

Extended automation Integrated solutions for cement industries



Qassim Cement Company (QCC), located 360 km north of Riyadh in the Kingdom of Saudi Arabia

Working together, every step of the way.



The challenge

You're under more pressure than ever before to run your operation profitably – to achieve greater results with fewer resources. In the past, optimizing process control defined excellent performance. However, with changing market demands requiring faster turnarounds, greater customization, smaller lot sizes and lower overall cost, production gains through process control improvements are not enough to guarantee success.

In today's fast paced global economy, competitive advantages result when a company can tap into its assets' unused productivity, safely and effectively, to meet changing demands.

With the Industrial^{IT} extended automation System 800xA, ABB provides you with the technology and solutions needed to achieve a sustainable competitive advantage by enabling your plant to perform smarter, safer and better at substantial cost savings.

Have you achieved operational excellence?

Operational excellence is achieved when continuous improvement strategies, in conjunction with real-time feedback and analysis tools, maximize production and asset availability safely, optimize quality, and ensure predictable and appropriate plant performance. You face daily operational issues: How quickly do you react not only to process upsets, but also changes in demand or product mix? Is the right information available to the right people in a usable format, or must they search several different systems to gather the data? Are you overspending on preventive maintenance?

Are you constantly reacting to equipment failures rather than proactively identifying poor performers? Does your end product consistently meet quality standards? At ABB, our tools provide more than a one-time improvement in performance, and continue to meet the challenges you're faced with on a daily basis. With System 800xA, the result is ongoing improvement in your overall productivity and profitability, ultimately leading you to operational excellence.



Control room at Jura Cement plant, located in Wildegg, Switzerland

Setting the gold standard of automation.



Industrial^{IT} System 800xA extends the reach of traditional automation systems – beyond control of the process – to achieve the productivity gains necessary to succeed in today's business markets. For the first time, this scope is accessible from a single user interface that is configured to present information and provide interaction in a context appropriate to all user disciplines.

Extended automation objects created within the engineering environment provide a foundation for the efficient development, deployment, reuse, and continuous improvement of production and safety applications with predictability unattainable from other automation solutions.

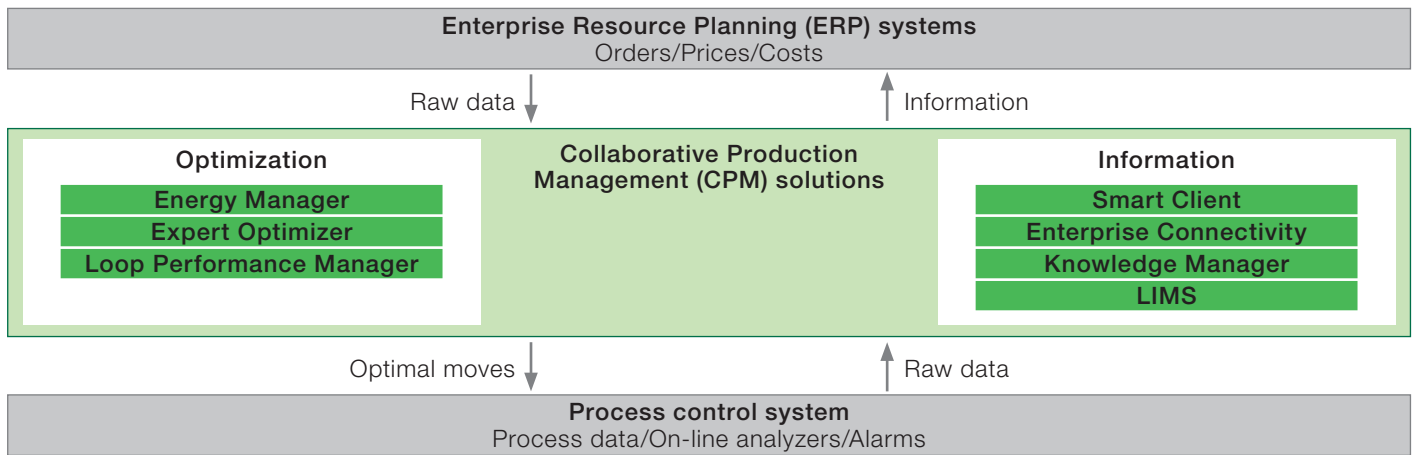
Compounding value throughout the enterprise

System 800xA's unique operating environment allows you to incorporate 'best in class' products, applications and services from the world's largest automation supplier. Built on the Industrial^{IT} Aspect Object™ technology platform and industry specific expertise, ABB's automation portfolio provides the seamless link between process, safety, and business management to deliver knowledge based solutions.

