

ArcelorMittal Mines Canada Saves \$7 Million Annually in the Maintenance Shop

ArcelorMittal Mines Canada is one of the leading producers of iron ore products in North America. The company operates an open pit mine and a crusher/concentrator facility capable of producing 18 million metric tons of iron ore concentrates annually at Mont-Wright in northern Québec. The company also operates a pellet plant with an annual production capacity of some nine million metric tons of iron ore pellets at Port-Cartier, Québec.

The Situation

The proven and probable reserves of ArcelorMittal Mines Canada are estimated in excess of 50 years' supply, although the mine's ore concentration level has gradually decreased over the years. Today, concentration is at 28%, compared to many other mines with 50 or 65% iron ore concentration.

The Challenge

To continue to be successful, ArcelorMittal Mines must now mine and process more rock for each ton of iron ore produced. To meet this challenge, the company has reduced costs over several years, becoming a very lean organization. However, it was apparent that additional measures were required. Already pared down, the only solution was to find a way to accomplish more with the same manpower and the same or less equipment.

ArcelorMittal Mines at a Glance:

- » One of North America's leading producers of iron ore products

The Situation:

- » The company's ore concentration levels decreasing over the years.
- » As a result, ArcelorMittal Mines must mine and process more rock for each ton of iron ore produced.

The Challenge:

- » Reduce costs and ensure lean, efficient operations
- » Produce more without increasing manpower or equipment

The Solution:

- » Ivora asset performance management software solution enables the company to optimize asset performance and reliability as well as adopt a proactive, condition-based approach to maintenance.

The Results:

- » \$7 million in maintenance savings annually
- » 28% increase in mine production
- » Mobile equipment maintenance costs decreased by 8.3% per cubic meter of concentrate
- » 5.1% increase in manpower efficiency
- » 190-Ton Off-Highway Trucks - 6% increase in availability; 35% decrease in operating costs
- » Wheel Dozers – increased availability while reducing fleet from 8 to 4
- » Track-Type Tractors - fleet reduced from 12 to 6; 20% increase in availability
- » Large Wheel Loaders – 3.5% increase in availability; 43.4% reduction in operating costs
- » Motor Graders - levelers decreased from 7 to 5; 25% increase in availability; 41.4% decrease in operating costs
- » Major safety incidences reduced by 74.7% resulting in an additional \$1.1 million in savings

The Solution

One of ArcelorMittal Mines' most important strategies for doing more with less, and driving increased profit without increasing costs was to partner with Ivara to focus on optimizing the reliability of its mining assets.

Ivara's asset performance management software solution has enabled the company to move to a proactive, condition-based approach to maintenance, optimizing asset reliability and driving business results. With this approach, profitability is now strongly connected to the reliability of the company's assets.

With a reliability strategy, ArcelorMittal Mines focused on improving the business process of maintenance – ensuring that the things people do each day include the right work on the right equipment. The company developed competency in reliability practices, such as Ivara's Maintenance Task Analysis and Ivara RCM2™. ArcelorMittal Mines installed Ivara's asset performance management software as the tool to support the best practices and to ensure efficiency and effectiveness of the process.

As part of this initiative, ArcelorMittal Mines established a Technology Transfer Group (TTG), whose responsibility was to provide transitional direction to its business units. The TTG members learned about the latest reliability practices from Ivara practitioners.

With input from Ivara, the TTG established the company's reliability business process and applied the best-in-class practices, moving ArcelorMittal Mines toward their goal of achieving a world-class maintenance process.

ArcelorMittal Mines quickly realized that the opportunity for reliability improvement to impact the bottom line in their Maintenance Shop was significant. With the old way of thinking, equipment (trucks, tractors, loaders and other mobile assets) was taken out of service for repair

when they broke down or at a specified number of running hours, necessitating either the availability of replacement equipment (hence a larger fleet) or a halt in production. Repairs were performed according to the availability of parts and personnel, further extending downtime. This old way of thinking was no longer viable and a new approach was adopted that focused on optimizing asset reliability, requiring closer attention be paid to the health of the equipment, not just its hours of service. ArcelorMittal Mines significantly improved the performance of its Maintenance Shop so that it supported the company's productivity and profitability goals.

The TTG placed particular emphasis on establishing key performance indicators that would allow improvements to be measured and tracked, and which would also identify areas for further improvement.

The Result

By the first year of implementing the proactive asset care process, mine production levels are up by 28% – without increasing resources. Mobile equipment maintenance costs (parts, labor, fuel) are down by 8.3% per cubic meter of concentrate – even without accounting for inflation or increased fuel prices.

The Maintenance Shop has been able to realize a \$7 million annual contribution to ArcelorMittal Mines' bottom line mainly by adopting a reliability-focused approach to maintenance across its mobile mining equipment.

Significant improvements have been realized for every type of mobile equipment since implementation began:

190-Ton Off-Highway Trucks:

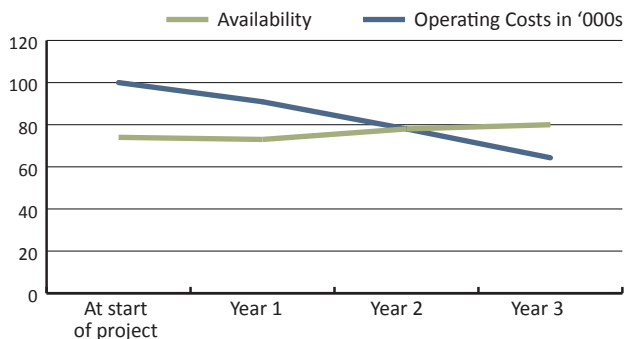


Figure 1: 190-ton Off-Highway Trucks: Life span extended by > 60% with more performance

When purchased, this fleet of 25 vehicles was estimated to have a useful operating life of 50,000 hours per truck. Since applying reliability-based asset management principles, many trucks have surpassed 80,000 hours and are still more economical to repair than replace. Availability is up 6% and operating costs are down by 35%.

