DESIGNING THE TECHNICAL PARAMETERS OF THE HYDROELECTRIC POWER PLANT

Mamarasulov Qudratbek Shuxratbek o'g'li
Assistant of Andijan Institute of Mechanical Engineering, department of alternative energy sources, Uzbekistan, 170119, Andijan city. 56 Baburshokh Street
mamarasulovqudratillo7@gmail.com
Ortiqova Shaxnoza
A student of the K-24.20 group of alternative energy sources

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Abstract. In this article, the guidelines for the application hydropower plants to agriculture were considered.

Enter

Currently, the design and construction of water management networks and complex hydroelectric units is carried out in accordance with the requirements of water supply of the national economy, irrigation, hydropower, water transport, fisheries and other sectors.

The main problem of modern national economy is the problem of rational integrated use of water resources and its protection. The development of industry and agriculture, the improvement of the urban and social situation creates demands for the use and protection of many water resources [1-4].

From 1961 to 1980, water consumption in the Commonwealth of Independent States (CIS) more than doubled. Every year, the national economy uses more than 300 km3 of water, which is 6% of the total annual river water volume and is equal to 4.74 thousand km3.

The most important current water consumer is agriculture (irrigated land) up to 60% and industry up to 30% of total water. Heat energy, metallurgy, fuel, oil, chemical, industries that have a great need for water include. The amount of water used for utilities is not very large.

With the increase in the level of water use, industrial, agricultural and communal wastes are being poured into rivers and water bodies. As a result, pollution of many water sources or deterioration of water quality is observed [5-7].

MAIN PART

Stages of hydropower development.

1st stage 1923-1941. Until 1923, there was only Murgob HPP with capacity N=1350 KW in Uzbekistan. Since 1923, hydropower began to develop in Uzbekistan, and in 1930 the Hydroproject was established, in 1926 the Bozsuv HPP with a capacity of N=4 MW, in 1933 the Kadirya HPP with a capacity of N=13 MW, in 1936 with a capacity of N=6.4 MW Borijar hydroelectric power plant, 1938-1941, the construction of Tavoqsoy hydroelectric power plants with N=73.6 mW and Komsomol hydroelectric power plants with N=86.4 mW began;

The 2nd stage, 1941-1960, is characterized by gaining experience in hydraulic construction. During this period, new technical methods of hydrotechnical construction were developed, from the construction of small and medium hydroelectric power stations to the construction of large hydroelectric power stations [8-12]. During this period, Chirchik - Bozsuv tract hydroelectric power stations, Farhod hydroelectric power station with capacity N = 126 MW, Namangan hydroelectric power stations 1, 2, 3, 4, Aksuv hydroelectric power station, Okkavok hydroelectric power station, 6, 7 Shahrihan hydroelectric power station, Hishrav hydroelectric power station, Kumkurgan hydroelectric power station and other hydroelectric power stations were built;

3rd stage 1961-1984 hydrotechnical construction reached the level of high world practice. High dams were built, large hydropower plants: Chorvoq HPP, Khojakent HPP, Ghazalkent HPP, Tuyamoyin HPP with a capacity of N=150 MW, Andijan HPP with a capacity of N=140 MW were designed and built;

4th stage 1984-1990, during this period the first aggregates of the unique Charvoq HPP were put into operation; Gazalkent HPP with capacity N=120 MW, Uchkorgon HPP with capacity N=180 MW were built. The design and construction of hydropower facilities has risen to the highest world level [13-16]. In the use of the hydropower potential of the rivers of Uzbekistan, the requirements of many sectors of the national economy, especially the irrigation sector, were taken into account, and it was carried out simultaneously with the construction of general hydrotechnical engineering;

Phase 5 is from 1990 to the present. agricultural energy consumption in 2005 was estimated at 11.7 billion. KWh has reached, by 2010 this figure will be estimated at 20 billion. It can reach KW hours and cause electricity shortages.

Currently, half of the irrigated land in Uzbekistan is related to energy-consuming machine water pumping, the ever-increasing electricity tariff is currently an urgent issue, that is, to supply the national economy with hydroelectric power stations, which are a cheap energy source. is cleaning up the ride.

