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Моделирование распределения однородного статического магнитного поля вблизи стальной колонны / Резинкина М.М., Гринченко В.С., Кондусова Н.В. // Вісник НТУ "ХПИ". Серія: Проблеми удосконалення електричних машин і апаратів. Теорія і практика. – Х.: НТУ "ХПИ", 2014. – № 20 (1063). – С. 49-56. Бібліогр.: 8 назв. – ISSN 2079-3944.

В статье исследованы методы описания искажения однородного статического магнитного поля в окрестности вытянутого сфероида, выполненного из однородного изотропного магнетика. Получены аналитические выражения для распределения магнитного поля в такой системе. Показано, что полученные аналитические выражения могут быть использованы для описания распределения геомагнитного поля при наличии стальной колонны.

Ключевые слова: аналитическая модель, однородное магнитное поле, сфероид, стальная колонна, COMSOL Multiphysics.

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Методика структурного синтеза подсистем утилит систем электроснабжения технических средств охраны границы / В.В. Левков // Вісник НТУ "ХПИ". Серія: Проблеми удосконалення електричних машин і апаратів. Теорія і практика. – Харків: НТУ "ХПИ", 2014. – № 20 (1063). – С. 57-66. – Бібліогр.: 9 назв. – ISSN 2079-3944.

Предложена методика определения множества рациональных структур подсистем утилит систем электроснабжения технических средств охраны границы на основе использования потенциала возобновляемых источников энергии. Обосновано, что количественный и качественный состав подсистемы утилит целесообразно определять с помощью аппарата алгебры логики, путем использования формализованных тождеств логических высказываний.

Ключевые слова: система электроснабжения, возобновляемые источники энергии, структурный синтез, утилиты, методика.

ABSTRACTS

Influence of the vacuum switch contact system heating temperature on static mechanical stresses in the vacuum bellow material / E.I. Bajda // Bulletin of NTU "KhPI". Series: Problems and Improvement elektrichesk machines and aids. Theory and Practice. – Kharkiv : NTU "KhPI", 2014. – № 20 (1063). – P. 3-7. – Bibliogr.: 9. – ISSN 2079-3944.

The article considers the influence of the heating temperature of the contact system on the internal stresses in the bellows vacuum switch finite element method. Semi-Chen dependence of mechanical stresses in the material as a function of temperature during a given contact. Shown that the greatest mechanical load test the attachment of the bellows to the contacts and the vacuum chamber. Values of mechanical stress in emergency modes can exceed the yield strength in non-properly chosen material of the bellows.

Keywords: vacuum bellow, thermo-mechanical stresses.

Analysis of a microprocessor terminal of a control cabinet for underground railway tubes heating // Ju.S. Grischuk, S.L. Zuenko // Bulletin of NTU "KhPI". Series: Problems and Improvement elektrichesk machines and aids. Theory and Practice. – Kharkiv: NTU "KhPI", 2014. – № 20 (1063). – P. 8-12. – Bibliogr.: 6. – ISSN 2079-3944.

Analysis of the functions of the microprocessor of the terminal, the peculiarities of the four analog current inputs and four analog input voltage devices 7SJ624 and 7SJ64. Outlined the features of digital inputs and outputs serial interfaces. Considered a separate service inter-

face to record data with a remote control center via a personal computer and a serial system interface for various protocols and data transfer to a central monitoring and control system.

Keywords: microprocessor terminal, control cabinet, microcontroller.

A technique for induction cookers' inductors calculation // M.G. Pantelyat, Ju.V. Gurentsov, A.V. Trofimov // Bulletin of NTU "KhPI". Series: Problems of Electrical Machines and Apparatus Perfection. The Theory and Practice. – Kharkiv : NTU "KhPI", 2014. – № 20 (1063). – P. 13-24. – Bibliogr.: 6. – ISSN 2079-3944.

In the paper a technique for the calculation of inductor – main structural part of an induction cooker is proposed. The presented technique is developed on the base of engineering methods for calculation of industrial induction heaters' planar inductors taking into account structural peculiarities and operation modes of induction cookers. Calculations of inductors regarding a number of heating modes for kitchen utensils of various sizes are carried out. Geometrical, electrical and power quantities such as outer and inner diameters of inductors, their thickness and number of turns, magnetic field strength on the utensils' surface, current in the inductor, electrical efficiency, etc. are calculated. Obtained results are analyzed.

