

# A new era of cost-effective and efficient mill management

Collaboratively-managed pulp and paper mills are able to predict failures before they occur, preventing costly downtime and identifying previously-inaccessible savings potential. John Schroeder\* explains what collaborative operations offer

The global pulp and paper industry has for many years relied upon varying levels of fairly basic remote support – in its simplest form, this is reactive and limited to fixing problems as and when they occur. Now, the advent of more proactive, analytical and collaborative approaches has sparked a new era of cost-effective and efficient mill management.

Having worked in this sector for over 30 years, I find it extremely pleasing to see the adoption of not only these new technologies, but also a novel, more collaborative and proactive mindset opening up among mill owners and operators. However, it is a hard truth that this paradigm change has been rapidly accelerated by coronavirus.

Never before has the value of remote collaborative operations to keep mills running efficiently been so widely recognised as during the global pandemic. The value of remote expert collaboration is particularly clear at a time when the ability of diagnostic and asset management experts to travel has been significantly restricted.

Today, industry leaders are more reliant than ever on continuous, virtual access to digital technologies, data analytics and collaborative partners' domain expertise to empower and protect their enterprise. It seems likely that – while the circumstances precipitating this change of



ABB's John Schroeder: 'A collaborative approach enables services to be delivered more effectively'

mindset are dire – the outcomes for mills of a turn towards greater collaboration will be highly beneficial in the long term.

## How do Collaborative Operations work?

A remote collaborations approach typically consists of a global network based around regional hubs – such as Collaborative Operations Centers operated by ABB – equipped with advanced applications that connect mill operations, engineering and business management seamlessly with digital technologies and data analytics.

One facet of the approach that is not always clear is the human collaboration between onsite personnel and remote experts – real people who collectively share hundreds of years of pulp and paper, automation and digital expertise. Working together, members of both the onsite and remote teams are able to access the same information and can

customer working closely, yet remotely, with their partner service provider to identify their asset, process or mill priorities. The partner establishes connections to systems, sometimes adding sensors on motors or other assets to collect additional data. Depending on the need, connections are made to the equipment and systems with the necessary data including distributed control systems (DCS), quality control systems (QCS), drives systems, data historians and maintenance systems.

Data is then collected directly from the sensors or systems where the information already exists. Data analytics and machine-learning applications glean important knowledge from this data, enabling proactive/predictive alerts, trending and highlighted anomalies. Remotely-located experts monitor and interpret this information and collaborate with onsite managers to help make the most appropriate, immediate and evidence-based decisions.

