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# CONSTRUCTION AND DEVELOPMENT OF MINI GESTURES IN UZBEKISTAN

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Keyingi yillarda mamlakatimizda iqtisodiyotni rivojlantirish va aholi turmush darajasini oshirishga qaratilgan tub o‘zgarishlar amalga oshirildi. Mamlakatimizning turli hududlarida erkin iqtisodiy zonalar, texnoparklar, klasterlar tashkil etilmoqda. “Obod qishloq”, Obod mahalla  Xavfsiz shahar kabi strategik dasturlar asosida shahar va qishloqlarda ulkan bunyodkorlik ishlari amalga oshirilib, ularning qiyofasi butunlay yangilanmoqda. Shunga ko‘ra turizm ham rivojlanmoqda. Ayni paytda atrof-muhitni muhofaza qilish va ekologik barqarorlikni ta’minlashga har qachongidan ham ko‘proq e’tibor qaratilmoqda. So'nggi paytlarda elektr energiyasi tariflarining ko'tarilishi tufayli qayta tiklanadigan amaliyotda bepul energiya manbalari tobora dolzarb bo'lib bormoqda.

In recent years, our country has undergone radical changes aimed at developing the economy and improving the living standards of the population. Free economic zones, technoparks and clusters are being established in different regions of the country. On the basis of such strategic programs as “Prosperous Village”, “Prosperous Neighborhood”, “Safe City”, huge creative works are being carried out in cities and villages, and their appearance is being completely renewed. Accordingly, tourism is developing. At the same time, more attention is paid to the protection of the environment and environmental sustainability than ever before. Due to the recent rise in electricity tariffs, free energy sources in renewable practice have become increasingly relevant.

За последние годы в нашей стране произошли радикальные изменения, направленные на развитие экономики и повышение уровня жизни населения. В различных регионах страны создаются свободные экономические зоны, технопарки и кластеры. На основе таких стратегических программ, как «Процветающее село», «Процветающее соседство», «Безопасный город», в городах и селах проводится огромная созидательная работа, полностью обновляется их облик. Соответственно, развивается туризм. В то же время больше внимания уделяется защите окружающей среды и экологической устойчивости, чем когда-либо прежде. В связи с недавним повышением тарифов на электроэнергию все более актуальными становятся свободные источники энергии в возобновляемой практике.

**Keywords:** *Garland, Rotor Darrieus, Pervanel, Hydro-turbines, St. Petersburg, Tyazhmash, Syzran, Wheel.*

## INTRODUCTION

According to the data, by 2030 the world's population will reach 15 billion, which in turn will require an increase in current electricity generation by about 50%. There needs to be enough fuel to do that, but that leaves the environment with more protection and control. Of course, nuclear energy has a greater role to play in this, but it will be necessary to find a solution to the problems associated with it. Hydropower, a renewable energy source, can play an important role in this. This means solving the problem of maintaining energy production and using environmentally friendly fuels. Uzbekistan is a country rich in hydropower, oil and gas and coal, which are effective sources of energy. Currently, the main source of electricity generation in the country is fuel. Every year in our country 60 billion. About M 3 of gas is produced. Gas and other fuels can be used for 30-40 years.

That's the decent thing to do, and it should end there. First of all, it is necessary to ensure the reliability and quality of electricity supply to consumers. Improving the construction of micro-hydropower plants will achieve energy savings and disruption and natural fuel savings through the widespread use of development in local areas.

## SMALL HYDROELECTRIC POWER STATIONS:

Even in ancient times, man focused on rivers as a source of energy. To use this energy, people have learned to build water wheels that rotate with water. Millstones and other implements were driven by these wheels. The water mill is a shining example of the oldest hydroelectric power plant in many countries, which has survived to this day in almost its original form. Before the invention of the steam engine, it was the main driving force in the production of hydropower. With the improvement of the water wheels, the power of the hydraulic blocks that move the machine tools has increased. In the first half of the 19th century, a water turbine was invented, which opened up new possibilities for the use of hydropower resources. The invention of the electric machine and the development of hydropower by the method of transmitting electricity over long distances began by converting it into electricity in hydroelectric power stations (HPPs).

