



The Modular Mining DISPATCH FMS Parkup module focuses on reducing inefficiencies during shift change to maximise productive time. Trucks will be assigned to shift change locations proximal to their assigned end-point to help ensure high levels of productivity during the last hour of a given shift and first hour of the subsequent shift

Performance assured

Modular Mining’s Performance Assurance (PA) program is a next-level support initiative designed to ensure that each customer receives maximum sustained value over the life of their Modular technologies. Here the company gives two recent examples with a North American gold mining customer

With each engagement, a dedicated team of regionally-based Modular Mining PA experts collaborates with a cross section of mine personnel to develop tailored, flexible, and proactive solutions to address the operation’s specific challenges. This article presents dual case studies, each highlighting how Modular Mining PA implemented the DISPATCH FMS automated Parkup module to help a large North American gold operation combat two of the mine’s challenges: efficiency declines during the last hour of each shift, and a halt in load and haul activity during scheduled breaks.

While conducting dispatcher training at a site in January 2019, the PA team observed that data trends indicated a decline in productivity at end of each 12-hour shift. Further investigation revealed that the dispatchers relied exclusively on a manual process for end-of-shift parkup times and locations, which resulted in a less-than-optimal workflow.

Optimising the end-of-shift

The PA team immediately recommended implementation of the then-new DISPATCH FMS automated Parkup module. In preparation, the team completed a thorough evaluation of the



Figure 1: Shift change results - initial Parkup module implementation

site’s shift change practices. They observed that dispatchers routinely missed opportunities to have trucks run later into the haul cycle, which led to production losses at the beginning of the next shift. Implementing the automated Parkup module would enable trucks to load and park further into the haul cycle, improving optimisation.

After implementation, PA worked with the dispatchers to configure the module to recognise and act upon site-specific conditions. With the automated Parkup module in place, the DISPATCH FMS was then able to incorporate the condition-based data into its optimisation logic and issue informed, real-time Parkup assignments to the operators. Modular Mining also provided coaching and mentoring to the mine’s dispatchers, to increase their ability to adjust the Parkup module’s parameters for ongoing adherence to plan. The PA team also worked with the main Dispatch Engineer to monitor shift change performance over time, and provide recommendations for configuration modifications based on changes to site conditions and mine plan requirements.

The mine realised marked

improvements in shift change productivity between February 2019, when the module was deployed, and April 2020 when the effects of COVID-19 prompted a return to manual parkup processes. Figure 1 shows a snapshot of the average Shift Change Hour Tons metrics as tracked between February and June 2019. As shown, the mine realised a 7.5% improvement in

shift change productivity, an amount equal to approximately 2,000 short tons of additional material moved via the use of automated parkup management.

While the Parkup module was in use, the mine also saw an increase in fleet utilisation during the first and last hour of each shift.

Effects of COVID-19

Because of COVID-19, the mine took necessary precautions to help ensure the safety of its workforce. These measures included a reduction in the number of operators allowed at one time in shift transport vehicles, which caused scheduling complexity and delays in getting operators to and from the boarding area during shift overlap. During this time, the mine opted to return to their manual parkup management processes, as this enabled the dispatchers to make changes on the fly based on their understanding of crew numbers and transport van capacity that could fluctuate by the day or even by shift. Unfortunately, the manual parkup assignments severely impacted shift change efficiency and production levels dropped.

Parkup module reimplementation

In June 2020, the PA team engaged with the mine via a virtual site visit. The PA team raised concerns about the downward trend in shift change production and encouraged the dispatchers to resume use of the Parkup module. Upon reaching an agreement, the PA team set about updating the Parkup module configuration to accommodate the ongoing variations in crew/vehicle availability. In turn, this enabled the FMS to once again optimise the shift change activity. With the Parkup module back in operation, the mine was able to increase shift change efficiency and production, while continuing to maintain its COVID-19 safety protocols. Figure 2 shows the outcome of shift change between January and September, 2020,

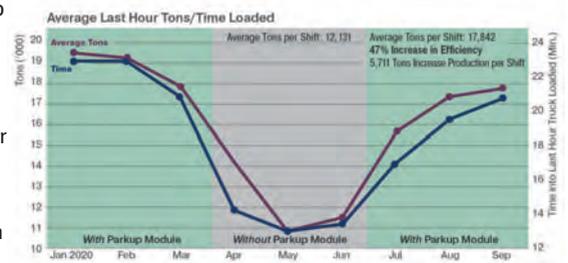


Figure 2: Shift change results: second Parkup module implementation

when performed with, and without, the Parkup module in place. Utilisation of available time during a shift’s 12th hour increased by 52.78% (7 minutes and 7 seconds), while total mined tons increased by 47% (5,711 short tons). In addition, as the statistics continued to improve the dispatchers’ confidence in the automated parkup process increased, as well.

A new challenge – addressing scheduled break efficiencies

The mine previously implemented the DISPATCH Parkup module and achieved a 10% increase in shift change efficiency. Based on the earlier success, the mine's Senior Dispatch Engineer approached PA to see if the module could also help to optimise the site's scheduled daily breaks.

The mine divided its truck fleet into two groups: A and B, and scheduled its four daily breaks (two per shift) in a staggered pattern, similar to the following:

- Group A: Cease operation, travel to break area, take break
- Group B: Continue operation while Group A is on break
- Group A: End break, travel back to haulage route, resume operation
- Group B: Cease operation, travel to break area, take break
- Group B: End Break, travel back to haulage route, resume operation

In this scheme, as Group A returned to the haulage route after their break, Group B was simultaneously en route to the break area. This brought a twice-daily halt in loading activity at the shovels, which led to recurring periods of costly hang time and lost opportunities for production.

To combat the issue, the PA team configured the DISPATCH System Parkup module to insert a 20-minute buffer between the end of Group A's

break and the start Group B's break. By doing so, traffic flow to the shovels was maintained between breaks, thus dramatically improving optimisation by reducing shovel hang time and recovering lost productivity. The PA team also worked with site personnel to fine-tune the timing and other related settings in the DISPATCH MineGraphics view, to ensure that the MineGraphics display reflected the most current haulage road conditions, including changes such as hazards, closures, or re-routes. With the MineGraphics view updated, the FMS is better able to optimise truck activity based on travel times to and from the break area and loading locations. Lastly, training was provided to educate the mine's dispatchers and operations personnel on the changes made to the breaks schedule and on best practices for keeping the FMS' settings up-to-date and accurate. Results Following the site's switchover to the new staggered breaks routine, the mine experienced significant improvements in equipment utilisation, increased availability, and reduced shovel hang times. As shown in the figure, hang time for the loading unit decreased by an average of 7.6% per hourly load, equating to a monthly average of 23,560 additional tons moved during the fifth and ninth hours of the shift. Additional realised benefits include:

- An 18.2% average per-load reduction in break hourly hang time



Figure 3: Hang time reduction during staggered break hours

- Overall increase in efficiency of the mine's previously-underperforming fifth and ninth hours of each shift

With the help of Modular Mining's Performance Assurance experts, the gold operation now has a continuous improvement plan in place to ensure that productivity is maintained at shift change, as well during their daily scheduled breaks. Through the implementation and configuration of the DISPATCH FMS Parkup module, and in-depth dispatcher training, Modular Mining's PA team helped the mine overcome two of its greatest challenges, while simultaneously enabling the DISPATCH FMS to better optimise the shift change and breaks processes for maximised efficiency and productivity. The mine saw extremely positive results, achieved a higher degree of maturity in their use of the DISPATCH FMS, and increased their production volumes which contributed to financial gains. [IM](#)

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