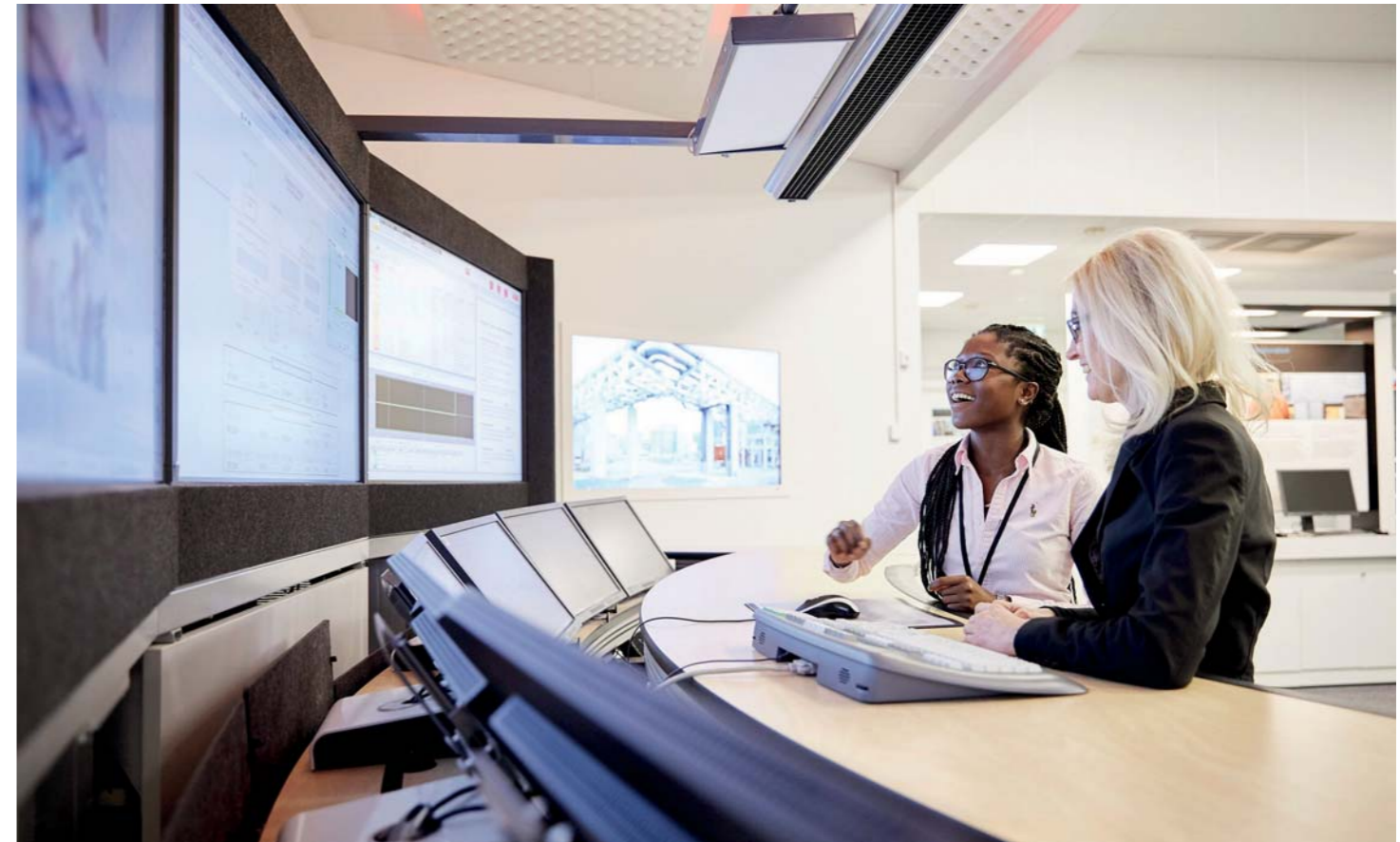
A recent example of this continuous collaboration with an ABB customer saw an abnormal decrease in signalling over time from a weight sensor. The analytics found that it was not in fact a sensor issue, but rather a reduction in the ability of other equipment to detect the sensor signal. The onsite team was alerted and addressed the

scrutinise analytics together; this collaboration helps onsite managers to make data-based decisions.

The process begins with a



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problem well before any quality issues were incurred.

## What are the benefits?

Primarily, collaboratively-managed pulp and paper mills are able to predict failures before they occur, preventing costly downtime and identifying previously-inaccessible savings potential. When issues do occur, the available data enables on-site personnel to take more informed and rapid corrective action, contributing to performance and productivity targets being met.

However, collaborative operations involves more than simply preventing problems before they occur; what is key is the 'actionable insights' based on process data analysed over time. This helps with the effective maintenance of equipment based on its criticality and can also be used to optimise production

processes to reduce costs while meeting specifications.

## Higher quality

With continuous monitoring comes the ability to establish alerts based on targets and KPIs. As such, when disturbances occur, or are nearing a crucial threshold, operators and remote experts can be made aware in order to take proactive steps and keep quality where it needs to be to meet specifications.

## Cost savings

ABB's Collaborative Operations solutions are proven to deliver significant improvements and savings across a number of industries, such as extending machine life by using immediate data analysis to better manage assets, processes and risks, and reducing maintenance costs by using predictive rather than preventive and reactive

maintenance practices.

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Cost efficiencies are derived from many sources, including adhering to target product quality levels and boosting efficiency in the use of electricity, fuel and raw materials. They are also found in increased production speed, reduced number of sheet breaks, increased output and proactive problem-solving and maintenance that avoids failures and unplanned shutdowns. The extensive data analytics and expert support enables onsite managers to streamline preventive maintenance and enables maintenance organisations to focus on other important tasks.

