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SUMMARIES

MODERN COMPLETE DISTRIBUTION EQUIPMENT INTRODUCED IN JOINT STOCK COMPANY – TELASI. ***G.Nemsithveridze, I.Chichua, G.Baramia, B.Tsopurasvili.*** **"Energy". Tbilisi. 2009. №3(51). p. 3- 4. geo. sum.geo.engl.rus.**

The article shows the results of performance of BB/TEL vacuum switches in high voltage sub-stations of TELASI. They have replaced morally and physically obsolete ВМП-150 type **oil switches. It is shown, that New KRY/TEL complete distribution facilities equipped with the vacuum switches have significant privilege, satisfy all contemporary reliability and safety requirements and successfully operate at the sub-stations. The article describes functions of all equipment included in distribution structure.**

Performance data of new distribution equipment of high voltage sub-stations functioning since 2006 clearly prove their privilege over the old complete distribution equipment. Ill.1, bibl.1.

EVALUATION OF EFFICIENCY OF MULTI-STAGE TURBINE EXPANDER POWER PLANT, COUPLED WITH THERMOELECTRIC POWER STATION. ***V.Jamarjashvili, M.Arabidze.*** **"Energy". Tbilisi. 2009. №3(51). p. 5-7. geo. sum.geo.engl.rus.**

Plan of utilization of potential energy of high pressure natural gas is discussed in the article. Effectiveness of its coupling with thermoelectric power stations has been determined in the field of reversible thermodynamics. Unlike traditional one-stage scheme (known for several decades), multi-stage one can effectively function using in fact zero exenergy heat source.

There are two drawings presented. First drawing shows principal scheme of the turbine expander power plant coupled with thermoelectric power station, and the second one – thermodynamic cycle in T,S co-ordinates. Ill.2, bibl. 1.

DETERMINATION OF RATIONAL STRATEGY FOR PROVISION OF GEORGIAN POWER SYSTEM WITH BASE POWER. ***V.Jamarjashvili.*** **"Energy". Tbilisi. 2009. №3(51). p. 8-16. geo. sum.geo.engl.rus.**

The article reviews particular units - hydro power plants, where it is reasonable to implement the idea earlier worked out by Power Engineering Institute to Georgian Academy of Science about coupling thermal and hydroelectric units.

It is shown, that prime cost of base power produced by the combined system is 20-40% less than prime cost of the power produced by any type thermo power plant. Besides, capital costs on the realization of the station are envisaged just within the Turnkey program.

Considering the costs of infrastructure of individually functioning thermo power plant, more priority is given to the combined system, as a base option, as it is known, that 30-40% of the total capital investment should be directed to the realization of just infrastructure. Ill.2, tabl.12, bibl.14.

ESTIMATION OF FRACTURED ROCKS ERODED BY FLOWN WATER STREAMS. ***Sh.Gagoshidze, D.Khachidze.*** **"Energy". Tbilisi. 2009. №3(51). p. 17-21. rus. sum.geo.engl.rus.**

The assumption, that erosion of bedrock base comes to an end, when speed of overflow stream decreases to the admitted value together with increasing the depth of the erosion pit, is acceptable in methods for estimating soil erosions. This value is identified empirically based on experimental observations or according to too simplified or insufficiently justified estimation schemes. As we know, such important factors conditioning wash outs as fracturing and blockiness of the bedrock base, elastic properties of bedrock separations, etc are not often taken into consideration.

New approach to research the erosion of the fractured rocks by water streams fallen from high platinums has been worked out. Criteria of resistance of the bedrock separations at the bottom of erosion pool have been deduced. Hydrodynamic properties affecting blocky structure of the bedrock base have been estimated. Formula to calculate the depth of local erosion is presented too. Ill. 1, tabl. 1., bibl. 4.

ISSUES RELATING TO ESTIMATING LOADS APPLIED ON UNDERGROUND CONSTRUCTIONS.
A.Kubaneishvili, R.Kakauridze, A.Iuriatin. **"Energy". Tbilisi. 2009. №3(51). p. 22-25. geo. sum.geo.engl.rus.**

Issue of estimating loads applied on the underground constructions is criticized. Normative documents under which hydrotechnical and transport tunnels are designed are reviewed in the article. It is shown, that the formulas to calculate vertical load caused by ground pressure, deliver the values significantly different from each other, but at the same time the value of vertical loads very insignificantly from the ground pressure value.

In designing the underground constructions, the ground pressure value should by any means be estimated based on experimental research.

