



## SUMMARY

ArcelorMittal - Mines Canada®

### Industry

Metals, Mining, Transportation,  
Logistics

### Business Value

- Digital business
- Supply Chain
- OT-IT Integration
- Data Democratization
- Logistics
- Real-time KPI Dashboards
- Integration with ERP systems
- Workforce Engagement

### PI System™ Components

- PI Server™
  - Data Archive
  - Asset Framework (AF)
  - Notifications
  - Event Frames
- PI Vision™
- PI ProcessBook™

## ArcelorMittal Meets Increased Production Targets with Data-Driven Logistics

Mines Canada is an integrated "pit-to-port" business that delivers iron ore products to the international steel market and its parent company, ArcelorMittal. Along with two open-pit mines, Mines Canada owns a private shipping port and a 420 km railway. Michel Plourde, Director of Systems, described how Mines Canada created an Enterprise Information Hub to make their supply chain more responsive to real-time production conditions and transform their business from a pure push operation to a client-driven, pull business.

In 2010, ArcelorMittal invested in an expansion project at the mine with the goal of increasing annual production from 16 Mt to 26-30 Mt. When the project culminated in 2012, the price of ore had dropped significantly. Mines Canada realized they needed to find a way to push the extra tonnage through their transportation infrastructure without additional capital investment. Plourde described their supply chain infrastructure. "We haul ore from our production facilities and our mine areas along a 420-km railway out to the port. The port itself is man-made, completely excavated out of bedrock and presents an interesting logistical challenge. There is only one loading facility, and because the port was designed for smaller ships and cannot be modified, you can't move multiple ships at a time - they just won't fit.

### Building a Business Case for an Adaptive Supply Chain

Plourde continued, "We started realizing very quickly that over the last 10-15 years, we had geared our supply chain for a 13-16 million-ton operation." With a 23-30 million-ton operation, their supply chain operations were going to cause severe bottlenecks. Plourde recalled, "We had to push the more ore through with no additional capital investment. All we could do was apply a bit of smarts to what we had and see what we could do."

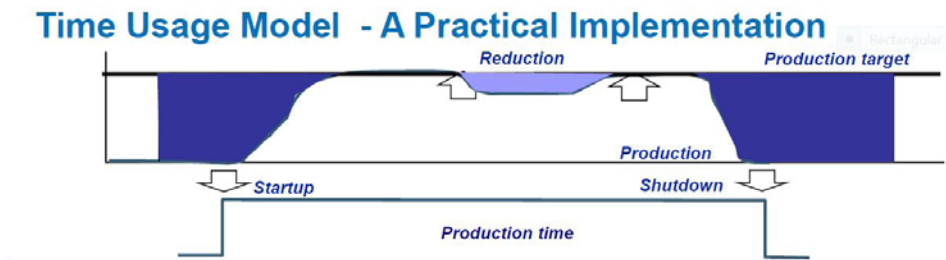
Plourde described their approach to resolving that challenge. We realized that we really needed was some sort of architecture to transform the data we had to make the entire supply chain much more resilient. **The supply chain had to be able to adapt.** We had to be much **quicker** at figuring out why we weren't delivering, why production targets weren't being met, or why we didn't have the right combination of ships, at the right time, at the port. Plourde described how the PI System was being used. "I understood what was happening in the mine, in the railway, but how could I make all this make sense to business decision-makers? We had to align budget numbers, daily production targets - which came from our business systems to know where we were going off-track." Finally, he said, "it's much more than knowing it, it's knowing it **fast enough** to be able to react."

### Three Steps to Creating a Data-Driven Supply Chain

**Creating a consistent Enterprise Information Hub** Mines Canada used the PI System to create "a way of getting data from multiple, disparate systems - including

DCS's, PLC's, mining systems, mine planning systems, railway dispatching systems, etc - and having it run through a central hub." Plourde said, "we had to stop re-inventing the wheel and integrate off-the-shelf technologies to get this infrastructure going." Finally, integrating ERP systems was a key driver. "Pulling forecasting data from SAP® systems can have significant impacts if you give it to an operator in the right context." Operations would know how their actions were making money at any given moment.

**Applying the right context** "Context, for us, was key and the means to seeing the data properly. We created unit templates by taking all of our equipment, processes, different plants, modeling them in Asset Framework (AF)...and associated them with our own time-usage model." Plourde added, "I may not be getting adequate performance on a process or piece of equipment, but it may not matter." Finally, they "needed a way to track events like downtime or excursions to start automating processes across the supply chain. Plourde indicated that Event Frames and AF were key to tracking events to "kick off different processes or different actions from people and even other systems."



**Visualizing information from anywhere and everywhere** "All of the information is available to everyone. Absolutely no limitation. Everybody from the shift operator all the way to the CEO is looking at the same data and information is plastered everywhere." PI Coresight<sup>1</sup> became a no-brainer for us." Plourde relayed, displays are "next to operator consoles indicating where they are relative to longer-term targets. Operators are able to react as things start to slide because they know exactly where they are in relation to their production targets. We've had shift foremen and crews looking at this stuff off work hours and management coming in and looking at real-time KPI reports."

### Expected and Unexpected Benefits and Future Plans

Plourde concluded by saying, "So the challenge, again, to crank out 10 million additional tons and ship it. The solution? Use our existing PI System infrastructure and transform it into an Enterprise Data Hub to give that data more context in the right areas." He added that, "the basis of their transformation was making a difference in information collaboration with the PI System and that fully integrating the supply chain is still a work in progress."

"The results? **A new collaborative mindset** was something a little unexpected. It was amazing to see how much people actually looked at [the data] from home and wanted to get involved. **We met our targets in 2015.** 26 million tons was quite a challenge for us and translated to about **\$120 million of additional revenue.** We needed to push it out, and we got it done."

<sup>1</sup> PI Coresight was renamed to PI Vision in 2017

Plourde, Michel. Heavy Haul Equipment Logistic Strategies in Iron Ore Mining. OSISOFT.COM. 4 April 2016. Web. 19 April 2016. <<http://www.osisoft.com/Presentations/Heavy-Haul-Equipment-Logistic-Strategies-in-Iron-Ore-Mining>>.

**We needed to bridge the gap between operations and the business systems. When an operator on the shop floor actually knows how he's contributing to the bottom line, pretty amazing things begin to happen.**

Michel Plourde  
Director of Systems  
ArcelorMittal Mines Canada