# METALS CASE STUDY

# Reduced Misfires and Costs in Cadia Hill Open Pit

## PROJECT SUMMARY

### ENHANCED SAFETY, IMPROVED EFFICIENCIES AND MILESTONES

When Cadia implemented electronic detonators they quickly discovered that they 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 electronic detonators were introduced, eliminating 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 optimise burden relief, allowing for the best combination of blast movement, fragmentation and dig-ability.

The transformation culminated with the largest electronics 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.

*Cadia mine site.*

## PROJECT GOALS

### REDUCE MISFIRES AND IMPROVE MINE TO MILL

Cadia had invested significant resources in optimising their blasting practices and saw electronic detonators as the next opportunity for improvement.

Their objectives were to:

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

## TECHNOLOGY APPLIED

### ELECTRONIC INITIATION SYSTEM AT WORK

The electronic initiation system allows the planning and implementation of advanced blast design.

It's the latest release in Dyno Nobel's 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.

There is 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.

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## VALUE ADDED

### GREATER BLASTING CONTROL AND BETTER EFFICIENCY

One of the most notable achievements of electronic detonators 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 muck pile.

The two-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 optimising timing, fragmentation was improved to the point that Mine-to-Mill powder factors were reduced by 17% without impacting 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.

This also allowed the mine to design their largest shot and 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.


*DigiShot tagger.*



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