

## Precision and control System 800xA at work in Lafarge cement plant



Extracting minerals from the depths of the earth, and transforming them into essential components is a complex process.

For over a century and a half, Lafarge has been leading the way in creating construction materials with innovative mechanical, functional and aesthetic properties. In carrying out this business, Lafarge employs cutting-edge research and technology in its processes.

In 2007, Lafarge selected ABB Malaysia to deliver an automation package for its Malaysian cement production plant (in Langkawi) and introduce new levels of efficiency, safety and sustainability to its operations.

### Lafarge in Malaysia

Lafarge Concrete (Malaysia) Sdn Bhd, a subsidiary of Lafarge Malayan Cement Berhad (LMC), is focused on the core businesses of manufacturing and sale of cement, ready-mixed concrete and other related building materials.

In the cement business, LMC currently employs more than 1,200 people and operates a Malaysia-wide network of facilities, which includes three integrated cement plants (Langkawi in Kedah; Kanthan in Perak and Rawang in Selangor), and a grinding plant in Pasir Gudang.

The Langkawi plant, comprised of two production lines, produces 3.3 million tons of clinker per year.

“With System 800xA, Lafarge operators have full control over energy and raw material consumption, as well as keep vital processes running without interruption.”

Mohamad Fadzil Ramli  
Methods Manager  
Lafarge Cement Sdn. Bhd.

#### Rationale and scope

Lafarge puts a premium on having well-structured businesses and a high level of innovation in its operations. In the area of cement production, it looked to advanced technologies that will improve its products and the processes that create these products.

Line 2 of Langkawi plant was run by an aging Polysius distributed control system (DCS). Given its datedness, spare parts for the DCS were no longer easily available in the market. Thus, in 2007, Lafarge Concrete started down the path to modernization with the launch of the process control system (PCS) project, involving the migration of Line 2's existing DCS into a modern automation solution from ABB. ABB Malaysia executed this project with the collaboration with the Operation Center in India (INOPC).

Done in four (4) phases or “shutdowns,” this PCS project involved the complete revamping of the control system, with only several lab equipment and weight feeders of the local control system retained. These were all interfaced with the new control system. Also in scope was the provision of training support for Lafarge personnel who will handle the system.

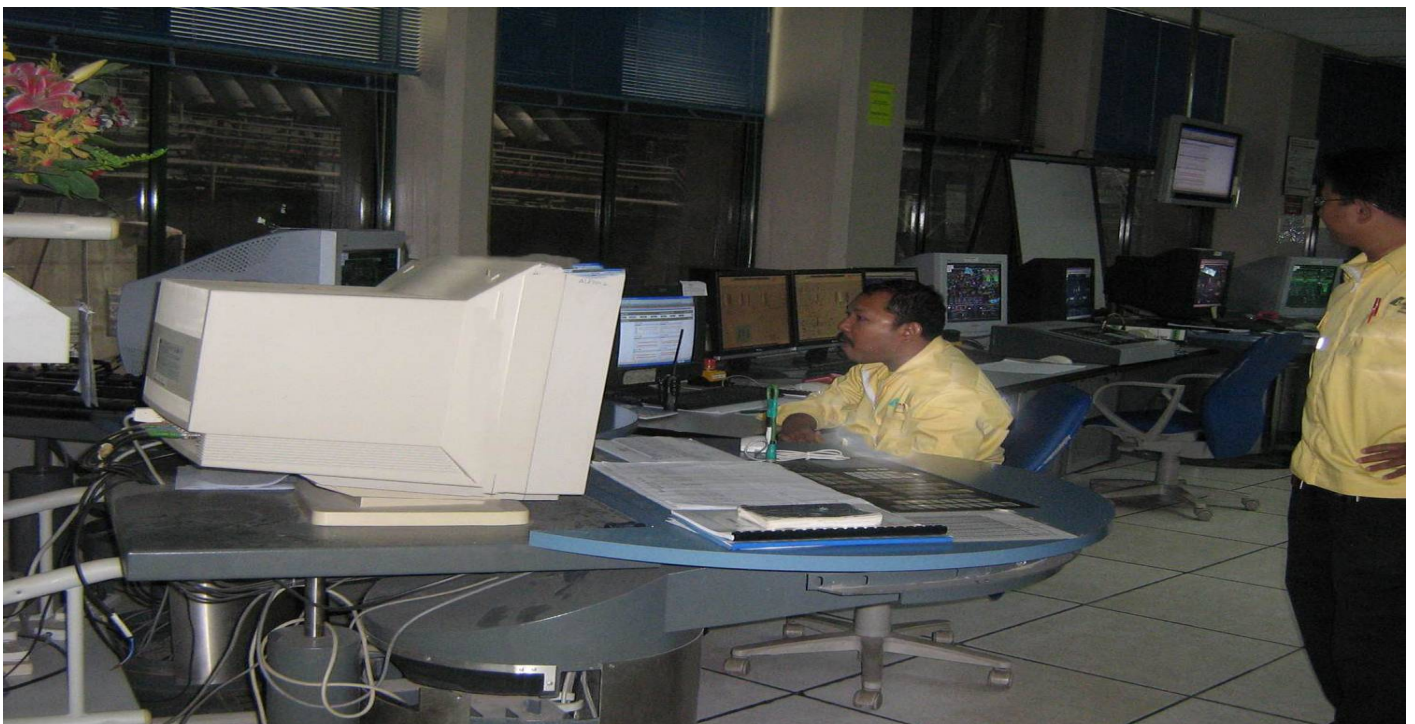
In June 2011, ABB completed the third phase of the project, migrating key process areas of Line 2 to ABB's flagship control system, the System 800xA. In June 2012, ABB will complete the final phase of this major revamp to System 800xA.

