

Queensland Mining Industry Health and Safety Conference

Safety Innovation Award Application

Company: Peabody Energy

Site: North Goonyella Mine

Innovation: No Hassall Magnetic Drill Holder

Presenters: Chris Hassall (Development Mechanical Engineer) & John Deacon (Development Superintendent)

1. The Problem

Risk of operator injury whilst bolting using Continuous Miner.

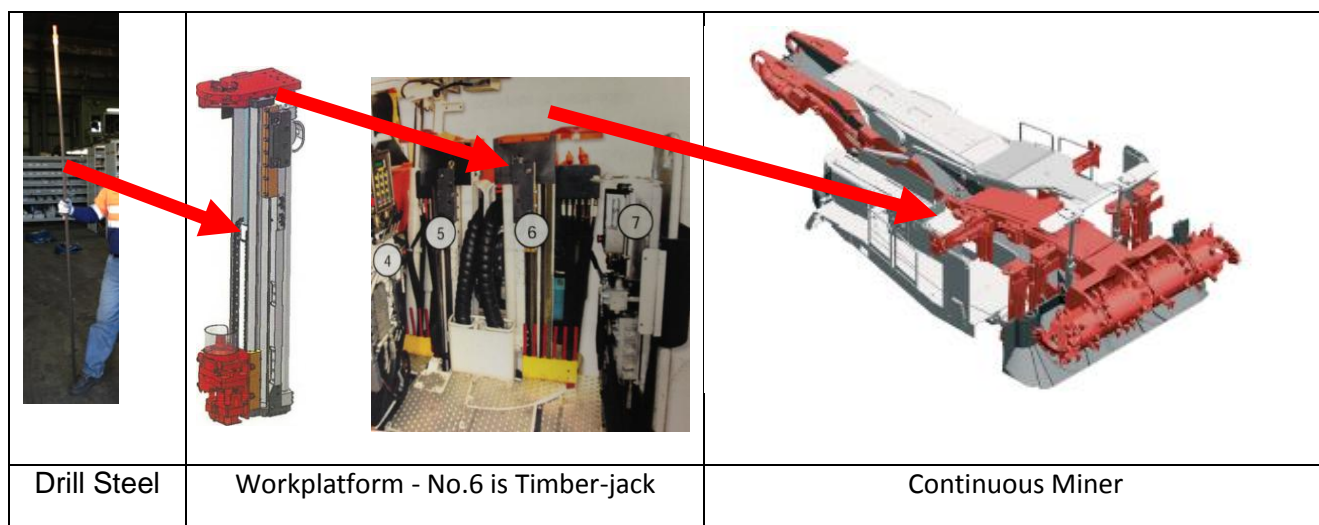
On the 28th August, 2012 an operator was operating the roof bolter on the continuous miner at the development face of North Goonyella Mine.

The operator rested the drill steel on his foot, he began to lower the timber-jack. The drill steel was caught under the lowering timber jack pushing the steel into the person's. Peabody maintains a strict requirement for metatarsal boots to be worn at all sites, however despite this, the force was sufficiently strong enough to crush both the metatarsal-protecting layer and the operator's right foot, causing fractures to the bones in his right foot. The operator was only able to remove this foot by raising the timber jack back up.



The investigation revealed that it was common practice for operators to rest the drill steels on their feet and other underground mines had seen similar injuries resulting from this practice before.

The findings of the incident investigation were shared with the operators to raise awareness and generate discussion about why operators commonly rested the drill steel on their feet and



what could be done prevent it a similar incident re-occurring.

The feedback from the operators confirmed it was common industry practice for drillers to rest the drill steel on their boots to stop coal dust and debris blocking up the drill steel water port. The incident confirmed the likelihood that when the timber jack is lowered it can catch the drill steel and press it down onto the operators boot. Post-incident investigations concluded this type of incident had already resulted in several injuries within the industry, and furthermore was highly likely to cause more serious injuries unless something was done about it.

