

Pitram: Block Caving

Pitram is a mine control and management reporting solution that can capture all mine related events of an underground block cave. Centred around a Control Room, Pitram provides a single environment for management and supervisors to make informed decisions related to the development and production of the cave.

Pitram's decision support tools improve the implementation of plans and maximise asset utilisation and efficiency, while integrating the planning process into a real-time mining environment.

Reduce Costs. Maximise Profits.

When mining a block cave, it is essential that the development and production stages are conducted efficiently, and adhere to mine and draw control plans to ensure reduced costs and maximum profits.

Mine Development

There is generally a greater financial investment in the development of the block cave than the production of it. Poor development practices have the potential to increase costs through additional material handling, consumption of additional support shotcrete and roadway concrete. Over the long term, this may result in increased production costs due to poor caving, fragmentation and rehabilitation issues.

It is therefore essential that underground block caves are developed on-time, within budget and to specification. Pitram provides the functionality to ensure that this occurs.

Achieve high face utilisation

Pitram's ability to assist clients achieve high face utilisation is unique to the solution and is essential to increasing the rate of mine development.

- **Tracks the face utilisation**, both mechanised and non-mechanised. By measuring all discrete tasks, managers can identify and clear bottlenecks. For example, managers can see how much time is lost by cleaning the shotcrete machine at the face.
- **Monitors activity duration**, so that assumptions made during the planning process can be captured and tracked in real-time. Activities can be set and alarms activated when thresholds are exceeded. Managers can be warned to either address the operational issue or review their planning assumptions.
- **Monitors idle time and reports excessive delays**. If a location exceeds a waiting period between activities, an alert can be raised to check the availability of resources.
- **Notifies key personnel of the current mine status**, effectively utilising and coordinating activities, equipment, location and personnel.

Optimise Mine Development

Achieving the maximum possible development advance for the firing that meets the design specification is essential to maximising productivity during the development stage of the block caving process.

- **Measures drill and blast consumables** by recording the position of the face and the consumable related to every cut taken. This provides reconciliation of drill and blast activities so that correct drilling patterns and charging methods are used.
- **Reconciles survey to claimed values**. Pitram produces a claim for each cut based on the drill parameters used. When survey results are made available, this information can be reconciled and used to plan future activities. This may result in additional drilling and blasting, or support and shotcrete consumption. Because these results are recorded in Pitram, it is easy to conduct an analysis of the factors contributing to poor development and implement controls to improve performance.

Mine Production

Measure and adhere to the draw control plan

The draw control plan facilitates the effective draw down of the cave by minimising ore dilution and maximising recovery. The draw control plan is often produced by specialised simulation software. Pitram integrates with third party applications, including Cave Management System, to ensure that the cave is drawn according to the outlined plan.

- **Visualises loader movements and measures draw**. When manual loading occurs in a block cave or a legacy caving operation, Pitram presents the draw plan to the Loader Operator and the Control Room. Pitram monitors the progress load by load and ensures compliance to the plan. Exceptions are reported in real-time and the Control Room can constantly view the position of all loaders.
- **Provides real-time reports related to third party draw plan simulation software, including Cave Management System**. Every time a simulation is run, relevant data stored within Pitram is utilised. The availability of accurate and real-time data ensures that the draw plan is adhered to and that loads are taken from the correct draw points according to the outlined schedule.

Pitram: Block Caving

Manage draw point availability and secondary breakage

The availability of draw points can be impacted by a variety of factors, including water, large rocks and hang-ups. Pitram ensures that draw points are available when required, and are released according to schedule.

- **Plans service or secondary breaking tasks.** By maintaining a real-time view of the draw point status and access to the draw plan, the crew can effectively plan the recovery of draw points with minimal impact to production loading activities.
- **Reports availability to draw simulation package.** In addition to claimed draw, Pitram can report the draw point availability to the draw simulation package for consideration during simulation.

Adhere to the Shift and Draw Control Plans

There are significant profitability benefits to building a mine according to schedule, within budget and to specification. Pitram's Shift Planner module is utilised by block cave operations to ensure that both the development and production stages are carried out according to outlined plans.

