

## North America's Largest Uncoated Freesheet Paper Mill Realizes Significant Savings Annually with Ivara EXP Enterprise

Domtar Corporation is the largest integrated manufacturer of uncoated freesheet paper in North America and the second largest in the world based on production capacity. The Domtar Ashdown Mill, located in Ashdown, Arkansas, is the largest uncoated freesheet paper mill in North America. The mill also produces bleached hardwood and softwood kraft market pulp. Domtar Ashdown employs 1,100 people and its operations include four paper machines and two pulp lines

### The Situation

In today's highly competitive North American pulp and paper industry, effectiveness is survival. With off-shore competition growing and increasing energy, transportation, and raw materials costs, the industry is facing significant risks to sustained growth.



Figure 1: Domtar Ashdown

Domtar's vision to be a world leader in paper, pulp, and wood products is firmly based on the foundation that optimized asset performance is a key strategy to address challenging market conditions.

"As manufacturers of commodity products, we had to ask ourselves 'How do we remain profitable for the long-term against lower cost off-shore competition?', comments Jay Shellogg, Reliability Superintendent, Domtar's Ashdown Mill. "The answer is to ensure our equipment operates at peak levels at all times. We consider it one of the greatest opportunities to improve operational and financial results without incurring capital expenditures."

Domtar selected Ivara® EXP Enterprise asset performance management software to drive its enterprise-wide reliability initiative and support its

### The Situation:

- » Optimize asset performance to address competitive market conditions

### The Challenge:

- » Lack of a technically-based maintenance program
- » Need to better leverage predictive technology data
- » No proactive maintenance process in place

### The Solution:

- » Ivara EXP Enterprise selected to improve production performance and profitability

### The Results:

- » 15% increase in proactive maintenance
- » Significant annual savings realized in the following areas:
  - Pulp Dryer:
    - reduction in annual production and maintenance costs
  - Powerhouse Area:
    - reduction in annual natural gas usage through increased reliability on bark delivery system
  - Woodyard:
    - 2.5 percent increased uptime of P & H crane resulting in increased throughput (tons)
- » Cost Avoidance Results:
  - Paper Machine #64:
    - Avoided costly equipment failures and production interruptions
    - Avoided unscheduled downtime
  - Pulp Dryer:
    - Avoided downtime costs

## CASE STUDY

goal of production and profitability improvements. An implementation of the solution began at the company's Ashdown Mill. With four paper machines and two pulp lines, the Ashdown Mill is the largest uncoated freesheet paper mill in North America.

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### The Challenge

Domtar Ashdown's mill assets are worth close to a billion dollars and require high cost raw material inputs to operate. "While we had no dramatic recurring asset failures, we knew that any incremental improvement in asset performance would result in a substantial increase to our bottom line," states Shellogg.

The mill had many maintenance procedures in place, yet there was no integrated business process to ensure a proactive, sustainable approach to asset care. On some routine frequency, maintenance and production workers either used paper-based check sheets to conduct inspections or maintenance was conducted simply as a result of the maintainers and operators own personal knowledge and experience of what the equipment needed. The Ashdown Mill required a technically-based methodology to define the maintenance requirements for each asset.

Ashdown also leveraged several predictive technologies, yet the resulting data was not consolidated into one centralized system. "Between our predictive technology data and our inspection check sheets, we had lots of information, but not everyone could readily see it. The raw data was not shared and check sheets were not easily retrievable," says Shellogg.



Figure 2: Employees at Ashdown

### The Solution

To improve production performance and profitability, the Ashdown Mill embarked on an implementation of Ivara® EXP Enterprise asset performance management software. EXP Enterprise is a cohesive, integrated platform for managing all aspects of a proactive maintenance strategy - creation, execution, and sustainment.

The EXP implementation was targeted at four areas within the mill:

1. Paper Machine #64
2. Pulp dryer
3. Powerhouse Area: This area is comprised of a collection of assets that supply the power to the mill such as recovery boilers and power boilers.
4. Wood Yard: This area is comprised of numerous assets including cranes, chip stackers, conveyors, and other mobile equipment.

The initiative began with the Ashdown reliability team's visit to Domtar Espanola – a Domtar Mill located in Ontario which had successfully employed EXP Enterprise. "We had no exposure to the software until we arrived in Espanola and then our attitude quickly changed," comments Shellogg. "We had the opportunity to sit down and try out EXP Enterprise. We were surprised how intuitive and easy the software was to use."

The Ashdown Mill began its EXP Enterprise implementation with the creation of core teams. Core teams are cross-functional groups that are trained, coached and mentored by Ivara on all aspects of the reliability initiative and act as

internal change agents. The Ashdown Mill assigned core teams, comprised of maintenance and production workers, to the power house and paper machine #64. The pulp dryer and wood yard areas shared a core team.

The core teams were then trained in Ivara® Maintenance Task Analysis (MTA) reliability strategy development methodology. MTA, which is based on RCM2™ principles, is an accelerated failure mode analysis methodology. This allows for a faster less resource intensive analysis that is technically sound. For each of the four target areas, the Ashdown Mill core teams established an equipment hierarchy, prioritizing the assets to be targeted for MTA.

