CAT® MINESTAR™ SYSTEM

KHUMANI MINE // BARLOWORLD, SOUTH AFRICA // APRIL 2014

WHEREVER THERE'S MINING.

CAT®

MINING MORE BY PUTTING TECHNOLOGY AND DATA TO WORK

CAT® MINESTAR™ SYSTEM DELIVERS SOLID RESULTS FOR KHUMANI MINE

In a goal-oriented process of training, implementation and follow-up, Caterpillar and Barloworld have helped a young mine in South Africa realize significant operational improvements by putting Cat MineStar System capabilities into daily use.

Throughout 2012, mining technology engineers from Caterpillar and Cat dealer Barloworld Equipment helped iron ore producer Assmang Limited ramp up the effectiveness of Cat MineStar System at the Khumani Mine. This mid-sized operation is currently running a fleet of 32 Cat 789C 200-ton trucks while utilizing Fleet and Health at the mine.

### AUTOMATED ASSIGNMENTS INCREASE PER SHIFT TONNAGE

The first success story at the site involved refining the mine model and training controllers in preparation for implementing the automatic assignments function of the Fleet capability set.

Also known as unlocked assignments, this function eliminates the need for trucks to be locked to specific loading tools and manually dispatched. Instead, the Fleet assignment engine now determines where to send the trucks based on parameters that include travel times to loading tools and processors, loading times and the production requirements for that shift.

Operators and controllers quickly adapted to using automated assignments. After a couple of months running unlocked assignments, the site's shift production increased by nearly 30%—despite an 8% drop in loading tool availability over the same period.

LONG-TERM PRODUCTION STUDY
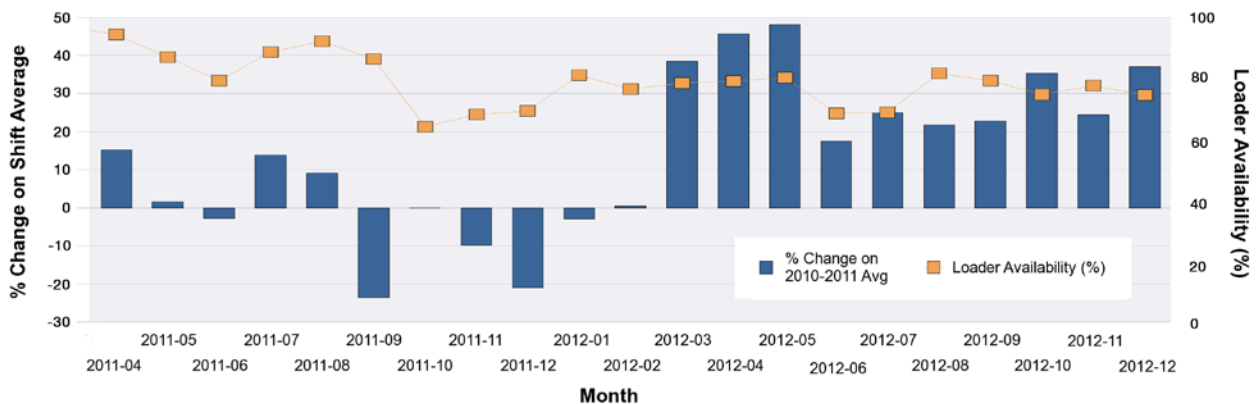
IMPROVED MATERIAL RECOGNITION FOR ACCURATE ORE CONTROL

Another problem in finding a solution was the number of unidentified loads coming from the pit. Unidentified loads require the controller to manually dispatch the truck based on the "last known material," rather than on the type of material that had actually been loaded in the dump bed of a truck.

