

Use of Drone and Lidar Technology for Mapping Underground Voids

D.Woolmer¹

1. Daniel Woolmer

Senior Analysis and Improvement Engineer, BHP Olympic Dam, Roxby Downs, SA, 5725.
Email: Daniel.Woolmer@bhpbilliton.com

ABSTRACT

In 2019 BHP Olympic Dam, in conjunction with Emesent Pty, has been trialling a Lidar and drone mapping system for the purpose of surveying stope voids. This new technology utilises Simultaneous Location and Mapping (SLAM) to prevent collision between the drone and the environment while providing in flight stability. The intention of this study is to evaluate the effectiveness of this new technology in improving the quality, productivity and safety of stope void surveys in comparison to traditional surveying methods such as C-ALS and CMS systems.

During the testing period the drone and Lidar scanner have been trialled in a variety of underground settings and stopes. The results of this trial to date have shown a marked improvement in the quality of scan data, survey time and safety of underground personnel. Use of this technology has reduced resource requirements for stope surveys, allowing for personnel and equipment to be deployed elsewhere. Rapid deployment of the drone has enabled multiple surveys to be conducted during a 12 hour shift, while allowing for urgent or ad-hoc surveys to be conducted with minimal disruption to the underground operations.

After the successful trial of the drone and Lidar scanner, further work has been conducted to utilise the Lidar scanner in other configurations to fully realise the systems benefits. One such configuration was to mount the Lidar scanner to a remote operated loader. This configuration has enabled stope scans to be taken directly after production, leading to faster stope close out and increased detail in final stope surveys.