Studies have concluded that roof bolting is the most dangerous job in underground coal mines. (Burgess-Limerick)

2. The Solution

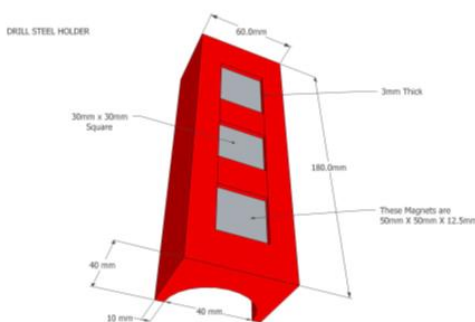
Determined to address the issue, Peabody’s NGC Development Mechanical Engineer, Chris Hassall consulted with the operators to generate ideas of how it could be solved in consultation with the operators. Several earlier concepts were developed and tested using clamps and brackets to secure drill steels but they weren’t readily adopted by the operators, mainly due to the fact that they weren’t practical.



Finally the concept of the Magnetic Drill Holder was devised and Chris set about designing it and getting it built. It seemed like it would be successful because it was simple and allowed the operators to readily move it around around to a convenient spot as it was magnetic. The main issues with the clamps and brackets concept that failed, was they got in the road and couldn’t be moved. The magnetic drill holder was basically a bit of polyurethane shaped to fit the drill steel with large magnets in the back. This allowed it to be easily mounted on the machine, easily moved and provided a fast and effective storage medium. You just place the drill steel onto it and it holds it there in place. The operators successfully trialled the unit and requested more units for the other continuous miners.

3. Application of Risk Management Principles

To ensure that no new risks were introduced by this concept a risk assessment was performed with the operators before it was used. This highlighted the need to fully evaluate the strength and distribution of the magnets to ensure it is was capable of holding the weight of the drill steel to ensure it would drop.



The original prototype was a flat round plate with a single magnet in the back. The risk assessment process identified that it would not be strong enough to hold the drill steel in the working environment and it would be prone to getting knocked off. It was enhanced to the cupped shape with three magnets to overcome this shortcoming. The potential pinch points were identified

and re-designed out to eliminate this risk.

The mine's change management process was also used to ensure it was implemented appropriately and that no new risks were created by the introduction of this tool.

4. Consultation Process

The operators and fitters were initiated presented with the problem and regularly consulted to generate ideas; the ideas that were generated were discussed with the other crews and then trialled if they seemed like possible solutions. The workforce was also involved in the risk assessment processes.

5. Benefits and Effects

The benefits have been very positive, most importantly operators are using it and not resting the drill steel on their feet anymore. There has been a decrease in production stoppages due to the water ports are not blocking up, which has helped improve development metres. Increased productivity and improved safety makes it a win-win.

The added benefit has been the way the innovation has been altered to improve safety and practicality for a range of other tasks on-site.

The key ingredient for the success of the '*No Hassall Magnetic Drill Holder*' is not only that it makes the workplace safer, but also its simplicity, versatility, easy to use, practicality, cost effectiveness. Both operators and maintainers love it.

6. Transferability across industry

Research indicated that most underground miners rest the drill steel on their foot, so the risk is apparent at all underground mines. All mines could benefit by installing this simple innovation. It has already been shared it within Peabody Energy and will be shared organisationally by nominating in the Peabody Energy Global Safety Innovation later this year.

A further indication of the versatility of the concept is that other workgroups have seen and adapted it for variety of other uses through-out the mine; such as dolly holders and tools. The innovation is equally useful to Open-cuts as it is for underground mines.

Contractors at the mine have even indicated that they are getting similar items made which will help transfer the innovation across the Bowen Basin.

Some of the examples of other applications that it has been adapted for at NGC include a portable water spray. Just stick it to the steel structure, connect the hose and an instant water spray is installed. These have been very well accepted at the mine. The mine is also in the process of installing one of these portables sprays on the tail of the miner to allow reticulated water to spray onto the coal as it goes onto the tail of the miner. This is will reduce water wastage and coal dust.



Bottom View: Portable Water Spray



Top View: Water Spray



Dolly Holder

7. Innovation and Originality

The innovation was totally original being developed in-house. The challenge was put to the crew to brainstorm possible solutions to eliminate the risk. All of the interaction and designing was done in-house, with the final concepts taken to a manufacturer in Mackay to be made.

8. Cost

JSIS, a local firm in Mackay was engaged to create the initial prototype which cost \$400 for the original mould and then \$200 to manufacture of each one.