HINZ
A Rockwell Automation Company

Gregg River Resources
Control System

The Client:

Gregg River Resources operates an open pit coal mine, adjacent to a coal preparation plant located approximately fifty (50) kilometers south of Hinton, Alberta. The mine has a long standing reputation for high quality coking coal.

The Requirement:

The original mill was built by McNally Pittsburg in 1981-82 with controls implemented by large pushbutton panels, wall mimics, relay interlocks and pneumatic loops controllers. The control system was working reasonably well but had three problems. The existing control room was located in the middle of the washery plant, which resulted in excessive noise and vibration for plant operators to work in. The existing pneumatic loop controllers and level transmitters were difficult to maintain and sourcing of spares was becoming difficult. The third and most important problem was the level of loop control being provided by the existing system. This instrumentation was used to provide control of the specific gravity in the heavy media circuits. A new control system would be capable of obtaining a tighter degree of control on the heavy media coal circuits, thus reducing the amount of magnetite being used by the process. These savings alone were the main justification for the controls upgrade.

The Design Solution:

Gregg River Resources already had two (2) Allen Bradley PLC 2- 30's installed in the plant and therefore it was decided to use Allen Bradley PLC 5 processors in the new control system configuration. In addition to the existing PLCs, two (2) color graphic terminals were in use on site for approximately two (2) years. Thus the plant personnel were comfortable with automated systems, and had a relatively clear vision of the control functions and alarming techniques that they would like to see on the new system.

Hinz was commissioned to implement a control system study. The scope of the study was to identify problems associated with the new control system and recommend an appropriate generic control system configuration. The study conclusions identified a desired control system configuration, possible project phasing and budget pricing for approval purposes. Once the project was approved, Hinz was engaged as the controls/electrical consultant.

An on-site Gregg River project manager was established to supervise and coordinate consultant design functions, procurement of hardware by Gregg River and installation by Gregg River electrical crews.

Approximately 120 motors and 10 loops were to be controlled by the PLC control system, with fairly detailed status and alarm annunciation. An Allen Bradley PLC 5/250 was configured as the main PLC providing control over all discrete applications. A PLC 5/15 was configured in adapter mode to pass all of its I/O states to the PLC 5/250 while providing logic control of all analog functions. A networked version of factory link was used so that communications on the Allen Bradley DH+ could be kept to a minimum. Since all communications between the graphic stations would be handled by the network the system response could be maximized at one to two (1-2) seconds even with four (4) graphic stations in place.

IBM industrial 80386 CPU's were used for the graphic hardware due to the initial environmental service conditions. These units were placed in an MCC room in Nema 4 cabinets surrounded by extreme dust and vibration. Once the system was commissioned the graphic CPU's were relocated to a clean and friendly office environment. Conventional office furniture was used for the control console due to the flexibility it offered for future modification.

The complete system was commissioned over three (3) phases to reduce downtime to a minimum. Two (2) regularly scheduled summer shutdowns and one (1) Christmas shutdown (1 week each) were used. The plant startup was extremely smooth, with very few

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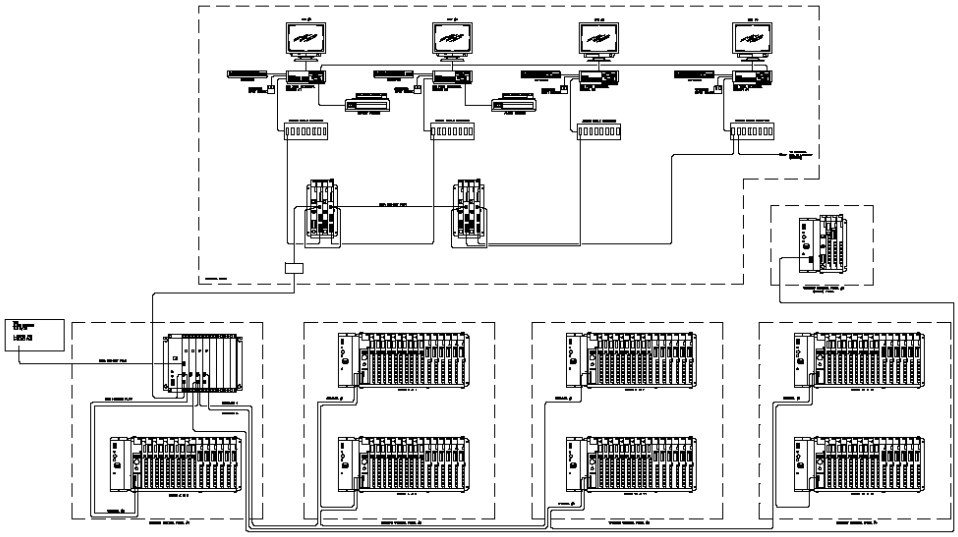

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problems.

The Gregg River Resources system provides control for the washery plant consisting of approximately 1225 DI, 232 DO, 94 AI and 10 AO. The PLC system was to be comprised of one (1) PLC 5/250 implementing the motor control and one (1) PLC 5/15 operating in adapter mode to the PLC 5/250. All analog and loop control were handled by the PLC 5/15 providing fast loop updates and also preventing any delay in the digital logic execution that would have been present if the PLC 5/250 executed all of the process logic. All communications to the plant MMI by the PLC were handled through the PLC 5/250. The MMI system selected was a four (4) station networked version of FactoryLink running on industrial IBM 80386 computers. One of the plant HMIs was assigned the task of communicating with the PLC 5/250. All of this information is then passed to the other three (3) HMIs via an IBM token ring network operating at 16Mb. Another MMI will be assigned the task of communicating to the existing dryer PLC 2/30, when it is added to the FactoryLink system at a future date. A networked graphic system was selected so that the DH+ highway traffic could be kept to a minimum. Each operator interface station has the ability to control all areas of the plant independently, while reflecting changes made to equipment states initiated from any one (1) of the four (4) stations. The graphics design incorporates a Hierarchical layout allowing the operator to move from an overview screen providing minimal control, down to detailed graphics screens with extensive control and alarm identification. The existing system has thirty-seven (37) graphic pages, however this will increase when the dryer plant is added in the near future. The plant is operated through the use of mouse control, keyboards are used in the configuration mode only.

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

www.hinz.com