As the world's largest provider of commercial explosives and innovative blasting systems, Orica told IM that it “has a vision to transform how drill and blast is used to unlock mining value, utilising digital and automated technologies to create safer, and more productive blast outcomes for customers.”

At the core of this vision is the digital transformation of the blasting process, where rock recognition informs intelligent and dynamic blasting to deliver predictable and consistent outcomes. The downstream impact of variable and poorly controlled blast outcomes today impact as much as 80% of the total cost of operation of a mine. This presents an enormous opportunity to deliver value to the industry with intelligent, data driven blasting optimisation technology.

Orica will soon release its next generation BlastIQ™ Platform, the latest version of its cloud-based platform designed specifically to optimise blasting outcomes by integrating data and insights from digitally connected technologies at every stage of the drill and blast process, driving continuous improvement for customers.

Orica Chief Commercial Officer, Angus Melbourne, describes how Orica believes that it is leading the digital blasting transformation with its next generation BlastIQ™ Platform, saying: “Orica is uniquely positioned to unlock the value that digitally enabled blasting can deliver to the global mining industry. Building on more than 140 years of experience and innovation in blasting, we have enhanced our ability to deliver value for customers by adding world-class digital expertise and solutions to our existing suite of market-leading products and services.”

He adds: “The BlastIQ™ Platform will enhance blast performance and outcomes for customers by seamlessly connecting data related to the entire drill and blast process under a single platform, linking geoscientific, blast modelling and design data with measured field operations data, optimised blast delivery and advanced learning for continuous improvement.”

“A complete Blast Control solution, enabled by BlastIQ™ delivers sustainable improvements that reduces the overall cost of drill and blast operations by eliminating rework, excess drilling and explosives consumption, improves productivity through autonomous and seamless data transfer between blast engineers and field crews, and facilitates regulatory compliance.

The information management component of the platform allows blast engineers to collate data from across the drill and blast process into a secure, centralised online location to speed up planning, analysis and auditing of blast data to meet regulatory requirements.”

Optimised blast designs are developed using Orica’s market-leading SHOTPlus™ 3D design software. SHOTPlus™, which has proven capability to manage simple and complex blast designs, integrates seamlessly with the BlastIQ™ Platform, allowing blast loading instructions and rules to be communicated to the field “to ensure the right explosives are used in the right place and initiated at the right time, every time.”

Improved in-field blast quality control and assurance is achieved using the new BlastIQ™ Mobile device, enabling the efficient capture of auditable data direct from the bench. Blast hole condition data is captured with the BlastIQ™ Mobile device in real-time, allowing data to be shared between operations and engineering personnel from anywhere on-site, empowering rapid decision making and better operational efficiencies.

“In a world-first for the industry, accuracy and efficiency of explosives delivery is significantly enhanced through the new BlastIQ™ enabled delivery system, with loading and delivery to design now fully integrated. Orica’s Mobile Manufacturing Unit (MMU™) delivery systems, in particular the recently released Bulkmaster™ 7 unit, can be integrated into BlastIQ to...
The Orica BlastIQ™ mobile interface on bench

wirelessly receive blast designs updated with near real-time blast hole quality data, while on bench. Using this data, Orica’s delivery systems load the correct explosive type and quantity according to the original design, adjusted based on blast hole condition measurement and the automated application of a defined set of rules managed by the drill and blast engineer. This unique, direct integration with the delivery control system automates process control, thereby eliminating interpretation and product selection errors, and reduces overall loading times.”

Where a BlastIQ™ enabled delivery system is not available, a BlastIQ™ Mobile device can be used to capture and record as-loaded data during the delivery process, with the system still updating instruction to the delivery system operator based on updated processing of design and in-field hole condition measurement that precedes loading.

Rounding out the Blast Control solution is the powerful insights and analytics engine incorporated into the BlastIQ™ platform. Data is presented visually to the various users, delivering insights and analytics to help the drill and blast team seamlessly measure and manage key blasting KPIs, thereby providing them the tool to improving blasting outcomes.

In addition to the new functionality and enhanced user experience in the next generation BlastIQ™ Platform, a comprehensive training, support and Customer Success Program is being introduced. The program aims to tailor each BlastIQ™ implementation specific to a customer’s needs, increasing the speed of implementation and importantly, maximising customer’s productivity, cost reduction and regulatory compliance.

Following sustained use at a selection of key pilot sites around the world, the next generation BlastIQ™ Platform will be officially released to the market in the third quarter of 2018. Multilingual support will be added by the end of the year, as well as the addition of enhanced functionality to support vibration control and optimal fragmentation, by integrating third party drilling and fragmentation data as well as predictive modelling to deliver even greater blast control.

Dyno centralises underground blasting with BlastWeb

An underground mine was employing conventional methods for the initiation of multiple blasts but found the end of shift firing requirements to be time consuming and inefficient. There were also concerns about employee safety when blasts had to be fired from underground. To address these issues, the mine was seeking a reliable, remote initiation system that would ensure the safety of its workforce by having the underground workings clear of personnel prior to firing.

After speaking with Dyno Nobel, the mine decided to implement BlastWeb, a centralised blasting system that is specifically designed for use in underground mining operations. “BlastWeb allows reliable remote initiation of development and production blasting from a safe and controlled location underground or on the surface. The blast areas can be completely evacuated as no-one is required to be underground for the blasting.”

This networking system can communicate on multiple platforms such as Wi-Fi, Ethernet, copper, fibre and leaky feeder, easily adjusting to the mine’s needs. The heart of the system is the Blast Control Unit (BCU), which can be permanently installed in the mine a safe distance from the blast. This control unit communicates with surface blast controller that sends the blast signal and the terminator, which communicate firing readiness of the detonators and protects the BCU during the blast. This system can initiate both electronic detonators and NONEL® detonators (using DriftShot Starter) so the mine could use the detonators it already had on hand.

In addition to the obvious safety benefits and its communication capabilities, the other main benefit of the system is a reduction in the blast misfire rates. The mine is developing multiple orebodies over a vast area and across multiple levels. Blasts are initiated at the end of shift with multiple development headings and production blasts fired across various levels and areas of the mine. With a multitude of personnel working over this vast area, blast clearances can be difficult and time consuming. To combat this, a radio-based remote blasting system was introduced some years ago to eliminate risks involved with initiating blasts from an underground firing location. The change ensured the mine was able to only initiate blasts once the tag board was completely cleared and no personnel were left inside the blast zones.

The old system was reliable, but without two-way communication, positive confirmation of initiation was impossible, particularly if multiple headings were initiated simultaneously. Poor radio frequency (RF) communication led to numerous misfired headings that consequently resulted in costly production delays. There were also areas without radio-based remote blasting system RF reception that still had to be fired from underground using conventional methods, leaving personnel exposed to blasting activities.

There were two main project goals:

- The ability to fire all blasts from a central location with the whole underground complex cleared of personnel
- Minimise the rate of misfired blasts

“The basis of the BlastWeb system is to enable firing of all underground blasts from a safe, central location, nominally on the surface. The system supports easy initiation of NONEL detonators to fire development headings, as well as initiating electronic detonators that are used in more complex production blasts. To

Dyno Nobel’s BlastWeb allows reliable remote initiation of development and production blasting from a safe and controlled location underground or on the surface