Asset Utilisation

Leveraging real-time location data to improve productivity

Longwall Relocation

A longwall relocation is a strictly planned and controlled process. Adherence to the plan is critical to complete the move within the shortest possible timeframe. Any deviation from the plan or schedule can delay completion and affect production.

Business Challenge

A Queensland coal mine's review of previous longwall relocation projects indicated that significant benefits could be realised by improving compliance and visibility of operations.

Checking and reporting the location of Powered Roof Supports (PRS) was a manual process performed by a person exclusively assigned to this task.

The Control Room Operator responsible for managing the longwall move recorded PRS movements on paper after the information reached the surface. This meant that non-conformances were only identified after the fact, resulting in poor utilisation of personnel and assets. Even implementing a dedicated Longwall Move Control Room did not improve matters as it still relied on a manual process.

In reviewing these inefficiencies, the mine was able to identify two critical aspects that could improve the process. To make proactive decisions they needed to know the real-time location of personnel, PRS, PRS Transporters, loaders, tool carriers, forks, baskets and other critical assets. In addition, they needed improved voice and data communications to manage deviations from plan to minimise delays and downtime.

Executive Summary

Objectives

- Proactive management of longwall move and adherence to schedule.
- Increase operational efficiency.
- Visibility of personnel, PRS and critical assets.
- Improve communications between key personnel.

Solution

- All PRS were tagged and numbered.
- MineDash provided real-time monitoring of movements.
- MineDash applied business rules to report non-conformances.
- Real-time reports, alerts and alarms via email, voice and MinePhone texts.
- CABA & DPM access control, and visitor management streamlined.

Results

- On-time relocation of longwall.
- No "lost" PRS's.
- Visibility of vehicles and equipment.
- Eliminated communication delays.
- Reduction of breakdown delays reduced.

Solution

The coal mine deployed MST's MinePhone and Personnel & Asset Tracking system. MST transformed location data into meaningful information for faster and more effective decision-making; directly contributing to improving achieving specific business objectives for the longwall move.

MST's MineDash, control room software, provided real-time visualisation, reporting and management tools to drive proactive decision making and adherence to plan. Together with the deployment of MST's MinePhones, communication was transformed, both between personnel underground and between personnel underground and surface personnel. Mobile communications and immediate access to information meant that decisions could be made quickly to reduce delays and maintain productivity.

Methodology and business rules

MST assisted the mine in fitting the tracking tags to all PRS and other key assets. (Figure 1) Each of the PRS had a specific route and destination; some going to the new face, others to an underground workshop, and others to the surface. MineDash was used in the Control Room to monitor real-time progress.

MST and the mine worked together to build business rules for the process. Any exceptions to PRS paths and travel times were quickly identified and signaled by MineDash as non-compliances using visible and audible alerts on the MineDash screen. It also communicated with personnel via rule-based emails and MinePhones. Divergence from the plan could be quickly and proactively corrected.

Results

During the first use of the solution, the mine successfully completed the longwall move two days ahead of schedule. According to the mine, it produces 24,000 tonnes per day @ $114/tonne, and so the new solution saved $2.7M of production and two days of labour costs. Identifying and remedying issues quickly ensured high levels of productivity.

It provided information, which they used to plan more effectively in subsequent longwall relocations, which resulted in further time efficiencies.

The investments in tracking and communications technologies provided successful monitoring, reporting and proactive management tools which functioned as core support systems for the longwall move. This project delivered a performance baseline for planning future longwall moves. The mine now has a documented benchmark for measuring efficiency and maintaining a cycle of continuous operational improvement.

PRS tracker tag installed here

Figure 1 – PRS were tagged and numbered. Location data was used to provide insight into longwall move operations.