CASE STUDY

Global cement manufacturer optimizes operations with ABB Ability™ Advanced Digital Services

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01 Conveyors transport raw material used in the production of cement.

The India-based global cement producer's integration of ABB Ability™ Advanced Digital Services led to substantial productivity gains for two plants, a success that will soon be replicated across its fleet.

One of Asia's largest manufacturers of gray cement, ready mix concrete (RMC) and white cement, this customer has 19 integrated plants, one clinkerization plant, 25 grinding units, seven bulk terminals and overall operations spanning Bahrain, Bangladesh, India, Sri Lanka and the United Arab Emirates.

The cement producer needed to optimize its facilities for maximum production and operating efficiency, and reached out to ABB because of ABB's reputation as a leading industrial automation company with deep domain knowledge and a comprehensive solutions portfolio.

The customer's needs presented several challenges for ABB to address:

- Improve availability, reliability, and lifecycle of electrical and process assets
- Reduce the cost of owning a diverse, fragmented automation landscape
- Increase yield, energy efficiency and quality
- Integrate quality information

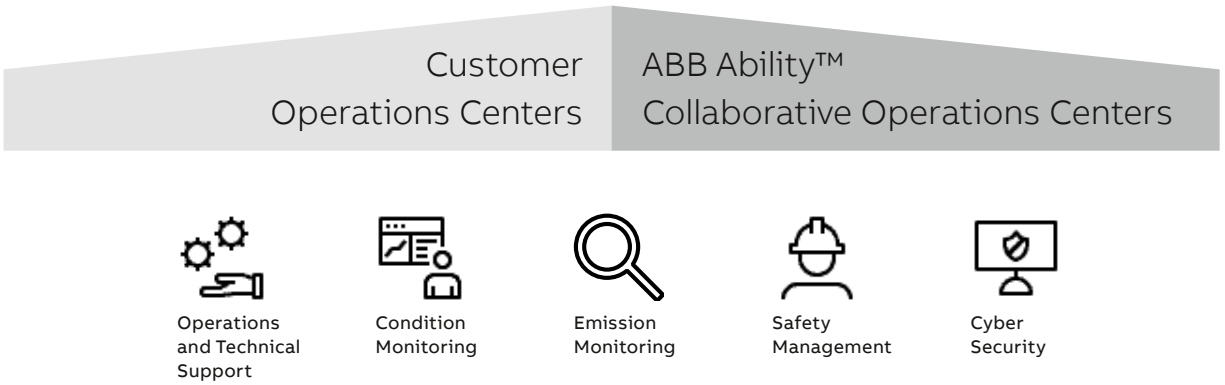
Increased quality by up to 15%

Reduced operating costs by 3-5%

Achieved ROI in 8 months

Solution
The cement manufacturer was most interested in ABB's energy monitoring solutions, but ABB recognized that other ABB offerings could increase the efficiency of its energy management by automating and improving resource use.

This could be achieved by:
- Deploying a plantwide approach that would increase automation use and reduce waste
- Leveraging domain and process experience from its many sites, supplemented with ABB expertise
- Interfacing quality and business systems for improved data collection that informs business decisions



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02 ABB works with customers to identify the solutions most critical to improve your operations. Services are delivered through an ABB Cement Care agreement.

Cement leader prevents production disruptions with ABB Ability™ Advanced Digital Services

ABB Ability™ Expert Optimizer was key to meeting the customer's needs. Part of the ABB Ability™ portfolio, Expert Optimizer is perpetually-licensed software for controlling, stabilizing and optimizing industrial processes. The solution uses linear and non-linear model predictive control, machine learning and neural networks to find the best operating conditions to maximize output, and can immediately detect deviations in cement production processes. The cement producer reduced fuel consumption and increased production at the kiln, the raw mill roller press and cement mill roller press thanks to the new capabilities enabled by Expert Optimizer. These improvements led to an overall increase in operational efficiency for the pilot locations, allowed the producer to meet its energy usage goals and enhanced safety and security in the pilot facilities.

To maximize the benefit the customer receives from advanced technologies like Expert Optimizer, ABB piloted ABB Ability™ Collaborative Operations with the cement producer as well. Collaborative Operations connects people in production facilities, corporate

headquarters and at ABB by giving them the right information to increase productivity, optimize operations and ensure security.

ABB Ability™ Collaborative Operations facilitates:

- Continuous communication and access to experts
- Sound business decisions using detailed data analytics
- Increased productivity through improved asset performance
- Improved communication between customer site managers, site technicians and ABB experts
- Higher safety and security while reducing risks and costs

ABB Ability™ Collaborative Operations provided the cement producer with actionable insights on the plants' production efficiency, performance deviation, losses and alarm management.

ABB introduced the pilot project to a thermal power plant that powers an adjacent cement plant. The services ensured stable operations at both sites. Now, operations can continue without disruptions despite variations in load demand and events that require the power plant to switch to islanding mode, during which it relies on a generator to continue production. With the pilots now completed, Collaborative Operations is being implemented at those sites, with plans to expand it and other solutions to the rest of the customer's locations in due time.

Improvements

Rotary kiln
- Thermal consumption 1.31% ↓
- Production 1.04% ↑

Raw mill roller press
- Electrical consumption 2.13% ↓
- Production 2.26% ↑

Cement mill roller press ball mill
- Electrical consumption 2.15% ↓
- Production 2.75% ↑

Standard quality deviation reduced by 15%

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