Case Study
Fragmentation Measurement to enable Reduced Drill and Blast Costs
Junction Gold Mine, Australia

The Situation
An extensive product comparison project undertaken at WMC’s St Ives Junction Gold mine, included a component of fragmentation analysis. Used as one of the measures to compare blast performances of ANFO based products verses bulk emulsion explosives.

Mining Issues
Fragmentation monitoring was considered a key product performance indicator for this project. However, for an accurate depiction of fragmentation trends, a large amount of reliable data was required over a period of months and from a number of challenging locations. Challenges included safety concerns, access restrictions, potential bogging delays and the requirement to source images from both ore passes and stockpiles.

Technical Solutions
Images were taken at the ore pass with a traditional zoom digital camera while Orica’s prototype Digital Vision System (DVS), which is new technology developed by Orica’s Mine Productivity Program, was used at the stockpile site. This system, designed for automatic acquisition of fragmentation images, has superior features over traditional methods. This enabled it to accumulate images of the stockpile 24 hours a day.

Images from both systems were then analysed using Orica’s proprietary image analysis software PowerSieve®. For accurate results PowerSieve® required these images be taken under certain conditions. These included:

- Sufficient lighting
- Good ventilation to minimise dust and fumes
- Direct line of site for camera or DVS

Results
Fragmentation was shown to change significantly according to the explosive used. The end result was that the fragmentation assessment study conducted as part of the larger product comparison project, helped quantify the benefits of converting production blasting explosives requirements from ANFO to bulk emulsion.

The financial rewards of the larger project, of which the fragmentation assessment component was an essential part, were calculated to be a 5.5% reduction in longhole mining costs.

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