

Sulzer's latest XFP evolution boosts performance in unscreened wastewater

Wastewater pumps can face some challenging environments and they are not always protected by screens and coarse filters. In these circumstances, which are often found in network pumping stations, pump design is crucial to avoid blockages. For one operator in Germany, part of a wastewater treatment plant was beset by blockages that needed to be cleared several times each week. A project to upgrade the pumps has benefitted from a Sulzer design option that has eliminated the problem with over a year of trouble-free operation since.



Simple maintenance feature saves time

The dry-well installation in Germany was designed to supply raw wastewater to another part of the treatment plant and it was equipped with two pumps that were reaching the end of their service life. The first replacement pump was specified by the main contractor and supplied by Sulzer. The design of the installation positioned the pump horizontally and included a maintenance skid which enables the pump to be easily disconnected and inspected. This feature proved to be very important in the first few months of operation.

Once the new pump was commissioned, technicians were still required to unblock the pumps regularly due to the unscreened nature of the raw wastewater. One positive aspect to the Sulzer pump was the maintenance skid, which minimized any downtime, but the issue needed to be resolved before the second pump was replaced.

The site owners contacted Sulzer to see if the pump design could be modified to improve the situation. Fortunately, Sulzer was in the process of launching the ContraBlock Evo impeller and wear plate which are specifically designed for an application that is affected by high levels of debris. Using the original pump specification, Sulzer supplied a matched impeller and backplate to replace the original parts.

Optimized design for trouble-free operation

The ContraBlock Evo solution has a unique impeller vane geometry with a variable slope leading edge that forces solids towards the high velocity regions and prevents the accumulation of debris. The trailing edge of the impeller is optimized for the exit angle of the wastewater to reduce pulsations and vane load, which promotes a longer service life. In addition, the hub cone geometry eliminates any low velocity zone, ensuring the solids do not have a place to accumulate.

Any pump that operates in wastewater upstream of a screen will have to handle high levels of debris. Specifying the optimum design is crucial to achieving reliable pump operations and this process can be enhanced by involving the original equipment manufacturer (OEM).

In other designs, fibrous debris can become trapped behind the impeller, quickly increasing the load on the motor and damaging seals. Sulzer's solution uses a spiral flow diffuser, which creates an outward movement of water and ejects any solids from behind the impeller. This is coupled with the high-torque cutter rings, which shear any long or fibrous materials into smaller pieces, helping to protect the sealing system.

A matching wear plate uses arced slots to create a pulse of water as the impeller rotates, generating a micro-shearing action and preventing solids from travelling along the impeller vane. This innovative design stops materials collecting between the impeller and the wear plate, enhancing reliability.

The upgrade to the ContraBlock Evo impeller eliminated blockages and saved considerable maintenance time.



The pumping installation supplies unscreened wastewater to treatment processes on the site.



Enduring reliability

Installing the new impeller and wear plate was a simple process, which included fine-tuning the impeller clearance, allowing the pump to be quickly returned to service. Since this update, the pump has performed without incident for over a year, which has saved a considerable amount of maintenance time.

Prior to the upgrade, the pump was blocking up almost once a day and while the standby pump would take over during this time, it too was prone to blockages. The design of the Sulzer maintenance skid minimized the repair time, which could cost around EUR 3'000 each month.

Based on the successful performance of the upgraded Sulzer pump over the last year, plans have been made to replace the second pump with another XFP pump equipped with the ContraBlock Evo impeller and wear plate. Together with the energy efficient design of these pumps, the revised installation will help to significantly reduce operating costs in the future.

For more information please visit

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