A lot of practical recommendations on estimating the ground pressure level have been given as a result of the works performed. Ill. 2, bibl. 7.

SOME ASPECTS OF SEISMIC MODE OF DEFORMATION OF UNDERGROUND CONSTRUCTIONS.
J.Kilasonia, T.Churadze, M.Grdzelishvili. **"Energy". Tbilisi. 2009. №3(51). p. 26-27. rus. sum.geo.engl.rus.**

The article presents evaluation of the information about behavior of the underground pipelines. At the same time, it is also noted, that the data on function of hydrotechnical tunnels and other massive underground constructions are limited.

It is specified, that there are two reasons for the damage of the underground pipelines: bending strains and axial extension caused by difference in dynamic features existing between the two horizontally adjacent layers of the rock.

Priority of using seismic records obtained as a result of dual integration of earthquake accelerograms in estimating seismic resistance of long underground constructions in case of space wave task is mentioned in the article.

Presented statistic data give certain impression about dynamic performance of the underground pipelines and it is reasonable to take this into consideration when estimating their seismic resistance. Bibl. 5.

FORMS OF FOREIGN INVESTMENTS AND THEIR PECULIARITIES. E.G.O.Guliev. "Energy". Tbilisi. 2009. №3(51). p. 28-31. rus. sum.geo.engl.rus.

The article presents discussion of various foreign investment forms and their peculiarities. Socially oriented market economy in Azerbaijan is formed and developed based on inalterable criteria of cost effectiveness. Azerbaijan announced its independence and quite quickly integrated in world economy. Oil agreements were signed with more than 20 major companies. In this regard, it becomes necessary to determine the effectiveness of the investment projects.

Components of the investment climate are grouped in a following manner: access to natural resources, development level of the industrial and social and domestic infrastructure, common economy status, taxation system, inflation level, etc. Each of these issues is studied in detail.

Development of oil sector in Azerbaijan will significantly contribute to modernization of various industry fields, introduction of leading technologies, which, in the coarse of time, will attract foreign capital to such base fields as power industry, mechanical engineering and oil chemistry. Bibl. 4.

METHODS TO EVALUATE INVESTMENT PROJECTS. E.G.O.Guliev. "Energy". Tbilisi. 2009. №3(51). p. 32-35. rus. sum.geo.engl.rus.

Switching to market economy requires increase of production effectiveness, production compatibility, initiatives and other features from oil producing companies. In addition, it is important to run analysis enabling to work out the company development strategy, justify the management decisions and reveal the reserves for increasing production effectiveness. The article also discusses problem of decision making regarding raising the effectiveness of oil and gas production, shows the reasonability of executing production sharing agreements. The so called "sensibility analysis" as one of the ways to justify decisions made under risky environment is published as well. An attempt of analyzing the behavior of total data in changing various factors has been made as well. Tabl.1, bibl.3.

MEDIUM-TERM FORECAST FOR PRODUCTION OF GEORGIAN POWER RESOURCES.
D.Japaridze, N.Giorgishvili. **"Energy". Tbilisi. 2009. №3(51). p. 36-43. geo. sum.geo.engl.rus.**

Methodology of medium-term forecast for the production of power resources in Georgia has been worked out and equations of the regression of the medium-term forecast have been obtained based on statistic analysis. Type of time dependant function of the resource production has been determined too. Medium-term forecast parameters for the production of power resources in Georgia have been defined by using a least square method and upper and lower limits have been determined considering averaging coefficients. An integral mathematic and statistic model of the medium-term forecast for both individual types of the resources (electric power, oil, coal, gas) and for the energy resources as a whole have been obtained as a result of the researches conducted. The obtained results may be used in forecasting fuel and energy balance of Georgia. Ill.9, tabl. 6, bibl. 12.

FLOW OF VISCOUS INCOMPRESSIBLE LIQUID IN INITIAL SECTION OF FLAT CYLINDRICAL PIPE.
A.Sarukhanian. **"Energy". Tbilisi. 2009. №3(51). p. 47-51. rus. sum.geo.engl.rus.**

The article discusses stationary streamline motion of flat cylindrical pipe on the initial section. Axisymmetric speed distribution is observed within the pipe initial section. Speed change patterns have been specified against the effective cross-section of the initial section.

Obtained common solution of the task enables to solve particular cases. For that, the values of C_k auxiliary coefficients are calculated for given values of initial speed distribution on the inflow face. Patterns of speed and pressure change along the pipe initial section are then identified. Knowing the patterns of speed and pressure change along the pipe initial section enables to estimate the length of the initial section and power losses. Ill. 1, bibl. 8.

