.I., LEVITSKY A.S., KESOVA L.A., TCHEREZOV N.N., LUKASHUK G.G. (Kyiv) **A capacitive dust counter for coal boilers of thermoelectric power stations**

Elaborated by the authors a running measuring device of coal dust concentration in dust-air mixture transported by a pipeline is described. The dust counter consists of a capacitive pick-up, a connecting triaxial cable of a few meters length and an electronic block. Special features of the dust counter constructions concerned with a specific character of the subject of measurement are considered.