Each of the core teams then facilitated MTA sessions simultaneously in the targeted implementation areas. This involved interviews with two production and two maintenance workers who were the subject matter experts from each area. Their combined knowledge resulted in the identification and development of technically-based equipment maintenance programs that were then captured in EXP Enterprise.

“You can’t realize the value of MTA if you can’t implement the analyses recommendations,” says Shellogg. “Because the MTA analysis is integrated right in the software, EXP made it possible for us to execute the proactive tasks recommended by the MTA - quickly and effectively.”

EXP Enterprise also provides templating capabilities that allow users to apply the MTA results from one asset to other similar assets. Commenting on this capability, Shellogg states, “The inspection routes for our oilers in the power area were easily applied to other oilers. This is an invaluable feature of EXP that dramatically reduced our implementation timeline.”

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EXP Enterprise has an indicator alarm monitoring panel with automated processing of all condition data from all sources. Automated alarming helps the maintenance and operations

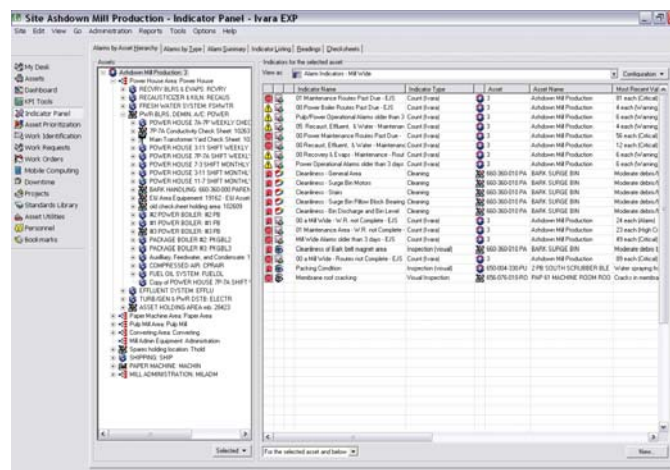


Figure 3: Ivara EXP Enterprise Indicator Panel

team make informed decisions when responding to an asset that has fallen into an (early warning) alarm state. EXP links to recommended corrective procedures during an alarm and the work is then executed in the Ashdown Mill’s CMMS/EAM system. Shellogg states, “When you have an alarm you can open it up and easily determine the alarm state and where the indicator came from. If it originated from an MTA, you can navigate right into that MTA, see what the failure mode is as well as the corrective actions that need to be taken.”

Once inspection routes were started, Domtar Ashdown recognized that they needed metrics to ensure the routes were being executed at the proper frequency. EXP Enterprise has built-in dashboards with graphically presented KPI information as well as configurable KPIs. The core team built KPI dashboards for each area of the mill, leveraging leading KPIs such as the percentage of on-time routes completed and number of indicators that are in alarm or past due. “The KPI dashboards allow us to easily monitor where we stand on some real critical cultural issues,” states Shellogg. “For example, we can easily see if a shift is not getting its routes completed and then quickly resolve the issue.”

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## Results

With EXP Enterprise, the Ashdown Mill has realized significant annual savings and increased proactive maintenance by 15% for the targeted assets within the implementation areas which represent only 2.5% of the mill's total assets. The annual savings are comprised of the following:

### Pulp Dryer:

- » Reduction in production and maintenance costs

### Powerhouse Area:

- » Reduction in natural gas usage through increased reliability on bark delivery system

### Woodyard:

- » 2.5 percent increased uptime of P & H crane, which translates into increased throughput (tons) annually.

The Domtar Ashdown mill also avoided incurring additional costs with EXP including:

### Paper Machine #64:

- » Avoided costly equipment failures and production interruptions by detecting and repairing a failed lubrication heat exchanger within the paper machine's vacuum pump system.
- » Avoided unscheduled downtime by detecting and repairing a failed gearbox pump coupling within the paper machine's vacuum pump system.

### Pulp Dryer:

- » Avoided downtime costs by detecting and repairing a failed clutch within the pulp dryer turning rolls.

EXP's asset health dashboard provides the mill with an asset-centric view of equipment health - online and in real time. "The EXP dashboard is truly command central for us. If I'm running centrifugal pumps in the paper mill, I can easily access the pulp mill's MTA results and routes for that same type pump to see if they're doing something unique and innovative that we can capitalize on," states Shellogg. "Similarly, if one area is doing something that's not value added, we can encourage them to change direction and execute work of greater value instead."

EXP Enterprise is consolidating all of the Ashdown Mill's inspection data, predictive technology, and MTA results in a cohesive reliability environment that is sustainable. "If you conduct failure analyses without EXP Enterprise, you'd end up with paper check sheets. We simply couldn't manage a paper system with the amount of checks we're going to have in this mill," states Shellogg. "We will easily have a half million to three quarters of a million indicators once we're done. You can do all the analysis you want, but without a tool to implement the recommendations and manage all of the resulting data - what good is it?"

## Conclusion

In a competitive global market, the pulp and paper industry must maximize production capabilities in order to survive. With capital assets worth close to a billion dollars, maintenance as a business unit plays a pivotal role in optimizing production capabilities through improved asset performance. "We believe maintenance is not a cost but an investment that enhances the growth and effectiveness of our business," states Shellogg. "With EXP Enterprise, maintenance is empowered to positively impact the bottom line and we continue to improve production performance and profitability as we move forward in our implementation."