Wheel Dozers:

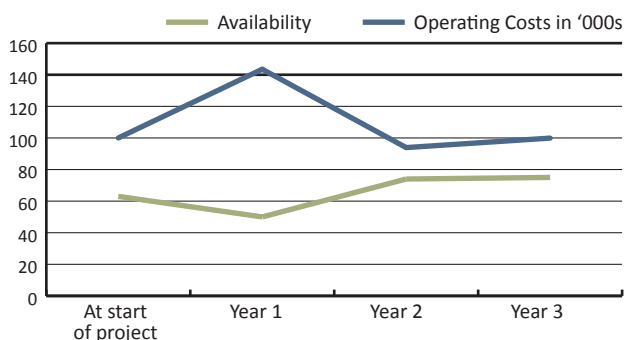


Figure 2: Wheel Dozers: Plant gets more performance with 1/2 the fleet

Through higher vehicle availability, the mine has reduced its fleet of dozers from 8 to 4 – and significantly reduced the cost of operating each of the remaining dozers.

Track-Type Tractors:

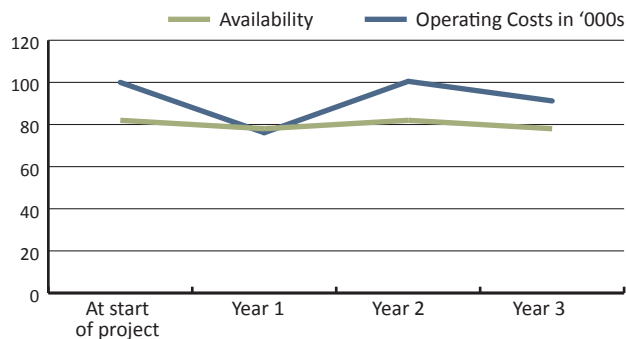


Figure 3: Track-Type Tractors: Less tractors, more performance

The tractor fleet has been reduced from 12 to 6 – yet overall availability has risen by 20%.

Large Wheel Loaders:

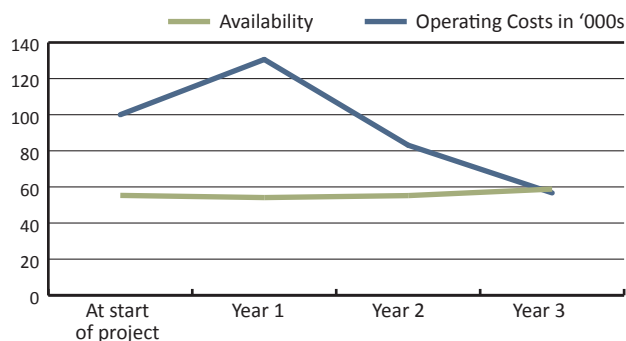


Figure 4: Large Wheel Loaders: Costs dropped by 43.4%

Equipment availability on the large wheel loaders has risen by 3.5%, and operating costs have dropped by 43.4%.

Motor Graders:

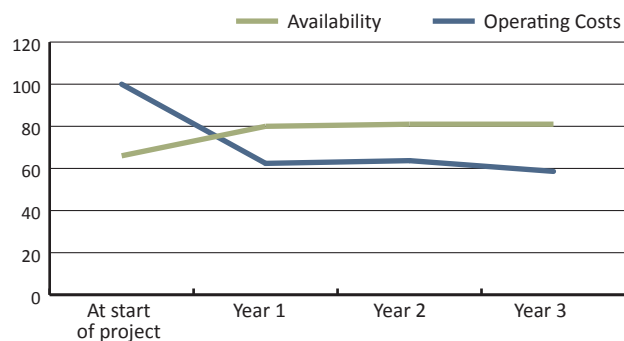


Figure 5: Motor Graders: Reduced fleet with increased availability and lower costs

ArcelorMittal Mines has dropped the number of levelers from seven to five while increasing availability by 25% and reducing operating cost by 41.4%.

Asset reliability is also making a significant contribution to the employees' quality of life. Not only does the transition to proactive maintenance create measurably increased worker satisfaction, major safety incidences are down by 74.7% since year one of the initiative resulting in an additional \$1.1 million in savings.

Finally, improved asset reliability has resulted in higher process stability raising the company's confidence in meeting production objectives and in managing the day-to-day operations.

Conclusion

While ArcelorMittal Mines Canada continues to implement the Ivara asset performance management software solution across its operations, the Maintenance Shop has already identified additional areas in which it can use Ivara's solution to achieve even greater improvements.

Having established a strategic approach to maintenance, the Maintenance group will next undertake a comprehensive reliability strategy development program to examine the effectiveness of their current maintenance practices on an asset-by-asset and task-by-task basis.

The process also drives to develop a closer relationship between operations and maintenance. This improvement will create an environment in which operators work much more closely with maintenance

workers, in order to create a structured maintenance program that better meets the requirements of both groups. Comprehensively mapping roles and responsibilities at the plant level will ensure that the activities of both operations and maintenance departments are continuously linked to the specific processes needed to achieve world-class maintenance standards.

The benefits of focusing on asset reliability have been significant in terms of the company's goal of doing more with less. The reliability focus is already contributing \$7 million per year to the bottom line and as the initiative expands additional financial benefits are projected. The reliability initiative is credited with playing a major role in sustaining the profitability and viability of the mine.