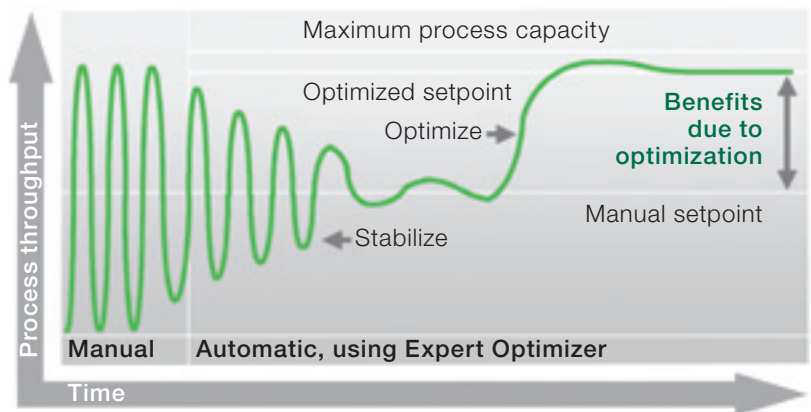
Protecting your investments

System 800xA is the latest installment of ABB's 20+ year commitment to our process control system users. Our pledge of "Evolution through Enhancement" ensures that future advances in systems technologies will enhance rather than compromise your current investments. With System 800xA, you have the ability to extend the automation reach of your present system to enjoy new levels of productivity.

System 800xA provides the flexibility to implement the functions you require today and the agility to add others as needs evolve. Where others promote "rip and replace" migration strategies, we deliver true system evolution, allowing you to build on your strong process control system foundation.



Expert Optimizer – stabilize then optimize



Improve your cement production with collaborative production management.

Increase efficiency, reduce costs and document your performance

Collaborative Production Management (CPM) solutions integrate manufacturing systems – providing visibility, execution, tracking, reporting and optimization of cement industries.

This results in decreasing costs through better scheduling, execution and performance management. Ultimately CPM solutions support increasing revenues through improved processes and product quality, increasing profits and enhancing shareholders value.

Integrated CPM solutions provide you with consolidated, consistent and clean information

With ABB's CPM solutions all operation, control, optimization and business systems are integrated as one. You are certain to obtain true integration of process, business, quality and energy data. The information is provided on a transparent platform in which information is accessible to all users in a consistent way and in clean, consolidated reports.

Take faster and more accurate business decisions based on manufacturing information

You need Enterprise Resource Planning (ERP) systems to know how your business is performing. In a similar way you need to know how your plant is performing. With CPM solutions that integrate business and manufacturing systems you will react

faster to changing manufacturing conditions, and take more accurate decisions based on real-time information.

Make goal oriented decisions to meet your production targets

You need to evaluate if you are on target to meet your production, operational and quality objectives. With Knowledge Manager you will be making goal oriented decisions by accessing the information you need at the right time, place and format. You will get analytical insights to identify deviations and best practices to keep your production on target.

Providing solutions suited to the cement industry, the Knowledge Manager system supports you with:

- monitoring manufacturing performance indicators.
- production accounting and inventory management.
- process operations and energy reporting.
- downtime management.
- integration with ERP systems.

Enhance your material balancing and production reporting processes

Material balancing is a time consuming routine activity which is, at the same time, vital because your production reporting must reflect the reality of the business.

With our solutions for production accounting you will have less administration tasks while ensuring consistency across consumption measurements, production measurements and confirmed stock levels.

