



Vale Mining Technology and Innovation

PVC Lifter Installation Solution

Moving Operators away from Seismic Hazard

Rock Bursts are challenges which are continuing since decades and have led to the loss of life, hampered production continuity and impacted many across the industry. In response to these challenges and as pro-active proponents of delivering social, stakeholder and stockholder value, Vale has undertaken efforts to better understand the causes of hazard and potential solutions around eliminating operating hazards in the mining cycle and is compelled to re-examine current practices and take stronger steps to achieve a zero-harm safety goal.

Context and Background

Keeping lifter blastholes that are drilled at floor level cleared in development headings is one of the key tasks in the drilling and loading process. As lifter blastholes are often buried under material that falls from the development heading during the drilling process, it is common practice for the jumbo operator to insert a one-to-two-meter length of polyvinyl chloride (PVC) pipe in the collar of lifters after they are drilled to protect the collars and make them easier to find following completion of the drilling cycle.

Clearing the lifter blastholes usually involves pumping out any accumulated water (in down gradient headings particularly) and manually shoveling or scraping away accumulated material from the drilling process. Lifters can be charged through the PVC pipe, using either pumped emulsion or cartridges.

Problem definition

This problem is focused on a PVC tube insertion capability. There is currently no commercialized solution that addresses inserting PVC tubes into lifter holes without an Operator approaching the face to complete this task. Further investigation and investment are required to bring a solution to market for PVC tube insertion.

Scope and Scalability

Potential adoption at ~7 Operations

PVC Tube Dimensions: L: 1-2m; W: Assuming holes are 38 mm (1.5”).



Solution Parameter Requirements

- Ability to prepare and install PVC lifter tubes with no human intervention from at least 5m from the working face.
- Have capabilities for future automation/ tele-remote operations.
- Be easily mounted and installed with low maintenance.
- Should ideally be mounted on an OEM agnostic platform.
- Low training requirements.