

Case Study

Gaining 66,150 tons per year by optimizing load time

Project Challenge:

One of the biggest inefficiencies in the continuous mining process is waiting for a batch haulage unit to arrive and get into position. Any reduction in this wait time is time spent cutting and loading material. Understanding these delays is key to a successful mining operation, and is seldom obvious.

A customer in the Midwestern United States recognized this inefficiency in its own operation, but could not achieve long-term results because whenever they focused and improved on one aspect of the process, the inefficiency seemed to take another form. The end result was no overall improvement.

Solution Design:

Integrating its products, services, experts and processes through Smart Solutions, we began tracking the mine's "Time between Haulers." **By tracking the time from when the conveyor on the continuous miner was turned "OFF" until the time the conveyor was turned "ON,"** our experts were able to determine wait time.

Initial studies were aimed at tracking the haulage units to determine delays. Experts identified confusion among the operators. Communication between the units was minimal and the routes seemed to change daily. Further investigation revealed a loose cutting pattern and no real sequence of operation as to when the feeder was advanced.

Process analysis revealed that the process to schedule the feeder move was based on availability of the night shift crew. With four active units at this mine, the crew was moving one of the units every night. Prioritizing was more of a first come, first serve.

Data produced by our smart connected products, revealed the challenge to be solved for an overall solution: inconsistent wait times and how it was affected by the feeder location.



The Solution:

Pulling data from the machines for analysis, Smart Solutions experts were able to reveal the important tie between wait time and feeder location. A benchmark average of 44.2 second wait time between cars was set, and the solution developed from there.

Through the use of comparison data between units the optimum feeder location was determined. **Production rates were used to pace the units' rate of advance and determine an optimum move schedule.**

With the feeder location now determined, Smart Solutions crews went to work choreographing the haulage routes. Refining the continuous miner cutting patterns gave a predictable and repeatable track for haulage operators to become familiar with.

By using data to identify inconsistent production rates, we were able to help pinpoint the true restraint and develop a solution that would improve productivity.

The Results:

By the end of 2014, comparison data showed a nearly 2-second improvement in wait times. By reducing the wait time between haulage units per continuous miner, per shift, over the year prior, from 44.2 seconds to 42.7 seconds, on average, the savings began to add up.

With eight continuous miners running daily, the tons added through wait times reduced came to an additional 66,150 tons produced per year.

The additional tons are credited to efficiency, and this gain is only a start. With additional focus, this customer has targeted another 1.5 second improvement for the coming year.

