CR DIGITAL
MINING BY NUMBERS

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Looking To Improve Your Production and Lower Your Emissions?

With Titan 3330™ Payload Monitoring, you can.

With more demand for minerals than ever before, miners are tasked with moving more dirt while minimizing costs and being more productive in the process.

Energy consumption and intensity in mining and mineral processing is rising at around 6% per annum, largely due to the **declining grade of ore bodies** and the **rising amount of waste** that must be removed to access them.[1]

So how do you keep your mine productive and lower your emissions?

Today's load haul circuits, despite technological advances, remain wasteful and highly variable. Overloaded trucks consume more fuel, reduce circuit efficiency and require additional maintenance, while underloaded trucks need more trips through the circuit, burning more fuel, to move the same amount of dirt.

Research has shown that up to 35% of total fuel and CO_2 emissions cost could be saved by reducing payload standard deviation from 30% to 0%.[2]

By optimizing your load and haul circuit so that the majority of your trucks are loaded to target payload, with a tighter distribution, your trucks will make fewer trips while making the most efficient use of fuel, reducing your CO_2 emissions per tonne of dirt moved.

How do you ensure consistent payloads, load after load?

Move up the value chain to look at your loading assets, this is where the value drivers lie to optimise truck loading and cycle time efficiency.

By increasing fill factor and tightening your payload spreads, you can increase average payloads and reduce your total CO_2 emissions.

Titan 3330 is an excavator and loader-based solution, measuring real time bucket payload and total truck progress to target. More accurate than truck-based systems, your operators get real-time feedback so they can make immediate adjustments to load trucks more precisely.

A real-world application from a Titan 3330 customer

The Challenge

Our customer is a tier one iron ore miner based in the Pilbara operating a fleet of backhoe excavators and autonomous trucks. Maximizing truck payload across the fleet was a high priority for the production management team.

The number of truck overloads recorded daily was identified as a bottleneck to production. Excavator operators did not have the confidence to target high-capacity loads using weights reported by truck payload systems due to variable accuracy and delays in calculations.

The Solution

We installed our Titan 3330 system on their fleet of backhoes to provide accurate, real-time payload guidance. Operator training was provided, as well as data reporting tools to measure the system's impact.

The Impact

Relying on Titan 3330, operators were able to increase average truck payload without increasing overloads. The Titan 3330 system delivered:

Background

Location
Pilbara, Western Australia

Commodity
Iron Ore

Digging Conditions
Hard / Moderate

Machine
Backhoe

Make & Model
Liebherr 996, 996B, R9400

3 tonne	**1%**	**9.4%**	**1.4%**	**1.7%**
increase to average truck payload	decrease in overloaded/ derated trucks	fewer truck underloads	increase in truck fill factor (compared to truck rated capacity)	decrease in truck payload spread

*Tramming & idle time not included

CO_2 Emissions

By increasing average truck payloads, the miner was able to reduce L of diesel per tonne by 0.8%, equivalent to a savings of ~1.3 million L of diesel per year over 800,000+ truck loads per year.

That's a savings of **3,500 tonnes of CO_2 emissions per year.**

Note: in our calculations, we've leveraged data measured by Titan, with modeling from independent research papers and standard industry calculations. We've held the number of trucks per hour steady and assumed constant loader activity, machine availability, and annual tonnes moved. The key number here is CO_2 emissions per tonne, not overall emissions.

Conclusion

Implementing Titan 3330 and increasing average payloads while tightening spreads is something you can do today to reduce your emissions on the road to your sustainability goals.

Let's chat about how we can help your mine boost productivity while reducing CO_2 emissions.
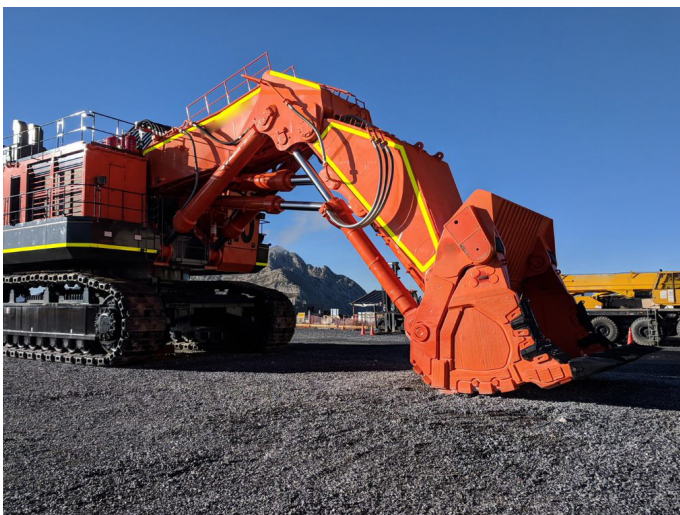
[1]*Deloitte: Driving value through energy management in mining Thought leadership series | Vol. 1*

[2]*'A Comprehensive Investigation of Loading Variance Influence on Fuel Consumption and Gas Emissions in Mine Haulage Operation 2015, International Journal of Mining Science and Technology, Soofastaei A., Aminossadati S.M., Kizil M.S., Knights P.*

CR Digital is transforming mines with cutting-edge technology.
We develop industry-leading digital technology solutions for the mining industry, working together with the world's best miners towards a safer, more productive, and sustainable future.

Start the conversation

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