Optimize your laboratory operation

The Laboratory Information Management System (LIMS) supports you in complying with your business processes. Providing a standardized and simplified workflow LIMS allows you to concentrate on the results and maintains laboratory productivity at its best level. With seamless integration to the production information system, quality results are promptly provided to the plant operation, production and sales teams.

With LIMS you will obtain:

- optimized laboratory workflows.
- industry specific validation procedures.
- support for collaboration among laboratories.
- control of instrument calibration.

Increase with efficiency robot supported applications for laboratories

Increasing consistency, efficiency and cost-effectiveness of sampling and testing operations are key benefits of ABB's robot supported applications for laboratories. The higher and more reliable throughput and performance of an automated laboratory not only guarantees quicker available results but also increases the use of capital investment in expensive analysis equipment.

Improve performance by using intelligent solutions for complex problems

With the award winning Expert Optimizer you can implement advanced process optimization to improve productivity, energy efficiency and profitability. Expert Optimizer will effectively manage process complexity to help you achieving the best possible performance.

You will achieve better control and optimal operating points for processes such as:

- Raw materials grinding and blending
- Pre-calciner, kiln and cooler
- Handling of alternative fuels
- Cement grinding and blending

Expert Optimizer's graphical and intuitive engineering interface combines technology such as Fuzzy Logic, Neural Network and Model Predictive Control to deliver an optimal solution to your problem.

Maintain product quality

ABB's optimization solutions will help you achieve minimum quality fluctuations at the highest production rate.

Maximize energy efficiency

With the process stabilized through all operating regions unseen level of energy efficiency and production will be reached.

Minimize energy costs

Reduce electrical and thermal energy cost by including consumption and market constraints in your optimization strategies.

Tap the vast experience of ABB's process engineers

In addition to their own process knowledge, customers can tap the vast experience of ABB's process engineers to develop the strategy best suited to optimize their dynamic process.

Modular, flexible solutions based on ABB's System 800xA

Integration of power and automation

A reliable and dependable energy supply is vital for the functioning of any industry. Monitoring and controlling the power is just as important as monitoring and controlling any other significant process automation parameter. But in reality the two are worlds apart – separated by a lack of common communication and architectural standards as well as organizational differences between departments.

Electrical integration means integrating process automation and power automation into the same plant control system. This creates a single automation environment that unifies the control of process-related equipment as well as protection, control and monitoring of substation equipment and power transmission and distribution. Integrating the process automation system with the power automation system permits a single strategy in the areas of engineering, operations and maintenance. Whether you generate power or consume it, the economic benefits of electrical integration can run into millions of dollars gained in increased production or saved in reduced operating costs.

Power distribution

There are many benefits of electrical and automation integration – having typical SCADA functions in the automation system. A single view of both electrical and automation systems is provided without additional process system I/O, complex software interfaces, and marshalling racks. It also gives plant personnel greater flexibility in controlling the entire facility. Unified operations reduce duplication of equipment, make staff more effective, and reduce training costs.

Extended asset management capabilities enable both process and electrical condition-based monitoring to be done with one system.

Process electrification

MV and LV equipment supervised and controlled from one single system.

Example use case: a medium voltage (MV) mill motor has been inhibited and cannot be restarted from the process display. The operator can immediately switch to the electrical single line diagram (SLD) display and check the circuit breaker status. He can also view the integrated CCTV (closed circuit television) and review online design documents, all from a single operator station. With the integrated information, plant operators can make informed decisions quickly based on good, relevant, known data.

Electrical energy management

The possibility of measuring the electrical power consumption in each process department enables individual supervision and optimization of energy consumption.

Optionally, the system can shut down process units according to (predictive) power limits or financial constraints. The shut down will be performed in a controlled manner using the process control application.

Process instrumentation

System 800xA supports all the contemporary standard interfaces to connect to process instrumentation.

Intelligent device management and asset monitoring functionality lowers life cycle costs through significant savings in the design, implementation, operation, and maintenance costs of field equipment.

Plant operations

The growing deployment of peripheral applications related to productivity improvement vastly increases the amount of data available to improve productivity in the plant. Yet, without the proper context, plant personnel can be exposed to information overload.

