MODERN TRADITIONS OF THE DEVELOPMENT OF SMALL HYDROPOWER IN THE WORLD.

Rizaev Bahodir
Professor of Namangan Civil Engineering Institute
Akhmedov Islombek
Associate Professor of Namangan Civil Engineering Institute
Khamidov Adhamjon
Professor of Namangan Civil Engineering Institute
Kholmirzaev Sattor
Professor of Namangan Civil Engineering Institute
Jalolov Zayniddin
Lecturer at Namangan Civil Engineering Institute
Umarov Isroiljon
Lecturer at Namangan Civil Engineering Institute

In the countries of the world since 1970, interest in the development of renewable energy sources has increased. The reason for this was the rise in prices for oil and oil products. Along with non-traditional - solar, geothermal, wind energy, traditional, i.e. river hydropower.

The use of fuel and energy resources has led to their limitation not only because of the value, but also because of the impact on the environment and the extreme complexity of the ecological process. [1] The exploitation of hydropower resources through large hydropower plants indicates that attention is also being paid to small hydropower.

The construction of the first small hydroelectric power stations has been carried out since the 19th century and was mainly intended to supply electricity to individual enterprises and small settlements. The number of such hydroelectric power plants is not very large. Then they were supplanted by small thermal power plants (CHP), since they could be placed anywhere. [2,3]

The second stage of construction of the KGPP corresponded to the years 1940-1950. There were more than 1000 of them in the CIS, USA, Japan, France and other countries. Since then, attention to CHP plants has declined, and 100,000,000 CHP plants have been decommissioned in many countries. The main reason for this is the development of large-scale energy and the construction of large hydroelectric power plants, thermal power plants, nuclear power plants and power lines.

At the end of the 10th year, the third stage of CHP development began to be built at a qualitatively new level.

Each new stage is characterized by a high level of technical and economic development and a high level of progress in the construction, design and operation of HPPs.

For example, improved second-stage hydro turbines that replaced the original hydro-mechanical devices are highly efficient even after 50 years.

However, CHPPs equipped with modern hydroelectric units have a number of disadvantages, one of which is the relatively high cost of construction.

In the third phase, advances in automation and control systems will enable full automation of CHP plants.

Currently, MHD operates more than 300 thermal power plants, 24 of which are located in Uzbekistan. These hydroelectric power plants differ in their construction and technical level. According to the economic analysis of CHP plants, they are all profitable. [4]

The MHD has developed a long-term program for the development of CHPP construction and justification of parameters. The main directions of this scientific and technical research include:

- technical re-equipment, reconstruction, modernization of all decommissioned, stopped KPPs;
- new CHPPs for individual electricity consumers
- construction and fuel for diesel power plants
- achieving consumption reduction;
- construction of KHPP facilities at reservoirs and canals of water supply networks;
- the use of new technical facilities for KPP, the creation of hydropower complexes;
- Reducing the cost of the main and auxiliary equipment of the checkpoint, etc.;
- Optimization and implementation of CHPP operation with IES, ShES, biones, etc.

The world's population has reached 6 billion people and is increasing by 2-3% per year. The average per capita electricity consumption is 0.8 kW, and national differences in energy consumption are very large: ~10 kW in the USA, ~4 kW in Europe and -0..1 kW in Central Africa. National income in modern countries is 2-5% per year. In such cases, the energy consumption corresponding to the population should increase by 4-8% per year. Ensuring this is no easy task.

If 2 kW of energy consumption is required per person in conditions of increased comfort, then 500 W of power can be obtained from renewable energy sources from each m2 of the earth's surface. With an energy conversion efficiency of 4%, 100 m2 of area is required to produce 2 kW of power. [5] If we take into account

that the average population density is 500 people per 1 km2 in the city and its environs, then to provide them with 2 kW of energy, it is necessary to take 1000 kW of electricity from 1 km2 of area. Thus, renewable energy sources (solar, wind, geothermal, wave, hydraulic, etc.) can serve to meet the needs of the population. [6] It is necessary to study only the convenient design of converters that convert them into electricity, the rise in price and other factors.

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