

PERFORMANCE

Sappi paper mills cut cost of expansion

Sappi Paper – Belgium & The Netherlands

Improving site planning and operational ability with
PowerLogic™ power meters.

schneider-electric.us/en/work/solutions

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Background

Sappi Limited is a \$4 billion group of forest products companies – managing five million tons of paper and three million tons of pulp every year at facilities on three continents.

As part of Sappi Europe's continuing expansion, the company installed high-quality paper production lines at mills in Maastricht, Holland and Lanaken, Belgium. The new paper machines each produce at least 250,000 tons of paper per year.

To support the higher energy requirements, Sappi constructed new 65 MW and 45 MW co-generation plants.

Anticipating the effects of expansion

Sappi's Technology, Energy, and Maintenance Department wanted to ensure that the installation and operation of the paper machines was efficient and cost-effective.

As Mart Op den Camp, Senior Electrical Technologist, attests, "The machines consume a tremendous amount of energy, so Sappi wanted to minimize energy costs by not overbuilding electrical generation and distribution capacity."

"Another consideration was power quality, influenced by the variable frequency drives (VFDs) that control operation of the machines."

VFDs reduce stress on drive components by starting motors gradually, and they lower energy consumption by limiting the speed of motor operation. However, VFDs cause harmonics that can be propagated through the wiring system and lead to overheating of transformers and motors, misoperation of electronic controls and relays, data corruption, capacitor failure, and shortened equipment life.

"We realized," says Op den Camp, "that extensive monitoring, analysis, and control were necessary to optimize the electrical systems, manage energy usage, pinpoint problem sources, and avoid unnecessary downtime."

Goal

Support the expansion plans of the company by supplying reliable power to new production lines.

Story

Sappi Paper wanted to expand in Europe and installed two high-quality paper production lines. They were looking for a solution that could carry out extensive monitoring, analysis, and control of the electrical systems, manage energy usage, pinpoint problem sources, and avoid unnecessary downtime.

Solution

- PowerLogic Power Meters

Results

- \$1 million savings in the construction of the new co-generation plants
- The meters and software provide complete energy management, power quality analysis, read-out and control of alarms, global event logging, and real-time diagrams
- Power management software uses an open architecture that allows 'plug-and-play' communication with meters, as well as data sharing with other users and applications
- Added flexibility because each power meter can be programmed for any measuring, analysis, and control function

The department wanted a flexible solution that could be fine-tuned to meet their specific needs. They also required comprehensive energy consumption logs and immediate access to a complete range of electrical parameters.

Another essential element was the ability to remotely view information through the company's existing computer network.

Sappi decided that Schneider Electric offered the right set of capabilities. Power management software and 55 power meters were installed at the Maastricht and Lanaken mills.

Breaker control at Lanaken

Along with flexibility, data logging, and computer access, the Lanaken mill was looking for a way to provide remote switching and control of their 10 kV breakers.

Sappi engineers initially planned to build a replica of the power system in the form of a hard-wired circuit board. The mimic board would monitor breaker switch status and other parameters, and be located in the factory control room.

However, the 450-foot distance between the proposed mimic board and the 10 kV power station had 20 duplex feeders, a significant amount of expensive control cabling would be required. Instead, power meters were mounted in the power station's feeder compartment, and power management software was installed on distributed workstations to automatically collect and process the data.

Beyond monitoring each 3-phase power feed, the meters make use of their extensive I/O to oversee breaker positions, earth switch positions, protective relay contacts, and control switch positions.

The power management software also supports real-time animated diagrams, which represent the power system more effectively than a mimic board.

“Extensive monitoring, analysis, and control were necessary to optimize the electrical systems ... and avoid unnecessary downtime.”

— *Mart Op den Camp, Senior Electrical Technologist*

\$1 million

Estimated savings with further saving expected

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The system has yielded considerable savings because it has replaced the need for a complex mimic board, extra cabling, a separate event recorder, and a control system.

A single fiber-optic cable is now used for data transfer between workstations in the power station and the factory control room.

The workstations are connected to power meters via RS-485 wiring. Sappi is interested in adding Ethernet ports to the meters for accelerated communications between the meters and any workstation.

Enabling fast analysis and adaptability

The meters and software provide complete energy management, power quality analysis, read-out and control of alarms, global event logging, and real-time diagrams.

The products also offer maximum flexibility: each power meter can be programmed for any measuring, analysis, and control function. Direct Ethernet links between meters and software ensure data is transferred at maximum speeds.

The power management software uses an open architecture that allows 'plug-and-play' communication with meters, as well as data sharing with other users and applications.

Report generation is made easy with a direct database connection to reporting applications. Using simple actions, Sappi can generate numerous types of energy consumption reports.

Million dollar savings

The new power management system has proven to be a valuable aid in the design and operation of electrical installations. Sappi estimates that the system has saved them \$1 million in the construction of the new co-generation plants. Further savings are expected, especially related to fast alarm response.

Sappi can also depend on the system's modular architecture to facilitate affordable growth of all their energy management applications.

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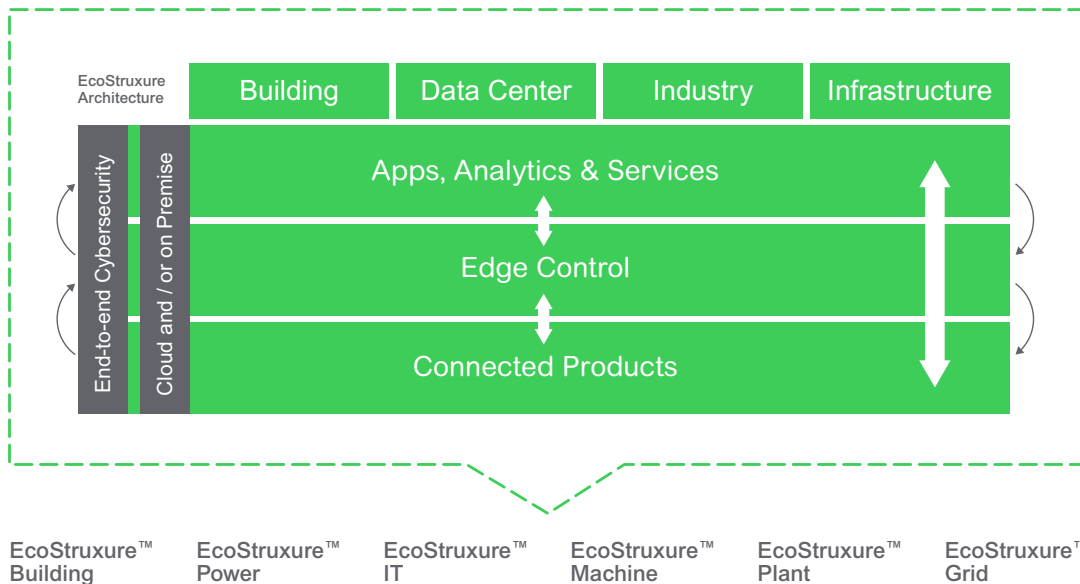
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