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C O N T E N T S

S U M M A R I E S

G. KOKHREIDZE, Z. GACHECHILADZE, N. BERADZE, GOCHA KOKHREIDZE, G.QADAGISHVILI.
Some Properties, Stability Of Operating Modes And Basic Parameters Of A Conversion System Of Two-Bridge Bipolar Dc Transmission Lines With Igbt-Transistor Modules.
"Energy". №1(109). 2024. Tbilisi. p. 5-13. geo. sum geo. engl.rus.

The scientific-engineering paper presents some basic properties, stability of operating modes and main parameters on a unit line length of the converter system of a two-bridge bipolar DC transmission line with IGBT-transistor modules. The main circuit takes into account the series connection of two one-bridge converters and, accordingly, the equalization of two linear voltages on the secondary sides of two three-phase transformers. A more secure 12-phase conversion has been obtained and we have a three-phase voltage system by a 30^0th shift relative to each other. In this regard, the rectified voltage has a 12-fold harmonic. In each rectified voltage of the bridges, the harmonics in the order (2k+1).6, k=0,1,2,3,… are in opposite phases, mutually compensate and therefore they do not exist in the total voltage of both bridges. In the circuit, the ground is used as a current-wire. The pattern of propagation of direct current and alternating current in the ground is very different from each other. The derivative of the active power transmitted by the main line, in terms of angles, existing between the primary and secondary voltages, must be positive in order for the operation of a single converter system to be stable.
Bibl. 3.

G. KHORBALADZE, Z. GACHECHILADZE, I. CHOMAKHIDZE, G. KOKHREIDZE.
Analysis of the compliance of the metering system with the target model of the future electricity market.
"Energy". №1(109). 2024. Tbilisi. p. 14-19. geo. sum geo. engl.rus.

The article discuss the transmission system operator (TSO) role in the new european electricity market in terms of metering issues. In 2019, the Georgian electricity sector underwent revolutionary reforms with the goal of creating a modernized marketplace by 2024. The power sector is about to change due to three major components, balancing market, day ahead/intraday market and bilateral contracts market. The proposed market concept highlights the critical function of the transmission system operator and provides guidance on TSO metering system compliance. Smart meters are a step up, giving users the ability to make educated decisions and promoting sustainability. The upgrading project signals Georgia's commitment to meeting European standards and promises improved customer satisfaction as well as a strong, green power region.
Ill. 3, bibl. 3.

T. MUSELIANI, B.JINTCHVELEISHVILI.
Discussion of possible options for improving the dynamic stability of the electric power system by introducing battery energy storage systems and photovoltaic systems in Georgia.
"Energy". №1(109). 2024. Tbilisi. p. 20-27. geo. sum geo. engl. rus.

In Gardabani region, a 30 MW photovoltaic system station is being put into operation, a project of a similar scale has not yet been implemented in Georgia, it is being implemented for the first time and is a novelty for the electric energy system of Georgia. The mentioned project is implemented by JSC "Solar Energy Bank". The implementation of similar projects only deserves a positive evaluation, because photovoltaic systems include battery energy storage systems, which in turn will help the electric power system to maintain dynamic stability. The article describes the modes characteristic of the electric power system of Georgia, their features, and discusses the need for a battery energy storage system during such modes of the electric power network of Georgia, such as: autonomous-isolated mode operation, synchronous-parallel mode operation with the neighboring country's electric power network, when electricity is exported or imported, in asynchronous mode Work with the electricity grid of the neighboring country – HVDC High Voltage Direct Current, when electricity is exported or imported.
Ill. 1, bibl. 7.

M.SARTANIA, G.SHOVNADZE.
Testing the function of automatic frequency regulation of power blocks/aggregates working in the electric power system of Georgia.
"Energy". №1(109). 2024. Tbilisi. p. 28-35. geo. sum geo. engl. rus.

