Aqua Stories

Danfoss Water and Wastewater
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A Wastewater Treatment Plant in Wisconsin Finds Energy-Saving Solutions with Danfoss

About a year ago, the Village of Ephraim Wastewater Treatment Facility in Door County, Wisconsin, was seeking new energy-saving solutions. Saving energy in its wastewater treatment process would not only improve overall plant efficiency and provide cost benefits, but would also be a positive step in favor of the environment, reducing the use of fossil fuels in Wisconsin and preserving resources for future generations.

Plant manager Bob Salmi turned first to Focus on Energy, a public-private partnership that offers energy-related information and services to residential and commercial customers throughout Wisconsin. With the partnership's help, he developed a strategy.

First, Salmi converted the plant to fine bubble diffusers and was able to reduce the blower size from 75 horsepower to 30 horsepower. This automatically cut down on the use of electricity. "The smaller blower uses less energy and is more efficient, but it also makes smaller bubbles," Salmi noted. "That works better for the bacteria that consume the waste." Next, he turned to Danfoss and its North American Water & Wastewater Division, headquartered in Milwaukee.

Bob Salmi, Ephraim Wastewater Treatment Facility Plant Manager

"We wanted to implement process control, so we purchased a Danfoss Adjustable Frequency Drive to run the blower," he said. The plant now uses the Danfoss VLT 8000 AQUA Variable Frequency Drive (VFD). "Wastewater treatment is like a living organism," Salmi explained. "It needs food to function. If the bacteria eat more waste, the dissolved oxygen level drops, and this hurts the overall organism. And if there's too much dissolved oxygen, we're wasting money."

The system automatically increases or decreases the amount of dissolved oxygen as needed, using only as much energy as is necessary. For example, when the dissolved oxygen level in the wastewater measures 2.71 milligrams per liter, the VFD operates the blower at only 53% of peak. "Before this, we were really operating in the dark," said Salmi. "All we could do was conduct a water test, which was only a snapshot of what was happening at that moment. Then we'd have to mess with the blower hardware to make adjustments."

Salmi pointed to a computer screen in the office, which displayed a jagged colored line on a graph and allowed him to constantly monitor the dissolved oxygen levels in the aeration basin. "With the Danfoss units, we can see what's going on in real time, and we can understand the big picture," he said. "It's a lot more efficient for us now that we're not spending our time adjusting hardware."

The Variable Frequency Drive's efficiency extends to maintenance as well, according to Salmi. "We're on a once-a-year maintenance schedule. Everything is so trouble-free."

For more information about Danfoss Water & Wastewater products, please visit www.na.water.danfoss.com.

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