Small and micro hydropower plants are small hydropower facilities. This part of energy production is associated with the use of energy from water resources and hydraulic systems using low-capacity (1 to 3000 kW) hydropower plants. In recent decades, the world has developed small-scale energy, mainly due to the desire of large hydropower reservoirs not to harm the environment, the ability to provide energy in remote and isolated areas, as well as capital expenditures during the construction of power plants. low and rapid return on investment. The construction of SHEP also has development prospects in different regions of the world, including transboundary river basins.

At present, there is no commonly accepted concept of small hydropower for all countries. However, in many countries its installed capacity is considered to be the main characteristic of such a hydropower plant. Small, as a rule, include hydroelectric power stations with a capacity of up to 30 MW. Small hydropower is free from many of the shortcomings of large hydropower plants and is recognized as one of the most economical and environmentally friendly ways to generate electricity, especially when using small watercourses. Small, micro or nanoSES combine the advantages of a large hydropower plant on the one hand and the capabilities of a decentralized power supply on the other.

Features of small hydropower plants:

In recent years, the practice of installing small hydropower plants has become widespread. This type of power plant is all types of equipment that are hydroelectric devices. Depending on the capacity of the devices, they are calibrated in mini hydroelectric power stations with a capacity not exceeding 10 MW, in micro hydroelectric power stations with a capacity not exceeding 0.1 MW, and in small hydroelectric power stations with a capacity of 10 to 30 MW. MW.

**ADVANTAGES AND DISADVANTAGES OF SMALL HYDROPOWER PLANTS:**

One of the main advantages of small hydropower facilities is environmental safety. They do not adversely affect the properties and quality of water during construction and subsequent use. Reservoirs can be used both for fishing and as a source of water supply for the population. However, there are also many advantages of micro and small hydropower plants. Modern stations are simple in design and fully automated. The electricity generated by them meets the requirements of GOST in terms of frequency and voltage, and the stations can operate both autonomously and as part of the power grid. Small-scale power facilities do not require the construction of large reservoirs with flooding of the area and huge material damage.

During the construction and operation of DATK, the natural landscape will be preserved, there will be almost no load on the ecosystem. Compared with fossil fuel power plants of small hydropower, it can include: low cost of electricity and operating costs, relatively cheap replacement of equipment, long service life of hydropower plants (40-50 years), complex use of water resources (electricity, water supply, land reclamation, water conservation, fisheries).

Because many small hydropower plants are seasonal power plants, they cannot always provide guaranteed power generation. In winter, their energy output drops sharply, and snow cover and ice events (ice and mud), as well as the drying up of low water and rivers in summer, can stop their work altogether. The seasonality of small hydropower plants requires renewable energy sources; their abundance can lead to a loss of reliability of the power supply. Therefore, in many regions, the capacity of small hydropower plants is considered to be excessive, not primary. There is a very acute problem with floods, reducing the hydropower potential of rivers and the production of

electricity. allows the regions to be supplied with electricity. The development of small hydropower will help decentralize the overall energy system, which will provide a steady supply of electricity to hard-to-reach areas. The energy generated by small hydroelectric power stations is used by nearby consumers. At the same time, the cost of transporting it is reduced and the reliability of the power supply is increased.

Zones of development and technological limitations:

Small hydropower is one of the most understandable directions for investors in the development of renewable energy sources. The development of small hydropower is currently promising in areas with high density of hydropower resources, especially in areas without centralized power supply and power shortages.

**THE FOLLOWING SCHEMES CAN BE USED TO GENERATE PRESSURE AT A HYDROPOWER PLANT:**

a dam in which the main dam is created;

formation, when the pressure is formed using a channel (channel), made in the form of a tunnel or pipe (twist, deflection);

combined, in which the head is formed from the dam and the crop.

The barrier scheme envisages the creation of backwaters of the water table by building a dam. The resulting reservoir can be used as a regulating tank, which allows for the periodic accumulation of water reserves and more complete use of the energy of the water flow.

In the diversion scheme, water is taken from the natural bed through an artificial water pipe with a smaller longitudinal slope. The water level at the end of such a pipeline is higher than the water level in the river, and the difference in this level is at the beginning of the hydroelectric power station. The greater the slope of the river and the longer the formation, the larger the head can be obtained.

