CASE STUDY

ABB Ability™ Expert Optimizer facilitates advanced process control

ABB successfully increased process stability and reduced energy cost at Votorantim Cimentos

Imagine you worrying less about ore grade variation impacting your process stability and associated energy consumption. The team at Votorantim Cimentos in Brazil is already living this reality thanks to ABB Ability™ Expert Optimizer.

A control system is crucial for any modern plant. It is directly responsible for regulating the plant's stability and the quality of product delivered. The most commonly used is PID (proportional integral derivative) control. This forms the base level for automation and performs adequately for simple processes. Cement processes are however, anything but simple.

Due to variability in feed and fuel sources, coupled with complex processes, manual operators with PID control tend to remain at "safe distances" from process constraints. ABB Ability™ Expert Optimizer (EO) tackles the complexity of cement processes, minimizes the effect of variability in feed and fuel and then drives the process in the direction that makes you money.

The installation topology allows it to be deployed both in ABB's 800xA control system and in third-party control systems, making it applicable to any type of control system setup.

One of the Votorantim Cimentos plants located in Rio Branco do Sul, Paraná, Brazil, launched a new line for cement production in 2013. After one year of operation, the company contacted ABB to optimize this new line using advanced process control techniques.

ABB's scope of supply
Gain more through better control

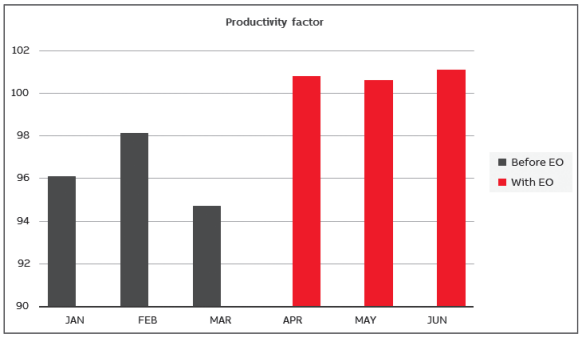
Expert Optimizer enhances control of the process using distinguished advanced process control techniques: such as fuzzy logic, soft sensors and model predictive control (MPC). After individual implementation in each of the plant areas, a connection is made between all applications to further compliment plant-wide optimization.

Scope of supply
- Expert Optimizer 8.0
- Implementation of Expert Optimizer for:
  - 1 raw mill (vertical)
  - 1 coal mill (balls)
  - 1 kiln
  - 1 calciner
  - 1 cooler
  - 2 cement mills (vertical)

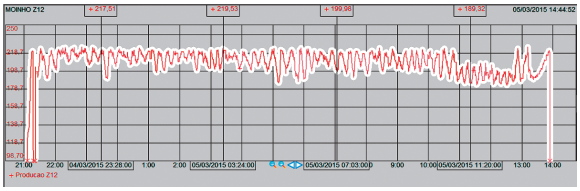
Features
- Expert Optimizer integrated with existing third-party control system
- Mills modeled and commissioned with MPC
- Calciner, kiln and cooler commissioned with fuzzy logic

Benefits
- 62% reduction in standard deviation of raw mill power
- 60% reduction in the standard deviation of raw mill bed depth
- 24% reduction in the standard deviation of kiln motor load
- 27% reduction in free lime standard deviation
- 16% reduction in liter weight standard deviation
- 5% reduction in burning zone temperature standard deviation
- Reduction in consumption of grinding media in ball mill

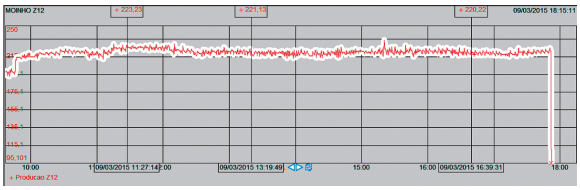
"The cement mill's productivity gain had a positive impact that reflected on a reduction of 1.15 kWh/t of energy consumption", says Bruno Marin, production manager at Votorantim Cimentos



Cement mill Z12 productivity factor



Cement mill Z12 stability before EO commissioning



Cement mill Z12 stability after EO commissioning

ABB Switzerland Ltd
Local Business Unit Process Industries
Segelhofstrasse 1K
5405 Baden 5 Dättwil
Switzerland
Phone: +41 58 586 84 44
E-Mail: minerals@ch.abb.com

For contact details,
please visit our website:
www.abb.com/cement