

Productive Fix

A ST. LOUIS TREATMENT PLANT RESOLVES PUMP STATION RELIABILITY ISSUES WITH AN EDDY CURRENT HIGH-POWER DIGITAL CLUTCH CONTROLLER

By Scottie Dayton

Six trickling filters at the Bissell Point Wastewater Treatment Plant in St. Louis, Mo., receive 110 mgd from a trickling filter pump station with two 1,650 hp centrifugal Peerless (90 mgd capacity each), and six 600 hp Peerless (40 mgd each) pumps.

The outdated analog system controlling the eddy current clutches on the large pumps caused maintenance headaches for operators: Reliability was suspect and replacement parts were hard to find.

"The many potentiometers also required frequent adjustments, usually done with a screwdriver," says Vince Stollhans, assistant manager of the Pump Station Division.

When the clutch and motor on one pump went to a local shop for routine maintenance, technicians saw an opportunity to upgrade the controller. They called Stollhans for recommendations.

"I'm responsible for automating the pump stations," Stollhans says. "Over the last five years, I've installed 10 digital controllers from Dynamatic. The units have a history of excellent performance and reliability."

Technicians installed a Dynamatic eddy current EC-2000HP high-power digital clutch controller. "They thought the price of the unit was a drop in the bucket compared with replacing the clutch with a half-million-dollar variable-frequency drive," says Stollhans. "The retrofit, around \$6,000, was definitely the most economical solution."

MAJOR WIRING PROJECT

The 350 mgd (design) Bissell Point plant uses primary clarifiers, trickling filters and secondary clarifiers. Effluent discharges to the Mississippi River. Biosolids are processed by dewatering, and six multiple-hearth incinerators consume 74,000 dry tons annually. The plant is one of the largest in the Metropolitan St. Louis Sewer District, which is the fourth-largest district in the United States.

With the old analog system, the three-phase, 240-volt clutch on the 1,650 hp pumps powered up only when the motors were running. "The new system is always powered up with the clutch waiting for a run command," says Stollhans. "Normally, eddy current digital clutch controllers don't go over 90 volts and 8 amps, but this high-power unit goes up to 180 volts and 64 amps."

Incorporating the new digital eddy current control was relatively simple; the challenge was rewiring the starting circuit. The two plant technicians wired a 4160/240-volt, three-phase, step-down isolation transformer into the main medium-voltage synchronous starter and rewired the starter to make it



The clutch and motor atop the 1,650 hp Peerless pump make the unit three-stories high.

compatible with the new system. Then they removed the dry contact from the starter that told the clutch when to come online. "Those were the biggest modifications," says Stollhans.

The team added the Dynamatic keypad to the pump control panel and changed out the speed potentiometer, enabling operators to switch between automatic and manual. They also replaced the analog control panel with a prewired augmented open-panel digital assembly. Stollhans oversaw the modifications and programmed the parameters.

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KEYPAD SIMPLICITY

The controller's functions include multiple cascading, linear acceleration/deceleration for soft starts and stops, instrument signal follower, four preset speeds, manual or automatic control, auto restart, jog speed, jump speed, and speed or torque mode.

According to the manufacturer, operators can regulate drive speed to within 0.1 percent of no load to full load, yet maintain 250 percent of rated torque for starting and momentary overloads. "I had three pages of parameters based on previous performance," says Stollhans. "It took me only two hours to program the 30 values using the keypad. That's the beauty of the system." The controller operates in speed mode for the centrifugal pump.

When the clutch and motor returned in a month, Stollhans helped start up the systems and made slight adjustments to the programming. Then the operators took ownership. "I believe the digital controller is easier on the equipment because of its greater flexibility," Stollhans says. "While I'm positive it is more efficient than the old drive, I wouldn't know how to prove it until we accumulate sufficient run time. We did the retrofit primarily for the technology and reliability." **tpo**



Technicians replaced the aging analog clutch controller (left photo, bottom of cabinet) at the Bissell Point treatment plant with an eddy current EC-2000HP high-power digital controller from Dynamatic (right photo). They also modified the blue module (top right in cabinet) and relays to the left.



LEFT: The control panel for a 1,650 hp centrifugal Peerless pump before modification. RIGHT: Technicians added the Dynamatic keypad to the control panel and changed out the speed potentiometer, enabling operators to switch between automatic and manual modes.