BMA Saraji Mine

Keeping In Control

Results:
- Reliable automated system has vastly improved security
- Introduction of real version control facilities
- Centralized storage of all critical files
- Improved access to critical code
- Audit process to track control system changes
- Payback for system implementation through improved production downtime is expected to be less than six months

Proficy Change Management Solves Maintenance and Engineering Software Management Issues

Coal is one of Australia’s most important minerals and BHP Billiton Mitsubishi Alliance (BMA) is Australia’s largest coal miner and exporter, and the world’s largest supplier to the seaborne coking coal market. BMA is a 50/50 alliance between the world’s largest diversified resources company and the world’s largest general trading company. Combined, the two owners employ more than 84,000 people and have operations in more than 80 countries.

BMA was formed in June 2001 as a partnership between BHP Billiton and Mitsubishi Development Pty Ltd, under which the two companies share equal ownership and management of eight Central Queensland coal mines - Goonyella Riverside, Broadmeadow, Peak Downs, Saraji, Norwich Park, Gregory, Crinum and Blackwater and the Hay Point coal export terminal near Mackay.

Construction of the Saraji open cut coking coal mine near Dysart, Australia, began in late 1972 and production commenced in the latter part of 1974. The open cut method of surface mining consists of breaking up large masses of ore-bearing rock and then removing it from the mine. While the effect on the landscape is more severe in the short term, according to the World Mining Association, recovery of the resource is much more efficient, generally about 85%. Coking coal is used to make coke, which is an ingredient in steel production.
Saraji has a current production capacity of 6.5 million tons of high grade coking coal a year with current production set at 5 million tons per year for a 7-day per week operation. Saraji Mine is located 24km south of Peak Downs mine and 213km south west of the Hay Point coal export terminal. Saraji mines the Dysart seam, which lies within the Moranbah Coal Measures, ranging from 4m to 6m in thickness. Saraji coking coal is sold to South and East Asia, Europe, the Americas and India.

The Problem

The mine operators utilize a variety of PLCs, including GE Series 90-30 PLCs to control draglines, as well as Allen Bradley SLC500 PLCs to control shovels and fuel farms. GE’s Proficy* HMI/SCADA - CIMPLECTIVITY in operator cabs provides a view of the process in real time.

Traditionally, BMA Saraji Mine carried out all PLC and SCADA project maintenance manually. Hopefully after a new change had been made and downloaded to the equipment, somebody would save the new copy in the appropriate place. Unfortunately this sometimes would not happen, making it difficult to track changes to projects and keep the correct copy of those projects.

The company came to Automation IT (AIT) for help in rectifying this situation. Automation IT’s areas of expertise include industries such as power and energy, mining, water and wastewater, and food and beverage. The company has a proven knowledge of control systems and frequently works with various vendors, such as GE Intelligent Platforms on customer implementations.

The company was asked to address the problem by providing BMA Saraji Mine with an automated system that had the following capabilities:

- Increased plant uptime
- Improved engineering processes
- Reduced costs of engineering and maintenance
- Improved safety, security and regulatory compliance
- Protection of key information assets
- Increased flexibility
- Centralized storage of PLC/SCADA projects
- PLC/SCADA project version control

Using the GE Proficy Change Management software and the Automation IT custom front end, AIT worked along side Saraji site engineers to design, install and commission GE Proficy Change Management at Saraji Mine.

AIT designed a system to solve Saraji’s maintenance and engineering software management issues including the integration of several custom additions to Saraji’s Change Management System. These included a custom report tool, site-specific navigation between PLC/SCADA projects using HTML Factory Layouts and custom project scripts, using the solutions and enhanced flexibility that Change Management provides.

Proficy Change Management assists in monitoring software and data assets, protecting against device failure or operator error and meeting government regulatory requirements. With Change Management’s centralized storage and client server system, plant information is backed up and available so you can be sure your system is running smoothly and safely.
Server / Client Layout

Saraji Mine has positioned the Change Management server in a central office to give users the ability to work on projects on the server directly or from any of the clients located on the draglines, which remove the overburden (soil and rock). This site layout also gives users the ability to diagnose problems from the server without lengthy drives to the draglines, saving time and money.

