HINZ
A Rockwell Automation Company

Luscar Line Creek Mine
Control System Configuration

The Client:

Luscar Limited is one of the largest coal suppliers in North America. Luscar operates 11 surface mines in Saskatchewan, Alberta and B.C. Luscar produces approximately 40 million metric tons of coal annually for both domestic and international markets.

One of the mines owned by Luscar is the Line Creek Mine, located in Southeastern British Columbia, 27 km north of the town of Sparwood, B.C in the front ranges of the Rocky Mountains. The mine was first opened in 1981 and produces 3.2 million metric tons of metallurgical coal and 0.6 million metric tons of thermal coal annually. The mined coal is conveyed to the plant via a 10.5-km conveyor and is stored in one of five raw coal silos which allows the coal to be blended to meet customers specifications. The coal is crushed, cleaned and dried in the plant and then shipped via rail to the West Coast to be sold in overseas markets or shipped to the Thunder Bay terminal to be sold in North American markets.

The Requirement:

A Modicon PLC control system was installed at the Line Creek Mine in 1981 when the process plant was constructed. The PLC system consisted of redundant 984-785E PLCs for the Metallurgical plant and similar redundant 985-785E controllers for the Thermal plant. The plant was operated from a main control room containing a control panel. The control panel contained a large number of start/stop pushbuttons for motor control, stand-alone loop controllers for PID control and chart recorders for trending data. All plant alarms were annunciated on a line printer run by ASCII modules in the PLC system. A number of PanelMate graphic displays were also used for plant status and alarming.

The requirement was to remove the main control panel and to move the PID controllers into the PLC.

The Design Solution:

The solution was to design a control system upgrade path that met the short term needs of removing the control panel and loop controllers as well as providing an upgrade path for all PLC equipment in the plant and movement to an Ethernet network for PLCs and HMIs. The upgrade is to take place in a number of phases. The first two phases have been completed and consisted of upgrading the Thermal and Met plant controls.

The first phase was to upgrade the Thermal plant control system. Two Wonderware HMIs were installed containing all Thermal plant graphic screens that were created with input from the plant operations staff. The graphic screens replaced the buttons/lights/loop controllers on the main control panel. A new PLC rack was added to the existing PLC system containing all analog loops associated with controlling the Thermal plant. All analog signals were displayed on the graphic screens and PID faceplates were created to replace all stand-alone loop controllers. The existing PLC program was modified to replace the hardwired start/stop buttons with the new start/stop commands from the HMI. PLC programming was also added for alarming motors, process analogs and any other alarms generated in the plant. This allowed for the removal of the ASCII module, alarm printer and PanelMate screen.

The new system was installed during a four-day shutdown where all analog wiring was switched over to the new PLC rack, the HMI system was installed and all equipment was commissioned.

The second phase was to upgrade the Met plant control system. The process here was similar to the one followed in the Thermal plant. Two more Wonderware HMIs were added to the existing HMI system. Screens were created for all Met plant process areas. New PLC racks were added to the existing PLC system to add all Met plant analogs to be wired to the Met PLC. All analog signals were displayed on the graphics screens and PID faceplates were created to replace all stand-alone loop controllers. The Met PLC program was modified to replace the hardwired start/stop buttons and to add PID controllers for all control loops. PLC programming was also added for motor alarms, process alarms and other alarms generated in the plant.

The Met plant control system was upgraded during a four-day shutdown where all analog wiring was switched over to the new PLC racks, the new HMIs were installed, the control room was moved and all equipment was commissioned.

Future phases include an upgrade in the loadout area, an upgrade in the breaker area and replacement of all Modicon 200 series I/O with Quantum I/O.

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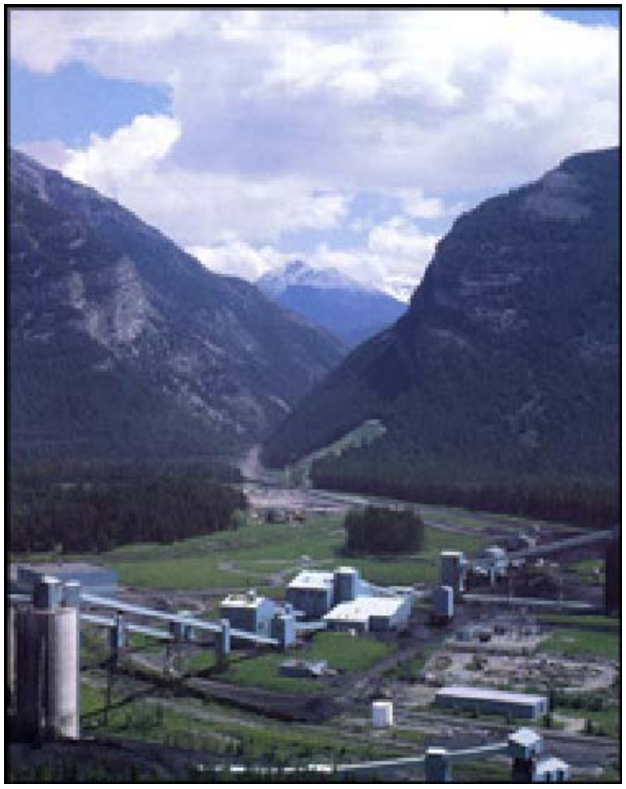

System Specifications:

Thermal Plant

- Redundant 984-785E Processors
- 15 Racks of I/O
- 1800 Digital Inputs
- 900 Digital Outputs
- 56 Analog Inputs
- 12 Analog Outputs
- 5 Wonderware Nodes

Met Plant

- Redundant 984-785E Processors
- 14 Racks of I/O
- 2000 Discrete Inputs
- 600 Discrete Outputs
- 120 Analog Inputs
- 44 Analog Outputs

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

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