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C O N T E N T S

S U M M A R I E S

G.ARABIDZE, M.ARABIDZE. **Regarding Necessity of Construction of Impoundment Hydro Power Plants.**

"Energy". №1(97). 2021. Tbilisi. p. 5- 11. geo. sum geo. engl. rus.

Analysis of the Georgian Electricity balance between 2010-2019 shows that average annual electricity consumption during the last 10 years has increased by 51% and generation by only 17.8% mostly from thermal power plants operating on imported natural gas, seasonal and deregulated hydro power plants. Generation from regulating hydro power plants has decreased. Electricity import has grown 7 times. For better defining trend of electricity consumption, 2019 data is compared to average between 2010-2018 data. Consumption here has increased by 24% and generation by 11%. Import has increased by 116% and export has decreased by 65%. The reason behind this balance is attributed mostly to the decrease of share of regulating hydro power plants.

A.KOKHTASHVILI, G.KHORBALADZE. **Operational measures for managing the power system of Georgia. operational measures for managing the power system of Georgia.**

"Energy". №1(97). 2021. Tbilisi. p.12-14. geo. sum geo. engl. rus.

This article is used for the management of operational measures. The basic main principle of this applies that the physical firmness of a nomination shall be sought to be maintained. Operational measures need to be conducted by Georgian State Electrosystem (transmission system operator) , i.e. the National Control Center in case remedial actions are necessary, in particular for congestion management, that are not part of the regular Balancing Service activities but inevitable to ensure the system security.

K.BERIKASHVILI. **Perspective of construction of underground gas storage in Georgia and aspects of monitoring at the initial stage.**

"Energy". №1(97). 2021. Tbilisi. p. 15-20. geo. sum geo. engl. rus.

For every country which consume natural gas and especially for the country that imports natural gas to satisfy almost 99% of the country's consumption underground gas storage is a vitally important. One of the sources of growth of technological and economic efficiency of underground gas storages is monitoring, analysis and forecasting of the dynamics of formation of the gas reservoirs. The work describes calculation of the complex parameters of the four underground gas storage processes and consists the criteria for monitoring the underground gas storage at the previous stage of operation. Subsequently, for each stage, when sequential data accounting, the mentioned monitoring criterion should be evaluated, determined and will be accepted the decision about scenario.

Ill. 2, bibl. 12.

G.KHURTSILAVA, O. KIGURADZE **Estimation of Uncertainty of Measurement Result of High-Voltage Cable Insulation.**

"Energy". №1(97). 2021. Tbilisi. p. 21-29. geo. sum geo. engl. rus.

Periodic inspection of the parameters of the power cable insulation is current task, since, as the time passes, during exploitation, the insulation material loses its quality, gets old, gets damaged mechanically which eventually is reflected in the reduction of its breaking power. This, in return, helps to trigger emergency modes in relevant electrical circuits and finally the electric breakthrough of the cable insulation. It is possible to avoid such undesirable modes by monitoring the value of the insulation resistance against direct current.

Insulation resistance of the power cables used in the narrow-gauge train locomotive was periodically monitored.

Uncertainty concept was used for estimating infallibility (accuracy) of the measurement results which over the recent years, in the developed countries, has replaced "traditional" error method of the estimation of the measurement accuracy.

$(1.609 \le R \le 1.685)$ მგობი, $P = 0.95$ **is received for intermediate estimation of the extended uncertainty.**
Tabl. 4, bibl. 4.

A.KOKHTASHVILI, G.KHORBALADZE. **Management of emergency state of electric power system of Georgia.**
"Energy". №1(97). 2021. Tbilisi. p. 30-33. geo. sum geo. engl. rus.

The article discusses the procedure used for the management of emergency cases. In particular, two different states of emergency are in place, i.e. Emergency State and Emergency Incident. In general, the Government is eligible to declare an Emergency State, whereas GSE – as the Transmission System Operator in Georgia – is empowered to announce an Emergency Incident. After the revocation of the emergency, adequate compensation mechanisms need to be applied as well as the imbalance data amended for the relevant time-frame.

T.NATENADZE, A.ZEREKIDZE, N.KERESELIDZE**. Factors that determine the resource and optimal service life of traction motors. .**
"Energy". №1(97). 2021. Tbilisi. p. 34-39. geo. sum geo. engl. rus.

It was found that timely and efficient factory repairs and compliance of the rules and operating instructions developed by the manufacturer provides an increase in the service life of traction motors.

The article identifies, analyzes and substantiates the reasons for the aggravation of the parameters of repaired traction motors.
Tabl. 1, bibl. 4.

I.TABATADZE, M.BIBILURI. **Relaxation internal friction in thermal treated GaAs:Te monocrystals.**
"Energy". №1(97). 2021. Tbilisi. p. 40-44. geo. sum geo. engl. rus.

Deformation origin high-intensity internal friction maxima have been revealed in the temperature areas of 400 and 500°C under the influence of hightemperature annealing of monocrystalline n-GaAs:Te samples with [100] orientation. Their relaxation character is established and the values of activation energy and frequency factors are determined. Significant increase of hightemperature background and relaxation maxima intensity are shown in a strain amplitude range of 10^{-4}-10^{-3}. Nondeformation origin low intensity relaxation process is revealed in a temperature range of 100-120°C. It is supposed, that it is stipulated by the motion of pair of vacancies formed in positions of arsenic atoms in a periodical stress field.
Ill.1, tabl. 2, bibl. 3.