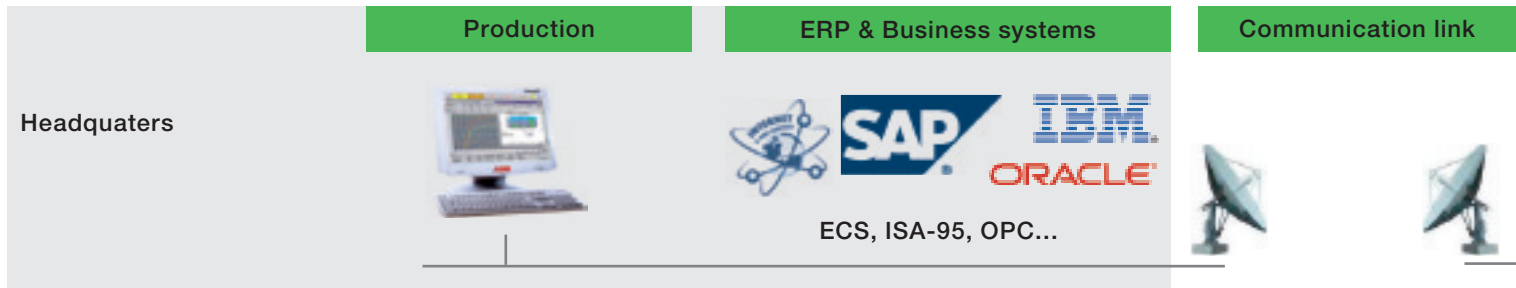
Unique to System 800xA is its ability to gather information from multiple plant sources and transform it into relevant information for a diverse set of users such as maintenance technicians, process engineers, production managers, or plant operators.

For example, operators require an environment that allows them to run the plant in a safe way and produce products in the required quantity and quality.

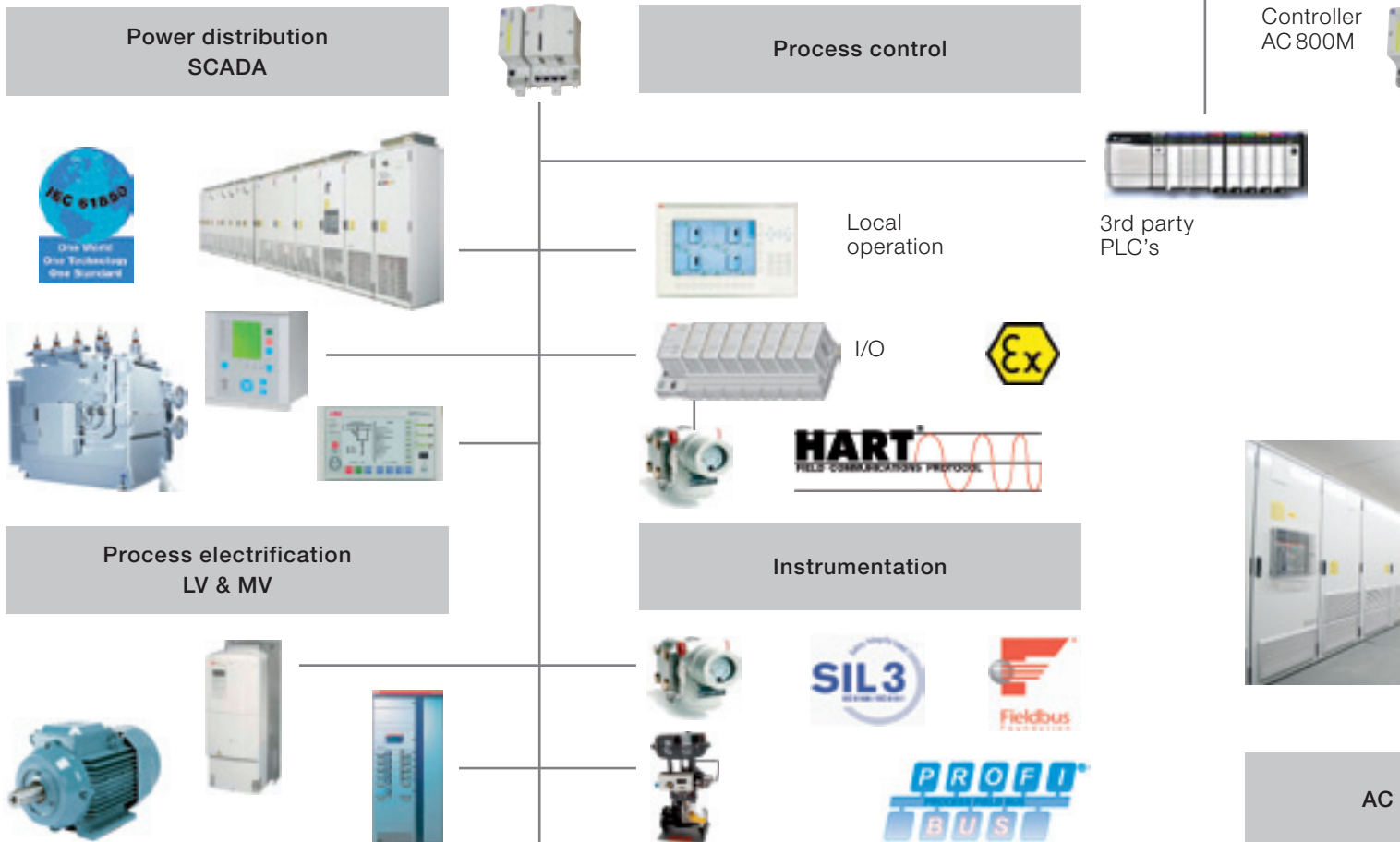
Operations managers require an environment that lets them know the return on investment, risk, uptime, and production and maintenance costs at any given time.