MANAGEMENT OF ESTIMATIONS AND ANALYSIS OF ADMITTED VALUES OF COMMERCIAL AND LOADING LOSSES IN CLOSED POWER INDUSTRY SYSTEMS. *G.Kokhreidze, N.Goginashvili, A.Sikharulidze, I.Kurashvili.* "Energy". Tbilisi. 2009. №3(51). p. 52-58. rus. sum.geo.engl.rus.

The article presents the review of economically reasonable and technically admitted values of operating parameters for the identification irrationally and optimally designed power industry systems. Indications of technical and commercial losses of energy are obtained too. Purpose of retrospective, operative and perspective estimation of the energy losses has been specified and main forms of analysing power losses have been considered. The article presents all basic information required for loss analysis. Methods for identification of admitted values of errors in power registration have been worked out as well. Order of calculating commercial and technical losses has been determined based on building virtual models of the system enabling to model the processes corresponding to real power grids. The system also enables to automatically manage the level of energy loss for obtaining the desirable values. Bibl. 6.

CONVERTING SYSTEM OF TRACTION SUB-STATION ACCORDING TO "TWO BACK STARS WITH PARALLELING REACTOR" SYSTEM. *G.Kokhreidze, I.Kurashvili, A.Sikharulidze.* "Energy". Tbilisi. 2009. №3(51). p. 59-67. rus. sum.geo.engl.rus.

Paralleling converters made according to three-phase system called "two back stars with paralleling reactor" are used at traction sub-stations. Principal electric system on thyristors of converting system of the traction sub-station has been worked out for both control and invertor conditions. Operation of the traction engine in starting, traction and recuperation conditions considering an impulsive control has been reviewed. Relation between the relevant values has been determined. Methodology to identify the potential at any point of the rail has been presented.

The suggested method enables to run mathematic and computer modelling of the process considering the constant current engine in out-of-switch time interval. Ill. 3, bibl. 6.

ECO-CHEMISTRY OF NATURAL WATERS OF UPPER IMERETI (CHIATURA) PLATEAU. *Z.Svanidze, V.Alpaidze, G.Turkadze.* "Energy". Tbilisi. 2009. №3(51). p. 68-71. rus. sum.geo.engl.rus.

The research is dedicated to the problem relating to contamination of natural waters of Chiatura manganous field by heavy toxic metals. As a result of chemical analysis of 89 samples taken within the region showed, that actual content of heavy metal (Mn, Fe, Cu, Zn, Pb, Cd, Co, Ni) in most of them is low than admitted concentration, although Mn, Fe, Pb, Cd concentration in significant samples is much higher than the admitted norm. It is suggested, that apart from technological processes associated with the extraction and dressing of ore, contamination factors may be natural hydro-geo-chemical processes occurring within the ore body and containing rocks. It is recommended to use activated and modified natural sorbents, the fields of which are found in Georgia, in ore dressing technological scheme. Ill. 1, tabl. 3, bibl. 5.

GEOCHEMICAL ASPECTS OF ECOLOGY OF MOUNTAINOUS REGIONS. *V.Alpaidze, Z.Svanidze, G.Turkadze.* "Energy". Tbilisi. 2009. №3(51). p. 72-75. rus. sum.geo.engl.rus.

Geochemical issues of soil of Lukhumi arsenic field are brought as an example and are discussed in the article. Microcomponent analysis of the samples taken in the region and schematic maps drafted according to them, show that soil here is significantly contaminated by heavy toxic metals, and copper and arsenic content in the entire region exceeds the accepted concentration 10 times. This circumstances cannot be explained by the effect of the residues of Uravi mining and chemical plant. It is supposed, that except for the mentioned reasons, the source of contamination may be ore body of the fields extended within the region, their diffusion areas and mother rocks. The latter, as known, experiences intensive physical and chemical depletion and erosion in mountain conditions. Geochemical processes associated with these phenomena promote migration of chemical elements within the top-soil. Ill. 3, bibl. 3.

STATISTICS OF EMERGENCY AND PLANNED CUT-OFF OF GEORGIAN 220 KILOWATT POWER LINES AND ESTIMATION PARAMETERS OF RELIABILITY OF POWER SUPPLY STATIONS. *G.Makharadze, A.Kokhtashvili, T.Jikia.* "Energy". Tbilisi. 2009. №3(51). p. 76-78. geo. sum.geo.engl.rus.

