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C O N T E N T S

ROLE OF TRANSIT OF OIL AND NATURAL GAS VIA MAIN PIPELINES AND ITS IMPACT ON SOCIAL AND ECONOMIC DEVELOPMENT OF GEORGIA.

D. Tsiskaridze. **"Energy". №1(85). 2018. Tbilisi. p. 5-13. geo. sum geo. engl. rus.**

Geopolitical location of Georgia with its transit corridor for oil, natural gas and electric power facilitating its political and energy safety defines the country's important role. South Caucasus, in particular Georgia, would constantly draw the interest and attention of many countries of the world. In most cases such an interest was associated with the supply of alternative hydrocarbon sources to the world's markets as well as the respective transit routes. Significant attention is paid to the role and impact of energy transit via the main pipelines on social and economic development of Georgia. In particular, all four main pipelines, their specifications, data and a benefit received from them are reviewed in detail. Diagram 2, bibl. 9.

IMPACT OF INDUCTION-TYPE SUPERCONDUCTOR CURRENT-LIMITING DEVICE ON SUSTAINABILITY OF POWER ENGINEERING SYSTEM.

T. Kokhreidze, P. Kenchoshvili. **"Energy". №1(85). 2018. Tbilisi. p. 14-20. geo. sum geo. engl. rus.**

An impact of the induction-type superconductor current-limiting device on the sustainability of the power engineering system is analyzed. Superconductor is suggested as a regulation element when variable induction impedance is a transformer. The impact of the superconductor and transformer parameters on the operation of the current-limiting device is studied. Ill.4, bibl. 2.

ELECTROMAGNETIC PROCESSES IN A THREE-PHASE BRIDGE CRYOTRON CONVERTER WITH SEMICONDUCTOR CONTROL.

T. Kokhreidze, G. Kadagishvili. **"Energy". №1(85). 2018. Tbilisi. p. 21-28. geo. sum geo. engl. rus.**

High temperature three-phase cryotron rectifier with semiconductor control is elaborated. Control of the cryotron rectifier is conducted by changing thyristor opening α angle. Electromagnetic processes in the three-phase bridge thyristor convertor is reviewed as a control system for the cryotron converter. Ill. 4, bibl. 2.

QUALITATIVE AND QUANTITATIVE ANALYSIS OF TECHNICAL LOSSES IN GAS DISTRIBUTION NETWORKS OF MEDIUM PRESSURE

G.Gagua. **"Energy". №1(85). 2018. Tbilisi. p. 29-35. geo. sum geo. engl. rus.**

The present research paper discusses qualitative and quantitative analysis of technical losses in gas distribution networks of medium pressure. In the case of damage to gas pipelines, gas distribution companies of Georgia take into account the statistical field data for gas leakage parameters (peculiar size of damage and time consumption). According to these statistics we got the approximation function for peculiar size of damage and time consumption in case of gas leakage and the probability for distribution density. In particular, the typical size of the damage corresponds to the exponential law, and the time consumption to cosecant, the so-called Schumann piecewise polyline feature. On the basis of the obtained results was carried out qualitative and quantitative analysis of forecast of technical losses. Ill.5, bibl. 11.

FORMATION OF OUTPUT VOLTAGE IN AUTONOMOUS VOLTAGE INVERTER.

E.Korkia, T.Shergelashvili, K.Tetrauli. **"Energy". №1(85). 2018. Tbilisi. p. 36-44. geo. sum geo. engl. rus.**

In this article we examined forming output voltage from autonomous invertor of voltage. Examined electro-magnetic processes of autonomous invertor of voltage while it is working with asynchronous engine. Also we provide calculations of load of autonomous invertor of voltage. Load was made on „АОЛ-3-4" engine. Also examined working modes of power part of invertor(tristors and diodes). Also examined different connection modes oftristors and diodes. Ill. 8, bibl. 3.

RESEARCHING REGULATING GOVERNING SYSTEM OF PARALLEL CONNECTED PUMP. ***Tsivkarashvili G.N.*** **"Energy". №1(85). 2018. Tbilisi. p. 45-49. geo. sum geo. engl. rus.**

In this work there is given functional characteristics of dominant point, possibilities of its regulation, research of flow change and the method of throttling. There are used basic mathematical equations for flowing liquid in magistral pipelines. On the example of simple hydraulic scheme a mathematical model for stable or unstable flows is defined. Mathematical model in pressure dominant point is created, it is also obtained pressure regulating mathematical expression considering electrodynamic analogs. According to carried out calculations there is obtained heading of pump characteristic. The results of this research can be used in energetic premises, particularly in oil and gas pipelines. Ill. 1, bibl. 4.

