

Easy-to-raise submersible pumps reduce downtime

Cleaning out debris from long-shaft pumps in a sludge handling system at a paper mill in the USA was taking up to one week per pump. By replacing them with submersible units, the entire operation could be completed within a couple of hours.

The Background

The Federal Paper Board mill in Augusta, GA, USA, had for a number of years experienced serious problems in the sludge handling system at its pollution control facility. Flow from the sludge lagoon was carrying debris that would jam the impellers of five, long-shaft centrifugal pumps operating in the decant canal. With the pumps out of action, the consistency of the flow to the primary clarifiers could not be maintained.

To unblock the impeller and volute meant disassembling the shaft to raise the pump above the liquid level. The process was both time-consuming and costly: it took up to one week to repair and reinstall each pump.

The Solution

The plant's engineers solved the problem by replacing the long-shaft units with submersible pumps from Xylem and designing a user-friendly arrangement to permit rapid cleaning and reinstallation of the units, to minimise downtime. Five 88 hp/64 kW Flygt pumps, each with a capacity of 2000 gpm/125 l/s at a total dynamic head of 100 feet/30 m, provide the required flow of approximately 10 mgd/38,000 m³/d. Because submersible pumps do not have to be fastened in the sump and do not require mechanical extensions, the units are free to be raised above the level of the fluid in the canal.

This made it possible to design a special one-piece module that houses both the pump and its discharge pipe. In this way the module can easily be raised by a mobile crane for fast access to the pump inlet. The only unfastening required is removal of the bolts securing the discharge pipe to the manifold that leads the fluid to the blend pit.



By simply removing the bolts securing the discharge pipe to the manifold, the entire pump-discharge module can be hoisted up, for fast and easy access to the pump

The Benefits

The great advantage with this set up is the speed with which the pumps can now be cleaned out when a blockage occur. In a submersible, the motor and hydraulics are integrated into a compact unit. This means that the pump can be raised quickly and easily with simple lifting equipment. And when reinstalling the pump, there is no long shaft to realign. Indeed because of the compact design of a Flygt pump, expensive alignment equipment and time-consuming realignment procedures can be avoided altogether.

When the module has been hoisted above the liquid, high-pressure water is used to spray the pump housing clean. The unit is then lifted above the pier to allow maintenance engineers to dislodge debris. The module is then lowered back into the sump. To clean all five pumps now takes just two hours.

To replace a pump in a module is also very simple. By removing four bolts the pump can be removed from the discharge pipe and a standby unit can be fastened into place.



CS 3300 88 hp/64 kW pump

Technical specifications

Application	Sludge pumping
Pump type	CS 3300
No of installed units	5
Impeller type	Channel impeller
Motor rating	88 hp/64 kW
Installation technique	CS - free standing installation with pipe connection
Weight	1.176 kg/2.590 lbs