

Successful Flygt 4220 mixer trial wins over hesitant utility

Wastewater treatment plant realizes significant energy savings and increased performance with adaptive mixer technology

Considered one of the best places to live in Illinois, Vernon Hills is a suburb of Chicago with a population of 26,343. Located in Lake County, the village offers residents an urban suburban mix feel and serves as a retail hub for the surrounding area.

Vernon Hills receives drinking water and wastewater services from the Lake County Public Works Department (LCPW). LCPW maintains 390 miles of sanitary sewer main, 250 miles of water main, three wastewater treatment plants, 12 water systems and other associated infrastructure.

Currently, LCPW is focused on improving the sanitary sewer system and reducing pollutants in all water sources through a sustained program to replace the aging infrastructure that collects and treats sanitary waste.

Challenge

The Vernon Hills Water Reclamation Facility (WRF) was experiencing chronic issues with its aeration basins as a result of its existing mixers. The WRF used high-speed compact mixers from a competitor, but upon installation they had required constant downtime repairs.

"The mixers repeatedly broke down, requiring us to pull and rebuild them," said Mike Grinnell, central plant supervisor for LCPW. "It was a maintenance nightmare."

Xylem proposed the facility switch to Flygt 4220 adaptive mixers for more reliable operation and reduced energy consumption. Because the WRF had 12 mixers and they did not want to replace all mixers with a new mixer that may not meet their needs, LCPW was hesitant to replace Vernon Hills' existing mixers. In order to prove the mixers high efficiency and optimized mixing, Denny Weber, a district sales engineer for Xylem suggested that LCPW do a "try and buy" solution. As part of the solution, LCPW performed remote power monitoring to monitor the electric motors on the utility's existing mixers for efficiency and power.



After a "try and buy," Vernon Hills NCT Water Reclamation Facility is replacing all of its mixers with Flygt 4220 adaptive mixers.

CUSTOMER: Vernon Hills, Illinois

CHALLENGE: The Village of Vernon Hills encountered chronic issues with its existing mixers, which frequently broke down resulting in downtime and costly repairs.

XYLEM SOLUTION: Xylem installed Flygt adaptive mixers on a "try and buy" basis, which proved to save energy and to be trouble free. The utility ultimately purchased the mixer at the end of the trial and has plans to replace all of their mixers with Flygt 4220 adaptive mixers.

"The customer wanted to monitor its existing mixers in order to be able to compare the electric usage of the existing mixers compared to the Flygt mixer," Weber explained.

Solution

The Flygt 4220 series mixers represent a significant departure from traditional compact mixers, even though they look nearly the same, and they do the same job in about the same way (a rotating propeller creating thrust and ultimately bulk flow in the tank to be mixed). The radical part of the adaptive mixer design is that it employs an IE4 equivalent permanent magnet motor, enabling previously unobtainable motor efficiency.

Also, integrated advanced controls and power electronics in the motor allow the adjustment of thrust and energy consumption to adapt to process changes as well as providing continuous communication with the operator. The mixer basically cares for itself and it can easily be controlled remotely by operators or other systems like SCADA via ModBus.

The trial installation ran for 6 months, during which Vernon Hills WRF operated both the Flygt 4220 and the existing mixers with a Xylem remote power monitoring and analysis tool attached. Utility operators could monitor energy performance from a web-based dashboard.

At the end of the trial period, data showed the Flygt 4220 mixer used 50% less power than the utility's existing mixers. Additionally, the Flygt mixer ran during the trial period without incident and required no maintenance. Based on those results, Grinnell went to LCPW board for purchase approval.

Results

The Flygt adaptive mixers proved to be a reliable, efficient solution for the LCPW. Since installation, the mixers have performed flawlessly and frequent maintenance calls are a thing of the past.

"The results have been outstanding," Grinnell said.

As a result of the utility's initial success with the Flygt mixers, to date LCPW has ordered six more mixers with six monitoring and control panels. LCPW also has long-range plans to replace a total of 12 mixers with the Flygt adaptive mixers.

"Most importantly, the Flygt mixers work," said Grinnell. "We have seen big energy savings."



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A facility operator pulls a Flygt 4220 adaptive mixer for inspection.



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Xylem, Inc.
4828 Parkway Plaza Blvd., Suite 200
Charlotte, NC 28217
Tel 704.409.9700
Fax 704.295.9080
855-XYL-H2O1 (855-995-4261)
www.xylem.com

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