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**Prospects of nuclear energy research and analysis of the position of people  
on this issue**

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Joining the 21st century and the rapid development of electric technology, humanity is faced with a large demand for electricity. All activity of modern man associated with the use of electrical energy. And this so-called "addiction" makes us more hostages electricity. Therefore, in the new century, a huge amount of resources, both material and mental spent on inventing new ways to produce energy, which is so necessary to people.

It is the use of solar energy through solar panels that have worked well in many countries, but they have several significant drawbacks : first, these batteries are expensive, and secondly, they are unlikely to be able to fill the power consumption with a small coefficient of efficiency, in places with shortage of sunlight. There are a number of alternative methods of energy that I want to tell you.

1) It is the use of solar energy through solar panels that have worked well in many countries, but they have several significant drawbacks: first, these batteries are expensive, and secondly, they are unlikely to be able to fill the power consumption with a small coefficient of efficiency, in places with shortage of sunlight.

2) One of the most promising sources of energy is wind. Principle of operation of wind turbines elementary. Wind force used to drive the wind wheel. This rotation in turn passed the rotor of the electric generator. Advantage of the wind generator is primarily the fact that the wind field, the wind can be regarded as an inexhaustible source of energy. In addition, wind turbines, producing energy, do not pollute the atmosphere with harmful emissions. Inconstancy of the wind and quite a large number of generated energy makes this species is not decisive.

3) A huge amount of thermal energy stored in the depths of the Earth. Geothermal energy and these suggest using as an alternative source of geothermal energy supporters. However, this view is still quite difficult to use.

In my opinion, the most promising direction of development of the electricity is nuclear power, at the moment only nuclear power in the future will be able to save the world from the energy crisis.

« Since then, as the phenomenon of radioactivity was discovered, it has been more than a century (as happened receiving coverage in 1896). Until a few decades it took a rocket scientist to grasp all the intricacies of the essence of this phenomenon and learn to use it for practical purposes.» [1. C. 3].

Discovery of radioactive decay and the use of nuclear power to solve the problem of energy shortages. However, there was a problem of confidence in the atom.

« It is human nature to be afraid of what he has no idea. We are afraid of radiation and that is connected with it, because little is known about her. However, that radiation is an indispensable tool for the detection and successful treatment of deadly diseases; nuclear energy generated in nuclear power plants – is light heat is working in our homes televisions, computers, household appliances.

All living organisms are continually experiencing the effect of natural ionizing radiation. There is even a theory that the origin of life on Earth has been associated with exposure to strong radiation fields . Our existence seems to have unthinkable without the use of knowledge about the atomic energy : almost all advanced countries actively develop nuclear power, jointly build the first fusion power reactor ; and the extent of use of radiation and

radioactive isotopes in space engineering, medicine, biology, food industry, agriculture, geology is increasing every year.» [1. C. 4.].

Distrust of nuclear energy due to several objective reasons. First, people are afraid to use peaceful nuclear energy for military purposes, it's stereotypes of the Cold War. Second, it's a major accident at Chernobyl (USSR) and Fukushima (Japan).

Third (after danger reactors and waste problems) main the danger of nuclear power is its close connection with atomic weapons.

«"Nuclear power – it's the atomic bomb, giving electricity" – figuratively, but physically accurate, said Nobel laureate physicist P. Kapitsa.» [2. C. 59.].

«The tragedy for the whole world that the establishment of nuclear power plants in a country today predetermines the possibility of creating in this country of nuclear weapons.» [2. C. 62.].

26 April 1986 at the Chernobyl nuclear power plant was the largest in the history of the world nuclear power accident. The accident resulted in radioactive contamination with cesium-137 levels above 1 Ci/km<sup>2</sup> (37 kBq/m<sup>2</sup>) underwent in 17 countries in Europe with total area of 207,500 square kilometers. Significantly contaminated with cesium- 137 were the territory of Ukraine ( 37,630 square kilometers ), Belarus ( 43,500 square kilometers ), the European part of Russia ( 59,300 square kilometers).

