NATURAL RESOURCES

PRODUCTION MANAGEMENT EBOOK
Real time visibility into operational performance data helps achieving stability, setting the foundation for excellence and agility

With the requirement of mining companies to be more agile in these changing market times, it is important to build on the right foundations to stabilize operations through management of all activities of mining, with a centralized control of all aspects of material management across Mining, Processing, and Logistics. Each activity needs to measure how it contributes to the effectiveness of the company. Knowing the impact of each event across the operation allows continuous improvement to focus on excellence in the pursuit of agility.

Mine Production Management provides validated, auditable production information ensuring both technical and business level validation for all activities to ensure traceability. This allows staff to better understand progress in the operation for any time-period and to help understand variances between Plan and Actual which can provide a Stable platform of Operational performance.

This eBook covers critical mining activities that when centrally managed can provide production gains to your mining operations. You will learn the key benefits of stability and increased confidence in data through managing each activity. This may remind you of similar challenges faced at your operation.

Increasing Shareholder Value & Confidence

RAPID CHANGE:
Business strategy
Market opportunities
Sustainable profitability

Global control
Continuous improvement
Sustainable productivity
CHAPTER 1

EQUIPMENT PERFORMANCE

Understanding equipment use, cost and impact, enables better comparison with operator and crew performance. By centralizing all areas of an operation—mining, processing and logistics—equipment can be compared and benchmarked for impact on the production and profitability of the operation.

Key benefits

- Automated capture of information from mining, processing and logistics.
- Integration with fleet management and OEM systems to capture and report information relating to operational efficiency and equipment utilization.
- Enables costs accrued against specific equipment including lubricants, wear, and labor at an activity level allowing for confident allocation of costs.

Use case

Production has decreased over the past few weeks and department heads have been searching through fleet management systems, data historians, and various excel spreadsheets but are unable to determine where the issue lies. The maintenance department is faulting operations and the operations department is blaming maintenance.

With a truly integrated tool combining production, maintenance, and ancillary activities, the management team is able to look at equipment performance and determine the lack in production is attributable to a single piece of equipment used each shift. Management is able to view the associated costing information (i.e. cost per ton) associated with that individual piece of equipment. Costs can be accumulated at an activity level allowing for more confident analysis for areas of cost reduction. After performing maintenance to this piece of equipment, production numbers over the next few weeks return to normal.
CHAPTER 2
PRODUCTION TRACKING AND ANALYSIS

As mining progress and priorities change throughout the shift, so can the plan. Production tracking and analysis allows quick and easy visualization of the progress of all activities (production, maintenance, ancillary, etc.) providing flexibility and the ability to review the shift in real time.

Key benefits

• Track production from the mine, to plant, to the market ensuring more data is available for review by capturing it from major mining systems like mine planning, dispatch, LIMS, and SCADA.

• Evaluate throughput levels by identifying trends earlier to access daily, weekly, and monthly summary reports detailing predicted production and actual output.

• Alert to KPIs that vary from pre-determined acceptable limits, reducing production bottlenecks.

• Maintain data integrity by automatic validation and conversion into a standard format before the data is allowed to be used in production reporting and analysis.

Use case

The mine manager receives a summary report at the end of the shift detailing events and issues that took place across the operation. By the time he reacts and addresses any issues that took place during the previous shift, it is too late; the issues are already reported problems. It is like driving a car only looking in the rearview mirror.

With real-time in-shift visibility into progress, better management of shift compliance is achieved. The control room operator is able to track activities during the shift and the progress associated with each activity.
CHAPTER 3

MATERIAL FLOW DASHBOARD

A material flow dashboard provides a visual overview of each activity, showing: plan, actual, trend data, and the requirement for a holistic view of the operations to gain a better understanding of the in-shift situation.

Key benefits

• Influence the geological scenarios used to reconcile the results of mining activities, with a seamless integration with geology and mine planning systems.
• Reconcile plan vs. actual, with the ability to track the quality and quantity of material throughout the entire mining process to logistics and beyond in a near real-time manner.
• Timeliness of information reducing the turn-around time on strategic decision making.
• Track in real-time multiple KPI’s across all operations from pit to port for easy monitoring.
• Easily navigate/drilldown to underlying data directly from the dashboard.

Use case

The COO is looking for an update on how all of the company’s operations are performing. They begin calling out to the sites trying to get a hold of someone to collate the desired information.

A holistic view of the entire operation from pit to port provides near real time variance of actuals to plan. The corporate office can access a dashboard immediately with the level of detail for each individual operation including summary level detail for all operations combined. Visual indicators provide immediate feedback for variance to plan.
CHAPTER 4
STOCKPILE MANAGEMENT

High data confidence is provided by accurate representation of all inventory locations in terms of quality and quantities based on each material movement in/out.

Key benefits

- High data confidence through an accurate view of stockpile mass and grade.
- Optimized stockpile utilization to improve throughput.
- Reduce blending errors through updated information about stockpiles and expected grades to be produced for improved plant performance.
- Reduce costs by decreasing rehandle with effective monitoring and managing of material entering and exiting each stockpile.
- Regular surveys performed to adjust calculated stocks.

Use case

The mill is trying to fulfill a contract for a specific grade and run as efficiently as possible. The mill now looks to the mine for help in planning what can be delivered from the many stockpiles to fulfill this contract. Having complete end-to-end visibility of material enables the management of all types of material stockpiles using First In First Out (FIFO), Last In First Out (LIFO), or Weighted Average Grade (WAG) calculation methods that are connected to powerful material balance capability, giving higher confidence to the material in process. All inventory locations are managed in real-time and updated based on surveys. Each individual material movement on and off of each inventory location is tracked, providing auditable transactions. Primary and secondary commodities are also tracked including any elements that could cause penalty clauses during sales activities.
CHAPTER 5
MATERIAL BALANCE

The integration of the entire mining process from pit to port enables operations to identify areas of deviation in production from plan. It also allows to better allocate variances in quality and quantity, helping to increase confidence in all material movements, including stockpiles.

Key benefits

- Increase the confidence in targets by minimizing the variance between plan and actual, and being able to identify problems in near real-time.
- Automatic daily and monthly reconciliation between mine, plant, and logistics.
- Shorten the month-end process from greater than a week to hours.
- Increased confidence in material quality.
- Eliminate the need for maintaining spreadsheets for data storage.

Use case

A Reconciliation Manager is looking forward to seeing how the End of Month process ends. Their current material balance process does not take into account EOM surveys on stockpiles. This means that when reconciling from the plant back to the pit, they cannot apply an accurate reconciliation factor back to the stockpiles. They cannot drill down to see where the issues lie in dispatch, as they are trying to collate the sheer number of truck cycles for the month.

With a powerful material balance capability, the ability to reconcile all variances back through the mining process to any level of granularity is provided, closing the loop with full volumetric reconciliation. This allows Geologist and Engineers to focus on opportunities rather than data management.
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