Keywords: induction cooker, inductor, calculation.

Comparison of electromechanical parameters of an induction-dynamic motor and an electromagnet motor / V.F. Bolyukh, S.V. Oleksenko // Bulletin of NTU "KhPI". Series: Problems of Electrical Machines and Apparatus Perfection. The Theory and Practice. – Kharkiv: NTU "KhPI", 2014. – № 20 (1063). – P. 25-35. – Bibliogr.: 20. – ISSN 2079-3944.

Comparison of electromechanical indicators of an induction-dynamic motor and an electromagnet motor, designed to work as an actuator of electrical switchgears is carried out. Motors with the same weight and size parameters using capacitive energy storage and electronic systems forming an aperiodic current pulse are selected for comparison. The advantages of the induction-dynamic motor by speed values in relation to the electromagnet motor are shown.

Keywords: induction-dynamic motor, electromagnet motor, actuator, speed values.

An analysis of transient modes of a switch reluctance motor at operation in regime of starting / L.P. Galayko // Bulletin of NTU "KhPI". Series: Problems of Electrical Machines and Apparatus Perfection. The Theory and Practice. – Kharkiv: NTU "KhPI", 2014. – № 20 (1063). – P. 36-39. – Bibliogr.: 6. – ISSN 2079-3944.

The question of analysis of influence of law of change of control parameters on the character of transients in the mode of starting of a Switched Reluctance Motor of a miner electric locomotive by means of models developed for the Simulink program of the software program Matlab is considered. Results of calculations by these models for a motor of power of 27 kW and frequency of rotation 1215 rev/ min are presented.

Keywords: switched reluctance motor, transient modes of operation, analysis, SIMULINK, regime of starting.

Increasing of precision of components of magnetic field determination in steel armour of power cable is obtained / I.A. Kostykov // Bulletin of NTU "KhPI". Series: Problems of Electrical Machines and Apparatus Perfection. The Theory and Practice. – Kharkiv: NTU "KhPI", 2014. – № 20 (1063). – P. 40-48. – Bibliogr.: 4. – ISSN 2079-3944.

By using Chebyshev polynomials approximate expressions for determination of radial and tangential components of magnetic field intensity on the surface of power cable steel armour are obtained. The increase of precision is obtained by choosing appropriate nodes of approximation. Obtained expressions for radial and tangential components are sufficiently

correct for determination of behavior of mentioned components on the surface of of power cable armour.

Keywords: Chebyshev polynomials, radial and tangential components of magnetic field intensity, power cable armour.

Modeling of uniform static magnetic distribution near steel column / Rezikina M.M., Grinchenko V.S., Kondusova N.V. // Bulletin of NTU "KhPI". Series: Problems of Electrical Machines and Apparatus Perfection. The Theory and Practice. – Kharkiv : NTU "KhPI", 2014. – № 20 (1063). – P. 49-56. – Bibliogr.: 8. – ISSN 2079-3944.

The article deals with the methods for describing the distortion of homogeneous static magnetic field induced by homogeneous isotropic magnet spheroid. The obtained analytical expressions describe the distribution of the magnetic field in such system. It is shown that these analytical expressions can be used to describe the distortion of the geomagnetic field in the presence of a steel column.

Keywords: analytical model, uniform magnetic field, prolate spheroid, steel column, COMSOL Multiphysics.

A technique for structural analysis of subsystems of utilities for power supply systems of technical means for frontiers protection / V.V. Levkov // Bulletin of NTU "KhPI". Series: Problems and Improvement elektricheski machines and aids. Theory and Practice. – Kharkiv: NTU "KhPI", 2014. – № 20 (1063). – P. 57-65. – Bibliogr.: 9. – ISSN 2079-3944.

A technique for determining the set of rational structures of subsystems of utilities for power supply systems of technical means for frontiers protection on the base of renewable energy potential is proposed. It is substantiated that the qualitative and quantitative composition of subsystem of utilities can usefully be determined using the apparatus of the algebra of logic by use of formal identities of logical statements. The technique can be used to produce a variety of alternative sets of tools in the future will provide a scientific-methodological apparatus to generate optimal structures of power supply systems technical security boundary.

Keywords: power system, renewable energy, structural synthesis, utilities, technique.