



A Rockwell Automation Company

## Baymag Calciner Plant Twinning

### The Client:

Baymag mines and processes raw magnesium ore and processes it into pure magnesium oxide (MgO).

The products they produce are used for livestock supplements, milk of magnesia, paint, ceramics and refractory brick.

They operate a Calcining Plant in Exshaw, Alberta.

The plant processes the raw ore using a crushing system and multiple hearth furnace. The product is then further processed through a screening and milling system and then stored.

The plant was twinned in key areas to provide redundancy and expand Baymag's production.

### The Requirement:

The existing calcining plant utilized Allen-Bradley PLC hardware and Intellution FIX HMI software. The new system had to integrate with the old PLC and HMI systems to provide plant wide uniformity and control.

The existing plant operations were required to continue running except during scheduled outages, resulting in the introduction of a redundant network architecture and HMI control system.

The new control system also needed to be able to

communicate with the old PLC in order to provide interlocking and control between various pieces of equipment in the old and new areas of the plant

Several dust collector control systems also required integration into the new system through the PLC and eventually in the HMI.

### The Design Solution:

The new PLC system was implemented using Allen-Bradley's 1756-L62 PLC processor, and 2 remote racks of I/O. ControlNet was chosen for communicating with 2 remote I/O chassis, 3 motor control centers and several variable frequency drives due to its fast I/O update speed and expansion capabilities.

For further communication a 1756-ENBT/A Ethernet communications module was also provided. The Ethernet module allowed for communications to the existing Intellution Fix HMI system, the Burner Management System for the new hearth furnace, and the old plant PLC. The existing Ethernet network was also upgraded into a star configuration with 2 new Intellution Fix HMI nodes for added redundancy.

The HMI database and screens were updated to provide control for new areas of the plant as well as

increased functionality in existing areas. The entire Intellution Fix HMI system was also upgraded to provide the latest support and stability.

Three separate motor control centers were configured to use DeviceNet to communicate to E3 Plus overload relays and several soft starts. The motor control centers then used CN2DN modules to communicate using ControlNet to the new PLC. This allowed information such as motor current, frequency of starts, and trip status to be collected and trended.

Uninterruptable power supplies were also installed at each PLC cabinet to provide ride-through during power outages, as well as power filtering, and surge protection for sensitive electronics.



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### System Specifications:

- 2 Intellution Fix SCADA Nodes
- 6 SixNet Industrial Ethernet Fiber Switches
- 3 120VAC Uninterruptable power supplies
- 1 Allen-Bradley 1756-L62 Processor
- 3 1756-CNB/E ControlNet Modules
- 1 1756-ENBT/A Ethernet Module
- 4 PowerFlex 700 Vector VFDs
- 3 SMC Flex Soft Starts
- 58 E3 Plus Overload Relays with 232 Digital Inputs and 116 Digital Outputs
- 224 Digital Inputs
- 160 Digital Outputs
- 128 Analog Inputs

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