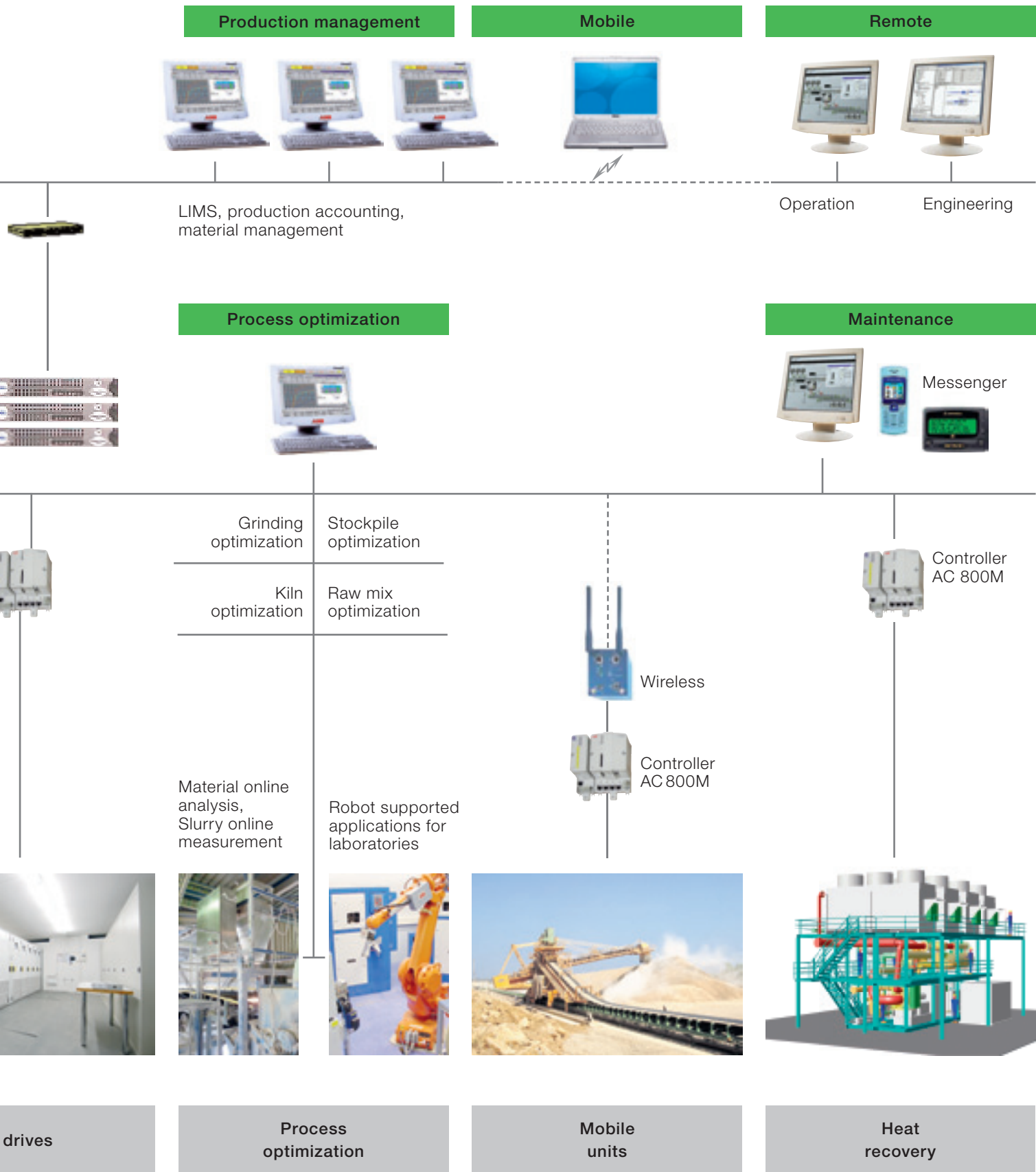
Engineers need an environment that will allow them to implement a specification change to their running plant in the shortest time with the lowest cost and at the lowest risk.

