CASE STUDY

SMARTSHOT™ REDUCES MISFIRES AND COSTS IN THE CADIA HILL OPEN PIT

PROJECT SUMMARY

ENHANCED SAFETY, IMPROVED EFFICIENCIES AND MILESTONES TO BOOT

When Cadia implemented SmartShot™ they quickly discovered that electronic detonators had more to offer than just precision timing.

NONEL® cutoffs resulting in misfires, due to ground movement along existing fault lines, and the associated impact on production, were part of everyday life until SmartShot was introduced. SmartShot eliminated these misfires with its global arm and fire commands.

Absolute control over initiation timing allowed Cadia to expand patterns and reduce powder factors by 17% without impacting mill throughput.

Through clever blast design and system flexibility, Cadia was able to optimize burden relief, allowing for the best combination of blast movement, fragmentation and dig-ability.

The transformation culminated on 29 February 2008 with the largest SmartShot blast in Australia at that time, consisting of 1147 detonators and a total firing time of over 13 seconds! The mine also made history, as this was the biggest blast ever fired on site.

BACKGROUND

MORE CONTROL OVER BLASTING RESULTS THAN EVER BEFORE

Cadia Valley mine is a large open cut gold and copper mine located about 20 kilometers south of the regional city of Orange, New South Wales, Australia.

The mine is operated by Newcrest mining, Australia's largest gold producer and one of the world's top ten gold mining companies by production, reserves and market capitalization.

The pit is currently 225m deep with a final planned depth of almost 500m. The rock is monzonite (granite) with multiple joint sets, soft infill materials and sub-parallel splays.

Cadia started using SmartShot in April 2007 and has been working closely with Dyno Nobel to extract the maximum value from this new technology.

PROJECT GOALS

REDUCING MISFIRES AND IMPROVING ON MINE TO MILL

Cadia had invested significant resources in optimizing their blasting practices and saw electronic detonators as the next opportunity for improvement. Their objectives with SmartShot were to:

1. Improve safety through the elimination of misfires.
2. Further optimize their mine- to-mill program.
3. Achieve economic savings through the accurate and repeatable results afforded by SmartShot.
4. Control blast movement to minimize the impact of blasting on production.

Ensuring site personnel are certified to use SmartShot autonomously was also an aim of integrating this system into the daily operations of the mine.

DYNO®
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CASE STUDY

TECHNOLOGY APPLIED

THE SMARTSHOT SYSTEM AT WORK

The SmartShot system allows the planning and implementation of advanced blast design. It's the latest release in Dyno Nobel's Shot range of electronic initiation, with a combination of advanced features that helps achieve exceptional blasting outcomes. It is a fully programmable, secure and reliable, easy-to-use, RF remote firing system that offers more control over blast designs.

SmartShot gives you more control over complex designs to enable superior blasting results. Tangible benefits are at your fingertips through millisecond accuracy, complete timing flexibility and a 20,000ms firing window.

Precision timing control allows operators to improve fragmentation, reduce ore dilution, control throw and reduce vibration.

VALUE ADDED

GREATER BLASTING CONTROL AND BETTER EFFICIENCY

One of the most notable achievements of SmartShot at Cadia is that the global arm and fire commands ensured the detonators were 'live' down the hole eliminating cutoffs and potential misfires from column shift and fly rock. This significantly reduced the risk of finding live primers in the muckpile.

The 2-way communication with detonators allowed the shot-crew to test and verify their functionality down the hole continuously up to the time of firing.

Dyno Nobel's innovative electronic initiation system also allowed Cadia to improve its blasting efficiency. At the same time that they improved safety, the burden and spacing was expanded well beyond a cost neutral position and still provided better fragmentation than before.

By optimizing timing, fragmentation was improved to the point that Mine-to-Mill powder factors were reduced by 17% without impacting mill throughput.

This resulted in the powder factor being only 10% higher than pre 2000 yet still banking the benefits of higher mill throughput.

Full programmability coupled with timing increments of 1ms allowed Cadia to also dictate the direction and extent of blast movement enabling them to control the amount of material thrown onto the lower benches that could restrict pit access.

And to top it all off, SmartShot allowed the mine to design their largest shot and also limit excessive vibration. In the blast, 2.2 million tonnes were blasted in 13.65 seconds. The mine is now capably and confidently applying blasting techniques using electronic detonators, achieving results which were previously impossible with non-electric detonators.

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