

SUCCESS STORY

PUMPING UP EFFICIENCY

INFORMATION

Industry

Water and Wastewater Treatment

Application

Wastewater Retrofit

Product

Yaskawa U1000 MATRIX VFD



Water pumps benefitting from a Yaskawa U1000 VFD's improved system efficiency.

COMPANY HIGHLIGHTS

When a city in the Midwest encountered an issue with its primary municipal wastewater facility, they solicited the expertise of local integrator. For over two decades, the integrator has been collaborating with Yaskawa America, Inc. to provide solutions for water and wastewater treatment facilities, including drive, motor, and pump systems. The city's municipal wastewater facility, currently the largest treatment plants in the Midwest, stands as a NACWA Platinum 12 Peak Performance award winner for its low carbon footprint and highly efficient pumping and water purification operations.

APPLICATION CHALLENGES

The existing system, designed for low harmonic operation, was an 18-pulse AC drive that powered four individual 350 HP wastewater lift pumps simultaneously. 12 years into its operational life cycle, the drive began experiencing technical issues, particularly with its crucial power supply components.

Any new solution being considered would have to meet two strict requirements. Firstly, the existing enclosures needed to be reused, which meant the new solution had to retain the same physical size as the old drive. Secondly, the new drive's harmonic performance and efficiency needed to meet, if not surpass, the performance of the existing 18-pulse drive. Along with those requirements, the municipality had one additional goal to minimize the motor drive system's heat output, which would lower the ambient temperature in their MCC room.

THE YASKAWA SOLUTION

The organization retrofitted the old drive system with Yaskawa's U1000 Industrial Matrix VFD. With the application of direct AC-to-AC technology used by Matrix drives, harmonic performance was improved, and the required panel space was greatly reduced. The **U1000** is a simple 3-wire in and 3-wire out solution meaning the municipality could eliminate the extra hardware and complexity of the 18-pulse system. This included dispensing of 18-pulse transformers, reactors, and an intricate 12-pulse + 6-pulse harmonic attenuating power supply.

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When the customer removed the old drive system's extra magnetic and harmonic attenuation elements, it created ample space for the **U1000** drive. This exemplifies how the **U1000** is an excellent retrofit solution for any 18-pulse system that is aging or needs a boost in performance.

By the end of the project, the municipality was able to meet both its requirements and additional goals. Notably, there were reductions in overall watt loss (heat) from the system, and efficiency improved by approximately 5% compared to the replaced 18-pulse technology. Using the **U1000** as their solution also allowed the municipality to save money by preserving its existing pump system controls.

Satisfied with the project's outcomes, the organization is now considering retrofitting more drives within this plant and at other sites.

KEY U1000 FEATURES

The Yaskawa **U1000 Matrix VFD** brings a set of notable advantages:

- Adheres to the 5% input Total Harmonic Distortion (iTHD) standard as per IEEE 519 guidelines for harmonic mitigation at the input stage
- Adjustable torque limit and overtorque settings for optimized acceleration and machine protection
- Equipped with a Safe Torque Off (STO) safety feature, meeting the requirements of IEC62061 (SIL3) and EN/ISO 13849-1 (PLe)
- Does not rely on bus capacitors that degrade over time, contributing to a long product lifespan
- Built-in fusing
- Access to Yaskawa's award-winning 24-hour technical support is free of charge

Contact Yaskawa today to learn more about how you can use Yaskawa AC drives to perfect your water and wastewater treatment industry applications!