TRACK, MONITOR, AUTOMATE AND MANAGE YOUR ASSETS

Are you looking for ways to make your mining operations more efficient, safe, productive and profitable? Cat® MineStar™ can help.

MineStar provides the ability to measure, monitor, manage and automate all types of assets — from people to production and auxiliary machines. There are solutions to help you assign fleets, manage material movement, evaluate operator performance, implement autonomy, gather production data, and use that information to gain insights that can lead to better business decisions.

Whether you're ready to integrate your first basic technology product or well down the path toward autonomous mining, there's a Cat MineStar Solution for you.

Equipment Tracking

MineStar Equipment Tracking provides information on mobile assets, telling supervisors what the fleet is doing, who is operating which machine, and how they are utilizing their time. It allows sites to replace paper with accurate recording so they can better understand utilization and make decisions about equipment investments and effectiveness.

Equipment Tracking delivers high-accuracy data recording, consistently providing a basic level of information on all assets, including data on locations and movements, velocity, payload, cycle times and fuel level, as well as service meter units (SMUs) and time utilization. Supervisors can view scheduled and unscheduled downtime and operational stoppages.

Production Recording

MineStar Production Recording helps surface and underground mines of all types and sizes improve the efficiency of their operations, enabling an increase in their overall tons produced. The data it provides identifies opportunities, allows you to make changes within the shift, and delivers insights on how those changes will impact production if implemented.

The accuracy of the data gives personnel such as Pit Supervisors, Mine Managers and Install Technicians the confidence they need to make quick, real-time decisions related to operational execution. Data can be accessed on a mobile tablet and through a web-based application.

People Management

MineStar People Management combines capabilities of Equipment Tracking and Production Recording to help you measure and manage operator activities so you can improve on the outcomes they deliver — which can lead to a more consistent operation and lower cost per ton.

MineStar provides the ability to allocate personnel to machines, and machines to work areas. It tracks operator performance during shift and over time and allows you to compare that performance to defined KPIs. This information helps you better understand the performance of your operators and identify opportunities for improvement — such as site issues that may be hindering performance or the need for training to improve their skills.

Material Management

Producing the right material for the processing plant and delivering it in the most efficient manner is a goal for every mining operation. MineStar Material Management solutions contribute to this goal, making it possible for mines to ensure the right material blend is sent for processing to create the optimum final product.

Material Management incorporates capabilities that help sites keep track of ore, discern the grade and the blend, see the quantity and location, manage material flow with precision and feed the mill with the right grade — without the wasted effort, costs and wear that come from unnecessary material rehandling.

Material Management capabilities help site controllers better understand progress toward the mine plan and provide information they need to make decisions that ensure production targets are being met. It allows the creation of goals for material movement, estimates the impact changes will have on the production plan and ensures appropriate material flow at stockpiles. This solution also provides real-time blending monitoring.

Optimization

MineStar Optimization helps to ensure that you are continuously getting the right material to the right place at the right time by measuring and optimizing assets such as your equipment, material, personnel and mine model. The dynamic assignment function automatically assigns haul trucks to reach their destinations in the most efficient way. Multiple features work to optimize material movement, cycle time, energy usage, tire life, first/last hour production, and overall shift production. MineStar provides quarries and smaller mines with the ability to allocate machines to work areas and personnel to machines to provide consistent and efficient operation.

Business Insight Solutions

High-quality data provides insights that can lead to better business decisions. Having easy access to that data and enabling it to be used across the operation is key. MineStar Business Insight Solutions enable that functionality by allowing integration with multiple applications across the mine site, providing easy reporting and exporting capabilities, and enabling data publishing.

Business Insights data-share functionality allows MineStar data to be shared with multiple applications — such as competitive fleet management systems, data reporting systems, HR systems and position monitoring systems — via an industry standard interface. It also integrates with third-party fuel monitoring systems. This solution minimizes manual data entry and the chance for human error and enables deeper system integration at customer sites.

Surface Management

The Surface Management capability helps you measure, visualize, design, execute and analyze the mining surface and engineering design of the operation. It works in conjunction with Equipment Tracking, Production Recording, Optimization, Command, Material Management, Safety and Business Insights. Providing real-time visual and actuals of the operation enables efficient mine design creation and execution with supporting data and analytics.

Surface Management is intended to be a real-time fusion of multiple inputs and attributes with various accuracies and timeliness. This capability set will empower operations and technical service teams primarily focused on mine design (plan) vs actuals.

Cat MineStar Command

Cat MineStar Command makes it possible for miners to automate their mining processes, automate individual tasks, remotely control machines, or implement a completely autonomous fleet of machines that operate around the clock with no human intervention.

Individual technology offerings can be used alone or combined in multiple ways to get the most out of your equipment investment and help your sites become safer, more efficient, more productive, and ultimately, more profitable.

Building Blocks to Autonomy

- **Operator Assist.** The foundational level of automation, these in-cab technologies help improve operator performance by automating machine functions or entire machine cycles.

- **Remote Control.** Line-of-sight solutions are available for Cat dozers, using an over-the-shoulder control that provides access to all machine functions from a safe distance. Non-line-of-sight solutions use remote operator stations that perfectly replicate the machine's cab and controls to give dozer, drill, and underground loader operators remote control of multiple machines.

- **Semi-Autonomy.** Command semi-autonomous capabilities can enable one operator to automate multiple machines, while scaling up to full autonomy.

- **Autonomy.** Command autonomy solutions deliver complete automation for surface and underground operations — fully autonomous surface haulage, autonomous drilling and automated underground load, haul and dump operation.

For more information, go to *cat.com/minestar* or contact your local dealer.

CAT®