Maintenance and service personnel need information to ensure the maximum availability of plants and applications.



Extended operator workplace





State of the art large screen operator workplace

System 800xA extended operator workplace, based on the 800xA process portal, projects a perfect picture of the industrial process data on a contoured, large-screen overview. Unlike many large displays that seem designed merely to impress control room visitors, the extended operator workplace gives operators the functions that matter most to them: an outstanding interactive, high-resolution display, full and easy-to-read information, an intuitive interface, effective alarm and trend display management, process interaction, and ergonomics that raise safety, comfort and efficiency to new levels.

Mobile and remote access

Use of commonly available IT and networking methods allows access to practically any production and maintenance information through to remote operation of the plant at virtually any place over the globe.

Performing engineering actions in the system is also not limited to the plant location but can be done remotely.

Integrating existing control systems

Native use of OPC and other current communication standards provides the upmost flexibility for integrating other control systems into 800xA. Interfaces with many commonly used systems are already available to be used in a “plug and play” manner.

Enabling predictive and proactive maintenance

Asset optimization software exploits the wealth of plant resident information to assess and report equipment conditions in real-time, reduce costly corrective and preventive maintenance and optimize maintenance and calibration work flows.

System 800xA maintenance management features make information within the CMMS (computerized maintenance management system), for example MRO Maximo® and SAP PM®, transparently accessible to users in both the process control and maintenance system environments. Seamless context-sensitive interaction is provided through standard System 800xA CMMS displays, such as active work orders, work order history, preventive maintenance schedules and available spare parts.

System 800xA optimizes the work process and significantly reduces the latent time between problem identification and resolution.

ABB Minerals Application Library

Modern object oriented system architecture enables the structured application of software design with pre-defined and tested functions. The ABB Minerals Library provides tools and functions to cover typically 80–90 % of the standard control functions of a minerals process – out of the box.

- Material transport and routing
- Grinding mill control
- Weighing and feeding controls
- The electrical control and power management functionality

The result is less engineering, commissioning and maintenance time over the whole life cycle of the installation.

Engineering

Integrated engineering environment efficiently supports the complete life cycle of the automation project, from planning, through configuration and library management, to commissioning and operation to minimize system ownership costs.

Using dynamic documents, you can quickly navigate to the displays required for action. Documents based on Microsoft Excel®, Word®, or AutoCAD® can be enhanced with live process values for easier diagnostics.

Heat recovery

ABB is focusing on energy saving and environment care. Therefore, we have designed the turnkey solution of a small power station to use the waste heat of the industrial process in the range of 150 to 350 °C.

