The Situation

The Jundee Gold Mine is located in the northern Goldfields region of Western Australia. The mine is owned and managed by Normandy Yandal Operations Ltd, and Orica supplies explosives via an agreement with open pit earthmoving contractor Henry Walker Eltin (HWE).

Mining Issues

A joint blast improvement process was established involving HWE, Orica and Normandy personnel. It was agreed the focus of the programs would be improved blast digability and reduced ore dilution. The work centred on the hard rock blasting areas in the Nimary 3 and North-West pits.

All of the hard rock blasting was also in wet conditions. Dewatering was performed by permanent bores located outside the pits and by temporary in-pit sumps. The groundwater problem was a significant issue to manage and had an adverse effect on both drilling and charging quality.

Technical Solutions

Orica technical services personnel initially reviewed existing site practices and established benchmark performance. This process prioritised the areas of blast design and field quality control as first opportunity for improvement.

A program of quality control audits reviewed blast videos, measured field charging performance and reconciled actual versus design powder factors. The following actions were implemented:

- Blast hole loading (hose handling) training for the blast crew;
- Development of quality control/assurance systems to ensure the design stemming height was achieved;
- Blast video review sessions with all personnel to demonstrate improvements.

Work also progressed on the refinement of blast designs, initiation timing and implementing effective buffered faces for choked firing to maintain consistent burden relief and powder factor. Other initiatives included the back filling of RC grade control holes to assist with confinement of explosive energy and improved pit floor dewatering to increase drilling quality control.

A further innovation was the introduction of the BlastPED™ remote blast initiation system as an alternative to the more time consuming and costly signal tube initiation.

The Result

The introduction of a quality assurance system produced a double benefit of reduced explosive consumption and improved blasting results. Improved consistency of the stemming length produced more effective confinement and utilisation of the explosive energy. A similar benefit was also achieved by consistently backfilling RC grade control holes. The reduced re-drill rate associated with improved dewatering has assisted with achieving effective subdrill on the bench and maintaining correct burden and spacing for overall improved blast performance.
A review of excavator dig rates from the Northwest Pit (shown below) over a 10 month period shows a significant improvement in productivity associated with commencement of the blast improvement program and other operational changes made by HWE.

The overall improvement in blast performance has reduced the generation of “toe” and reduced areas of restricted bench access. Excavation to a consistent design floor level and more trafficable floors due to effective subdrill has contributed to improved truck cycle times.

The introduction of the BlastPED™ remote blast initiation system has improved excavator utilisation and reduced blast crew labour due to elimination of delays associated with lay out and retrieval of signal tube for each blast. The system is also inherently safer and gives the shotfirer more control.

**Acknowledgements**

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