Economic studies of foreign scientists show that hydroelectric power plants will remain the main source of electricity production in the long term, as the price of fuel products increases, and the construction and operation of thermal and nuclear power plants become more expensive [17-19].

At the current stage, taking into account all the difficulties associated with the construction of large hydroelectric power plants, it is possible to build medium and small hydroelectric power plants in existing irrigation networks and water reservoirs. It has been a long time since all existing small hydroelectric power plants in Uzbekistan were built and paid for, and today they are operating efficiently.

Our republic has an installed capacity of 505 MW in reservoirs, 1354 mln. The possibility of the construction of 43 small hydroelectric power plants, which will create the possibility of producing electricity in the amount of KWh for many years, has been identified. The resource of small hydroelectric power stations in the water discharge channels is 3060.7 mln. It can be KWh. Examples of these are the 3 MW Uighur HPP, Topalon, Gissarak, Sharhansoy and Gulba HPPs.

Electrification is the basis of technical and cultural development.

Global energy consumption doubles every 10 years. Compared with other types of power plants, the following advantages can be observed:

- HPPs use the energy of water coming from the water flow every year and do not require expensive and non-renewable fuel for their work;

- The cost of electric power at HPP is 5-10 times cheaper than at IES;

- HPP is characterized by rapid changes in its capacity (HPP capacity changes depending on load) and operates at the peak of the energy network graph;

- due to the automation of processes at HPP, the number of employees is 3-4 times less than at HPP;

- Irreversible water consumption of HPP operation is not followed by either chemical or heat pollution of the environment. Aggregates installed in hydroelectric power plants have a high FIK of 90%, and in thermal power plants 50%.

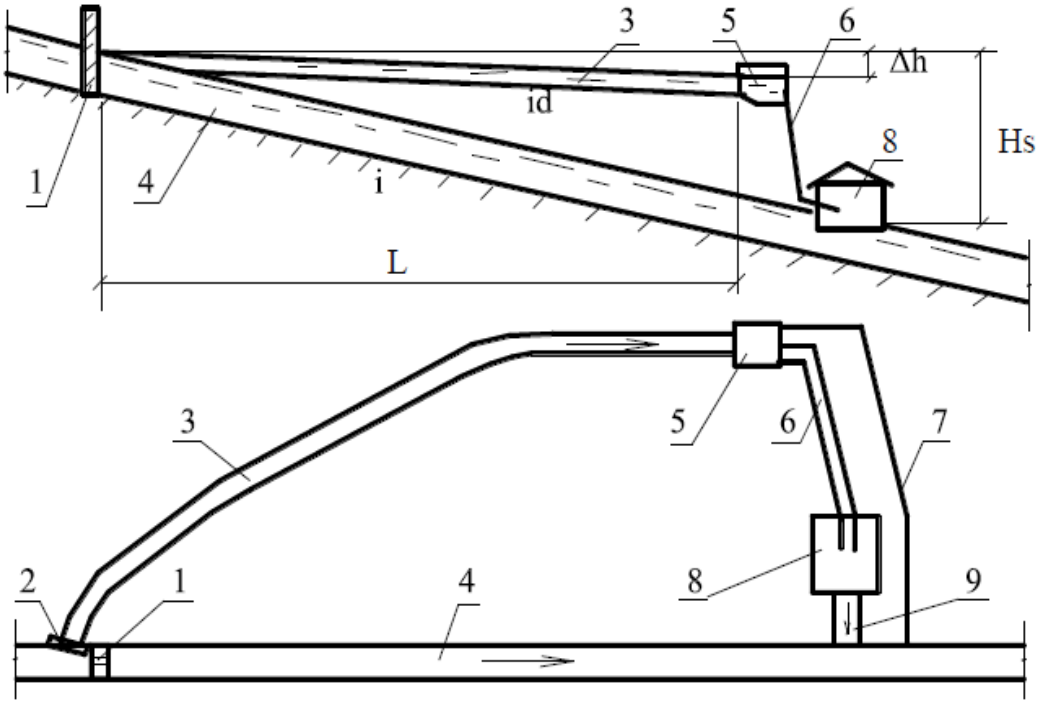
All this applies to hydroelectric power stations with large reservoirs. At present, such hydroelectric power plants are not being built, but it is necessary to use the built hydroelectric power plants as little as possible without negative effects.