SOCIETY AND RESEARCH THE SYSTEM OF NATURAL GAS FEES PAYMENT.
D.Balavadze. **"Energy". №1(85). 2018. Tbilisi. p. 50-54. geo. sum geo. engl. rus.**

In 2017 natural gas prices have been increased in Georgia and it caused people's aggression and anger.As the economic level of the country is low consumers find it difficult to pay the price for consumed natural gas.The most difficult period for consumers is winter when they need more gas than in other period. At this time expenses iare rising and it becomes more difficult to pay.It will be interesting if we examine the method different from current gas payment system which will reduce the tax on winter at the expense of summer.In the article will be discussed the method different from today's natural gas payment system and its advantages. Tabl. 2, bibl. 3.

WAYS OF USING AN ALTERNATIVE SOURCE OF ENERGY - HYDROGEN IN ELECTRIC POWER ENGINEERING. ***Kamkamidze E., Kamkamidze K., Gvaramia E., Bochoridze E.*** **"Energy". №1(85). 2018. Tbilisi. p. 55-58. geo. sum geo. engl. rus.**

Prospects of transition to hydrogen technology are considered. It is shown, that an environmentally friendly product should be used in the electric power industry. It is noted, that losses during the transmission of energy by electric grids in many respects exceed losses during transmission of gas or hydrogen by a pipeline. The collection of hydrogen is identified with the accumulation of electricity and the presence of a reservoir. The transportation of hydrogen, conservation and use is described. It is shown that the success of the development of hydrogen technology leads to the conclusion that its use is economically justified and effective. Bibl. 2.

INFLUENCE ANALYSIS OF INTEGRATION OF SOLAR POWER PLANTS ON THE STABILITY OF GEORGIAN ELECTRICAL SYSTEM.
D.Datashvili. **"Energy". №1(85). 2018. Tbilisi. p. 59-61. geo. sum geo. engl. rus.**

The increasedairand water pollution is the main reason leading to try solving the urgent problem of climate changes. Using fossil fuel is the cause of pollution, thus it is important to find the source of energy not producing CO_2. In addition, this source of energy should be enough for domestic and industrial demands. The solar power plant plays one of the important role in production of clean energy not polluting the environment. This article analyzes the influence of integration of solar power plant on the stability of Georgian Electrical System. The modeling is performed using the PSS/E (Power System Simulator for Engineering) software. Ill. 2, bibl. 6.

ALTERNATIVE HEATING. ***O.Kighuradze, O.Japaridze, G.Beridze.*** **"Energy". №1(85). 2018. Tbilisi. p. 62-64. geo. sum geo. engl. rus.**

Perspective for application of various agricultural residues (husks of grapes, plum stone, apple and onion peel, nut shell) as an alternative heating has been reviewed.

The measuring experiments of biomass humidity and calorific value have been executed by precision isothermal calorimeter MAY-1C. Sample substance – benzoic acid (with 99.99% purity) has been used for calorimeter analysis. Calorimeter constant equals to 1434 J/°C.

The highest calorific value experimental data of dry samples have been adopted, based on which the lowest calorific value have been calculated for different humidity conditions of residues and the relevant calculating analytic formulas have been adopted. Oil equivalent for separate sample has been calculated. Ill. 1, tabl. 2, bibl. 1.

AGRICULTURAL RESIDUE BIOMASS POWER POTENTIAL.

O.Kighuradze, O.Japaridze, G.Beridze. **"Energy". №1(85). 2018. Tbilisi. p. 65-70. geo. sum geo. engl. rus.**

Perspective for application of agricultural residue biomass (corn, beans, sunflower) in view of power has been discussed. Measuring experiments of humidity and heating value of residue biomass have been done using precision isothermal calorimeter MAY-1C. Experimental data of the higher heating value of dry samples have been adopted, based on which the lowest heating values for different humidity conditions of biomass have been calculated. The relevant calculating analytical images have been adopted.

For the purposes of using residue biomass as an alternative heating, power potential of each investigated residue biomass has been assessed. Cumulative power potential of residue biomass of corn, beans and sunflower consisted of 2956292 GigaJoule, which is equivalent to 100784 ton conditional heating. Tabl.4, bibl. 3.

"CONSTRUCTION BLOCK" FOR PUTTING INTO SUPPORTING LAYER OF THERMALLY EFFICIENT MULTILAYER WALLS, FOUNDATIONS AND FOR ARRANGING ROOFING TILES

G. Loladze. **"Energy". №1(85). 2018. Tbilisi. p. 71-77. geo. sum geo. engl. rus.**

For speeding up the construction time of the resource saving, three-layer stone walls the surface of which is paved with the tiles manufactured by KNAUF, it is suggested to use T and Γ shape construction blocks. Such blocks allow to create space for filling it up with its insulation material when arranging supporting layers together with paving the tiles. Suggested construction block is made in form of a rectangular bar with a nib on the side of one of the slopes. The construction block can also be used in arranging the foundation of the low buildings. The block configuration enables to arrange the foundation both in a straight and angled parts of the building. Construction of the low building using the construction blocks can be conducted with small mechanization without the help of heavy cranes. Ill. 7.