The article talks about the maintaining of nominal frequency levels in Georgian power system. in order to maintaining of nominal frequency it is important each unit takes part in the automatic frequency regulation. Also, there are discussions about testing methodology of function of the unit's automatic frequency regulation, which allow this units will relevant with requirement of grid code. therefore, increasing reliability and stability of power system.
Ill. 8.

B.JINTCHVELEISHVILI.
Study of the dynamic stability of the electric power system, adjacent to the 500 kV substation "Ksani-500", using a 200 MW battery power storage system.
"Energy". №1(109). 2024. Tbilisi. p. 36-39. geo. sum geo. engl. rus.

At the peak hour, the battery energy storage system with a capacity corresponding to approximately 10% of Georgia's consumption will meet the solution of all the problems that may pose a threat to the dynamic stability of Georgia's electrical energy system. The energy management system (EMS) of the battery energy storage system is integrated into the SCADA program, which immediately ensures the continuous regulation of voltage, frequency close to the nominal values and cross-flow (export-import) according to the schedule.
Bibl. 6.

T.MUSELIANI, B. JINTCHVELEISHVILI.
Maintaining the dynamic stability of the electric power system during any momentary disturbance by using the battery energy storage systems.
"Energy". №1(109). 2024. Tbilisi. p. 40-48. geo. sum geo. engl. rus.

Battery energy storage systems and integrated energy management systems must ensure that immediate disturbances to power systems are avoided before existing automation and regulators can respond. All of the above is discussed in detail in the article. Today, for control systems, it is possible to make chips that are made with a nanotechnology machine called ASML, this machine creates ultraviolet light rays with a wavelength of 13.5 nanometers (EUV), with the help of this light beam, modern nanotechnology chips are created that allow everything management systems for full regulation of the electric power system.
Ill. 2, bibl. 7.

G. KHUTSISHVILI, M. DVALIDZE.
Efficiency and environmental impact of solar power plants.
"Energy". №1(109). 2024. Tbilisi. p. 49-54. geo. sum geo. engl.rus.

There is a discussed, about the principle of obtaining energy from a solar power plant, the constituent components, the types of plant and the achievements in the field of production of photovoltaic modules. A silicon-perovskite crystal module created by LONGI, one of the world's giants in the field of module production, is also shown the efficiency of which reached 33.9%. The importance of the solar power plant in the environmental impact factor is discussed and an example of environmental pollution is given.
Ill. 2, bibl. 3.

M.TURDZELADZE, A.PEIKRISHVILI.
The influence of the quality and dosage of binders on the properties of concrete mixture and hardened concrete.
"Energy". №1(109). 2024. Tbilisi. p. 55-59. geo. sum geo. engl.rus.

The most rational way to reduce the cost of cement in high-strength concrete is to use modern modifiers in concrete mixes and minimize the water-cement ratio. Equally important is the

unconditional fulfillment of the requirements for the quality of high-strength concrete binders; Careful selection of the granulometric composition of fillers and determination of the exact ratio between sand and gravel. Along with this, special attention should be paid to freeing fillers from harmful impurities, which have a negative impact on concrete strength and durability indicators. ***ll. 3, bibl. 10.***

L. PAPAVA, T. ISAKADZE, M. RAZMADZE, G. DAVITAIA, G. GUGULASHVILI.
Thermoacoustic Refrigeration System.
"Energy". №1(109). 2024. Tbilisi. p. 60-65. geo. sum geo. engl. rus.

It has been shown that in most devices used to produce cold, in modern conditions, the main element is various refrigerants, which are characterized by global warming potential and have a negative impact on the ozone layer of the earth. In order to eliminate the use of environmentally harmful refrigerants, a principal scheme of a new thermoacoustic refrigeration device is presented, in which acoustic waves are used to produce cold. The cooling device contains a device for creating acoustic waves, which is hermetically attached to the pipe. The acoustic waves generated by the device when moving along the pipe are converted into a temperature gradient. ***Ill. 5, tabl. 1, bibl. 5.***