

CASE STUDY

Continuous Blast Improvement with FRAGTrack™

Akyem Gold Mine, Newmont Corp, Ghana

Site Profile

The Akyem Gold Mine is a large open-pit project located in the Eastern Region of Ghana. Owned and operated by Newmont Golden Ridge Ltd, the mine employs over 450 people and mines approximately 32 Mt per annum. Newmont is committed to maximising operational efficiency and consistently looks for ways to improve blast performance whilst maintaining operational standards.

The Situation

One of Orica's core principles is to provide value to its customers. As testament to this, Orica and Newmont have been working in partnership to deliver a series of value delivery projects at Akyem. First among these projects was the trial of a higher energy bulk explosive, Fortis™ Extra, to optimise fragmentation and therefore reduce downstream costs.

The challenge for Newmont was how to baseline the current blast performance and objectively assess any potential improvements. One option was to use existing key performance indicators (KPI's) such as dig rates or crusher throughput. These metrics can, however, be influenced by factors other than pure blast design, such as machine downtime or operator skill. In the end, the existing KPI's were deemed unsuitable as the variation that these external factors introduce makes it difficult to accurately compare blasts.

Ultimately, Newmont decided that the best indicator of true blast performance was particle size distribution (PSD), particularly when measured at the point of excavation. Free from the external influences that affect other KPI's, fragmentation can only be the result of blast design, implementation and geology. To ensure reliability in the data, a large unbiased sample size was required. To achieve this with manual sampling methods would be extremely time consuming and disruptive to operations, so an automated system was the most viable option. In addition, the system had to be capable of performing in varying lighting conditions as Akyem operates 24/7. With all these requirements in place, Newmont chose FRAGTrack™ as the best option to meet its needs.



Figure 1 FRAGTrack™ F60 camera and F50 processor

Technical Solutions

In September 2020, amid the Covid-19 global pandemic, Newmont successfully installed two FRAGTrack™ cameras on two Liebherr 9400 face shovels. Detailed installation guides and online training enabled the cameras to be installed remotely without the requirement of specialist onsite support. The total installation time of both units was sub 8 hours and, to ensure no loss in production, installation was timed to coincide with scheduled maintenance for each shovel.

The stereo vision cameras and 3D photogrammetric analysis not only improve the definition of finer size fragments and the capability to cope with varying lighting conditions, but their use also means that automated analysis does not require costly annual calibrations. In fact, calibration was completed at the factory before the units were even shipped. Once installed, the cameras could be configured remotely and were operational within a matter of days.

Configuration consisted of adjusting several smart trigger settings which ensure that only representative samples are captured. No sides of dump trucks or clouds of dust are captured; just the muck pile, every time.

So long as the strict trigger criteria are met, the samples are recorded every couple of minutes and each image is processed and uploaded via Wi-Fi or cellular to the FRAGTrack™ website where they can be viewed at any time.

FRAGTrack™ cameras are IP67 rated with an operating temperature range of -40 to +50 degrees Celsius. They have also been thoroughly tested without issue in the extreme heat of Western Australia and the



CASE STUDY

Continuous Blast Improvement with FRAGTrack™ Akyem Gold Mine, Newmont Corp, Ghana

freezing temperatures of the Arctic Circle. This provided Newmont with the confidence that the system would be capable of performing in the harsh conditions on site.

The Result

FRAGTrack™ has now been running continuously at the site without issue for over five months. In the first three months of operation alone the two FRAGTrack™ units collected over 30,000 images. Each sample is tagged with a GPS location which allowed Newmont to attribute the results to specific blasts. From this, Newmont was able to identify that a change to Fortis™ Extra resulted in a:

- 17.8% improvement in fragmentation;
- P80 reduction from 359mm to 295mm; and
- 5% increase in dig rates across both shovels.

On average, 50% of the ore now blasted will pass through the gyro crusher without it having to do any work. This reduces power consumption and ensures lower comminution costs.

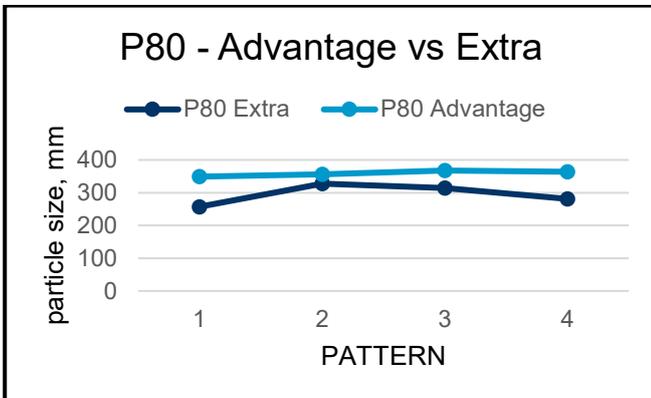


Figure 2: Fragmentation Analysis (P80)

Testimonial

“Since we started using FRAGTrack™, access to and monitoring of data and reporting related to fragmentation has been very efficient. We can make timely decisions and vital business plans to improve productivity on the mine”.

Elvis Kyeremeh – Senior Mine Engineer II (STP), Akyem.



Figure 3: F60 camera unit mounted on EX002

Acknowledgements

Orica wishes to thank the Newmont management and team for their support and permission to publish this case study.

Authors: Joe Alford, John Jackson, Christopher Tannor

Date: 9/01/2021

Disclaimer

© 2021 Orica Group. All rights reserved. All information contained in this document is provided for informational purposes only and is subject to change without notice. Since the Orica Group cannot anticipate or control the conditions under which this information and its products may be used, each user should review the information in the specific context of the intended application. To the maximum extent permitted by law, the Orica Group specifically disclaims all warranties, express or implied, in law, including accuracy, non-infringement and implied warranties of merchantability or fitness for a particular purpose. The Orica Group specifically disclaims, and will not be responsible for, any liability or damages resulting from the use or reliance upon any information contained in this document.

The word Orica and the Ring device are trademarks of the Orica Group.

