

Wastewater managers know all too well that clogged pumps not only are an inconvenience, but also a threat to an entire wastewater transport system.

If management misses a clog alarm, the flow can rise up the well and out of the manhole. The result is a public health issue, as sewage may contain everything from fecal matter and urine to blood and viruses. Besides the added labor costs, wear caused by chronic clogging can lead to premature pump failure and an unplanned capital expense. If the station is unable to keep up with demand, the cascading impact on nearby

a pump won't pass grease, it will plug up." She also noted that people can flush anything down the toilet that will fit.

Swift turned to Fort Walton Beach, Fla.-based distributor Gilbert Pump & Mechanical for a solution to the persistent clogging. Gilbert principal Brian Widman learned that, almost every day, two workers would have to drive to the Oakdale lift station, pull the pump, vacuum it out and lower it back down into the wet well. The cost for such visits ranged from a few hundred to thousands of dollars—a strain on the community's maintenance budget.

After analyzing the demands on the station, Gilbert recommended a pair of 4-hp, 1,800-rpm Grundfos SLV pumps, each of which has a capacity of 125 gal per minute (gpm) at 25 ft of total dynamic head (TDH). To overcome prior difficulties with clogging, the team selected the optional SuperVortex pump impeller to manage the housing complex's unusually high solids volume.

"The beauty of this impeller is that it works by not touching the solids," Widman said. "Instead, it creates a vortex that moves effluent through the pump, allowing for greater free passage of solids."

Gilbert selected the optional SuperVortex impeller to help ensure that solids up to 4 in. in diameter pass freely through the pump without jamming. The winglet-vane impeller is ideal for larger solids because of its recessed position and the fact that the water and debris do not actually pass through the impeller. Although not as energy-efficient as channel-style impellers, Widman noted that passing solids, not energy consumption, were the overriding challenge for the Oakdale lift station.

The two SLV pumps at Oakdale, which were designed to handle raw sewage, grit, fibrous material and drainage water, are submersible wastewater pumps that are staged to alternate each time the station comes on (in order to share the workload). Features include a short rotor shaft to minimize shaft deflection and vibration, a cartridge-style double mechanical seal for reduced maintenance time, and an easy-to-open clamp for access to the pump housing. The pumps are controlled by level-sensing float switches and a duplex control panel with variable-speed drives used for phase conversion.

The pumps solved Oakdale's clogging problem. They have been in place for more than three years without needing a cleanout.

Clog-Free Communities



Since installation, the pumps in DeFuniak Springs and Destin have been clog free.

By Thomas Morrison

Florida cities use wastewater pumps to put an end to clogged lift stations & cut maintenance costs

stations can turn into a wastewater nightmare.

Keeping a smooth flow through the lift station is a top concern for municipal wastewater managers. This demands wastewater pumps that will handle the required flow at the specified head, pass solids without failing, day in and day out, and never require a 1 a.m. phone call or overtime service.

Two recent retrofit projects in DeFuniak Springs and Destin, located in the Florida Panhandle, demonstrated how pump technologies can eliminate clogging and raise efficiencies while reducing utility, maintenance and labor costs.

Softball-Sized Balls of Grease

DeFuniak Springs is a small city an hour's drive east of Pensacola, Fla. A lift station serving the Oakdale apartment complex constantly was clogging with softball-sized balls of grease and goo, reducing pressure so much that the 4-in. conventional two-vane, non-clog pump struggled to overcome the 16 ft of static head.

Oakdale, with 252 housing units (50 single-family homes and 202 apartments), places high demand on a wastewater pump.

"Lots of apartments with lots of people cooking most meals at home generate a lot of grease," said Jayne Swift, project manager for CH2M, which operates the municipality's wastewater system. "If



Less grease buildup in the wetwells has led to reduced maintenance costs for both entities.

"The SLV is a great pump for a demanding application like an apartment complex," Swift said. "It really reduces the amount of required maintenance."

Handling Increased Flow

A similar pump failure took place about a six-hour drive across the panhandle, where a private, nonprofit utility serving Destin, Fla., and parts of Okaloosa County was struggling with extended run times and pump fouling. At Destin Water Users Inc. (DWU), the utility was plagued with recurring clogs at lift station E-03, a duplex pump station with two 5-hp pumps serving about 100 homes in the Kelly Plantation area. This station faced many of the same challenges as the one in Oakdale, with less frequent jams occurring once or twice a week.

