IMPROVING THE METHOD OF CALCULATING THE HYDRAULIC RESISTANCES IN THE WATER RECEIVING STRUCTURE OF EKIN-TIKIN PUMP STATION

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Abstract: We planted a crop analysis of design information, operating conditions and operation of the pumping station and, based on this, development of scientifically based measures and recommendations to increase the efficiency of the pumping station's operating mode

Key words: *Ekin tikin pumping station operated by the "Pump stations and energy" department under Norin-Qoradaryo ITSB, Andijonsoy*

Relevance of the topic: 35 out of 1,688 state-owned pumping stations are considered large pumping stations in our republic. These pumping stations were mainly built and put into operation in the 70-80s of the last century. Many pumping stations have lost efficiency due to years of non-operation. The reason for this is the operation of pumping stations in our Republic in difficult conditions, the presence of pumps in the water of water receiving sources and their sinking to the bottom of the channel, the change of hydraulic parameters in the water-carrying channel of the pumping station, as well as the abrasive and cavitation erosion of the water-carrying parts of the pumping stations, the

spiritual deterioration of equipment and equipment. and leads to physical wear and tear.

1. In the conditions of the Ekin Tikin pumping station, the technical condition of all hydrotechnical structures included in this pumping station was studied.

2. In Avankamera, large Loika sediments were formed on both sides of the Avankamera, where a large amount of sediments accumulated and islands were formed.

3. Funnels appear on the surface of the water in the receiving chambers of the aggregates on both sides, and in the same cases, air is sucked into the aggregates from the bottom side of the pump along with the water flow (up to 5-10% air inflow). This situation causes the phenomenon of cavitation in the pump units and decreases the energy performance (power, FIK) of the pump units.

4. In order to prevent this situation, it is recommended to install flow diverting devices (flow diverting walls) inside the vane chamber to reduce the size of the vortex generated in the vane chamber and to distribute water uniformly to all receiving chambers.

The pumping station was fully commissioned in 1970 and is designed to transfer m ^{3} /s of water to the "Andijan" collector, which is km long. The shortened version of the canal limits the demand for project water and the pumping station does not operate at full design capacity. At present, there is a 0.6 km long water supply channel to the Ekin Tikin pumping station, 8 pumps of 10 NMKx2 brand, 630 kW 1500 rpm pump station building equipped with electric motors, 75 m long individual pressure pipeline with a diameter of 820 mm and a length of 1600 meters. The pressure pipeline consists of two threads, a pressure pool and a 0.6 km long drainage channel.

Water transmission reliability category II.

Capital class III.

The main designer is the "Ozsuvloyikha" institute.

Water intake facility - it is of the type without a dam, and is located at the confluence of the eastern and northern bays of the Andijonsoy canal. Due to the difficult hydrological conditions and the instability of the right bank for the implementation of construction works, water intake is carried out without a main structure. At a low water level, the channel bed moves to the left and there is a need for mechanical cleaning of the current between the right bank of the channel. A device that cleans and removes various wastes and garbage flowing in the water is provided, but it is not repaired.

When the camera becomes muddy at a level of more than 0.5 m, according to the project, it is planned to clean it mechanically with a submersible projectile floating in water. During the initial period of operation of the pumping station, both chambers were used for settling sediments, then alternately; one is working, the other is in mechanical cleaning. When the pumping station has been operating for a long time in reduced water transfer mode and limited mechanical cleaning supplies, the right chamber has become completely muddy and overgrown with reeds, and now only the left chamber is working.

Due to the lack of electricity before the start of the irrigation season in previous years, the canal was not cleaned. As a result, in April and May, due to the decrease in the capacity of the canal, pumping units were forced to stop many times.

Fig. 1 Space image of Ekin Tikin naos station

Front camera – due to the fact that the pumping station is built with a siphon water receiver, there is almost no vane chamber. In practice, there is a simple geometric arrangement of 2-chamber silencers with a single siphon block without expansion, reverse slope and other flow-forming elements. Turbidity is not abundant, and in many places it is collected at the transitions from the trapezoidal intersection of the channel to the right-angled intersection of the water receiver.

At the same time, the siphon creates an additional pressure loss as hydraulic resistance. The measurements made during the research proved that the average expression of the pressure loss in the siphon is 0.2 m.

A visual inspection of the above-ground part of the water receiver revealed no defects and damages in the concrete part, no leaks between the siphon chambers.

Operating experience has shown that the most easily damaged place for the hermeticity of the siphon is the junction of the vacuum pipe of the injector through the concrete-covered part of the siphon. All siphons have traces of temporary dirt contamination of the suction area.

The electronic vacuum structure of charging siphons includes injectors, pipelines that deliver water to the injector, a special pumping station to create a

pressure increase of the water injectors, and a main that discharges the air-water mixture into the vane chamber. According to the project, it is envisaged to install 5 16 nDn pumps for the initial filling of water intake pipes from 5 D320x50 pumps and an advance chamber to ensure the necessary pressure of the working environment of the injectors. The suction and discharge pipes of the pump are connected with common collectors: with a diameter of 600 mm for the 16 nDn pumps, with a diameter of 150 mm for the D320 x 50 pumps. To carry out lifting operations, a hanging crane with a lifting arm of 2.0 5.1 according to the state general model 7413 80 is used.

During the operation of the injector vacuum system, contamination of the pump body with small debris is observed.

To control the process of charging siphons, the project provides remotely adjustable siphon chambers and piezometers in the advance chamber, as well as vacuum meters in the vacuum line of the injectors. In order to make a decision about the completion of the charge, the operating personnel is limited to visual control ("by eye") of the compliance of the water level before and after the siphon.

Protection from running water and garbage is carried out by a combined method according to the project of Uzhgiprosuvozhogi:

a grader for removing large floating liquid and garbage in front of the receiving walls of the siphons;

each siphon chamber is provided with protective grates with a grate cleaning machine of continuous movement.

The total volume of the float in front of the siphons and in the siphon chamber in the study of the water receiver is 2...3 m ^{3} · Floating consists of roots and stems of grasses and reeds with a diameter of up to 40...50 mm and a length of up to 1.5 m.

There is a 4 m wide two-member grader for cleaning food and garbage, and a 2x16 ts + 5 ts crane for maneuvering. In the condition of the grader, the periodicity of cleaning is 7...10 days.

On the right side of the engine room, there is a control building with dimensions of 29.3x14.4, a height of 12 m, in which (from bottom to top) the following are located; There is a control panel with drainage pumps and service cabinets and additional rooms.

On the upper left side of the control building, there is a cargo hatch leading to the drainage building, from the outside there is a transport platform. To the left of the engine room there is a gate for the vehicles to enter and exit, along the pump sets, there is an assembly area with a cargo hatch for communication with the pump room below.

CONCLUSION

1. The water intake facility is without a dam, and when the river level drops, the water inflow rate decreases.
2. The water-carrying channel served as a silencer at the same time, and it was designed with two chambers. The condition of the left side camera is also unsatisfactory.
3. Due to the fact that the pumping station is built with a siphon water receiver, there is almost no avanchamber.
4. The general condition of the pump station building is in good condition. No cracks were found in the walls. The lifting crane is in working condition.

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