

Retrofitment of old pumps with VFD driven Submersible Sewage pumps for raw sewage: Jayanti nalla Pumping station of Kolhapur Municipal Corporation

About the Project

Kolhapur Municipal Corporation (KMC) was in a process of building a 176 MLD STP. Raw sewage for this STP was to be received from Jayanti nalla pumping station which is around 5 km away from the STP site on the banks of Panchaganga river.

This is an existing pumping station from 20 years ago where 5 numbers of vertical non clog pumps were in operation. As a part of this project, these pumps were to be replaced with higher capacity pumps so as to cater to the increased population and feed to the enhanced capacity STP.



Image for representational purposes only

The Challenge

1. New pumps were to be installed in the existing pumping station without much alteration in the existing piping layout and structure.
2. Although the plant is to be designed with average capacity of 176 MLD, current requirements were relatively smaller. Therefore, suitable pumps were to be selected which can take care of existing as well as future requirements without changing the pumps.

The Solution

After initial discussions with officials of Kolhapur Municipal Corporation and the turnkey contractor, KISHOR team visited the site and took actual measurements of the piping and civil structure. A series of meetings were carried out with KMC and the engineering consultants NJS Engineers India Pvt. Ltd to ascertain possible options and select the optimum one.

KISHOR team suggested to go in for submersible sewage pumps instead of dry pit vertical non clog pumps in view of many inherent advantages and space saving. With this, it was also possible to retain the existing pipeline and structure. A complete piping design was simulated in 3D design software which was shown to all the concerned before arriving at the final layout.

Since the STP is bit away from the pumping station site, frictional head loss was more and the total head loss was as high as 57 meters. Since it was a friction head dominated system, the head loss would be varying at different flow rates. For this, KISHOR suggested to select 4 numbers working pumps to take care of the peak flow (5,312 m³/hr at 57 m head) and operate these pumps based on the load conditions through a variable frequency drive.

This scheme was developed after a series of discussions and an operational philosophy of pumps operation through VFD and PLC was submitted by KISHOR and accepted by the consultants.

KISHOR supplied 6 numbers of 450 hp VFD driven submersible sewage pumps which were the largest of its kind so far. The pumps were tested in presence of KMC and NJS on 500 kW VFD installed in KISHOR works for this purpose. Since this was a unique project, KISHOR team was continuously present and offered technical support during installation. Pumps were commissioned in Dec 2013 and are working well since then.

The Benefit

KMC could install higher capacity pumps in the existing pumping station without change in the existing structure. Since submersible pumps option was selected, the risk of motor getting damaged due to overflowing in monsoon was completely eliminated.

The Customer Opinion

KISHOR offered complete support including R&D intervention at many occasions. The Plant was commissioned in Dec 2013 and pumps are working well. A satisfactory performance certificate was issued by Kolhapur Municipal Corporation acknowledging KISHOR contribution for this project.