

A photograph of a yellow Link-Belt motor and blue drive unit installed at a water treatment plant. The motor is mounted on a blue base and is connected to a blue drive unit. The background shows a concrete structure with metal railings and a red life preserver hanging on the wall. The scene is illuminated by artificial lights, suggesting an indoor or covered outdoor setting.

Turning on the Savings...

A **High-Performance** Solution
Helps a Water Treatment Plant
Become **More Energy Efficient**
and **Cut Maintenance Costs**

More than half a million people in Toledo, Ohio, and the surrounding area use an average of 70 million gallons of water a day. And it's the responsibility of the city of Toledo's Department of Public Utilities water treatment plant to make sure the water, pumped from Lake Erie, is safe. But with aging and outdated equipment being used in a key purification process, that job was getting more difficult. So when funds became available for an upgrade, plant management turned to a trusted local distributor to help them find a high-performance solution that was easy to use, easy to maintain and energy efficient.

Andy McClure, plant administrator for the Collins Park facility, says 12 mechanical variable speed drive systems, installed in 1941, power fully submerged paddles on a 60-foot-long shaft in four large treatment basins. These paddles stir added chemicals in a process known as flocculation, one of the most common steps in removing contaminants from drinking water. The process induces particles to collide and clump together into larger and more easily removable "floc."

The mechanical system was an early way to achieve variable speed control, but McClure says the PIVs are well past their prime.

"Our maintenance crews have done a terrific job keeping the PIVs running," says McClure. "But it's becoming more and more difficult to get parts. And because it's a mechanical system, we are stuck with whatever speed it was on when it shut down, which makes it a little bit of an adventure when we start it back up. It was time for us to move to new technology."

Because the flocculation process needs to be carefully controlled, McClure required a solution that would offer a lot of torque, even at low RPMs. But he



Aging mechanical variable speed drives, pictured on the left, are being replaced with a high-performance, energy efficient Baldor•Dodge® Quantis® Gold solution that includes a Dodge Quantis right-angle helical bevel (RHB) reducer with a Baldor•Reliance® Super-E® premium efficient motor, along with a Baldor drive. Plant officials say this system allows them to precisely control the speed of the submerged paddles in the treatment basins.

was finding it difficult to determine just which gearbox would be the best fit for the application. After a first attempt at a retrofit didn't work, McClure called local distributor Binkelman Corporation for assistance.

"I needed help to find the right products," says McClure, "making sure the gear reducer had the right service factor and the right reduction ratio for the range we needed. I wanted help to find a packaged system that would allow us to precisely control the speed of the paddles during the first, second and third pass."

The help McClure needed came from Binkelman's Scott Tomaszewski. Based on his experience retrofitting old mechanical variable speed drives for other customers, Tomaszewski was confident that a packaged Baldor•Dodge solution would be the best fit. With the go-ahead from McClure, Tomaszewski and Dodge Field Sales Engineer Tim Bachler got to work to identify correct sizing and gear ratios.

"Basically, Tim and I reviewed the application and the old unit, and reverse-engineered a new solution that would meet the torque requirements," explains Tomaszewski. "We proposed a Quantis Gold package: a Dodge Quantis RHB (right-angle helical bevel) gearbox with a Baldor Super-E premium efficient motor, along with a VFD. Not only is this an energy-efficient package, it's also one that is easy to order and easy to install. It was good news when we learned that this was the package that was selected through a competitive bidding process."

McClure was also convinced this was the right solution, but since this upgrade was part of a Better Buildings program using Energy Efficiency and Conservation Block Grant money, funded by the American Recovery and Reinvestment Act (ARRA), the equipment selected had to meet program standards. Christopher Green, energy efficiency and sustainability manager for the city of Toledo, says

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Andy McClure, plant administrator,
Collins Park Water Treatment Facility

they were pleased that the Baldor package fit all the criteria.

"The program seeks out projects that result in reduced energy usage, and the Baldor solution does that," says Green. "And since the Baldor products were manufactured in the United States, they also comply with the 'buy American' provisions as required by the ARRA. The city of Toledo also had a 'local

preference' worked into the specs, so by working with Binkelman, we are also supporting our local community."

But there was one more hurdle to overcome. The Quantis Gold package needed to be installed in the same spot where the old drives sat. McClure says the solution Baldor provided, fabricated steel brackets, made the installation quick and easy.



Not only will the highly efficient Quantis Gold package help the facility reduce energy consumption, but officials also expect to reduce maintenance costs and improve uptime, making it easier for them to ensure and maintain water quality.

"It turned out to only be a one-day job, because we didn't have to do any concrete work, or drilling or tapping," explains McClure. "The new brackets bolted right into the old equipment base, which was very convenient. This was really a drop-in replacement."

Once it was installed, McClure says, the benefits of the new package were obvious, like the precise control they achieved with the Baldor drives. He says the drives are a hit with the maintenance staff because they are user-friendly, which makes it easy to vary the speed of the flocculators. But it's the way the drives can help them prevent problems that really got McClure's attention.

"These drives allow us to plug in and fine-tune the current so the drive knows exactly what the motor needs," explains McClure. "So, if there is a problem that causes an inrush of current, the drive will shut down to prevent damage, not only to the motor, but to all of the equipment. Protecting the system like this means a lot less maintenance."

The city is also pleased with the efficiency of the Baldor solution. Green has calculated that based on current prices per kilowatt hours, the city will see an annual electrical cost savings of \$7,569 when all 12 units are installed. Year after year, those savings will add up. But while this project fell under the umbrella of energy efficiency, Green says there are savings for the city beyond energy.

"Because these products are nearly maintenance free, they will help us reduce downtime and we'll become more efficient," explains Green. "This project is a great example of what we call soft savings, which may be a bigger part of the story. I would say the soft savings on this project are huge compared to the energy savings."

It's clear to McClure and his team at the Collins Park facility that all of the savings add up to a successful project. But, he says, the project's success is in much more than just saving money.

"Our goal is to better serve our community," says McClure. "This Baldor solution provides consistent

and reliable control, which will make it easier for us to ensure and maintain water quality for years to come."



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