«In 2011, the 25th anniversary of the explosion of the fourth unit of the Chernobyl nuclear power plant. Consequences of this biggest industrial disaster in the history of mankind devoted many thousands of scientific papers, and effects of the overall picture begins to clear shape . This picture is very different from the one from the first days after the Holocaust drew ( and still draws ) supporters of nuclear energy development . I recall that a few months after the Holocaust, the then head of the IAEA G. Blix curled in an interview that nuclear power can withstand a Chernobyl type accident every year.» [2. C. 162.].

The Chernobyl accident has generated fear and distrust of the peaceful atom world for many years. This accident has generated fear and distrust of the peaceful atom in the world for many years. All newspapers were full of protests against nuclear power. People have become more cautious about the atom, received an important lesson.

March 11, 2011 as a result of the strongest in the history of the Japan earthquake and ensuing tsunami there was a major radiation accident at the nuclear power plant Fukushima-1. As a result of all these incidents at the plant "Fukushima-1" radiation leak occurred, both by air and on the water, so the government had to evacuate people from the area of a radius of 20 km from the station. In addition, the exclusion zone was forbidden to be people, and people living within 30 km from the station.

After the accident, the whole world was scared again, but to a lesser extent. People took it more adequately.

However, relying on the atom, do not forget about safety.

The design, construction, operation and decommissioning of nuclear power plants, safety issues are a priority. To do this, at the stations used the latest equipment and advanced security systems

Nuclear power plant safety is now a priority. Place the plant construction to be safe, in the sense seh. The most earthquake-resistant areas should be a place of construction. Eliminating a number of dangers, it is an earthquake, tsunami, etc.

The most advanced equipment, the best specialists and responsible attitude to their office workers do our best station in the world. Perhaps this is the lesson of Chernobyl is left its mark on the direction of development of nuclear power in our country.

Due to the high demand for electricity, it is necessary to use nuclear energy. For several reasons, nuclear power plants are more environmentally friendly, more productive and until what other energy sources can not solve the problem of lack of energy. Therefore, the future of nuclear power, and do not be afraid to use it!.

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**The basic voltage and reactive power control devices**

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The target of this paper is to present the main devices of automatic voltage regulation in the power system. The basic function and principles of operation of these devices are described in this paper.

To ensure a reliable supply of energy imposes mandatory requirement to maintain a certain level of voltage. The voltage level is closely related to the reactive power. Increasing or decreasing the voltage level occurs due to increase or decrease of the amount of reactive power into the grid. Therefore, the control of voltage and reactive power is one of major issues in the power system operation. After that, basic units of voltage regulation and reactive power in the network are considered.

Automatic voltage regulator of synchronous generators (AVR).

The automatic voltage control of synchronous generators occupies an important place among numerous automatic control systems for energy systems. Originally, the sole task of AVR was to maintain a constant voltage on the terminals of generators, but the development of electric power systems expanded the task list relating to AVR.

Automatic adjustment is based on three principles:

- perturbing effects;
- controlled deviation;
- combination of the above principles.

The simplest AVR performing voltage regulation of generations is a compounding device by full load current. It is also least accurate, so it is usually connected to the controller of voltage deviation, which should provide sufficient accuracy voltage regulation of generator, thereby yielding a device with a combined principle of regulation.

Phase compounding devices are more accurate, but they are hardly ever used without a voltage regulator. Increase of the unit capacity of synchronous generators and emergence of high-frequency excitation systems have promoted the development of AVR of proportional action. This type of device provides voltage regulation in the full range of possible changes in its normal operating condition, as well as the force driving in emergency mode.

However, the advent of AVR proportional action has not stopped development of systems of automatic voltage regulator. Energy systems grow, length of transmission lines increases as a result requirements of AVR are increased so automatic excitation regulator of