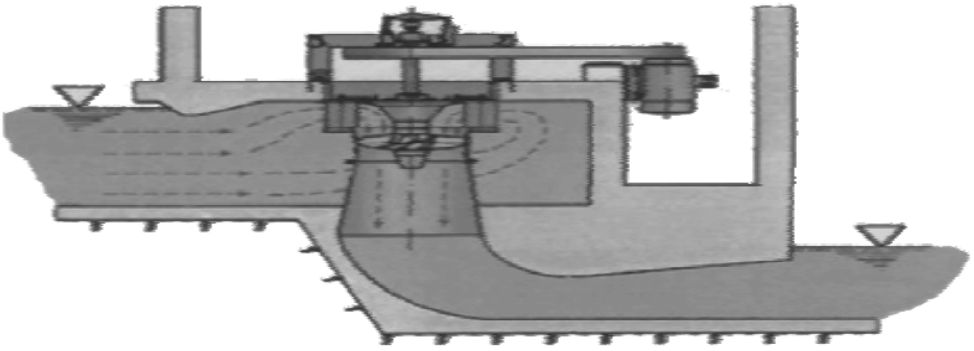

**FIGURE: 1. REACTIVE AXIAL TURBINE**

At the hydroelectric station, the turbine and generator are connected by a common shaft. Their rotational frequencies depend on the number of pairs of poles of the generator rotor and the frequency of the alternating current, which must comply with the standard. Turbines with low velocity coefficients at high heads and large values of this coefficient at high coefficients are used to obtain the velocities of units close to the optimum.

INSET Association (St. Petersburg) manufactures hydropower plants for small HPPs with a capacity of up to 5,000 kW and micro HPPs from 3 to 100 kW. Hydraulic units are designed to operate at different head and flow rates with high energy properties and are manufactured with propeller, radial-axial and bucket turbines. The supply complex, as a rule, includes an automatic control system of the turbine, generator and hydraulic block.

Tyazhmash OJSC (Syzran) supplies hydraulic turbines with a capacity of 15,000 for small hydropower plants, as well as repairs and restoration of individual units, installation and adjustment of equipment.

Hydropower equipment for small hydropower plants is being developed by NPO RAND (St. Petersburg). Hydraulic turbines have been developed that allow efficient use of low heads. The power of such devices ranges from 6-20 to 2500 kW.

In recent years, free-flowing underwater hydrobines have been produced that use the speed of water flow in watercourses to generate energy and do not require the construction of a dam. Sufficient width and depth can be used to accommodate underwater hydrobines, as well as water currents with a water flow velocity of 3 m / s.

Portable submarines can be widely used when it is necessary to quickly generate electricity with minimal time and financial costs.

Microelectric power stations (up to 100 kW) can be installed almost anywhere. The hydraulic block consists of a power block, a water intake device and an automatic control device

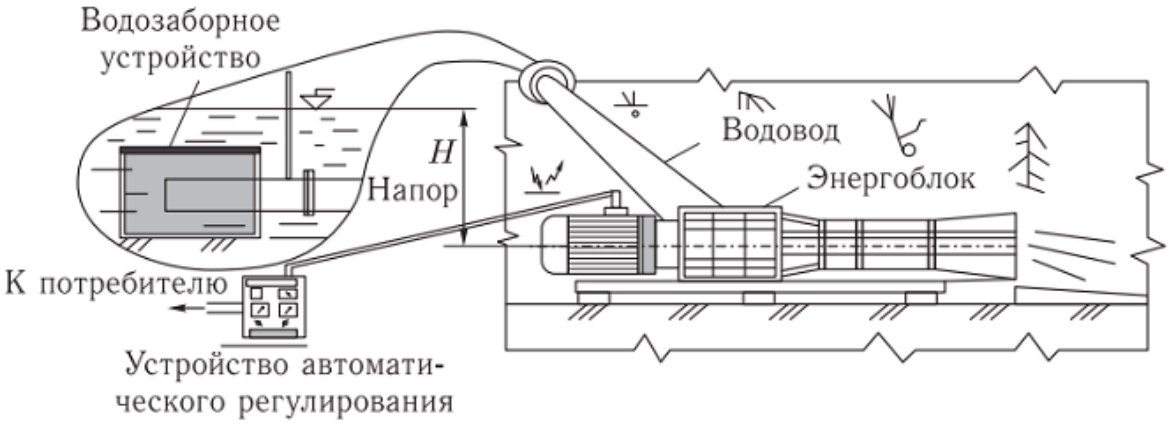


**Figure: 2. Micro hydroelectric power station**

Micro-hydroelectric power stations are simple. They are reliable, environmentally friendly, compact and pay off quickly. First of all, micro-hydroelectric power stations are in demand as sources of electricity for villages, farms, summer houses, farms; mills, small industrial networks in remote, mountainous, and hard-to-reach areas where there are no power lines nearby (and the construction of such lines is currently longer and more expensive than the purchase and installation of micro-hydropower plants).