Khumani Mine was still running old ore control software that site personnel found difficult to use, so the mentoring team recommended implementing the Terrain capability set. After upgrading to the latest Terrain office system, controllers, operators and geologists received training and quickly began to use the new software effectively. Over the next few months, the site experienced steady decreases in unidentified loads coming from the pit, resulting in much more accurate ore control.
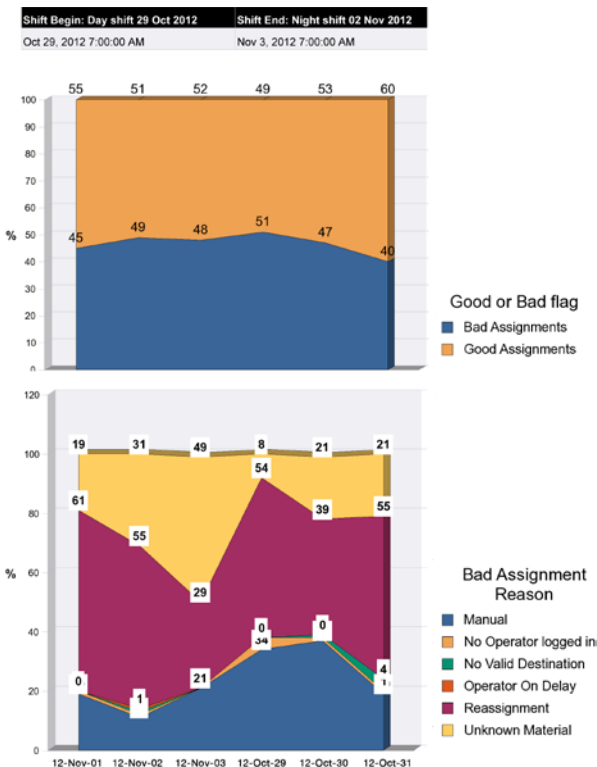
LOADED TRUCK ASSIGNMENTS

NEW REPORTS HELP MANAGERS SEE THE BIG PICTURE

Along with operational gains in the pit, the Khumani Mine front office saw increased benefits from implementation of Cat MineStar System reporting features. Using the highly flexible reporting platform, the mentoring team produced a suite of new site-specific reports and dashboards to help site managers easily interpret production, operational and health data.

New reporting tools include a Crusher Qualities Report that enables the site to track material grade values per hour. It compares records from the pit to those from the material scanners in the processing plant to help Khumani Mine achieve more accurate crusher output.

A new Controller Handover Report displays the day's production and KPIs. It is printed at the end of each shift for the incoming team and dramatically reduces the amount of manual paperwork required of the controller team.

The mentoring team also produced a suite of five reports for use on company iPads, which enables site managers to easily monitor shift production from anywhere.

In addition to the reports, a new, shift-based Operational Dashboard shows the current site production along with key performance statistics such as loading time, underloads and overloads, queuing, hanging and more. The dashboard refreshes every couple of minutes, giving the site a near-real-time overview of progress throughout each shift.

SHIFT PRODUCTION REPORT: HOURLY TRENDS

MORE IMPROVEMENTS TO COME

As Caterpillar and Barloworld continue to work with the Khumani Mine, site managers are looking at ways to implement more Cat MineStar System capabilities that will further improve operational productivity and management efficiencies.

New capabilities under consideration include using Fleet shift change to assign trucks to tie down at the end of the shift, helping to maximize first and last hour tonnages by getting as many loads as possible before the truck must arrive at the tie-down locations. Fleet fueling assignments are also being considered. Fueling assignments send trucks to get fueled when a specified fueling window is reached. This happens at a convenient point in the production cycle to minimize operational interruptions.

Other possibilities include leveraging the Health capability set to help increase wheel loader availability, and tying Health events to operators and crews to help reduce operationally induced maintenance problems.

As more and more miners implement advanced technology systems, Assmang's experience at Khumani Mine highlights how expert advice, in-depth training and ongoing support is critical for achieving success with a mining technology system. Caterpillar's technology mentoring and implementation program for Cat MineStar System demonstrates the company's leadership in the mining technology sector and sets a high standard for the industry.

CAT® MINESTAR™ SYSTEM

The industry's broadest suite of integrated mine operations and mobile equipment management technologies configurable to suit your operation's needs. It lets you integrate products, processes and people like never before — so you can define what the next generation means for your operation.

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