

Case Study



Optimize hard-rock underground operations with real-time shift and fleet management.



Compliance

Meet draw compliance targets reliably and effectively.



Reliability

Rely on resilient data for optimised decision-making.



Optimization

Automatically optimize your draw strategy in real-time.

Automated draw management and loader dispatch optimization.

THE CUSTOMER

The customer operates a large block cave mine and is part of a tier-1 mining company with international assets.

THE CHALLENGE

The ORB Live / Autonomous module was introduced at the start of operations to automate and optimize the draw management strategy and loader dispatch for production. One of the key challenges that emerged was to manage the coordination of development and production priorities while the block cave transitioned from an establishing cave to full production. These activities were often happening in the same spatial environment, making it challenging to simultaneously dispatch to producing drawbells while developing others.

Consequently, close collaboration between production and development teams was required to coordinate drive and drawbell availability as crews progressed through their schedules.

Synchronizing production and haulage levels presented an additional challenge. Once ore is mucked, it's tipped into one of the ore passes which is then transferred to the materials handling system by trucks on a haulage level below. Thus, the loaders tipping into the ore passes above had to be synchronized with the available trucking fleet below.

THE SOLUTION

The ORB Live / Autonomous module, with its new and enhanced user interface, was implemented for both production and haulage levels. ORB is able to take data from a wide range of data sources including third-party systems such as Micromine Pitram and from equipment OEMs to build a real-time digital twin of the block cave.

Unlike the traditional approach, where monthly production targets are manually translated into daily plans, ORB now automates this process dynamically, adjusting in real-time to conditions within the cave.

In contrast to the common practice of using Excel and making manual adjustments, often resulting in delayed updates (e.g., due to equipment breakdowns), ORB ensures that such adjustments are made promptly.

At the production level, the emphasis was on streamlining loader dispatch in coordination with haul truck availability via the ore passes. Instructions are dispatched in real-time from the ORB Autonomous module to equipment operators for each specific task, including which draw point to visit, the quantity of material to pick up, and which ore passes to deposit into.

At the haulage level, ORB dispatches trucks to the required ore passes to efficiently haul ore to the material handling system. The primary objective is to extract the maximum tonnage from the cave safely, considering the draw strategy and various geotechnical constraints.



THE BENEFITS

One of the primary advantages that ORB delivers is improving compliance with the draw strategy, especially in meeting geotechnical targets and ensuring the stability and safety of the cave.

In addition, the mine operator can streamline operations and enhance overall efficiency by eliminating the need to plan manually. The reliability of ORB is underscored by the consistency it brings to decision-making, which eliminates variations influenced by different shift planners.

By having ORB involved from the start of mine production, it has facilitated smooth technology adoption leading to high acceptance levels and reduced change management challenges. This strategy also favorably positions the mine for future automation advancements.

Moreover, having reliable data from the inception of the cave establishes a solid foundation, serving as a central source of truth and supporting informed decisionmaking as the cave continues to grow.

OPTIMAL PLANNING DECISIONS

The ORB Live / Autonomous module provides mathematically optimal answers for questions such as:

- How can I ensure full compliance with my draw strategy?
- How can I systematically address all geotechnical constraints in the draw planning process?
- How can real-time capture of any changes in the plan be ensured?
- How can I facilitate the seamless integration of production and haulage level dispatch?
- How can I optimize draw planning in an evolving block cave with ongoing development activity?
- How can I eliminate variability in operator decision-making?



Discover how real-time shift and fleet management can optimize your hard-rock underground operations.

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