The role of power systems in terms of the tasks of power transit in South Caucasus has been obvious over the last years. One of the factors to resolve such tasks successfully is the reliability level of power transmission within the power system, which, from its side, depends on the value of reliability coefficient of power lines.

The reliability coefficients of the power lines, as a rule, are calculated based long-term statistic observations, according to the data of the planned and emergency cut-off of the lines.

Calculated parameters of the expected emergency and planned line cut-off in Georgian power system have been obtained based on the observations run over the last three years (2006-2008) and therefore need more specification. However, these parameters unable to more precisely define the reliability level of power supply stations. Tabl. 2, bibl. 4.

ABOUT ONE METHOD OF TRANSFERRING RESISTORS FROM LOW ACCURACY GRADE TO HIGH ACCURACY GRADE. *A.Muchiauri, G.Kutchava, I.Jikhvadze.* "Energy". Tbilisi. 2009. №3(51). p. 79-81. geo. sum.geo.engl.rus.

Contemporarily manufactured resistors, according their accuracy grade, are divided in a following manner: cheap ±5, ±10, ±20% and expensive ±1, ±0,1, ±0,01% resistors. Study suggests one of the methods of getting high accuracy grade resistors from low accuracy grade resistors by insignificantly changing manufacturing process of the resistors.

The method is called compensation method in which compensation of positive and negative deviations of the parameter are used. Ill. 2, bibl. 4.

SEDIMENTATION PROCESS OF ZHINVALI WATER STORAGE. *G.Gigiberia.* "Energy". Tbilisi. 2009. №3(51). p. 82-89. geo. sum.geo.engl.rus.

In 2003, Italian team of specialists (within the donation program of Italian Government in Georgia) shot (bathymetry) underwater relief of Zhinvali complex hydro system using modern geophysical tools. As a result of the survey, topographic map of the surface of underwater sediments in 1:10000 scale with 1m spacing between isohyps has been drafted.

Based on the obtained data, thickness of deposited silts made 42,3 million m3, and caved material of the embankment slope – 2,8 million m^3. Taking into the account, that according to the data from hydrometeorogical center, an average long-term consumption of weighed silts arrived at the water storage makes 23,8 kg/sec, and according to the sediment data – 27,35 kg/sec, within 19 years of the exploitation period, it makes 16,3 million tons, and14,9 million m^3 in volumetric units. Ratio between the actual sediment amount and silt volumes estimated based on official data makes 42,3:14,6=2,85. Provided that thin silt fractions do not participate into the sedimentation process, and their amount in a sink equals 15%, it is obvious, that the given figure will exceed 3. Thus, in fact, sedimentation of water storage is more intensive than specified in the project.

The article describes sedimentation process and presents graphs of distribution of fractions deposited within the water storage. Ill. 4, tabl. 1, bibl. 6.

ABOUT EFFECTIVENESS OF MANAGEMENT DECISION MAKING IN POWER COMPANIES.
***N.Lordkipanidze, G.Amkoladze.* "Energy". Tbilisi. 2009. №3(51). p. 90-93. geo. sum.geo.engl.rus.**

The article analyzes managerial activities of both company management team and employees jointly taking part in creating and analyzing management information and making effective decision.

The article discusses performance of the company management, quality criteria of the decisions made and implemented, essence of staff stability and economy coefficients together with the evaluation of management criteria of the power company team. Tabl. 2.

ANALYSIS OF RESULTS OF LONG-TERM RESEARCH OF CREEPAGE AND MAXIMUM STRETCHING PROPERTIES OF CONCRETE OF ENGURI HYDRO POWER STATION PLATINUM. *P.Tchitchagua, J.Kilasonia, M.Kalabegishvili, I.Dekanosishvili.* "Energy". Tbilisi. 2009. №3(51). p. 94-97. geo. sum.geo.engl.rus.

The article presents the results of the analysis of concrete Creepage of Enguri platinum obtained by loading samples directly into the building at their early hardening ages taking into the account their real hardening conditions and also the results of analysis of large-size lab sample tests. Works were conducted at platinum research sector of Georgian Scientific and Research Institute of Energy and Power Buildings and scientific and research sector of HydroProject Institute of Moscow.

Comparative analysis of the above research results showed their satisfactory coincidence. Therefore, both long-term research results were synthesized in order to determine function parameters reflecting the history of change of concrete creepage characteristics of Enguri platinum. Test results of the samples from directly the building, as more accurate ones, were used for early loading ages – 4, 7 and 27 days. Test results of large-size samples were additionally used for longer loading ages - 60, 90 and 180 days.