The increasing cost of energy and the requests to reduce the CO² content are the market drivers for this solution. ABB can produce electrical energy without using additional fossil energy. In different countries, our customers may get benefits from governmental organizations, like CO² certificates etc. to support their investments. This small power station also gives the customer a partial independence from the power supply of the utility board. Particularly in areas where the permanent power delivery cannot be guaranteed.



Capitalize on field-proven solutions.



Efficient installation and commissioning

The most professionally designed electrification and process control application can be almost worthless, unless the installation and commissioning is in experienced hands. With ABB's professional engineering and commissioning team, excellent project management and well-proven installation supervision, we ensure that your plant is operational in the shortest time and at lower cost. Installation and commissioning is always planned in fine detail and ABB expertise ensures a quick response to any unforeseen issues. In ABB, you can rely on a partner, which is able to provide the widest possible range of services, experience and expertise.

Maximize personnel efficiency

ABB training programs are highly effective, with an optimized mix of theory and practical hands-on exercises to guarantee better knowledge transfer that will lead to increased productivity. Over 250 focused courses and curriculums are available within the global ABB University network covering a wide range of automation products, specific application solutions and process related programs. More than 30 courses and seminars are specially tailored for cement industry customers and can be delivered at dedicated ABB training centers in various locations or if requested, and for more flexibility at customer sites

Typical course program:

Process control system

- Industrial^{IT} 800xA applications with Minerals Library
- Configuration and operation
- Industrial^{IT} 800xA engineering with PDA tool and Control Builder M
- Industrial^{IT} 800xA maintenance and troubleshooting

Plant electrification

- HV and MV switchgear
- Intelligent low voltage power distribution system
- Protection relays

Drives applications

- Gearless mill drives
- Variable speed drives
- Low voltage AC drives
- Low voltage DC drives

Solutions for plant optimization

- Expert Optimizer
- Knowledge Manager
- Laboratory Information Management System
- Raw Mix Preparation
- SpectraFlow analyzer

Visit ABB's training homepage to obtain more information on the current offering (course locator) and actual schedules at www.abb.ch/abbuniversity or send us an e-mail: minerals.training@ch.abb.com



