

## Current Technical State of the Ground Pumping Station

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**Annotation.** This article provides information on the post-reconstruction indicators and current technical condition of Kuyimozor pumping station located in the Amudarya basin.

**Keywords:** Pump, unit, pumping station, reconstruction, technical water supply, hydrocyclone, filter.

"Amu-Bukhara machine canal" is an irrigation canal in the Bukhara region. From the right bank of the Amudarya, the city of Chorjoi. It starts 12 km above (Turkmenistan). Passing Kyzylkum, it supplies water to the oasis of Bukhara. The 1st line was built in 1965, the 2nd line was built in 1976. The total length is 400 km. The maximum water lifting height is 111 m, and the maximum water transfer capacity is 270 m<sup>3</sup>/s. After the commissioning of the 1st line of the Amu-Bukhara machine canal, 136.5 thousand ha of land irrigated from other sources in the Bukhara region became irrigated with Amudarya water, 377 thousand in the Amudarya basin. it was possible to improve the water supply of the land, to irrigate 23.8 thousand ha of new land. There are 65 hydraulic facilities and 11 pumping stations in the main canal.

As one of these 11 pumping stations, the Kuyimozor pumping station, launched in 1965, is operating. The Kuyimozor pumping station serves to fill the Kuyimozor reservoir during the period of new vegetation. During the growing season, it receives water from the ABK-1 canal and Kuyimozor reservoir and supplies water to the Shahrud canal. 6 aggregates are installed in the pumping station. 3 of them are OP-10-180 and the other 3 are OP-11-180 units. These units are driven by 6 VDS 325/44-18 synchronous motors with a capacity of 5000 kW. 123,200 hectares of land in the Peshku, Shofirkon, Vobkent, Kogon, and Bukhara districts will be irrigated with the pump station..

The total water output capacity of the pumping station is equal to  $Q=102$  m<sup>3</sup>/sec.

Water lift height  $H=22$  m

The total irrigated area is 100,000 ha

Pressure pipe diameter  $D_{bos}=2840$  mm

The total length of pipes  $L_{um}=420$  m

During the 50 years of operation, the hydromechanical and hydropower devices of the pumping station have worn out both physically and mentally. As a result, the efficiency of the pumping station decreased, and the number of emergency shutdowns increased. Taking all this into account, the pumping station was reconstructed at the expense of international organizations during 2017-2020.

As part of the reconstruction of the pumping station, 2 different types of aggregates manufactured by the Austrian company "Andritz" were installed.



Figure 1. Pump units installed at the foundry pumping station.

Currently, the pumping station is fully centralized and controlled through the control room.



Figure 2. Pump station control room.

To supply water to the technical water supply system of pumping units, a reservoir was built at the upper level. There is an automatic system for removing the sediment in the pool. The water-cooled in the pool is cleaned using filters and a hydro cyclone and sent to aggregates using pumps.



a) Hydrocyclone

b) Pump unit

Figure 3. Hydrocyclone (a) and pumps (b) are used in technical water supply systems.

Technical indicators of the pumping station after reconstruction.

For aggregates #1,2,3.

1.	Pump brand-	VLSP-1955-41-300
2.	Water release	18.4 m <sup>3</sup> /ps
3.	Water lifting height	23 m
4.	Pump rotation speed	300 rpm
5.	Efficiency	88.5 %
6.	Electric motor brand	TKSL-5600-20/3250
7.	Electric motor power	5600 kwt

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8.	Electric motor rotation speed	300 rpm
9.	Electric motor efficiency	96 %
10.	Voltage	6000 V
For aggregates #4,5,6.		
1.	Pump brand -	VLSP-2020-54-300
2.	Water release	20 m <sup>3</sup> /ps
3.	Water lifting height	18 m
4.	Pump rotation speed	300 rpm
5.	Efficiency	88.5 %
6.	Electric motor brand	TKSL-5100-20/3250
7.	Electric motor power	500 kwt
8.	Electric motor rotation speed	300 rpm
9.	Electric motor efficiency	96 %
10.	Voltage	6000 V

To sum up, the current technical condition of the pumping station meets all requirements. The necessary amount of water is being taken with the help of a pumping station. The introduction of modern technology and NOA in the facility made the operation process a little easier. In addition, the number of employees in the facility has decreased and the speed of execution of operations has increased.

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