Anglo Coal Mining

Innovative control solution increases efficiency for world-class coal mine

Conveyer at Moranbah North, Queensland

Anglo Coal Australia is a wholly owned division of Anglo American plc, a global leader in mining and natural resources, with coal operations in Australia, South America and South Africa.

Moranbah North, situated deep in the coal belt of central Queensland, is an underground operation, with coal mined from approximately 200 meters below the surface. Occupying over 100 square kilometers, the site began as a greenfield site for Anglo Coal Australia and contains a number of innovations in its automation system.

The Challenge

At the outset of the project, Moranbah North envisaged a control system that would provide more flexibility and increased mobility for operational staff by allowing fast access to maintenance documentation.

This vision required technologies more commonly used in business rather than in mining environments. The solution also had to have the durability and flexibility to integrate with the mine's expansion plans for the coming 10 years.

The Solution

The solution was based on CitectSCADA's localized redundancy capacity, tailored to the challenges associated with relaying data between above-ground and below-ground operations. The control system alleviates manual monitoring of site equipment at various locations around the mine.

With dual network cards, redundant connections are enabled for each computer underground. Two redundant CitectSCADA servers reside on the surface to facilitate the relaying of vital production data.

The Challenge

To build an automation system that would employ the latest technologies, to increase efficiency through staff mobility and flexibility.

The Solution

An innovative control solution utlizing CitectSCADA focused on localized redundancy accomplished the immediate goals of the mine, as well as offering the flexibility to meet the operation's expansion plans.

The Benefits

CitectSCADA's redundancy ensures system reliability while increasing efficiency. In addition, CitectSCADA's user-friendly web interface allows maintenance and operations personnel to access information to any site from anywhere. This has greatly increased flexibility and productivity.

CitectSCADA

Case Study

Moranbah's conveyor

Vent fans

Each CitectSCADA computer underground operates as a standby I/O server for its local PLCs. If the communications linking the two surface servers fail, the underground CitectSCADA station instantly takes over data acquisition tasks for the local PLCs.

Localized redundancy is used to overcome reliability issues associated with a single network path running from the surface to underground. As it is not advantageous to run redundant cables in such situations, a single network link is used instead.

The SQL Server on the surface retrieves data from the CitectSCADA historical databases. Information such as responses, operator actions, production statistics, alarms, events and production trends are sampled every 30 seconds.

This information, stored on the SQL Server, is published via a web interface. This allows access to production and downtime information by any authorized personnel on the Anglo intranet – anywhere from the site itself to Anglo's Brisbane or Melbourne offices.

The web interface is also used to publish maintenance and operational information to the field personnel, both above and below ground.

The Benefits

Web documentation available at any CitectSCADA station nearly eliminates the time spent traveling between the underground and the surface for maintenance documentation.

With increased visibility of vital production data, operations and maintenance teams are able to work together more efficiently. Personnel can view the status of the entire site from any location and, in some instances, perform control from remote locations. This greatly reduces the travel requirement between locations and increases the mobility and flexibility of personnel on site.

Additionally, Anglo Coal's control system has been designed to require zero engineering modifications for an initial 10 year period. All processes requiring modification during this time frame have been designed to accept configurations in runtime from process rather than engineering personnel, optimizing costs for Anglo Coal.

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