THE AUSTIN ADVANTAGE

FINDING SOLUTIONS, CORRECTING INEFFICIENCIES, AND MANAGING CHANGE AFTER A TWO YEAR SHUT DOWN

GENERAL INFORMATION

Location: Northern Minnesota

Project Type: Surface

Industry: Iron

Product Used: Hydromite 3500

Project Lead: Joshua Napsta, Technical Representative

THE HISTORY

An Iron-Ore mine restarted after nearly two years of being shut down. Upon restart, the drilling and blasting team had a large inventory deficit to overcome. Providing necessary inventory levels - of the right qualities - to maintain blend targets directly affected mine development plans and production levels. The mine wanted to maintain a blasted inventory level of more than 3,000,000 tons of ore and 1,500,000 tons of waste rock. The mine worked with Austin Powder to find solutions, correct inefficiencies and manage change.

CUSTOMER CHALLENGE

Production equipment was waiting to dig immediately following a blast. Catching up, then getting ahead, of production was the name of the game. We could not afford to have a chunky blast. We had to find a way to be more productive and efficient in the way we were doing business.

THE GOALS

1. Increased blasted inventory levels
2. Provide the correct material based on ore quality and location
3. Decrease spend on ore blasting
4. Move any extra gudgeted money to wast rock blasting
5. Do not produce chucnks
6. Increased operating time for shovels, loaders and drills

THE **AUSTIN** SOLUTION

In this study, the solution was to blast as soon as patterns were ready, ensure drills are being as productive as possible, inspect shots and find ways to improve, and coordinate with mine engineering when improvement opportunities arise; drill, blast, analyze, repeat. This solution allowed them to catch up and they had a sustainable inventory level after one year. After two years of work, we found the perfect balance for this operation.

THE **OUTCOME**

1. Increased drill production by 12%
2. Decreased powder factor by 11.5%
3. Fewer blast delays
4. Fewer equipment moves
5. Fewer pattern cleanup jobs
6. Increased operating time for shovels, loaders and drills

THE **OUTCOME**

Our plan of attack was to work off an initial drill pattern and from there we made gradual increases over time as we worked to identify the optimum pattern size. As we expanded the patterns, we incorporated adjusted timing plans to further improve shot performance until we found the most efficient shot design moving forward. We were able to achieve an 18% increase from the initial drill pattern which greatly improved the drill and blast process efficiency to help catch up and quickly surpass the customer's demand. We were able to gradually increase the average blast size from 450,00 tons to 783,000 tons which helped take our annual blast event totals from 44 to 27 events. This yielded massive efficiency improvements such as increasing drill production by 12% and decreasing the powder factor by 11.5%. Additional customer savings included fewer equipment relocations, fewer pattern cleanup jobs and increased operating time for shovels, loaders and drills.

This helped immensely in getting caught up; then getting ahead. Once we got in the groove, we increased pattern size from an average of 449,704 tons to 691,452 tons, then up to 782,626 tons. We found that we could help the mine (and ourselves) by blasting larger patterns with larger burden and spacing. We had less blast delays and fewer shots to cleanup. We failed to meet all criteria a few times. Some shots were chunky, so we tried them again with different timing and found the burden and spacing were too wide. We kept going until we figured out what worked. It was the right thing to do. We used to shoot 44 crude blasts in a year. We ended with 27 blasts resulting in the same tonnage. We increased drill production by 12% from wider burden and spacing (72.57 tons/foot to 82.95 tons/foot) and decreased the powder factor by 11.5% (from 0.87 LBS/ton to 0.77 LBS/ton). Untracked savings included – fewer equipment moves, fewer pattern cleanup jobs and increased operating time for shovels, loaders and drills.

AUSTIN POWDER