I.TABATADZE. **Inelastic properties of vanadium and $V_{0,95}NB_{0,05}$ alloy.**
"Energy". №1(97). 2021. Tbilisi. p. 45-48. rus. sum geo. engl. rus.

Temperature dependences of internal friction and dynamic shear modulus in V and $V_{0,95}Nb_{0,05}$ alloys have been studied by registration of logarithmic decrement of damping and frequency of torsion oscillations. Relaxation processes caused by migration of oxygen and nitrogen atoms have been revealed in a frequency range of 0,5-5,0 Hz. The values of IF maxima's activation energy and frequency factor have been determined. Migration energy of grain boundaries has been estimated and its increasing tendency in $V_{0,95}Nb_{0,05}$ alloys is shown. Doping with Nbstipulates an increase of dynamic shear modulus and a decrease of concentration of O and N impurities by 10-15%.
Ill. 1, bibl. 2.

BESTAEVA L., DONDOLADZE N., MEGRELISHVILI Z. **Establishment of randomness and time stability of the experimental isotherm data Askantiha ions (Ca-Na).**
"Energy". №1(97). 2021. Tbilisi. p. 49-55. geo. sum geo. engl. rus.

The experimental results showed that the average total exchange volume of Askantikha made up 500 mg/eqv/L/. The coefficient of ion exchange Ca-Na of Askantikha is established k = 1.59 m^3 / m^3.
The data obtained during the experiment are homogeneous, random and stable over the time. Therefore, it is possible to check the consistency of the data obtained as a result of the experiment and the formula with the Pearson equivalence criterion.
Tabl. 2, bibl. 10.

R.JGHENTI. **Effective Methods of Settlement of Seasonal Loads in Public Catering Facilities in Resort-Recreational Systems.**
"Energy". №1(97). 2021. Tbilisi. p. 56-63. geo. sum geo. engl. rus.

According to the results of the study and implementation of the novelty, the social effect in the future by 2025 means highly efficient maintenance of up to 5 million people at Georgia resorts for the season with an open network of catering facilities, which will contribute to their full rest and health, recovery and life expectancy; The creation of such contrasting situations in open-ended enterprises with highly artistic and architectural means, which are clearly different from everyday situations. The main distinguishing feature is a combination of nutrition and entertainment activities (recreation, entertainment, games, etc.).
Ill. 4, bibl. 2.

R.JGHENTI. **Structure of Urban Planning Organization of Open Catering Network in Resorts of Georgia.**
"Energy". №1(97). 2021. Tbilisi. p. 64-74. geo. sum geo. engl. rus.

We consider the sphere of recreational services as a complex, polyfunctional system, the main elements and subsystems of which differ in their socio-economic, demographic, environmental, ideological, aesthetic and other, colors "" in rank and significance, development patterns and ability to organize space.

Considering the concept of the consistent formation of different ranks and types of recreational formations, we find it advisable to determine the place and role of objects of an open network of cultural services and catering in the formation of recreational structures, based on urban planning principles taking into account architectural and planning features.
Ill. 5, bibl. 5.

G.TUMANISHVILI, T.NADIRADZE, G.TUMANISHVILI, S.BITSADZE, M.TSOTSKHALASHVILI. **Decreaze of rolling resistance of a railway wheel by perfection of tribological properties of wheel and rail contact zone.**
"Energy". №1(97). 2021. Tbilisi. p. 75-81. engl. sum geo. engl. rus.

Improvement of tribological properties of the wheels and rails interacting surfaces, decrease of rolling resistance of a railway wheels, the train energy consumption, and wear rate is reached by their separation with the third body having due tribological properties. The ecological friction modifiers for tread and steering surfaces are developed. Presence of the third body in the contact zone is determined experimentally by the change of the friction moment and noise. The reasons of the negative, neutral and positive friction, mild, severe and catastrophic wear and types of damage of corresponding surfaces at various relative sliding velocities are revealed.
Ill. 5, bibl. 16.

G.TUMANISHVILI, T.NADIRADZE, R.BITSADZE, G TUMANISHVILI, B.DIDEBASHVILI.
Damage of the wheel and rail interacting surfaces and the rail corrugation.

"Energy". №1(97). 2021. Tbilisi. p. 82-92. engl. sum geo. engl. rus.

The characteristic roll-slip phenomena between the wheel and the rail are prone to develop a rail corrugation. There are a lot of scientific works and opinions about rail corrugation, but some aspects of this phenomenon are still insufficiently studied.

Studies have shown high sensitivity of the third body to the sliding speed, which for heavy loaded interacting surfaces, like wheel and rail, often destroys the third body. This leads to sharp increase in wear rate and other undesirable phenomena.

Was revealed the especially high sensitivity of various types of damage (scuffing, fatigue, plastic deformations) proceeding simultaneously in the contact zone to destruction degree of the third body.

The researches have shown that necessary conditions for the rail corrugation are periodic slipping of the interacting surfaces of wheels and rails, destruction of the third body, and seizure of separate places of the surfaces. The onset and degree of destruction of the third body were determined in the laboratory conditions. In the capacity of sliding sources are considered movement of the wheelset in curves, non-roundness of the wheel, and wheels of the wheelset with different diameters.

Ill. 9, tabl. 1, bibl. 9.