

Consumer goods manufacturer saves \$20k per hour

Power management system solves mystery of unexpected downtime



In the competitive fast-moving consumer goods (FMCG) market, avoiding downtime is crucial for profitability and customer satisfaction.

A leading manufacturer of high quality soaps and detergents, with multiple plants throughout Vietnam, was facing unexpected downtime in one of the plants due to production line stoppages. Despite the efforts of the facility engineering team, the root cause could not be determined. The situation was costly, as each outage typically required 3.5 hours to restore production. It sometimes took up to 8 hours for production to be restored, leading to the loss of an entire shift. Each hour of production lost production cost the plant \$20,000 USD.

After ruling out maintenance and equipment issues, the plant's engineering manager suspected that power problems could be the source of the outages, but he did not have the tools to prove this. He contacted Schneider Electric to help diagnose the problem.

Expert audit reveals potential issues

A Schneider Electric power solutions expert arrived on-site for an initial assessment. Based on a walk-through of the plant and interviews with various technical staff, a preliminary analysis identified harmonics and voltage disturbances to be a possible source of the problem.

To make a conclusive diagnosis, the expert made a recommendation to install a Schneider Electric power management system that could provide 24/7 monitoring of the electrical network and detect and record power quality events the moment they occurred.

Power management system reveals problems in detail

The power management system initially consisted of a power meter installed at the main switchgear where the electrical utility feed enters the building. This acted as a "shadow" of the utility-owned meter. This revenue-accurate meter is able to detect and record the type of power quality events that were suspected to be impacting the plant. A unique feature of this meter is the ability to analyze the event to determine within a level of confidence whether a disturbance is generated electrically upstream or downstream of the meter installation location.

"Using the system, we have been able to resolve the power quality issue which was causing production stoppage and hence loss of revenue."

— Engineering Manager



To complete the system, the meter was connected on the plant Ethernet network to a server where the power management system software was installed. The purpose of the software is to automatically download all data from the meter into a database, and provide out-of-the-box reports and tools to analyze the information.

Upon installation, harmonics measurements from the meter were analyzed in the software. The results confirmed the presence of significant harmonics, but still not at a high enough level to cause the production downtime that the plant was experiencing.

The source of disturbances confirmed

Soon, the meter detected multiple power quality events, such as voltage sags and transients. The patented Disturbance Direction Detection feature of the meter indicated a high likelihood that the events were actually being generated upstream of the facility electrical network. In other words, the disturbances were coming in from the utility grid.

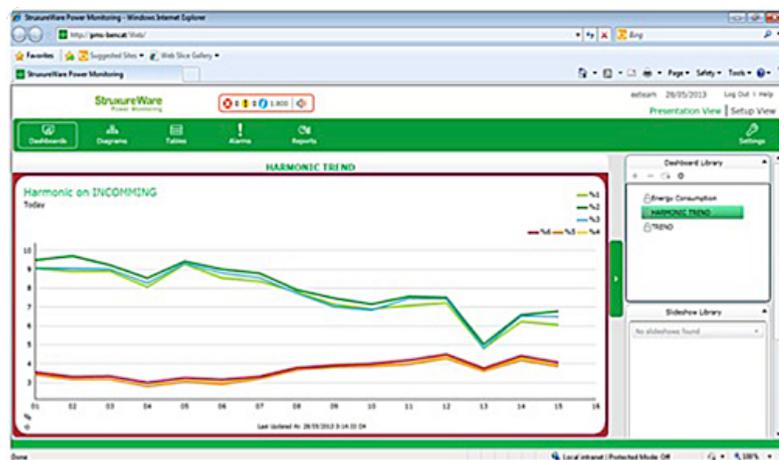
Using the standard power quality reports from the software, the engineering manager shared his findings with the local utility operator.

The presentation of this data compelled the utility to investigate the issue. They found the source to be a heavy equipment operator that was located nearby. The utility promptly installed new lines and equipment to isolate the equipment operator from generating disturbances back onto the grid. This resolved the downtime issue for the manufacturing plant.

The investment in their power monitoring system had generated an immediate return on their investment many times over. They now rely on the system to ensure that reliability is maintained. "The PQ reports are a key element in our working process to ensure reliability of power supply," confirms the engineering manager.

Sub-metering supports energy conservation efforts

Impressed with the results they were able to achieve, the plant decided to invest in additional meters to monitor each of their production lines, allowing them to extend their existing system to monitor power and energy across their whole plant. They installed 25 additional power meters



Harmonics trending in the dashboard of the power management software.

The meter indicated a high likelihood that disturbances were coming in from the utility grid.

and connected them back into the power management software.

They also implemented an energy management program in the plant, using the system to create a baseline of their energy use per unit of goods produced - allowing them to track the benefit of energy conservation measures implemented throughout the plant.

One of those measures was an initiative to drive behavioral change through energy cost accounting. The built-in reporting capabilities of the software allow the plant to generate energy cost allocation reports for each of the sub-units within the manufacturing area.

“We appreciate the capability of the system, including its measurement accuracy, flexibility, and the ease-of-use of the software interface.”

Tracing the source of harmonics

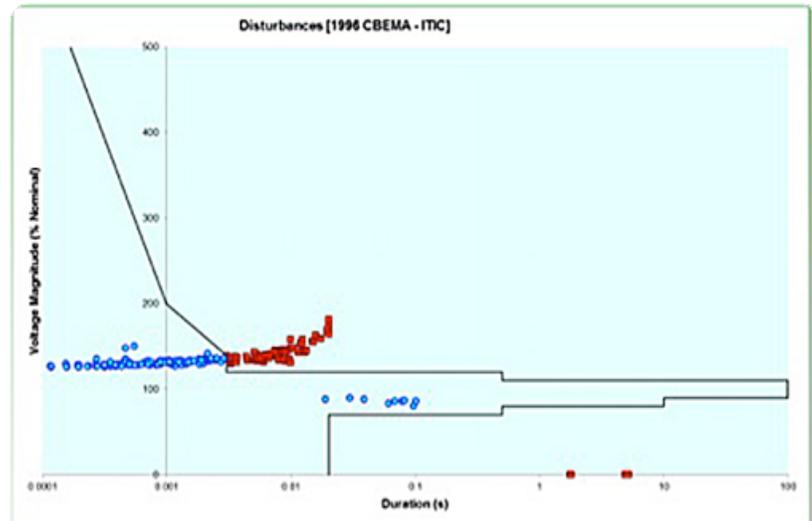
Another benefit of the additional metering was to help pinpoint the source of the harmonics that were detected in the first installation. If left alone, the harmonics can cause premature aging of equipment, which could result in further unplanned downtime.

The engineering manager plans to install equipment to help mitigate the harmonics issues.

Extending best practices to other plants

Subsequently, the company decided to implement the same power management system in all of their plants in Vietnam.

“We are fully satisfied with the system delivered. Using the system we have been able to resolve the power quality issue which was causing production stoppage and hence loss of revenue. Our collaboration with Schneider Electric was very successful and we are looking for new opportunities to work together.”



CBEMA disturbance tolerance curve report from the power management software.

“The information we capture in our power management system made the response to that problem much faster.”