



Blue Circle Cement

Designed for Success

Results

- Higher production efficiency
- “Significant” cost savings
- Decreased troubleshooting
- Automatic data collection and reporting
- Remote access to production information
- Ethernet-based, enterprise-wide communications
- Expandable system for future growth

“The CIMPLICITY/SQL/Access combination has significantly changed our data collection and reporting process, allowing us to focus more attention on production and quality of our products. Using the system’s Web capabilities, anyone with access to our company intranet can view CIMPLICITY screens, review process information, and print reports without having to install additional software.”

Filiberto Morales
Automation Manager
Blue Circle Cement

Cement Manufacturer Sees Concrete Results with New GE Fanuc e-Manufacturing System

Automation eliminates troubleshooting and reporting time while providing mobile and enterprise-wide communication

At Blue Circle Cement’s Atlanta plant (BCCAP), the days of time-consuming manual data collection and shot-in-the-dark troubleshooting are fast becoming a faded memory as the entire operation is becoming networked and automated. Using a well-blended mix of Ethernet-networked GE Fanuc Series 90™-30 PLCs and CIMPLICITY®* collaborative production management software, BCCAP is cementing its relationship with modern day monitoring and control capabilities, increasing its efficiency, and enabling enterprise-wide communications.

Solid Reasons for Change

Originally built in 1963, with a second cement line added in 1967, BCCAP endured several years of an outdated and increasingly obsolete system of mercury relay switches and loop controllers before Automation Manager Filiberto Morales met the hard facts head on and needed to bring the plant into the new millenium. With the plant already operating near capacity, producing 625 thousand tons of clinker and 795 tons of cement annually, Morales was challenged to justify a new system.

* Part of Proficy Intelligent Production Solutions from GE Fanuc.



imagination at work



Without an integrated control system, BCCAP usually spent one to two hours pinpointing a problem at an average cost of \$3,000 per hour in lost production—and untold quantities of manpower and frustration. Beyond targeting production improvements, Morales had other goals, including automating the collection and distribution of BCCAP's process data. While BCCAP was equipped with some accumulators in the control room, its system of data entry was still predominantly manual. Even after BCCAP's first computer installation in the early 1990s, operators were still required to spend approximately two out of every 24 hours of the work day logging production rates and failure information, resulting in a yearly total of more than 700 hours—nearly one month out of the year!

"Our existing system had simply reached the end of its life cycle," Morales states. "Parts and qualified service were becoming increasingly scarce. We had to make a change, but we had to do it wisely."

A New Mix of Automation

Situated on 47 acres, BCCAP is a somewhat unusual operation in that it has no on-site raw material resources. Instead, BCCAP receives shipments of limestone, gypsum, and other raw materials via truck and rail car. Primary and secondary crushers condition these raw materials, which are then ground in a raw mill to obtain the raw meal that is placed in a kiln and burned at 1,800 °F at a rate of 50 to 70 tons per hour. The main byproduct is called clinker, the main ingredient in cement. The clinker is then combined with more gypsum, iron ore, or fly ash and ground again into final mixes, including Colored Masonry, Colored Portland, Grouting, Masonry Cements, Special Cements, and Types I, II, and III.

Before Morales selected the components that would comprise BCCAP's new automation system, he spent six months evaluating the entire manufacturing operation. With ten years in the cement manufacturing industry, Morales knew BCCAP was ready for a change, but not just any change. With virtually no documentation to support the plant's existing equipment and control system, Morales began compiling a list of equipment, including I/O, and established parameters for logic, process control, engineering, and other related areas. He then qualified the available system solutions based on their importance to the operation, cost, return on investment, and projected maintenance costs over a ten-year period.

"I wanted to be as objective as possible in the selection of the system, so we weren't predisposed to a particular vendor for any reason other than the performance of their products," Morales recalls. "In the end, the GE Fanuc automation system scored best in terms of our parameters and our priorities."

