Customer Success Story:
Centro Elettromeccanico Bassanese (CEB)

Markets Served
Utilities, buildings and machine building

High performance cogeneration

Location:
Bassano del Grappa (Vicenza), Italy

Segments:
Utilities, buildings and machine building

Challenge:
To provide the cogeneration plant with a reliable monitoring system and remote diagnostics

Solution:
Automation based on Micro Panel HMI PLC XV400, motor starter combinations, SmartWire-DT intelligent machine wiring, XI/ON I/O system, SLX9000 inverters

Results:
Simple and quick installation of a cogeneration system equipped with numerous motor starters yielded a reduction in energy costs and personnel costs; improved efficiency, company productivity and sustainability

"The possibility to diagnose and solve problems quickly and efficiently allows our customer to avoid productivity interruptions, thus maintaining production at optimal levels."

Maurizio Bizzotto, CEB

Background

Energy costs are triggering companies to adopt alternative energy solutions such as the combined production of electricity and heat within the same plant, also known as cogeneration. This technology converts a primary energy source of any origin into electrical and thermal power (heat in the form of steam). The latter can be successfully used in manufacturing and industrial applications as well as for civilian purposes. Cogeneration plants guarantee significant savings on primary energy consumption, meaning lower costs and greater sustainability, contributing to meeting the requirements of the Kyoto Protocol.

The Centro Elettromeccanico Bassanese (CEB) recently built a modern natural gas cogeneration system for an Italian textile factory, a leader in the production of polyester and geotextile cloth for industrial and civilian applications.

With headquarters in the city of Bassano del Grappa (province of Vicenza), CEB boasts 35 years of experience in electricity systems and electromechanical applications. The company designs and installs cogeneration systems and medium/low tension electrical systems for managerial office buildings, shopping centres and high-end real estate properties. CEB not only designs and manufactures the systems, it also handles their maintenance by offering its customers nonstop assistance and rapid support.

Challenges

With an electricity capacity of 600 kW, CEB's natural gas-powered cogeneration plant supplies 700 kW of energy to heat diathermic oil, which is essential to the production of polyester. The plant also includes an innovative 50 kW Organic Rankine Cycle (ORC), which enables it to use the thermal energy from the cogenerator's excess hot water. Thanks to this innovative system, the company is saving 3 GWh of electricity and 1 GWh of thermal energy every year.

Although cogeneration plants can offer substantial savings on energy costs, their diagnostics and maintenance can be quite challenging. Being completely automated, these systems require the intervention of the installer's technicians, both for failures and maintenance. Consequently, the installer would bear additional costs for logistics and qualified personnel, would have to rely on assistance from external

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The system supplies electricity to the factory from the methane-fueled motor and uses the residual thermal energy to process heat transfer oil.

technicians. The risk of downtime could penalise overall productivity while increasing costs and losses.

CEB turned to Eaton to tackle these challenges and equip its plant with effective monitoring and remote diagnostics. Eaton's cutting-edge technology enabled its technical personnel to be proactive with remote preventive maintenance.

Solution

The solution developed by Eaton provides CEB with effective monitoring and remote diagnostics, while also reducing the time required for manufacturing, wiring and commissioning by up to 85 percent. CEB selected Eaton's SmartWire-DT intelligent control panel wiring solution, to reduce panel complexity by consolidating circuit wiring into a single, durable eight-pole cable. It significantly simplifies the connecting and wiring process, but also streamlines testing. This solution reduces commissioning and troubleshooting, saving valuable time and money. Individual components, such as switchgear, switches and push buttons, motor starters drive inverters, sensors and actuators can directly communicate with the PLC, allowing for a high level of data transparency.

The CEB system relies on a large number of motor starters and SLX9000 drive inverters. Most components communicate via SmartWire-DT with the XV400 Micro Panel HMI PLC, which communicates via CANopen with the remotely controlled I/O system XI/ON. Thanks to this setup, it was possible to simplify the entire wiring and installation effort for the plant. SmartWire-DT allowed for the fast and easy connection of all the motor starters without the need for specialized tools and eliminated the risk of wiring errors, while tool-less plug-in units combine motor-protective circuit-breakers and contactors to make a motor starter.

Thanks to Eaton's technology, CEB can easily monitor the entire system while archiving files containing all the I/O data of the various components. In addition, all this data is available from any remote workstation including PC or smartphone via VNC connection.

"Thanks to Eaton's technological support, our technicians are able to maintain the status of alarms, monitor temperatures and process values of the plant, and can also intervene rapidly from their offices to amend programmes," explains Maurizio Bizzotto, the CEO of CEB. "Any notice of system component breakdown is immediately sent by SMS or e-mail and our technicians can also identify the cause of a problem remotely and understand whether it was of a technical nature or a short circuit."

The Micro Panel HMI-PLC XV400, the main control unit of the system, allows CEB technicians to use CANopen to visualise every component of the automation system. This hub controls the status of the drive inverters, and gathers diagnostic data concerning transducers and actuators. All in all, CEB benefits from an overview of the plant status and can also conduct remotely controlled interventions as needed.

Results

By reducing design, wiring, testing and commissioning time by up to 85 percent, SmartWire-DT enabled CEB to install a cogeneration plant with a large number of motor starters in a quick and simple manner.

Furthermore, remote monitoring of the system has enabled the enterprise to identify and solve potential problems, without any need to send technicians to conduct onsite inspections, which translates into significant savings.

"We are very satisfied with the results that we have been able to obtain thanks to the dedicated support of Eaton," commented Bizzotto. "Being able to monitor plant functions and solve problems remotely means the possibility of saving time and money and, consequently, it is a key factor in contributing to the company's efficiency and corporate productivity.

"The possibility to diagnose and solve problems quickly and efficiently allows our customer to avoid productivity interruptions, thus maintaining production at optimal levels," Bizzotto concluded.

The Micro Panel XV400 provides an overview of the plant and its local and remote components.

The Eaton SLX9000 inverters are communicating with the PLC via CANopen; motor starters are connected to the PLC via SmartWire-DT.

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