



A Rockwell Automation Company

Obed Mountain Coal Thermal Coal Preparation Plant

The Client:

Union Oil of Calgary proceeded in 1982 to develop a 3 million metric tons-per-year open pit coal project. Obed Mountain Coal is located near Hinton, Alberta, 200 miles West of Edmonton. The project was completed on schedule

on August 5, 1984. In 1989 Luscar Sterco Ltd. purchased the property and continues to operate the facility producing thermal coal.

The Requirement:

The decision was made early on in the design of the Coal Preparation Plant to maximize automation of the Plant. The entire Plant is controlled from a central control room applying modern process control and operator interface technology. Motor control forms the bulk of the control, with instrumentation a smaller portion. Because the plant is essentially a single contingency system, high reliability was required in the design. Very detailed alarm annunciation is provided to minimize recovery time in the event of failure.

The power system is designed to be fed off of 2 - 25kV mine distribution lines as a double ended front end. 4160V and 600V distribution voltages were to be standard with as much

equipment located indoors as practical. Emergency generation was to be provided to facilitate emptying of all critical coal fire areas.

In 1994 a control system upgrade was undertaken. The original design included Advisor graphic terminals which were becoming obsolete and required replacing. As ease of use was to be an important part of a graphics system update, the new graphics had to be similar to the existing screens. The System had to interface to the existing PLC-3 programs and data file structure and still maintain 1 to 2 second updates.

The Design Solution:

The selected PLC solution selected was Allen Bradley PLC-3 processors in a redundant configuration. The control PLC-3 CPU utilizes Hot Back-up connected via a high speed parallel interface. The PLC-3's interface to 4 independent stations and functional keyboards. One data highway is dedicated to color graphics units to optimize the response for operator interface. A second data highway communicates to the remote PLCs.

The plant graphics are designed in a hierarchy with the layers including: overviews, process area graphics, power and control system monitoring, analog faceplates, and analog or loop parameter adjustments. All motors, valves, and other devices can be addressed individually from any keyboard or in groups. The operator has access to all analog information including: trending, loop tuning, and alarm adjustments. Extensive motor control alarming is provided with individual alarms and status for Control Power "on", HOA in Auto, Motor Run, Local Stop, Overload Trip, and Motor Associated Process Control Devices. This extensive alarming not only aids operations in identifying failures, it greatly assisted in plant commissioning and start-up.

The power system design incorporates Allen Bradley 4160V

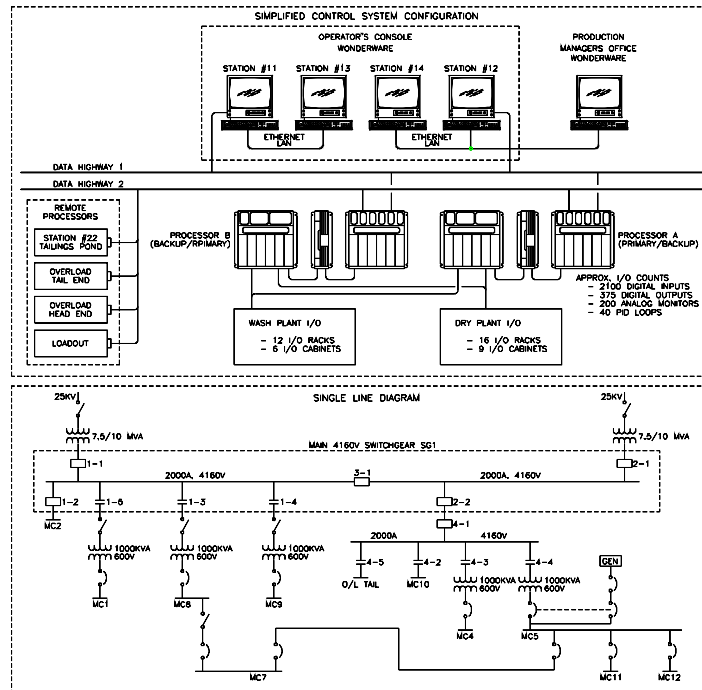
and 600V MCC lineups. MCCs are mounted adjacent to I/O cabinets to facilitate the extensive motor control I/O wiring. The installation incorporates the first Allen Bradley 5kV Vacuum Contactors. Early versions of 7 electronic 600V reduced voltage starters ranging in size from 10 to 300HP are also installed.

For the upgrade an IBM-PC personal computer platform was chosen to run the Wonderware Version 5.0 for Windows software. Utilizing a mouse in conjunction with Windows 3.11, ease of use is maximized. The PC was chosen to have 16MB of RAM and to have a 486DX2-66MHz processor. Sutherland-Schultz 5136SD cards were used to connect each of the two main nodes to the existing data highway. This system the detailed alarm structure and provides great flexibility in the graphics screen layout. Also, a display hierarchy was adopted with 12 main screens with analog displays, analog loop control and start/stop control in pop-up windows activated by a mouse click on a control element. All control functions, alarming and trending are accessible from any of the four stations.



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System Specifications:

- Redundant Allen Bradley PLC-3 Processors
- Beta Test site for PLC-3 Redundancy MX Module
- 28 I/O Racks
- 2,100 Digital Inputs
- 375 Digital Outputs
- 200 Analog Inputs
- 40 PID Loops
- Data highway Connections to 2 PLC-2/15, 1 PLC5/30, 1 PLC 2/20
- 2 Wonderware nodes with identical databases of 5000 tags. 2 additional w/w Nodes connected VLA Ethernet LAN.
- 12,500 Connected Horsepower
- 4 NEC IBM-PCs c/w 16MB of RAM, 420MB SCSI-II hard drive, 17" NEC Multisync monitor, keyboard, mouse, Colorado 120 MB tape backup, Windows 3.11
- 2 SS5136SD I/O cards and driver software for data highway connection
- 2-7.5/10MVA 25kV-4160V transformers
- 5 Indoor Silicone Oil 1,000kVA 4.16kV/600V transformers
- Initial Installation of Allen Bradley 4160V vacuum Contactors
- 300HP Solid State Reduced Voltage Starters
- 3 - 150HP Variable Frequency Drivers

For further information or to contact a Hinz office near you, please check our website at:

www.hinz.com