There are the results of analysis of maximum stretching properties of the mentioned concrete given in the article as well. Tabl. 1, bibl. 17.

IDENTIFICATION OF INTEGRAL AND DIFFERENTIAL POROSITY OF CONCRETE. ***T.Jojua, T.Turmanidze, M.Lordkipanidze.*** **"Energy". Tbilisi. 2009. №3(51). p. 98-99. geo. sum.geo.engl.rus.**

The article presents the issues relating to identification of integral and differential porosity of concrete considered by the authors. The Boil-Marriott law has been used. Suggested method is quite quick. It is possible to identify concrete porosity within an hour. There is the description of tools worked out by the authors for identifying the volume of concrete pores.

The volume of pores identified under maximum pressure value represents an integral apparent porosity. Differential porosity is identified by difference between pore volumes calculated at different pressure values. Ill. 1, bibl. 1.

CLIMATE PECULIARITIES OF GEORGIAN BLACK SEA COAST AND ITS AFFECT ON ATMOSPHERIC CORROSION OF REINFORCED CONCRETE. ***M.Lordkipanidze, O.Verbetskaia, T.Jojua, T.Turmanidze, N.Dondoladze.*** **"Energy". Tbilisi. 2009. №3(51). p. 100-102. geo. sum.geo.engl.rus.**

Georgian black sea coats is located within subtropical region with warm, humid maritime climate. Peculiarity of the climate conditions the specificity of exploitation of reinforced concrete.

The climate data have been studied and analyzed in three towns, Batumi, Poti and Sokhumi of the black sea coast. For comparison purposes, Tbilisi climate data have been taken as a standard, as it is located in rather dry zone.

Monthly, annual, average annual temperatures, humidity, sediments, relative humidity, duration of sun ray shining, amount of radiation in sediments, average annual speed of wind and amount of strong wind days have been studied and the affect of the above factors on the corrosion resistivity of the reinforced concrete constructions in the above towns is shown in the tables attached. Tabl. 2, bibl. 3.

BIOENERGETIC EVALUATION OF REHABILITATION OF DEPRECIATED TEA PLANTATIONS.
I.Gaprindashvili, N.Mamulaishvili. "Energy". Tbilisi. 2009. №3(51). p. 103-104. geo. sum.geo.engl.rus.

The article discusses technologic issues of rehabilitation of depreciated tea plantations. Main attention is paid to bioenergetic evaluation of the rehabilitation. Optimal power saving technology has been worked out. Consumed power has been calculated by formula containing 5 independent energies. Illustration of each consumed energy is indicated. Calculations have been made for the acreage of 100 hectares. Table indicating the values of power consumed on the rehabilitation of depreciated tea-plantations is given too. There are two options discussed. The amount of consumed power is given in megajoules.

It is obvious from the presented tables, that it is possible to significantly decrease the existing power consumptions by using suggested technology and milling machines in the rehabilitation of the depreciated tea-plantations. Based on the review of particular example, power saving may make 4,7 million megajoules. Tabl. 1, bibl. 3.

OIL OF RUSTAVI FIELD. ***I.Gaprindashvili, Z.Megrelishvili.*** **"Energy". Tbilisi. 2009. №3(51). p. 105-107. rus. sum.geo.engl.rus.**

Physical and chemical features of Rustavi oil have been studied. It has been specified, that it is paraffin oil containing small amount of sulfur and resin with high fraction composition of up to 350^0C. It is reasonable to treat it to get diesel fuel. Above 350^0C temperature it can be used as fuel masut and secondary treatment raw material.

In order to settle the problem, it is necessary to construct combined resistor from the available ones according to the scheme proposed by the authors.

Group hydrocarbon and structural compositions as well as diesel fuel and kerosene characteristics are given in form of tables.

It has been determined, that Rustavi oil field is distinguished by its good composition and significant exploitation features. Tabl. 2, bibl. 3.

ANALYSIS OF GEOCHEMICAL SURVEY OF CONTENT OF ORGANIC SUBSTANCE OF SOUTH GEORGIA SEDIMENTARY FORMATIONS FOR DETERMINING POTENTIAL FOR OIL AND GAS. ***N.Chakhnashvili, N.Khundadze.*** **"Energy". Tbilisi. 2009. №3(51). p. 108-112. geo. sum.geo.engl.rus.**

The article presents the analysis of geochemical survey of the content of organic substance of Mesozoic and Cainozoic sedimentary formations of South Georgia. It is known, that the coefficient the value of which corresponds to the upper borders of the main phases of oil and gas, is estimated by reflectivity of vitrinits extended within the rock. The most complete set of data about catagenesis stages within the sedimentary formations of South Georgia is available for oil and gas-bearing regions located near Tbilisi. It should be noted, that oil and gas exploration activities aimed at testing deeply located (5-7 km) productive units are at

present carried out in various countries. Geothermal gradients, paleotemperature and physico-chemical features of oil-gas-bearing rocks are defined by studying the catagenesis stages. Ill. 1, tabl. 2, bibl. 6.