Many micro-hydroelectric power stations can be built in water supply and irrigation hydropower facilities. With a large difference in surface markings in the water supply systems on the route sections, micro-hydroelectric power stations can be built instead of

different types of energy absorbers (pressures). With a water flow rate of 5 to 100 l / ms their power can reach 20 to 200 kW.

Interesting design solutions are made by some foreign firms Figure 3 shows the design of a blown drainage dam proposed by Dyrhoff. Instead of traditional materials for fences: concrete, steel and wood, the company uses a “bubble” made of reinforced rubber. To create pressure, the dam is inflated with air or filled with water under a pressure of 20-30% more pressure (h).

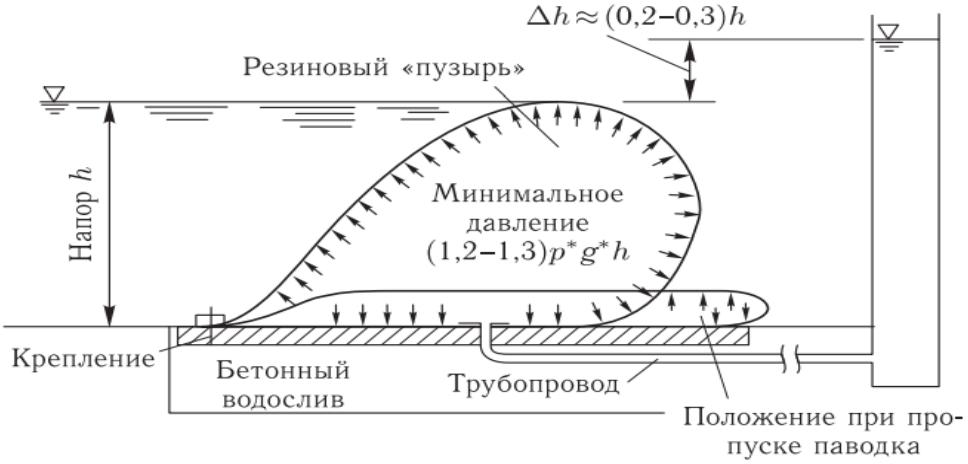


**FIGURE: 3. IRON SPILL DAM:**

The concrete base is held in place by bubble anchors. The compressor or pump is connected to the internal cavity of the dam via a pipeline located on a concrete base. The convenience of this design is that, if necessary, you can quickly and easily remove the cavity from the cavity, and the "bubble" sinks to the bottom, allowing water to flow freely. This feature of the reservoir can be best used in fast-growing rivers for water transit. These dams can be used for seasonal passage of fish and ice. The advantages of this dam, in the opinion of the manufacturer, are low cost, ease of operation and minimal operating costs.

**CONCLUSIONS AND SUGGESTIONS:**

Small hydropower plants have a number of advantages that make this equipment increasingly popular. First of all, it should be noted that the environmental safety of mini-hydropower plants is a criterion that is becoming increasingly important in terms of environmental protection issues. Small hydropower plants do not adversely affect either the properties or the quality of the water. The low-capacity hydroelectric power station can also be used as a source of water supply to settlements for fishing from installed water areas. In addition, there is no need for large reservoirs to operate small hydropower plants. They can run on the energy of streams of small rivers and even streams.

In terms of cost-effectiveness, micro and mini hydroelectric power stations have many advantages here. Stations manufactured with modern technology, easy to manage, they are fully automated. Thus, the equipment does not require the presence of people. According to experts, the quality of current produced by small hydropower plants meets

the requirements of GOST in terms of both voltage and frequency. However, mini hydroelectric power stations can operate both autonomously and as part of the power grid.

When talking about small hydropower plants, it should be noted their advantages, their full service life, at least 40 years. Most importantly, small-scale power plants do not require the construction of large reservoirs with flooding of the area and huge material damage.

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