The number of reservoirs on earth is 30,000, the water surface area is 400,000 km2. more than There are about 1,000 reservoirs with a volume of 1,010 km3 in the CIS. By 1974, 1,600 reservoirs had been built in the United States. By 2010, the useful volume of water reservoirs in the USA may double. Every year, 300-500

reservoirs are built and put into operation around the world. 30-40 years ago there were no reservoirs in Africa. Today, 4 out of 5 large reservoirs are located there.

In the last 40 years, the number of water reservoirs in the world has increased 4 times, their size has increased 10 times, in the countries of Latin America, Africa and Asia it has increased 40-90 times.So, hydroelectric power plant and water reservoir indicate the need for technical development, if they are used skillfully, many economic issues can be solved.

It is not necessary to abandon hydroelectric power reservoirs (except for the plains), but it is necessary to take appropriate measures to protect nature and the environment.



The scheme of generating pressure by the derivation method (cut and plan). Facilities include:

1. Head link of HPP facilities: barrier dam (1), water receiver or water intake facility (2). Incoming channel (3);

2. Derivation: open channel, tunnel, pipe;

3. HPP pressure - station link: pressure pool (5), pressure pipe (6), idle (excess) water thrower (7), HPP building (8);

4. Outgoing channel (9).

Hydraulic calculation of derivation channels.

HPP pressure in the derivation scheme equal to Risunok,where: Hst is static pressure, L is derivation length. The larger the L, the greater the pressure, but the

costs are higher in long channels, such as crossing existing channels, ravines, etc. The water-receiving main joint provides the derivation with the required amount of water. In the main joint, bottom waste is fought (on the curved part of the coast). To fight with suspended saliva, you can install a strainer after the water intake. Derivation can be done in the form of an open channel, tunnel or pipe, depending on the topography and geological conditions of the place. An open channel must have a lower slope than that of a river (river slope). Duties of pressure-station facilities: - pressure pool - turns non-pressurized movement into pressurized movement, in which water is distributed between pipes, measures are taken against suspended garbage and waste, excess water is thrown away (in pressure derivation, an equalizing tank is used instead of a pressure pool); - pressure pipes - bring water to the turbine under pressure (made of reinforced concrete or steel); - waste water disposal facility - automatically discards excess water from the upper bay to the lower bay in the event of an emergency shutdown of the turbine; - HPP building - houses turbines, generators, distribution devices and other auxiliary equipment;- drain channel - discharges the water used in the HPP to the water source; The derivation scheme is preferred in mountain and sub-mountain conditions, when the rivers have a relatively large slope and short length, and in the derivation with a small cross-section, they generate relatively large pressure and HPP power.

CONCLUSION

With the increase in the level of water use, industrial, agricultural and communal wastes are being poured into rivers and water bodies. As a result, pollution of many water sources or deterioration of water quality is observed. In addition, it is known that the amount of water is limited in many regions of our country, which is especially true for developed industrial and agricultural regions. Most of the water resources are located in the eastern part of the CIS, and 85% of the river water resources are underdeveloped regions. For example: rivers of the CIS, such as the Ob, Yenisei, Lena and Amur, pour 40% of their annual water volume into the oceans. In 1996-2010, the area of irrigated land was 3.3 mln. to improve the technical conditions of irrigation networks on the ground, to quickly switch to saving water used for irrigation, to take care of water sources and land use, to further develop the study of the problems of rational redistribution of water resources, to carry out great works in the field of nature protection, Kara, Azov, Baltic, Caspian, Accelerating the implementation of water protection in the island and other main industrial regions of the CIS, improving the protection of water sources, including the rational use and protection of small rivers and lakes from pollution and drying up, and the

continuation of protection works, is the main issue of basic scientific and engineering research in the current conditions.

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