

Partner note

Industrial steam process upgraded using ABB drives

SSB Energia Renovável Ltda supplies saturated steam for industrial processes. The steam is generated in two low pressure boilers at the company's plant in Limeira, São Paulo, Brazil.

Biomass fuel – wood chips – is discharged into a channel and then transferred by a screw and conveyor system to a rotary dryer. After drying, the chips are fed into furnaces to heat the water in the boilers to 160 to 180 °C. Fans maintain a balanced air flow into and out of the furnaces to ensure the correct combustion rate. The temperature in the furnaces is kept in the range 600 to 700 °C. Steam is produced at a rate of 35 t/h and a pressure of 14 kg/cm².

Until recently the process was subject to disruptions and downtime, which were caused by reliability issues with some of the equipment. SSB Energia Renovável also felt that the use of equipment from a large number of different vendors was a factor in the process instability.

Extensive automation and increased safety

The process was therefore upgraded to automate as many production stages as possible. The objective was to minimize the need for intervention by the operators, and reduce risks by incorporating safety interlocks into the process.

A total of 35 ABB drives were installed, together with HMIs (Human Machine Interfaces), PLCs (Programmable Logic Controllers), and other equipment. The equipment supplied by ABB was specified by the team at Multidrive Comercio Eletro Eletronico Ltda, based on their extensive applications expertise. This company is now an ABB authorized value provider.

Following the upgrade, field sensors monitor the production process and feed data to the ABB PLCs, which send command signals to the drives to control the process equipment.

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SSB Energia Renovável's plant in Limeira uses wood chips to produce steam for industrial processes.

The ABB drives control:

- The fuel handling screw and conveyors, and the dryer metering valve
- The furnace FD (forced draft) and ID (induced draft) fans. The fan control is integrated with the fuel feed
- The water treatment system, which demineralizes the water before it is pumped into the boilers
- The boiler feed water pumps
- The electrostatic precipitators used to treat the furnace exhaust gases
- The flow rate and pressure of the output steam

Improved reliability, consistent output

Following completion of the upgrade, the process has been stable and reliable, generating steam at a consistent pressure and flow rate. Maintenance costs and downtime have both decreased, electricity consumption is reduced, and the company has been able to streamline its headcount.

The use of drives means less stress on the electric motors, which had previously been subject to high-temperature damage. The project reduced the current required from the network so it was not necessary to upgrade the transformers or power cables. As each motor is now supplied via its own drive, the system is very flexible: the speed of a specific shaft can be changed without having to change pulleys, for example.

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The project also included installation of interactive, user-friendly control screens that deliver a large amount of information to the operators in an easy-to-understand format.

Challenge

- Upgrade the steam generation process while reducing the number of different vendors on site

Solution

- 35 ABB drives (5 x ACS550, 30 x ACS350), ABB PLCs (4 x AC500), ABB HMIs (4 x CP430 B and 1 x CP450 T) ETH panels
- ABB's PLCs receive data from the field sensors and send command signals to the drives to control the furnace air flow, boiler water feed, fuel feed, water treatment system, electrostatic precipitators, and output steam flow and pressure

Benefits

- Maintenance costs reduced by around 20%
- Cost savings of US dollars 70,000 per month through reductions in electricity consumption, employee numbers and downtime
- More consistent production, without interruptions caused by automation faults
- Increase of US dollars 85,000 per month in sales
- Project payback time of only 11 months

Technical specification

Drives

ACS550: 40 to 150 Hp

ACS350: 3 to 30 Hp

PLCs

AC500

Automation equipment

CPU: 2 x PM582-ETH, 2 x PM581
Fieldbus type/network: Modbus RS485
HMI: 4 x CP-430 B, 1 x CP-450 T
Communication modules: CM574-RS A2, FMBA-01
I/O modules: 10 x DC532, 3 x DC522,
1 x DC523, 4 x AI523, 3 x AO523,
2 x AX521, 2 x AX522
Supply: 4 x CP-C 24/10

The drives and automation equipment are located in an air conditioned room (maintained at 30 °C and 50% humidity, with 3000 m³/h air exchange).

Motors

2 to 150 Hp



The upgrade minimized the need for intervention by the operators and incorporated safety interlocks into the process.

Multidrive Comercio Eletro Eletronico Ltda

This family-owned business, founded in Sumaré, São Paulo, Brazil, today operates in three locations in São Paulo state.

The company has been working with ABB since the mid-1980s, and has been an authorized member of the global ABB technical partner network since 2003.

Their focused industries:

- Automotive
- Food and Beverage
- Metals
- Plastics and Rubber
- Textiles
- Water and wastewater

Multidrive Comercio Eletro Eletronico Ltda is a technical distributor and a service provider, and a member of the ABB Value Provider Program. It provides consistent quality in sales, support and service for ABB drives. In addition to its in-depth knowledge of local markets, the company is conversant with ABB low voltage AC drives products and processes.

For more information, please contact your local ABB representative or visit:

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