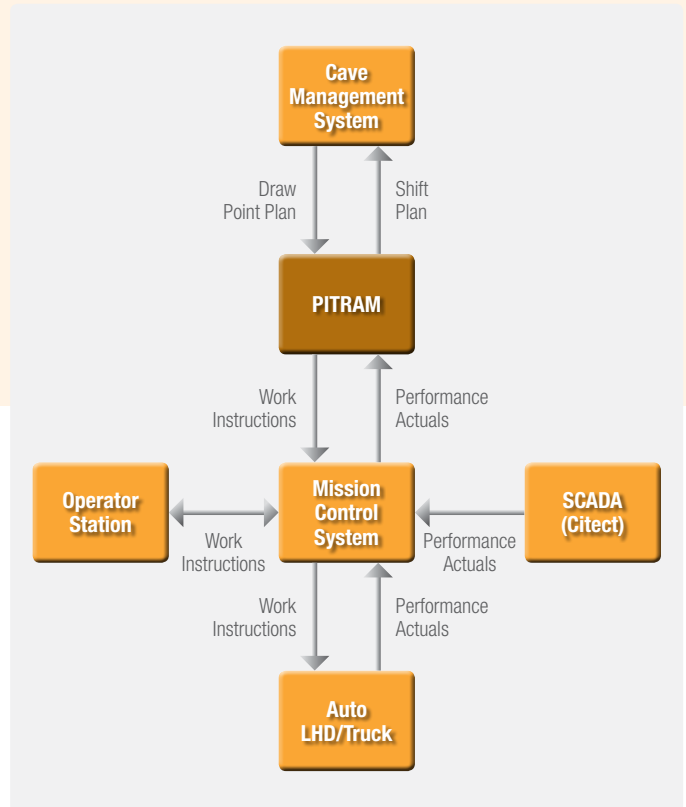
Shift Planner contains short-interval control components which can be used for short term mine planning and to track activities shift by shift for up to a week. The module's short-interval control functionality forecasts the current performance of each task. Any exceptions to the plan are highlighted so that timely action can be taken.

For example, if during the production process draw points are under or overdrawn and tonnage targets aren't being met, the Control Room is notified in real-time. Because management is alerted to issues earlier in the shift, they are empowered to take immediate steps, such as changing an equipment operator or assigning more haul units, to rectify the problem.

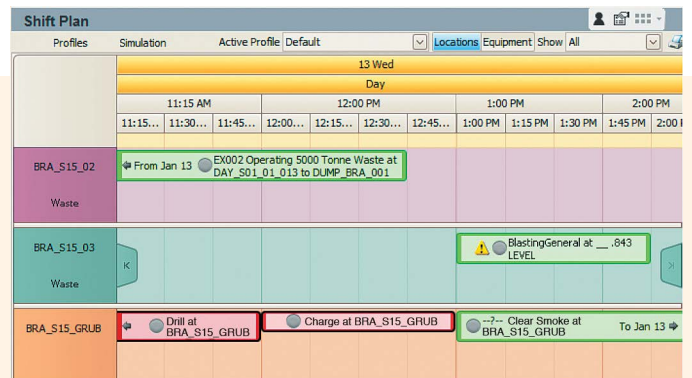
Software Integration

MICROMINE's Pitram solution integrates with a variety of third party applications specific to underground block caves, including Cave Management System. Cave Management System is a draw point simulation package which communicates the draw point plan to Pitram and utilises Pitram's reporting functionality and real-time data to ensure that the draw control plan is adhered to. Key personnel use the draw plan actuals provided by Pitram to measure mine activities against KPI's and implement operational changes if required.

Pitram also integrates with other software applications related to the block cave, including the Mission Control system, SCADA and Operation Stations. All of the information provided by Pitram related to the draw point plan is essential to ensuring operational efficiencies, increased production and reduced costs.



Pitram integrates with a variety of software applications related to the block cave, including Cave Management System.



Pitram Optimum's short-interval control components plan and track shift activities for up to a week.



MICROMINE
Intuitive Mining Solutions

www.micromine.com

MICROMINE Corporate
174 Hampden Road
Nedlands WA 6009 Australia
T: +61 (0)8 9423 9000
E: marketing@micromine.com

MICROMINE Africa
MICROMINE Brazil
MICROMINE Canada
MICROMINE Central Asia
MICROMINE China
MICROMINE Indonesia
MICROMINE Mongolia
MICROMINE Russia
MICROMINE Turkey
MICROMINE Ukraine
MICROMINE United Kingdom
MICROMINE USA

Tel: +27 (0)87 150 7580
Tel: +55 31 3347 5904
Tel: +1 (604) 646 8924
Tel: +7 727 225 18 72
Tel: +86 1861 079 8400
Tel: +62 21 7590 5333
Tel: +976 7011 3889
Tel: +7 (495) 665 4655
Tel: +90 312 241 5571
Tel: +380 44 332 3858
Tel: +44 (0) 203 176 0080
Tel: +1 (303) 996 6270

mmafrica@micromine.co.za
mmbrazil@micromine.com
mmcanada@micromine.com
mmkz@micromine.com
mmchina@micromine.com
mmindonesia@micromine.com
mmmongolia@micromine.com
mmrussia@micromine.com
gssiyok@micromine.com
ababynin@micromine.com
mmuk@micromine.com
mmusa@micromine.com