"The pumps were clogging with everything from rags to construction debris," said Rick Martin, lift station superintendent, who noted that run times had increased to almost six minutes, instead of the expected five minutes. "We needed something better. Brian Widman suggested a Grundfos pump, so we decided to give it a go."

Unlike the apartment complex's lift station, where there was an unusually high volume of solids, the pumping objectives for the Destin utility included reducing pump run time and clogging.

Gilbert determined that the best hydraulic fit for this application would be the SL1 with the S|tube impeller. The impeller has no edges, dead zones or cutting functions that can get worn and fail over time.

Due to the pump's high rate of efficiency, it was able to meet the utility's high flow rate while still reducing pump run time. Because the duplex lift station had experienced so many clogs, Martin decided to replace just one pump at first, and to give it a three-month trial. The pay-off was a run time of two minutes—a third of the old pump's run time—and when the SL1 was pulled for inspection, there were no signs of impending clogging.

"The SL1 pump was hitting the design point of 350 gpm at 35 ft of TDH with no debris buildup in the volute," Widman said. "During the inspection, the other remaining pump was clogged."

The test results sold the DWU utility on the SL1 wastewater pump's performance. It replaced the second pump at the E-03 lift station and purchased two more pumps to retrofit other lift stations in its network. All have been running flawlessly since installation.

Lessons Learned

Widman has installed more than 200 SL1 and SLV pumps.

By offering free passage capabilities without compromising efficiencies, the pumps serve as a solution when heavy solids-handling capabilities are needed.

"When the wipes, rags, trash and other debris are pumped out of the station by a pump such as the SL1 or SLV, the fats, oils and grease have nothing to grab on to," Widman said. "The station becomes cleaner, maintenance costs decrease, and consumer flushables and other solids are sent to the treatment plant, where the solids can be processed."

That has been the case in Oakdale and Destin. Not only have the pumps been clog free, but there has been less grease buildup in the wet wells, further reducing maintenance costs.

Eliminating wear caused by chronic clogging also means a longer service life.

"A pump should run at least 12 years without problems," Swift said. "I expect these to last closer to 20." **w&wd**

Thomas Morrison is vice president for sales and business development for the water utility market in North America for Grundfos. Morrison can be reached at tmorrison@grundfos.com.



FAIRBANKS NIJHUIS®

7600 SERIES HORIZONTAL MULTISTAGE PUMPS



Pentair's Fairbanks Nijhuis® 7600 Series turbine pump brings more than a century of experience to a pinnacle. The 7600 Series pump is a multistage, horizontal, radially split pump for high pressure service.

With as many as 30-50% fewer stages than the competition, repairs are less costly and can be accomplished in the field. Its higher efficiencies allow for the use of smaller motors and less power consumption—another operational savings for the user. Fewer stages mean a shorter pump taking up less space.

Pump Features

- Patented design for higher efficiencies
- Fewer stages, shorter length, smaller foot print
- Field repairable
- Only the worn or damaged part needs to be replaced
- No plate-type bearings or pressurized oil system
- Easily replaceable, anti-friction thrust bearing
- Easy field alignment
- Simpler mounting base than others
- Thrust-balanced hydraulic design for minimal axial thrust

Easy field alignment. Innovative design eliminates need for plate-type thrust bearing. Thrust is taken in each stage.

Materials of construction options allow for the right material choice for your fluid. Options include cast steel, 316 SST and CD4MCu maximize life and MTBF. Investment cast bowls and impellers provide optimum surface finish and dimensional integrity for parts repeatability.

The 7600 Series pump is designed for service in salt water injection wells, pipeline service, reverse osmosis, boiler feed and other high pressure applications.



FAIRBANKS NIJHUIS
 1.913.371.5000 main
 1.913.748.4025 fax
 3601 Fairbanks Avenue
 Kansas City, KS 66106
www.FairbanksNijhuis.com

© 2015 Pentair Ltd. AIFN-01-2-CM

WRITE IN 122