

Unique Technology from Flygt Responds to Lift Station Woes

Flygt's brand new Concertor™ pump system installed in a maintenance-needy and energy-inefficient lift station yields promising results.

The Fond du Lac (WI) Regional Wastewater Treatment Facility treats the City of Fond du Lac's wastewater along with that of 18 neighboring entities. The water is then discharged to nearby Lake Winnebago. The city's population is 45,000, but with neighboring communities included, the plant handles flow from about 75,000. The average hydraulic flow capacity is 9.84 million gallons a day with a peak flow of 50 million gallons a day. On average, the facility, which is located at the south end of Lake Winnebago, treats about seven and a half million gallons a day of wastewater.

Scope

Neighborhood wastewater collection systems are submersible and primarily gravity driven. Of the 17 pump lift stations, 11 are submersible, none of which use variable frequency drives. Overseeing the maintenance of these submersible stations as well as rising energy costs are two stiff challenges for Fond du Lac's wastewater treatment facility.

Installation

In July 2015 Fond du Lac, under the guidance of Flygt engineers and overseen by city personnel, installed a Concertor™ pump system in a duplex pump station located at Wild Life Acres, replacing one of the old pumps (five-horsepower CP3102 pumps each rated for 140 gallons per minute). The first Concertor pump is the lead pump and it is expected to handle all flows in normal operation.

Concertor is the world's first wastewater pumping system with integrated intelligence. A seamless system that makes use of advanced technology, Concertor combines a fully integrated control system with IE4 motor efficiency, patented adaptive impeller N-hydraulics, and intelligent functionalities.

Concertor's control system integrates a processor, software, sensors, power electronics, a synchronous electric motor, and self-cleaning hydraulics into a submersible shell. This system delivers significant cost savings, a more precise level of motor control, reduced risk of clogging, substantial energy savings, and comprehensive data reporting.



Fond du Lac lift station being upgraded with innovative Concertor™ pumping system.

Customer: Fond du Lac (WI) Regional Wastewater Treatment Facility

Challenge: Reduce maintenance and save energy at the lift station

Products: Concertor™

Concertor users are able to more efficiently manage their assets. They are able to select from a variety of performance fields instead of being limited to a fixed performance curve, which allows for enhanced operational flexibility and reduced inventory requirements. The system's adaptive technology automatically selects the duty points to optimize performance; fine-tuning on-site is also available without having to change the impeller.

Energy savings have the potential to be substantial, starting with the premium efficiency of IE4 motors. The system's patented Energy Minimizer automatically optimizes performance to reduce energy costs while adaptive N-technology impellers deliver sustained efficiency. The Concertor pump is running at 3.3 horsepower, as compared to the original pump, which was running at about four horsepower. The new pump is using about 90kWh/month.

“Because our stations consist of a pit and a panel, the built in intelligent controls is a plus; most of these stations are in residential areas and this feature reduces the size of the panel.”

The smaller cabinet and pre-engineered solution with simple set-up wizard simplifies design and startup. Customers can significantly reduce their total investment.

Solutions

Since its installation, the Concertor pump has undergone over fifty cleaning cycles, e.g., the pump detected some kind of blockage and completed its cleaning cycle of reversing the pump rotation at a reduced speed, jogging back and forth until the blockage cleared. This results in a cleaner sump and no costly call outs. In addition, these cleaning cycles prevent build up and potential clogs that would eventually have to be cleared manually, an unpleasant and unsafe situation. The pump acceleration and deceleration cycles are designed to limit the maximum torque so that the pump life will not be compromised. The pump cleaning cycle will often free a clog within minutes, but may continue for up to one hour virtually guaranteeing the removal of all clogs in the toughest wastewater.

Results

The City of Fond du Lac estimates energy savings at 20 percent at the Wild Life Acres lift station after installing the Concertor system. Bothersome, time-consuming, and expensive cleaning call outs have also been reduced, as confirmed by monitoring system tracking the lift station operation both before and after the introduction of Concertor.

“When our existing pumps are due for replacement or major overhaul, Fond du Lac will be looking at using the Concertor™ pump.”



New Concertor™ pump being lowered into the wet well.

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