Lafarge also took this opportunity to upgrade its equipment's operating safety standards and implement global safety requirements. This meant the revamp and modification of the plant's electrical system. The scope of electrical revamping included the installation of visible cut-off switch power isolation and control units for more than 300 motors and local control units for 13 high tension (HT) motors. Around 100 units of pulse-controlled speed sensors were installed for all critical drives.

#### Challenges posed

Apart from addressing equipment obsolescence and spare parts availability, Lafarge wanted a solution to increase production efficiency, without incurring high engineering costs. Other requirements included:

- Adherence to very tight and detailed shutdown and commissioning schedules
- Local support



Lafarge control staff making full use of ABB's System 800xA control capabilities to adjust the process to run at its optimal level.



# System 800xA integrates connectivity to Lafarge's enterprise and plant systems, applications and devices.

- Reputable supplier
- Single source for automation and electrical components
- Ease of maintenance
- High availability
- Minimal to low downtime during switchover

## The ABB solution

The automation solution from ABB was comprised of the following:

- System 800xA with 11 AC 800M controllers for 14,000 I/O points
- Integration of existing 5 AC 800M controllers for 6,000 I/O points
- Seven (7) operator workplaces.

The electrical package comprised the following:

- Visible cut-off switch power isolation
- Control units for more than 300 motors
- Local control units for 13 HT motors
- Approximately 100 units of pulse-controlled speed sensors

ABB's System 800xA control system extends the reach of traditional automation systems — beyond the control of the process — to increase energy efficiency, asset utilization, energy savings and operator effectiveness

System 800xA integrates connectivity to Lafarge's enterprise and plant systems, applications and devices. With its intuitive human machine interface (HMI), System 800xA presents all data in one single interface. This means the information is



In producing top-grade cement, the processing operation itself – including the control system – is just as important as the raw material.

presented in a context appropriate for all user disciplines. With this integrated information, Lafarge's plant operators can quickly make qualified and sound decisions based on relevant, real-time and reliable data.

In the area of safety, System 800xA provides a complete and scalable IEC 61508 and IEC 61511 compliant Safety Instrumented System (SIS) that spans the entire safety loop, including SIL-related field devices, I/O modules, controllers and field actuators.

For asset optimization, System 800xA employs software that reads and presents to plant operators all plant-resident information. This means Lafarge operators can monitor and assess equipment conditions in real time. Ultimately, this capability means corrective and preventive maintenance is also reduced.

## Results

The benefits of a control system go beyond convenience. ABB's System 800xA reduces costs through reduced time to decision and action, ease of engineering, integration of information for improved visibility, and optimizing plant asset availability and performance.

"With System 800xA, Lafarge operators have full control over energy and raw material consumption, as well as keep vital processes running without interruption," said Mohamad Fadzil Ramli, Methods Manager at Lafarge Cement.

By making full use of ABB's System 800xA Control System capabilities, control room staff can adjust the process to run at its optimal level. For instance, with a fully integrated control system, the average temperatures in the kiln can be adjusted for minimum energy requirements. When an operator combines process knowledge with System 800xA's full capability, energy consumption can be reduced by 10%.

The immediate gains are in maintenance costs. The risk of production downtime is greatly minimized as spare parts and technical support are within reach, even within Malaysia. A reduced maintenance downtime also means increased production efficiency.

Indeed, the quality of the cement depends on the raw materials. However, in the final analysis, the processing operation itself is just as important as the raw material. It is in controlling and managing these complex processing operations that ABB comes in – to play its role in helping Lafarge create building materials that shape our society and very homes.

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