Version Control ensures only one person at a time makes changes to the system and archives the versions when the changes are made. It is possible to revert to previous versions or set an earlier version as the ‘Master.’ If unauthorized changes are made directly to a PLC, it is easy to restore a previous version to keep operations running.

All projects, settings and other files that can be modified by users are stored on the Change Management server.

Users work on Change Management clients with projects retrieved from the server via the ‘check out’ process. This is often referred to as a local copy of the project or file. Users modify the local copy, then return it to the server via ‘check in.’

If Change Management detects a change to the project an option is given to assign the new version as the project master. The previous version is archived but can be recalled at a later date.

Access Control is a security tool that allows controlled access to both the server and projects. It is used to set privilege levels applicable to users for all server settings, PLC and SCADA projects and files. As an example, PLC user restrictions can be individually set for upload, download, set forces or modify logic, etc.

At Saraji, users were separated into groups to define which runtime operations could be performed on each type of PLC, etc. Problems such as downloading an incorrect program to the PLC were eliminated.

The Scheduler automates repetitive tasks associated with maintaining industrial projects. Saraji’s scheduled tasks include the monthly backup of all of the latest versions of both PLC and SCADA projects as well as PLC compares. A comparison report between the latest version of a dragline project and the logic actually in the dragline PLC is compiled in graphical format. Differences are automatically emailed to the system administrator as well as a log file describing any problems with scheduled tasks.

Tracking Progress

The Audit Trail tool is designed to help track actions performed within the automation and control system. Actions are triggered by a user or by the project being monitored. These actions are recorded in a database and can be accessed to generate a report. The reports used by Saraji Mine include:

- Change Management server log in / log out
- Projects managed by Proficy Change Management
- Server status and scheduler additions

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AIT's custom report tool provides access to records stored in the database and advanced search facilities exist for each report. Other features of the AIT Report Tool include:

- Past search results
- Obtain copies of backed up projects
- Clear / backup Audit Trail database
- Access to scheduled compare results

The AIT Report Tool is not only available inside the Change Management environment but can also be run independently.

In addition, factory layouts have been configured at Saraji to organize projects for ease of access. Engineers, technicians and other users gain access to the projects using the customized layouts.

AIT developed the factory layouts to replicate the site layout, allowing site electricians to use Change Management without any complex navigational environments. Anyone who can surf the web has the skills necessary to use the system.

Retrieving the latest version of a PLC or other program is as easy as point and click!

Using the Proficy Change Management software, Automation IT delivered a solution to the long-standing issue of software management for Saraji Mine.

The final result is a reliable and automated system that has vastly improved security, introduced real version control facilities, centralized the storage of all critical files, improved access to critical code and introduced an audit process to track control system changes.

Payback for the system implementation in terms of improved production downtime is expected to be less than six months.

About Automation IT

Automation IT (QLD) was incorporated in 2000 and is located in Springwood, Australia approximately 12km south of Brisbane. From here a team of professional engineers provides automation solutions to companies throughout Australia and overseas. In 2002 AIT achieved ISO9001:AS2000 Quality Assurance certification. This recognition was further enhanced when the company was nominated for the IEAust Engineering Excellence Awards for its Turnkey project at Noosa’s Waste Water Treatment Plant. AIT’s areas of expertise include industries such as power & energy, mining, water & waste water and food & beverage. Proven knowledge of control systems has provided AIT with System Integration Agreements for GE, Allen-Bradley, Citect and Schneider (Modicon).

Contact Information

Phone: +61 7 3299 3844
Fax: +61 7 3299 3866
Web: www.automationit.com

About GE Intelligent Platforms

GE Intelligent Platforms, a General Electric Company (NYSE: GE), is an experienced high-performance technology company and a global provider of hardware, software, services, and expertise in automation and embedded computing. We offer a unique foundation of agile, advanced and ultra-reliable technology that provides customers a sustainable advantage in the industries they serve, including energy, water, consumer packaged goods, government and defense, and telecommunications. GE Intelligent Platforms is a worldwide company headquartered in Charlottesville, VA and is part of GE Home and Business Solutions. For more information, visit www.ge-ip.com.