



Monitoring System Helps Medical Device Manufacturer Avert Costly Construction Project



Monitoring System Helps Smith & Nephew Manufacturer Avert Costly Construction Project

Discovering the benefits of a power management system came in the nick of time for Master Electrician Don Haney and his team at Smith & Nephew's Memphis manufacturing plant. Installing the system has saved the company at least \$2 million it would have needed to expand its plant or completely reengineer the manufacturing operation.

The seemingly constant development of new medical devices is great for the patient who needs a state-of-the-art joint to replace his worn out knee or hip. It's also great for the bottom lines of companies that produce those products. Such persistent change, however, requires an exceptional level of flexibility and ingenuity from people who manage the facilities that produce those goods.

Such was the case at the Smith and Nephew facility. Smith & Nephew is a London-based global medical device company to which continuous innovation and new product development is essential. Its Memphis plant produces orthopedic implants, including artificial hip and knee replacement parts and trauma products.

Market growth, along with innovative product changes and introductions, were forcing the facility personnel to struggle to keep up with the demand for changes in the manufacturing processes. Production lines were frequently being added, moved, or modified.

"We're constantly adjusting our production lines for new products, which requires us to move around milling machines and computer numerical control work centers and other equipment," said Haney. "We're not only moving existing machinery but ordering new equipment, too. That requires our machinery maintenance and building maintenance departments to make sure electrical circuits can handle a new configuration of machinery."



With all the changes taking place, facility electricians struggled to determine if a particular circuit had the spare capacity to handle a new load. They would add up the nameplate ratings of all connected loads – sometimes as many as 20-30 machines – to check for spare capacity. Not only was the task time consuming, it was inaccurate and costly.

For example, the plant almost never ran all of its presses, welders, metal lathes and chemical baths on a circuit at once. The total peak demand requirements on any given circuit were almost always less than the sum of the nameplate ratings of all of the loads. But without a detailed understanding of actual demand, electricians had no choice but to add new electrical service equipment when the nameplate ratings exceeded available supply. Such a costly practice, which entailed penalties from the utility for using peak demand, cried out for an alternative.

The problem came to a head when the company introduced a new product that would require many new machines. “We were almost certain that our existing electrical system could handle the additional loads, but the total nameplate ratings told a different story,” Haney said. “Without a clear understanding of actual demand, we had no choice but to add new bus duct to support the new machines. That bus duct costs \$1,100 to \$1,200 per section.”

The maintenance team soon realized that the plant didn’t have enough ceiling space to run the new overhead bus duct and that the only way to accommodate the new bus duct was to expand the building or completely re-engineer the plant. As the team was weighing its options, one of the electrical staff mentioned a magazine advertisement he’d seen for a PowerLogic® Circuit Monitor by Square D. Haney called the local Square D sales rep a call and set up a demonstration.

Haney liked the power management system’s monitoring capability, which could count the amp load and feed the data into a spreadsheet that could be printed and presented to the electrical inspector. He also liked the system’s ability to record peak demand nameplates on machines without counting bus ducts.

Square D Solution

The company purchased 29 model CM2350 circuit monitors and PowerLogic® System Manager™ software. After the circuit monitors were connected to Haney’s PC via an RS-485 serial communications link, he immediately began logging data and printing kW demand and other reports.

Before long, the electrical staff had determined the peak loading on each of the monitored buses. As they had suspected, actual peak demand values were significantly lower than the sum of the nameplate ratings.





The staff were able to connect the new loads to existing bus duct and avoid a building expansion and the purchase and installation of new bus duct. Haney estimated the savings at \$2 million. “We now use circuit monitors on all new equipment,” Haney said. “We’ve installed 44 circuit monitors, and plan to install 29 more.”

Additionally, the software provides power system data instantly and can produce reports, which save the staff many hours they previously spent creating and revising written circuit loading records. “In the past, the paperwork just piled up and got out of hand,” Haney said. “We don’t have that problem now. The system also allows us to learn more about harmonics and power factor that can help us save on our power bill.”

Smith & Nephew’s efforts to use the circuit monitors and software to identify system capacity even had an unintended benefit – a change in the local electrical code. Local code now states that either handle rating or trended capacity can be used to determine system-loading restrictions. The code revision was beneficial because, by using actual system loading in addition to handle ratings, Smith & Nephew can better utilize its existing equipment and spend less on new equipment.

The power management system produced more residual benefits. After the electrical staff submitted its savings story to corporate headquarters, the company honored the team with an award for cutting costs. “We’ve seen a lot of changes as a result of this system and we’re still learning about all it can do,” Haney said. “It was the right solution at the right time.”

Benefits Realized

- By understanding system loading, facility engineers were able to use spare capacity to add new machines, and thus avoided the purchase and installation of new bus duct, and a building expansion. They estimate their savings in equipment and installation costs (not including the cost of a building expansion) to be around \$2,000,000.
- In addition to the money saved by avoiding new equipment purchases, instant access to power system information via software and automated monthly reports, has saved the company countless hours previously spent creating and revising written records of circuit loading.

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