Twin strand cables replaced with Falcon Bolts at Tomingley Gold Operations

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ABSTRACT

Cable bolts are a staple in most Australian underground mines, offering a cost effective and highly capable ground support option that can achieve deep embedment lengths. While cable bolts are versatile, their installation can be challenging, with installations either completed manually or utilising a variety of mechanised bolting machines. Manual installations are inefficient and highly labour intensive, applying pressure to the development cycle and exposing personnel to risk of injury. A range of mechanised cable bolting machines are available that can circumvent these disadvantages, however the initial capital investment and ongoing maintenance of a fully mechanised cable bolter as well as physical restrictions in mine design may compel mining operations to pursue alternative options.

This case study, conducted between Tomingley Gold Operations and Jennmar Australia, explores the full-scale adoption of pre-tensioned, post-grouted self-drilling bolts in lieu of manually installed cable anchors for intersection support, brow support, and other applications where cable bolts are typically implemented. The data required to justify the change was collected during early trials and is also presented in this case study. The removal of cable cutting, pushing, plating and tensioning stages, as well as a decrease in reliance on elevated work platforms translated to a reduction in worker's susceptibility to injury. The grouting procedure utilises a top-down injection principle, with all cement/resin flow occurring between sealed joins. This further mitigates hazards to workers by limiting exposure to high-pressure cement flow and removing the 'wadding' process. Improvements in installation efficiency, the adoption of fast setting resins in place of cement grouts and the development of a high capacity steel provide further opportunity for schedule optimisation and rapid development.