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Power Monitoring System Can Reduce Costs for Treatment Facilities

By Joey Jeffcoat

Traditionally an ammeter, voltmeter and kilowatt-hour meter all were required to monitor power distribution equipment and electrical activity within a water/wastewater treatment facility (WWTF). The wiring for these essential meters is complicated and offers only basic functionality. If a wastewater engineer wanted to add components, such as a power factor meter, he or she would need to do so at the expense of more wiring, added engineering and downtime.



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Today, it is possible to gather all this information through a single meter with minimal wiring. With Square D® brand PowerLogic® monitoring systems from Schneider Electric, this information can be available 24 hours a day. The monitoring system adds efficiencies to troubleshooting, planning, accounting and daily operations. Investing in a the monitoring system can lead to reductions in labor, costs and downtime for various departments within a WWTF.



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Accounting Perspective

With PowerLogic software, the finance department can verify the accuracy of an electric utility bill, as well as automatically allocate budget to utility costs. Generally, if a WWTF can provide its own energy during peak usage, it can participate in a utility curtailment program to mitigate ongoing operational costs.

The software can be used to prove compliance with the utility's program to realize available cost savings. If there is more than one WWTF in a region, the software enables comparison of the facilities. Benchmarks can be set to identify inefficiencies among the facilities and help eliminate wasted costs.

IT Perspective

Integrating a new system can prove to be a headache or a reward, depending on the system chosen. PowerLogic software uses Ethernet and the Internet or company intranet as its primary vehicles, making it easy to integrate within existing networks. The software includes the ITIC/CBEMA curve, which is the standard for depicting power quality disturbances, and the EN50160 standard, which defines the voltage characteristic of electricity supplied by public supply networks.

EN50160 parameters that are critical to monitoring IT department functions – including flicker, supply voltage variation and unbalance – are preset within the software, making it easier to verify that operations fall within the parameters. A circuit monitor can be retrofitted to any piece of equipment that needs to be observed, such as an ATS, uninterruptible power supply, STS or generator.

Engineering/Maintenance

One of the chief concerns of a wastewater engineer is growth of the WWTF. Anticipating population growth, new facilities typically are oversized, with equipment designed to accommodate additions and harmonics induced by variable frequency drives and other electronics. Manual load studies of these large facilities and equipment are no longer necessary because present and historical data are stored within PowerLogic software.

The Ethernet functionality enables site management from virtually anywhere and can eliminate travel expenses related to third-party consultations. Single-line diagrams, equipment information, site maps, CAD drawings and any PDF file can be stored in the system, making it easier for engineers and maintenance personnel to locate essential information in large or growing facilities.

For a WWTF, downtime is not an option. Disturbances can be monitored and diagnosed through the system to prevent future problems. Auto-throttle schemes can be implemented to minimize system downtime, and alarms are easy to access during a real-time outage. Facility temperatures, breaker trip status, generators and utility status all can be monitored to prevent downtime.

Generators can play a key role in a WWTF. They need to be tested regularly to maintain reliability, and automatic reporting reduces both labor and training costs related to tests. A central source to monitor generator testing prevents duplications in testing or the omission of a test. PowerLogic software also enables engineering and maintenance personnel to identify a load unbalance and monitor circuit loading, faults and alarms.

Operational Perspective

Opening and closing valves and operating motors to move liquid from one basin to another are key WWTF operations. Each operation can be tracked with the PowerLogic software to examine the energy used and related costs, and processes can be streamlined to minimize the number of operations required. For complicated operations, this can be a challenge, but with the software, process inefficiencies can be identified to help reduce unnecessary or ineffective operations.

Operator safety is extremely important. Procedures, single-lines, equipment data and other information can be stored online and easily retrieved using a Web browser. If a certain piece of equipment has a high arc flash rating to operate, the PowerLogic system can remotely control the power system. If a system does fail, a temporary monitor does not have to be installed, thus reducing risk to personnel. The software also monitors the levels of methane gas typically present in a WWTF, and historical data can be logged to show trends in gas levels. In addition, water conductivity can be monitored, which is useful for



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About the Author:

Joey Jeffcoat is currently a senior power systems engineer for Square D/ Schneider Electric Engineering Services, LLC. He gained communication experience at Bellsouth as a co-op and engineer from 1995-2000. He became an application engineer at Square D Company in 2000 and worked on the Transparent Ready team in 2003. In 2005, he became licensed as a professional engineer. He joined the Engineering Services team in 2008 and takes part in wastewater consulting.

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