

Domtar Espanola Increases Pulp Mill Efficiency By 5% With Ivara EXP Enterprise Software

Domtar is the largest integrated manufacturer of uncoated freesheet in North America and the second largest in the world. Over 14,000 employees, Domtar produces 4.9 million tons of fine paper capacity per year, 1.3 million tons of market pulp with 34 mills (9 in Canada, 25 in United States) and 80 paper distribution facilities, 10 sawmills with production capacity of 1.3 billion board feet of lumber per year. Domtar Espanola has 590 employees. With 2 pulp machines and 2 paper machines, Domtar Espanola has an annual paper production capacity of 80,000 tons and an annual pulp production capacity of 350,000.

The Situation

Domtar, like others in the market, is under enormous pressure to succeed in a very competitive global market. Since 85% of the company's Canadian-made products are exported to the United States, and since many of its products sold in Canada are based on US prices, the significant increase in the value of the Canadian dollar compared to the US dollar has affected profitability significantly. The company was also facing increasing energy and raw material costs as well as increasing duties on softwood lumber exports to the U.S.



Figure 1: Domtar Espanola Mill

At A Glance:

- » Third largest producer of uncoated freesheet paper in North America
- » Two pulp machines producing 80,000 tons annually
- » Two Paper machines producing 350,000 tons annually

The Situation:

- » Competitive global market
- » 85% of Canadian-made products exported to U.S.
- » Fluctuation in Cdn/US dollar impacting profitability
- » Increasing energy, chemical, transportation and fibre costs
- » Higher duties on softwood lumber exports to U.S.

The Challenge:

- » Reactive approach to maintenance
- » Low equipment uptime
- » Aging maintenance workforce

The Solution:

- » Domtar implements Ivara EXP Enterprise to increase mill efficiencies & reduce maintenance costs.

The Results:

- » Improvement in Pulp Mill Efficiency: 5% in just 3 years
- » Improvement in Maintenance Spending: >15%
- » Improvement in Pulp Mill Uptime: >5%
- » Reduction in Paper Mill Mechanical Downtime: >1%
- » Maintenance Overtime improvement : >7%

The Challenge

In order to achieve their goal of improved mill efficiency and decreased maintenance costs, Domtar Espanola had to address several challenges.

Current maintenance practices were reactive in nature. Typically operators would request equipment repairs when needed, with a maintenance team responding to repair failed equipment.

Domtar Espanola also recognized that the transition from a reactive to proactive maintenance culture would involve a change in the way both maintenance and operations would work. Change management would need to be a critical component of the initiative to ensure a smooth transition.

In addition, many previous initiatives failed to take off as a result of outside consultants developing programs without employee involvement. Domtar realized that in order to successfully launch their new asset care program, a collaborative approach was required to create and implement asset maintenance programs for all critical plant assets in the shortest time possible and at a reasonable cost.

Another consideration was the pending loss of knowledge due to Espanola's aging workforce. The company required a systematic way to capture the equipment expertise of their experienced workers to ensure it would be available for the long-term.

Domtar was actively seeking areas for business improvement that would allow it to continue its industry leadership. "We realized that we had a significant opportunity to improve return on our largest investment – our paper-producing mills," says Gary Clackett, Director of General Services, Domtar Espanola. "The goal was to achieve a significant recurring annual improvement to the bottom line by reducing maintenance costs and increasing mill efficiencies."

To achieve this goal, Domtar partnered with Ivara to optimize equipment performance and reliability with the first implementation of the Ivara solution to take place at the Espanola mill.

The Solution

To reach its goal of reduced maintenance costs and increased mill efficiencies, Domtar Espanola implemented the Ivara EXP Enterprise asset performance management software solution. EXP Enterprise improves business performance by preventing industrial equipment failure, increasing production, and lowering costs.

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The initiative began with an assessment of the Espanola mill's current maintenance processes and practices. The assessment revealed how initiatives Domtar had already undertaken – from predictive analysis to improved planning and scheduling, and benchmarking – would be leveraged in the new proactive maintenance environment.

Once the assessment was complete, Ivara assisted in developing a business case for the mill, demonstrating the financial value of adopting the Ivara solution. The business case showed that significant rewards could be achieved from equipment performance improvements through reduced labour and material costs and increased mill efficiencies.

Ivara's Work Smart™ implementation methodology provided training, coaching and mentoring to a core team – a small cross-functional group of workers who acted as the internal change agents for the initiative. The mill was divided into 20 process areas with each of 2 core teams assigned to 10 areas.

Domtar used Ivara's unique reliability strategy development methodology, Maintenance Task Analysis (MTA), to quickly build and implement maintenance programs for assets across the mill. Domtar chose MTA because it would leverage historical and readily available employee knowledge about the reliability and performance of an asset to efficiently and effectively develop maintenance programs.



