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Let's Solve Water

Case study
Sewer bypass

Xylem Provides High-tech Bypass and Peace-of-mind During Kiski Valley Treatment Plant Upgrade

Advanced remote monitoring system facilitates successful transition that doubled plant capacity

To stay in compliance with state Environmental Protection Agency requirements, the Kiski Valley Water Pollution Control Authority (KVWPCA) in Pennsylvania had to double the capacity of one of its plants – from 15 million gallons per day (MGD) facility to 31 MGD. The large-scale job called for outside expertise and innovative solutions.

As part of the expansion process, KVWPCA needed to de-commission their existing influent pumping station and tie into a new influent pump station once construction was completed. To enable all that to happen, KVWPCA – with help from an engineering contractor and Xylem – built a bypass pumping system that could handle the flow as the construction process was taking place.

Solution

Working with the contractor and Xylem engineers, KVWPCA mandated a number of conditions that had to be met. Keeping the plant running throughout the project was imperative and critical requirements of the bypass included:

- Construction of a 12-foot by 12-foot by 37-foot bypass pumping wet well to facilitate the bypass
- 24/7 monitoring – either manual or automated – for equipment failures
- Variable Frequency Drive (VFD) pump controls to address a wide range of flows
- Monthly reporting of flow data to the Pennsylvania Department of Environmental Protection

Xylem recommended and installed five Flygt NS-3301 electric submersible pumps for a temporary rental installation. Since the plant didn't have enough power to run the pumps, each pump ran off of a 104-kilowatt Godwin generator. Each generator was equipped with a 100-horsepower Godwin Variable Frequency Drive (VFD) to handle the variations in flow. Two 24-inch Xylem brand MJK flow meters were also installed, in addition to level transducers in the wet well.

As part of the rental solution, Godwin VFDs and Generators – one set for each of the five Flygt pumps – were integral to the bypass operation.

Customer: Kiski Valley Water Pollution Control Authority (KVWPCA), Pennsylvania

Challenge: Meet Pennsylvania Environmental Protection Agency requirements to increase facility capacity from 15 million gallons per day (MGD) to 31 MGD. As part of the process, KVWPCA needed to de-commission the old influent pumping station and tie into a new influent pump station once construction was completed.

Products:

- Flygt NS-3301 electric submersible pumps with 85 hp motors and 100-feet power cables
- 104-kilowatt Godwin generators
- 100-horsepower Godwin VFDs
- Advanced Remote Monitoring System offering SCADA interface and remote monitoring capabilities
- 24-inch MJK Flowmeters

Result: Substantial cost savings with dependable and efficient bypass were made possible by an Advanced Remote Monitoring System and SCADA interface. Remote monitoring by any Internet-able device results in a successful treatment plant upgrade and piece-of-mind for the customer.

At the core of the project was a remote supervisory control and data acquisition (SCADA) system that Xylem installed to drive the monitoring and control aspect. The SCADA system received data from level transducers in the wet well, which triggered the generators and started the pumps at pre-determined levels. The VFDs then controlled pump speed to maintain appropriate system flow.

The pumps, generators and VFDs were all installed to work sequentially. For optimal efficiency and to save energy and diesel fuel costs, each pump activated only when increased flows called for additional pump activity. During low-flow activity, one or possibly two pumps were needed. At peak-flow activity, three or four pumps kicked on. The fifth pump was programmed to start running only as a back-up if any of the other four pumps failed.

Linked together to work in tandem via SCADA, the VFDs fed real-time run data – including RPM speed, AMPS current and levels measured in feet – from the pumps to the display. The system parameters were pre-set at specified levels, and sent KVWPCA personnel text alerts to their mobile phones in the case that any parameter was not being met, or if the equipment wasn't running at optimal levels.

The remote SCADA tied back to the plant SCADA, so plant personnel could monitor all activity from one single control panel. Providing real-time visibility of the entire process, the remote SCADA was also accessible from any device with Internet access, including smart phones, for ultimate monitoring and control.

Results

Over the life of the long-term project, the Xylem technology used by Kiski Valley – most notably the SCADA system and the precise on/off control of the onsite equipment – saved thousands of dollars through increased energy efficiencies. The real-time, advanced remote monitoring and control technology supplied and installed by Xylem also provided KVWPCA personnel and their customers with peace-of-mind.

Once the piping was affixed to the Flygt pump, it was lowered into the wet well.

High-density polyethylene pipe exiting the wet well.