

Pumping Up Efficiency

YASKAWA

Wastewater Lift Pump Drive Retrofit - Springfield, MO

When the City of Springfield, MO had a problem in its major municipal wastewater facility, it called on JCI Industries of Joplin, MO to provide a solution. JCI has been a Yaskawa America, Inc. partner for over 20 years, supplying drive, motor, and pump solutions to the water/wastewater treatment industry. The Springfield municipal wastewater facility is the third largest treatment plant in the state of Missouri. It is a NACWA Platinum 12 Peak Performance award winning plant, demonstrating high efficiency, low carbon footprint pumping and water purification operation.



CHALLENGE

The existing system was an 18 pulse Benshaw model AC drive, operating four 350HP waste water lift pumps. The drives were about 12-13 years into operational life cycle, and some technical issues had developed with major power supply components in one of the four drives.

The challenge was twofold. One challenge was to maintain the same footprint as the existing Benshaw drives. This required reusing the existing enclosures. The second challenge was to meet and exceed drive harmonic and efficiency performance. The utility is also very interested in limiting the heat dissipation of their motor drive systems, so as to favorably reduce MCC room ambient temperatures, and hopefully improve the vibration performance of the pumps.

SOLUTION

JCI decided to take a look at Yaskawa's U1000 Industrial Matrix drive as a possible retrofit for the Benshaw drive system.

They selected the 414 A model, which fit nicely into the existing enclosures. Since Matrix drives use direct AC to AC technology, JCI was able to eliminate the heat-producing 18 pulse transformers and the magnetic-producing reactors from the enclosures, dramatically simplifying the system.

The complex external 12 pulse + 6 pulse line side harmonic attenuating power supply was also removed and replaced by the direct AC to AC U1000 technology.

RESULTS

The customer removed all of the Benshaw drive system's magnetics, and all of the power supply devices that generated the harmonic attenuation. U1000 chassis drives fit nicely into the enclosures. The customer was able to reuse the main input CBKR. They were also able to maintain all of the existing controls for the pump system. Overall watt loss reductions related to the system were achieved. Overall efficiency was improved about 4-5% compared with the replaced 18 pulse technology.

The customer was very pleased with the project and is looking to retrofit additional drives throughout this plant, and other locations.



The U1000 Industrial Matrix Drive is a compact all-in-one solution for low harmonics and/or full regeneration, and is the ultimate choice for power quality and energy savings. Additionally, the U1000 delivers high flexibility and motor control performance to meet a wide variety of application requirements.



Before Retrofit



After Retrofit