Alcoa - Aluminerie de Deschambault

Designed for Success

Results

- Improved collaboration and troubleshooting via secure remote access
- Faster identification and resolution of problems through information-rich, user-friendly screens
- Outstanding local service and support
- Reduced development time with industry-standard Windows®-based tools
- Higher product quality through better data integration and analysis
- Greater productivity via high-speed networking
- Elimination of expensive investments in nonupgradable, home-grown systems

"Because collaboration is so important in our plant, we really appreciate CIMPLICITY HMI Plant Edition's solid client-server architecture and remote access through WebView. In addition, GE Fanuc's outstanding local support gave us a level of confidence that really helped in developing this complex control application."
Pierre Boutin
Application Engineer
Alcoa – Aluminerie de Deschambault G.P.

GE Fanuc e-Manufacturing System Strengthens Alcoa – Aluminerie de Deschambault Raw Aluminum Production Process

Aluminum is the most abundant element in the earth's crust, and with its high strength-to-weight ratio, applications range from the structure of buildings and airplanes to the foil in which we wrap and heat food. Producing consistently high-quality raw aluminum used in the many different objects that we take for granted every day is no simple process. With the help of CIMPLICITY®* HMI Plant Edition software and a tightly integrated network of Series 90™-70 and Series 90-30 PLCs from GE Fanuc Automation, however, Deschambault's plant is well-equipped to meet the challenge.

Forging Ahead
With nearly $23 billion in revenues and plants in 38 countries, Alcoa is the world's leading producer of primary aluminum, fabricated aluminum, and alumina. Alcoa – Aluminerie de Deschambault, built in 1990 and formerly owned by Alumax, is located in Quebec, Canada. Employing approximately 550 people, Deschambault is a primary metals facility, producing raw aluminum ingots that are sent to transformation facilities and manufactured into various products.

According to Pierre Boutin, Application Engineer at Alcoa in Deschambault, process control and monitoring was accomplished through a system that was running on DOS and could not be upgraded. The data acquisition was realized through a homemade OpenVMS (VAX) system. "We needed a system that could be modified with a minimal amount of work," Boutin explains.

* Part of Proficy Intelligent Production Solutions from GE Fanuc.

imagination at work

Company personnel also required greater access to process data. Various users, such as the 30-plus members of the plant's environmental team, collaborate closely but can be located anywhere in the half-mile long plant at any given time. The new system needed to provide a highly secure method of allowing authorized users to access control data from anywhere in the plant, but to change control parameters only from specific locations.

Based on the performance advantages offered by GE Fanuc Automation, Boutin and his colleagues chose a control and monitoring solution featuring CIMPLICITY software on top of the existing Series 90 PLCs infrastructure.

Plant-Wide Automation

Alcoa – Aluminerie de Deschambault—where the alumina is electrolyzed to extract the metal it contains—is divided into five process sectors that revolve around the electrolysis area. In each sector, 10 to 15 GE Fanuc Series 90-70 PLCs and a few Series 90-30 PLCs provide redundant control and monitoring. Each of the five CIMPLICITY projects monitors approximately 10,000 points from the PLCs.

ALCOA

ALCOA PRIMARY METALS

Alcoa - Aluminerie de Deschambault

Using a star Ethernet topology, the PLCs and operator interfaces with CIMPLICITY software are connected to a switch in each sector and networked through standard 10Base-T copper connectors. Each sector is, in turn, networked via 100 Mbps Ethernet running on fiber optics to the IT Department. The master CIMPLICITY servers reside in the IT Department while the slaves are located in the different sectors. The IT personnel are responsible for the whole system maintenance and development.

CIMPLICITY HMI Plant Edition leverages the latest Web technologies to provide superior human-machine interface (HMI) and SCADA functionality through a client/server architecture and open-system design. This configuration provides Alcoa Deschambault with fast, easy integration, and expansion capabilities. And, with CIMPLICITY WebView, users can access real-time data remotely through Web browsers on the CIMPLICITY viewers located throughout the plant. While CIMPLICITY has built-in user access security features, Alcoa – Aluminerie de Deschambault's IT group added an additional level of security to ensure that, while processes can be viewed by authorized users from all stations, parameters can only be changed from a few designated stations.

"Our IT Department invested significant effort in designing this networking architecture to meet our specific needs," Boutin says. "Without a good architecture, this control system, no matter how good its components, would not work."

Join Together

But, thanks to the efforts of GE Fanuc and Alcoa – Aluminerie de Deschambault's IT and process groups, the new control and monitoring system has worked quite well. One of the project's major achievements is the teamwork it facilitates among IT and process control personnel, where disconnects are prevalent in many other enterprises. "The collaboration between these two groups is outstanding, and it plays a major role in the successful operation of our control and monitoring system," Boutin says.

Another aspect of the automation that helps bridge the gap between business and process systems is the tight integration with the company's Oracle database and the resulting data logging capabilities. "By logging all information to the Oracle database, using an OLAP tool, users can send a query to any master or slave server to see, for example, the status of all alarms in the different sectors," Boutin explains. "This allows users to identify and troubleshoot problems more quickly."

Boutin is particularly impressed with the outstanding service and support he has received from his local GE Fanuc representatives. "They really take care of us and work well with our development team," he says.

Superior customer service is something that Boutin, in turn, strives to provide every day. "Our customers are our co-workers in IT and process engineering, and helping them work better is our goal," says Boutin. "If we can do that, we can ensure that this plant continues to be one of Alcoa's best performers."

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Additional Resources

For more information, please visit the GE Fanuc web site at:
www.gefanuc.com