ENERGY SAVING SHOULD BECOME PRIORITY OF STATE ENERGY POLICY. *G.Meskhia.* "Energy". Tbilisi. 2009. №3(51). p. 113-116. geo. sum.geo.engl.rus.

In order to implement wide-range activities relating to energy saving in the country, it is required to develop appropriate policy, strategy, legislative base of the energy saving, work out mechanism for wide introduction of the energy saving technologies, prepare energy saving programs, etc. In order to sort out these problems, it is necessary to establish a new licensor body - "energy saving department" in energy sector.

Functioning of the energy saving department will significantly consolidate energy safety of the country. For example, by making measures relating to the energy saving in Tbilisi, we may significantly save energy resource, including: 430,4 million kilowatt per hour electric power, 64 million m3 natural gas and 13 million liters of car fuel.

By implementing the energy saving program in Tbilisi, each family, improving living conditions, within 6 years, will save an average of 5,44 GEL per month, reduce emission of CO_2 into atmosphere by 0,87 million tons, reduce capacity shortage in the power system by 80 megawatts, etc. Scheme 1.

DEVELOPMENT OF GEORGIAN POWER INDUSTRY IN 2006-2008. *G.Kiknavelidze.* "Energy". Tbilisi. 2009. №3(51). p. 117-118. geo. sum.geo.engl.rus.

The article presents the material on the course of implementing the dynamics and prognosis of increased power production for the years 2006-2015 worked out by Georgian Ministry of Energy in 2006 and approved by Georgian Government.

As the results of last three years show, the program for increased power production has not been fulfilled and therefore the issue of the complete fulfillment of the approved estimated figures is now under suspect.

The article presents the analysis of the negative sides that might have impact on Georgian power system, if the approved plan of power production is not fulfilled. There is the list of primary organizational and technical activities performance of which, as the author believes, is compulsory for timely fulfillment of the state programme of power production.

DETERMINATION OF AVERAGE OVERHEATING OF ALTERNATIVE CURRENT ELECTRICAL MACHINE WINDINGS. *G. Tabatadze, T.Natenadze.* "Energy". Tbilisi. 2009. №3(51). p. 119-121. geo. sum.geo.engl.rus.

The article describes experimental method to determine average overheating of alternative current electrical machine windings. The method is not provided in the standards or in testing guidelines. It is shown, that in most cases, when studying heating rates, it is necessary to identify just average temperature of the windings. It is determined, that when the value of measurable current does not exceed 0,1 part of nominal current, its effect has no impact on the measurement accuracy 0,5 grade device. Ill. 2, bibl. 4.

INVERSE PROBLEM OF COMPENSATION PRINCIPLE AND CONSEQUENCES. *R.Jashi.* "Energy". Tbilisi. 2009. №3(51). p. 122-126. geo. sum.geo.engl.rus.

The article presents the review of inversive problem of compensation principle well-known in the theory of electric circuits. According to it, any voltage and current source of the electric circuits may be replaced by ohmic resistance (by dividing voltage by current). Such replacement should maintain the distribution of current and potential invariable. It appeared, that this is possible if we replace the source generating capacity by negative ohmic resistance and vice versa, if we replace the source consuming power capacity by positive ohmic resistance. If we do such replacement for all the sources participating in the scheme, we will get the so called compensated resistor matrix being a copy of a relevant scheme. Based on matrix, it is possible to write an equation of resistor balance $R_M+R_Э=0$, where $R_Э$ is the ohmic resistance of any matrix element (or a scheme) and R_M – the inside, equivalent matrix resistance from $R_Э$ connecting points (when $R_Э$ is disconnected). The obtained equation is quite comfortable to control the prepared estimation scheme. Ill. 12.

WAY OF MANAGING PROCESS OF ORE REDUCTION IN ROD MILL. *R.Enageli, G.Javakhishvili, M.Jibuti.* "Energy". Tbilisi. 2009. №3(51). p. 127-130. geo. sum.geo.engl.rus.