**Core Team Members
at Domtar Espanola**



Paper Machine

For each of the 20 process areas of the mill, sustaining teams comprised of maintenance and operations personnel, staff and hourly, were utilized. The sustaining team members were the subject matter experts on the equipment in each of their respective areas. The objective of the sustaining team was to capture employee expertise related to the ways that their equipment components could fail, and how best to detect early signs of failure to prevent the consequences.

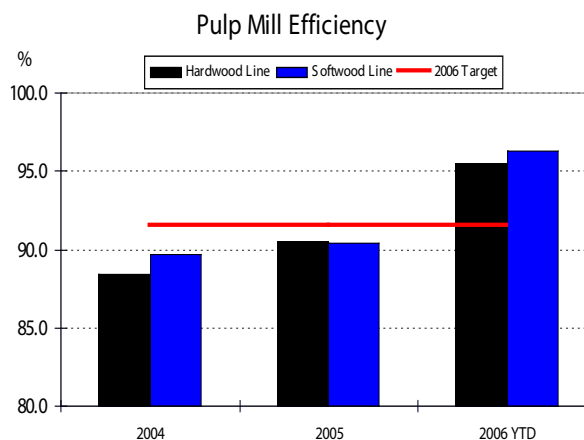
Using MTA, both the core and sustaining teams jointly identified all potential failure modes for the assets by reviewing existing PM activities, the asset's work history and their own knowledge of the asset. Once the failure modes were identified, each one was examined to determine the appropriate action necessary to mitigate the consequence of the failure. The resulting tasks were organized into a complete maintenance program and captured in EXP.

With MTA, an asset template library was developed for common equipment. This allowed programs to be established at an accelerated rate for most of the assets in each area.

The sustaining team was then responsible for implementing the newly developed maintenance program, in their respective areas with core team coaching.

The Results

The Domtar Espanola pulp mill, one of the first areas to implement the new asset care program, has seen an overall mill efficiency improvement averaging 5% per year, surpassing original expectations.



Overall pulp mill efficiency improvement from project initialization into reliability program sustainability.

Additional results include:

- » Improvement in Maintenance Spending: >15%
- » Improvement in Pulp Mill Uptime: >5%
- » Reduction in Paper Mill Mechanical Downtime: >1%
- » Maintenance Overtime improvement: >7%

“Since the implementation of asset condition based monitoring routes using EXP, I have seen a marked reduction in emergency breakdown work, and overtime hours,” states Denis Auge, Pulp Production Maintenance Superintendent, Domtar Espanola. “Additionally, equipment issues that operators would note regularly in their daily shift logs for maintenance attention have been virtually eliminated.”

Domtar Espanola has now adopted a proactive approach to maintenance - no longer repairing failed equipment but now focusing on asset health to prevent failures and their consequences from occurring in the first place.

In addition, predictive maintenance data which had previously resided in separate systems, applied to only a portion of the mill, is now consolidated in EXP allowing Domtar Espanola to view overall equipment health in one centralized location. Equally important, EXP is being used to capture the knowledge of experienced maintenance and operations workers.

“The average age of our maintenance workforce is 48. These workers amass a wealth of equipment knowledge but it was never formally documented,” says Clackett. “With EXP, we are now able to capture, store and disseminate their expertise before retirement - ensuring the sustainability of our new reliability program.”

There is also far greater collaboration between operations and maintenance. Ivara’s Work Smart methodology requires both operator and maintenance personnel to jointly analyze the failure potential of each asset, and develop the resulting proactive maintenance tasks. This collaborative approach not only addresses change management issues by involving

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those that will be affected by the change, it also instills a sense of ownership in the new asset care program.

With MTA, operations and maintenance personnel also have a much better understanding of how the equipment functions, how it fails and the specific proactive maintenance that is required. Since MTA leverages existing asset performance information to develop maintenance programs and has templating capabilities, Domtar Espanola developed and implemented reliability programs for 90% of its mill assets six months ahead of its original timeline.

Commenting on the success of the reliability improvement initiative, Clackett states, “When we first began the partnership with Ivara, our reactive approach to maintenance resulted in a very hectic environment. Now I often hear our guys saying things like ‘I can’t believe that this equipment runs so well.’”

Conclusion

In an increasingly competitive pulp and paper industry, improving asset performance while reducing costs is critical to ensure long-term profitability and success. Domtar Espanola is setting a new standard for asset reliability at Domtar with maintenance and operations teams working together to proactively manage the health of mill assets. While other Domtar mills have also started their implementations, the Espanola initiative demonstrates the value of Ivara EXP Enterprise solution in supporting Domtar’s goal of business improvement.