Building a Strong Foundation with an Open System Architecture

Enlisting the services of experienced integrator Engineered Software Products, Inc. (ESP) of Lawrenceville, GA, Blue Circle has successfully automated two finish mills, a kiln, a raw mill, and a crushing area. The company is in the process of automating a second raw mill, a loadout system, a tire burning management system, and a power monitoring system.

Each automated area of the operation employs a Series 90-30 PLC that feeds I/O data to a pair of redundant CIMPLICITY software servers in the main control room via a dedicated Ethernet TCP/IP network using fiber optics to maximize reliability. Currently monitoring approximately 2,300 I/O points, CIMPLICITY provides a graphical interface with comprehensive diagnostics, well-defined alarms, and control of stop/start on all devices, as well as an interface for manual data entry when necessary.

Using CIMPLICITY's SQL option, BCCAP can log the I/O data, such as motor and valve control, material flows, air and water flows, and temperatures, to a Microsoft® SQL Server™. A front end Access® reporting program configured by ESP and fed by the SQL Server automatically generates BCCAP's numerous daily alarm, pollution, and quality reports, virtually eliminating manual collection and compilation of report data.



"The CIMPLICITY/SQL/Access combination has significantly changed our data collection and reporting process, allowing us to focus more attention on the production process and the quality of our products," Morales says. "Add to that the PLCs and graphical CIMPLICITY screens and instantly we're seeing a significant impact on our troubleshooting capabilities. Now we can immediately identify, down to the point, the exact location of a fault. In the past, we lost a lot of time searching."

Designed as an open system based on Microsoft technologies and standards, CIMPLICITY reduces integration efforts and the chance for errors during installation and configuration of the database. "CIMPLICITY's ability to interface with Microsoft SQL gives us an open platform from which we can extract data and configure reports as needed," notes Grib Murphy, ESP principal. "It's really the key to the entire system."



Instant Access to Information Anytime, Anywhere

To complement the system's functionality, ESP installed a Web server connected to the CIMPLICITY server via a dedicated Ethernet local area network (LAN) that allows BCCAP to share real-time process information and graphics screens with its corporate office in England over the company's intranet. The only software required to access the data is a Web browser, such as Microsoft's Internet Explorer. "Using the system's Web capabilities, anyone with access to our company intranet can view CIMPLICITY screens, review process information, and print reports without having to install additional software," Morales explains. "It also allows our corporate office to manage our operation without having to make frequent and costly overseas trips."

In addition to BCCAP's intranet capabilities, Morales also plans to add CIMPLICITY handheld technology to the mix for mobile automation. Handheld technology is a hardware- and software-bundled product that uses a wireless link to connect to the CIMPLICITY server, displaying screens and data on a palmtop computer for operators and maintenance personnel who move from area to area within a plant.

A Blend of Benefits

From issuing the purchase order to starting up the first finish mill, implementation time was just 11 weeks. The second finish mill required only nine weeks from start to finish. According to Morales, startup of the second finish mill was so simple that Blue Circle personnel did it themselves.

While startup time was minimal, the resulting benefits of the new GE Fanuc automation system have been extensive. BCCAP has achieved "significant" cost savings from using a PLC-based control system. The days of manual data entry, and the concurrent loss of nearly one month of work time annually, are a thing of the past now that BCCAP's Microsoft SQL Server and Access products are working in conjunction with CIMPLICITY's SQL option. And, as Morales points out, "using standardized software tools to collect and analyze our plant data, versus the more expensive and complicated packaged solutions, further increases the savings."

"With the GE Fanuc system and its efficiency over the Ethernet network, we've created a solid automation foundation with open features that will allow us to continue to grow and add new functionality," Morales summarizes. "Much like our cement products, I'd say we've got the perfect mix."

GE Fanuc Automation Information Centers

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Additional Resources

For more information, please visit the GE Fanuc web site at:

www.gefanuc.com