Ore reduction is an important and power consuming preparation operation providing the effectiveness of further ore-dressing. The article reviews the process of automatically controlled ore reduction in rod mill. New way of the ore reduction has been suggested based on principles obtained by management practice and statistic data. It involves regulation of voltage when running shaking feeders according to the change of physical and chemical features of the supplied ore.

Suggested way of the management can be implemented by using functional structure and is given in the attached diagram. Ill. 3, bibl. 2.

UTILIZATION OF SOLAR ENERGY IN VENTILATION AND AIR CONDITIONING SYSTEMS. ***O.Purtseladze, G.Gvindjilia, D.Kutchukhidze.*** **"Energy". Tbilisi. 2009. №3(51). p. 131-133. geo. sum.geo.engl.rus.**

The article discusses the possibility to use solar energy in ventilation and air conditioning systems for obtaining both heat and coldness. Presented is the chart on which hot water received from solar collectors is supplied to the heaters of this system. Hot water received from these collectors is also used as an energy source in the absorbing refrigerating equipment (chillers), where water to be supplied to the air cooler of the air conditioner is refrigerated.

The article also reviews the possibility of using single-circuit or dual-circuit absorbing chillers for air conditioning systems.

Main privilege of the absorbing chillers is small power consumption. Absorbing chiller of 1 megawatt cooling rate consumes just 15 kilowatt power. Utilization of the solar energy significantly reduces exploitation costs of the described system.Ill. 2, bibl. 2.

USAGE OF SOLAR ENERGY IN LOCAL POWER SUPPLY IN HIGH MOUNTAINOUS VILLAGES. ***K.Kobakhidze, N.Chkhenkeli, L.Kobakhidze, G.Bokuchava.*** **"Energy". Tbilisi. 2009. №3(51). p. 134-136. geo. sum.geo.engl.rus.**

The article shows the way of local power supply on the example of high mountainous village Ukanapshavi. There are survey results of the potential of local energy resource such as water, wind and sun given here. Taking into consideration the economic reasonability, source of renewable energy is chosen based on the analysis and according to this, individual solar micro-power systems for lighting buildings and one big system for supplying power to TV centre have been constructed in the village.

Solar photo-electric system functions automatically and practically does not need any service. Capital expenses after putting the system into operation become minimal. Operation term of the main component, solar battery, is 20 years. Photo 3, tabl. 1.

STABILIZATION OF ASYMMETRIC PERFORMANCES OF 0,4 KILOWATT VOLTAGE SYSTEM.
M.Sadradze, M.Loria. **"Energy". Tbilisi. 2009. №3(51). p. 137-138. geo. sum.geo.engl.rus.**

The article raises the issues relating to stabilization of asymmetric performance of 0,4 kW voltage system. Asymmetric performances created in the systems raised the issue of overvoltage, which may cause passage of current from zero line to ground loop leading to significant power losses especially in city conditions.

Measurement made in one of the many-storied buildings of Kobuleti is brought as an example. In metering the voltage in one of the many-storied buildings of Batumi, the power losses achieved 216 kW/hr.

The authors worked out a scheme of three-phase stabilizer. It may be used for compensating asymmetric performances. It is anticipated to install such stabilizers in residential buildings. Ill.1, bibl. 3.

BRIEF REVIEW OF ACHARA REGIONAL POWER SECTOR. ***M.Loria.*** **"Energy". Tbilisi. 2009. №3(51). p. 139-141. geo. sum.geo.engl.rus.**

The article presents brief review of Achara power sector. Power consumed in towns and villages during 2007 is illustrated in diagrams by months.

The most complicated issue is recoding power supplied to the residents.

There are views about the power tariff given in the article too. In specifying the tariff, it is important to take into consideration all the circumstances to provide fair competitive and attracting investment environment in this field. The tariff should cover all the costs made on service and provide revenues required for the power companies and effectiveness of the investments made. Diagr. 1, tabl. 2, bibl. 3.

FINE-GRAINED HIGH SOLIDITY CONCRETE ON ORGANIC AND MINERALOGIC MODIFIERS AND STUDY OF THEIR TECHNOLOGIC AND PHYSICAL AND MECHANICAL FEATURES. ***V.Kankava, A.Nadiradze, G.Rosnadze.*** **"Energy". Tbilisi. 2009. №3(51). p. 142-145. geo. sum.geo.engl.rus.**

There was the study of fine-grained high solidity concrete obtained on organic and mineral modifiers together with their physical and mechanical features performed. Obtained experimental data enable to essentially fill up the data base with physical and mechanical and rheological features of high solidity concrete.