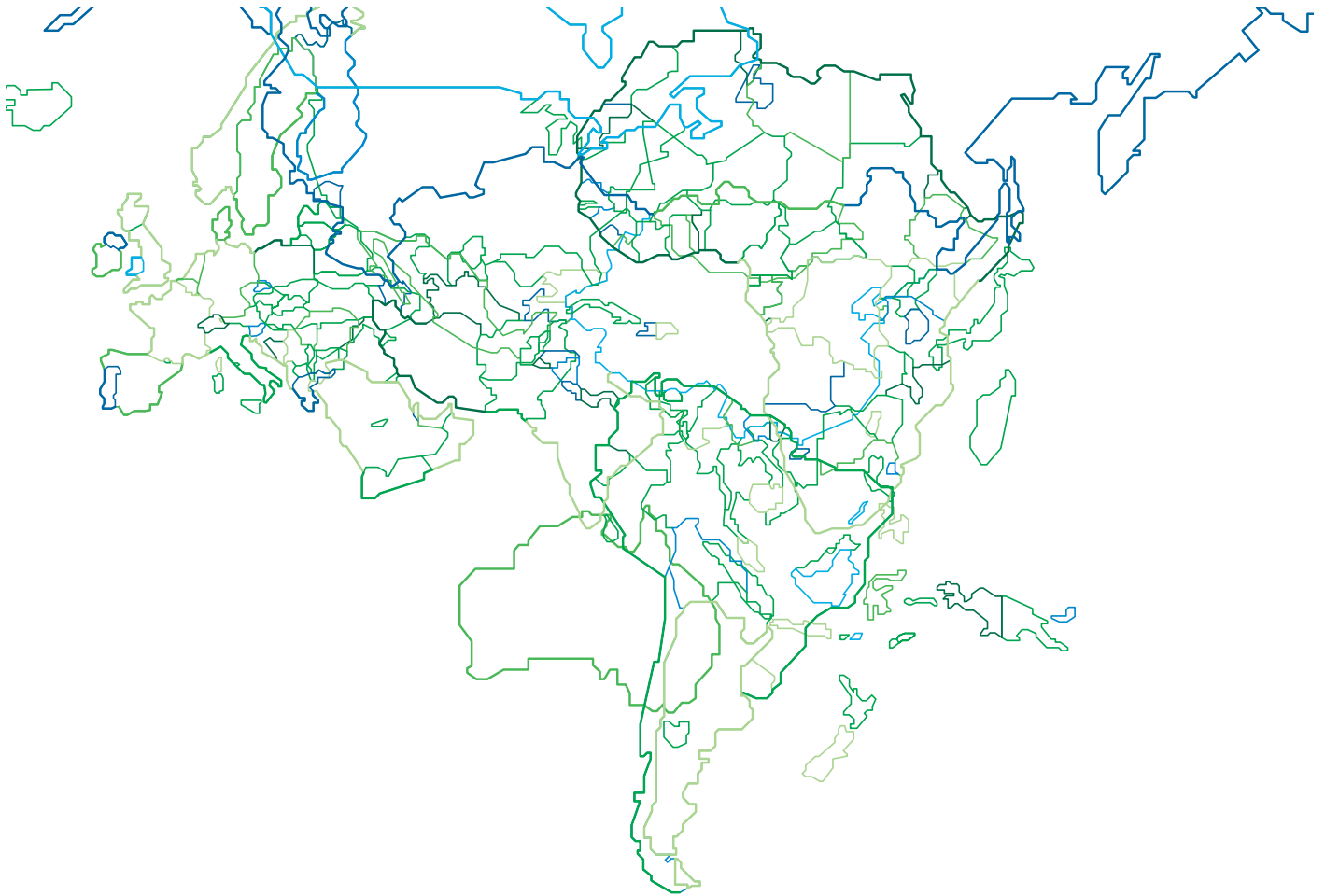
Cam Pha Cement plant, located in Cam Pha town in Vietnam's northern Quang Ninh province

Commitment to the cement industry.

ABB is committed to the cement industry. Since 1961, ABB's dedicated Center of Excellence in Switzerland has continually developed standards for the cement industry.

During the last 50 years, ABB has delivered successful process control systems for more than 600 cement plants worldwide. More than 200 of these applications are complete plant installations in over 40 countries.

ABB is a leading global supplier of process control systems to the mineral processing industry. Its engineering departments, with their industry-specific validation procedures, ensure consistently high quality in automation technologies.



Customer care –
ABB is never far away.

Challenge us on support services

With offices in almost every country, ABB provides local support and engineering facilities that are always close at hand, for the fastest and most efficient backup possible.

You can count on ABB's long-term commitment to provide ongoing service and support throughout the life cycle of your plant. Our portfolio includes services such as:

- Technical support and remote services
- Service agreements
- System upgrades
- Maintenance and retuning services
- Process optimization consultancy
- Spare parts and repair services
- On-site workshops
- Training services

You receive fast responses to your specific requests by contacting our **SupportLine:**

Phone: +41 (0)844 845 845, available 24 hours per day,
365 days per year

Telefax: +41 (0)58 586 73 08

E-Mail: minerals.supportline@ch.abb.com

ABB SolutionsBank homepage:

<http://solutionsbank.abb.com>

Contact us

ABB Switzerland Ltd

Local Business Unit Minerals

Segelhofstrasse 9P

5405 Baden 5 Dättwil

Switzerland

Phone: +41 58 586 84 44

Fax: +41 58 586 73 33

E-mail: process.industries@ch.abb.com

ABB's Minerals business unit is represented in the following countries:

Australia, Brazil, Canada, Chile, China, Egypt, Estonia, Germany, Greece, India, Indonesia, Latvia, Lithuania, Malaysia, Mexico, Norway, Oman, Peru, Poland, Saudi Arabia, South Africa, Spain, Sweden, Switzerland, Thailand, USA and Vietnam.

For contact details, please visit our website:

www.abb.com/cement