

### Complete Blast Furnace Control System Replacement

#### Overview

**Focus:**

Replacement of an aging system with a state-of-the-art system

**Country:**

Canada

The automation goals for the blast furnace reline were to replace the existing, aging control system with a modern state-of-the-art control architecture, with the intent to reduce spares, reduce maintenance support requirements, and provide for a more open connection with Level 2 systems and above.

JNE Automation took the lead role, providing all system design engineering, documentation, software development and testing, training and commissioning and start-up services. Gerrie Electric, the local Rockwell Automation distributor, provided the staging area, inventory management and Rockwell training. Rockwell provided the control system equipment, technical support and site verification services.

The existing control system was comprised of a DCS with its own HMIs, supported with PLCs and their own HMIs.

The new control system architecture was designed to replace the separate DCS and PLCs with one control system with one common HMI.

The existing control system was comprised of 6 DCS controllers and 11 PLC processors. The new design divided the architecture into process areas, reducing the overall number of new controllers to 10. The new architecture was augmented with a centralized database and HMI.

A set of standards for the control system and its design were produced, including the software development for the controllers and the HMI.

The control system design engineering was performed first, including P&I diagrams, instrument and I/O lists, electrical and I/O schematic diagrams, panel layout and wiring diagrams. The procurement plan included producing the software and the I/O panels on a parallel schedule. This was achieved by designing the I/O panels in such a way that the panels could be installed and wired to the field devices and, when testing was completed, the controllers and I/O could be installed in an easy and modular fashion.

*continued on back page*



### *Complete Blast Furnace Control System Replacement*

JNE Automation provided control system software development, including controller software, (ladder logic, structured text and function block languages) and HMI database and screen development. Extensive internal testing of each of the process areas was performed, both in the software and the screen designs, before the customer carried out factory acceptance testing of each area. An integrated systems test was carried out thereafter.

The system was used by the BF operations and maintenance personnel for off-site training in an effort to reduce the learning curve at start-up. Training of the application software and screen navigation was provided.