The modifier of a completely new concrete composition is produced on industrial and engineering losses, in particular, on ashes of Zestaponi Ferroalloy Plant, Ajameti spongoliths and on superplastifiers of various modifications.

Experimental data obtained as a result of studying the fine-grained high solidity concrete unable us to increase reliability of the design of reinforced concrete construction produced based on this concrete. This involves both new constructions and reinforcement and reconstruction of old buildings. Utilization of new high solidity fine-grained concrete enables to reduce carrier structural section providing the efficiency of reinforcing metal and other labor resources. Ill. 2, tabl. 3, bibl. 12.

SURVEY OF POSSIBILITIES TO GET CONSTRUCTION MATERIAL (CEMENT) ON THE BASIS OF INDUSTRIAL-ENGINEERING LOSSES AND THEIR PHYSICAL AND MECHANICAL FEATURES. ***V.Kankava, A.Nadiradze, G.Rosnadze, A.Kankava.*** **"Energy". Tbilisi. 2009. №3(51). p. 146-149. geo. sum.geo.engl.rus.**

Cement is the most in short supply and power consuming material. The article reviews the possibilities of using industrial-engineering losses and slag of Kutaisi Lithopone Plant as well as coal of Tkibuli field in cement production. This makes it possible to reduce clinker part of cement by 30-70% and get new type cementing material, the so called low water consuming cement. The mentioned cementing materials have good physical and mechanical, technological, economical and number of exploitation features.

In particular, the following should be noted: normal density of cement paste is reduced, cementing term is quicker, cement milling frequency as well as its activity are increased. Tabl. 1, bibl. 4.

STATIC AND HYDRAULIC CALCULATION REPORT OF PRESSURE-DIVERSION TUNNEL OF EXTRA GENERATED UNIT OF HYDRO POWER STATION ON KURA RIVER.
T.Lordkipanidze, G.Tchumburidze. **"Energy". Tbilisi. 2009. №3(51). p. 150-153. geo. sum.geo.engl.rus.**

The article presents static and hydraulic report of pressure-diversion tunnel of extra generated unit of hydro power station on Kura river. It is part of the hydro power system described in journal "Energy" #2(50), part 2, 2009. As it is intended to construct the tunnel on the territory bordering Tbilisi embankment, static report was prepared in compliance with the requirements of construction norms applicable in Georgia.

However, inside pressure of the tunnel is not high (around 5,5 m), its diameter, due to high estimated flow rate Q=100 m^3/sec, is taken 6 m. This, from its side, needs performance of special activities, which is the subject of further research. Ill.2, bibl. 8.

TELEMETERING UNIT MEASURING CHANGE OF WATER LEVEL IN WATER STORAGES.
I.Gabrichidze, G.Kharabadze, V.Gabrichidze, S.Gedenidze**. "Energy". Tbilisi. 2009. №3(51). p. 154-156. geo. sum.geo.engl.rus.**

There are two options of metering change of water level in water storages, that enable to accurately measure water level change in water storages and supply measurement results to the control department, personnel on duty at the power plant and computer control system.

In the first option, in changing water level, video camera installed on a flocet moves against dip rod and transmits dip rod digital values corresponding to the water level through the television transmitter.

In the second option, ultrasonic level meter or laser rangefinder are used for metering the water level using telemetering unit. Measurement results are transmitted via television communication channel. Closed construction excludes the effect of water waves on the flocet, and reduction of the amount of moving elements increases reliability of the unit operation. Ill. 2, bibl. 3.

SURFACE REGULATOR-SPILLWAY WITH INCREASED POWER EFFICIENCY. ***I.Gabrichidze, G.Schumburidze, G.Kurdgelashvili, M.Dzidziguri.*** **"Energy". Tbilisi. 2009. №3(51). p. 157-160. geo. sum.geo.engl.rus.**

An issue of evacuation of excessive water from water storage to the lower pool has been worked out. Main point is, that water is not evacuated via coping immediately. Water jet falling near platinum foundation is excluded too. Spillway may be arranged on a side slope or immediately within the water storage. Multi-angular water receiver in shape of abutment is constructed on the spillway ridge. Shields move on hinges within the range of 30^0 and open from inside. Abutment of hanging shields of the spillway have parachute shape and represent polygon angles. Shields are open stage by stage through each diametrically located shield pair.

Provided are advantages of constructive settlement of the proposed spillway. One of the most important advantages is that the spillway does not need lifting facilities and power. It is known, that there might be accidents during running the spillway due to malfunction of the lifting facilities and interruption of power supply. Ill. 4.