There is still the perception among mill managers that the collaborative approach requires a huge investment. On the contrary, a remote-delivered service is easily scalable and can start with a small initial investment; a supplier can start monitoring just a few critical motors and gradually expand to monitoring all assets within the mill. Once customers proceed with implementing the collaborative approach to manage one problem or area of plant operation, they gain confidence in the framework and have the evidence needed to expand.

## Improved maintenance efficiency

With ongoing data and analytics, mills can be efficient beyond problem solving. The reality is that they now have a deep understanding of asset health and a prioritised preventive

maintenance plan. Instead of wasting time on routine maintenance that is not critical, mills can better serve the needs of operations by focusing maintenance where it matters most.

### Increased productivity and reduced risks

A recent example of where remote collaboration has delivered tangible benefits can be seen at the Gävle mill belonging to leading Swedish packaging materials producer, BillerudKorsnäs, one of dozens of pulp and paper mills connected to ABB using Collaborative Operations. For the Gävle mill, its status as an ABB Collaborative Operations customer means that specific, in-depth expertise with its installed ABB control systems is not needed. For example, when an alarm is triggered due to abnormal values, the mill's operators are

able to rely upon ABB's experts to interpret the issue, provide detailed analysis and send fully qualified service technicians to check the causes of the alarm on site – preventing disruption and production losses.

"We do not have the very specific expertise of the control systems. The Collaborative Operations Center catches up with issues early and gives us access to ABB's expertise. In this way, we prevent disruptions and production losses," says Andreas Eriksson, service engineer at BillerudKorsnäs.

In another recent example, ABB helped a North American packaging supplier that had previously been hesitant to embrace remote collaboration capabilities to keep their production running through remote control loop tuning. The company – a critical supplier of packaging materials to a large

metropolitan area – encountered a situation with weight variation during the coronavirus lockdown. They had limited expertise on site due to social distancing and needed support understanding why they were experiencing 2-Sigma CD weight variances with higher grades, which was causing their paper machine to slow down.

Remote diagnostics were used to reach a solution and ABB's experts found a mapping error in the CD weight profile. Operations were quickly normalised, with improved CD control and the paper machine on its way back to normal speed, all under remote supervision by ABB. The customer was so impressed with the speed and diagnostic capabilities available by using remote connectivity that a proposal for ongoing remote support is now in progress.

The changing mindset towards regarding collaborative operations more of a necessity

than a nice to have underscores the importance of ongoing development to continue to find new and innovative ways to help our customers. That's why our ABB Collaborative Operations team members also work closely with the Artificial Intelligence (AI) lab within the ABB Corporate Research function to further develop AI and machine learning applications, finding ways to help customers with even more optimisation opportunities.

### Taking the first step

So, with these benefits in mind, how should mills go about taking the first steps into this developing area? I recommend that any mill considering collaborative operations solutions needs to first identify and select a well-established partner that has the high level of process expertise, plus automation, technology and domain know-how, required



### ABB's three-stage cybersecurity model ensures multiple layers of defence

to identify where your needs and highest pain areas lie. A collaborative-based approach is fundamentally more than just technology and needs the skillset – and real people – to analyse the data in a way that delivers a solid return on your investment.

As with any new service framework, customers naturally need reassurance about the level of proactivity and benefits that will be provided. Mills taking even the most modest, first step to a collaborative approach quickly come to understand the benefits obtained from the range of proactive alerts that are available, and the support from the best experts – wherever they are in the world – provided in real time.

Another area of concern that customers typically need reassurance on is cybersecurity.

When considering any new digital solution, ensure that decisions include how to address cybersecurity concerns, and that multiple layers of defence are implemented. Secondly, it is important to comprehend and respect different cultures and mindsets of your people. For example, the engineering mindset, where safety is critical, tends to seek a deterministic process and system. However, our experience suggests that cybersecurity requires much more dynamic processes that are continuously evolving.

It is worth noting that ABB's three-stage cybersecurity model ensures multiple layers of defence by first establishing a foundational level of technical and organisational security controls to defend against the majority of

the generic threats, continuously managing and maintaining these controls and enhancing with more sophisticated controls. This involves implementing a strong collaborative operation of cybersecurity controls with managed security services.

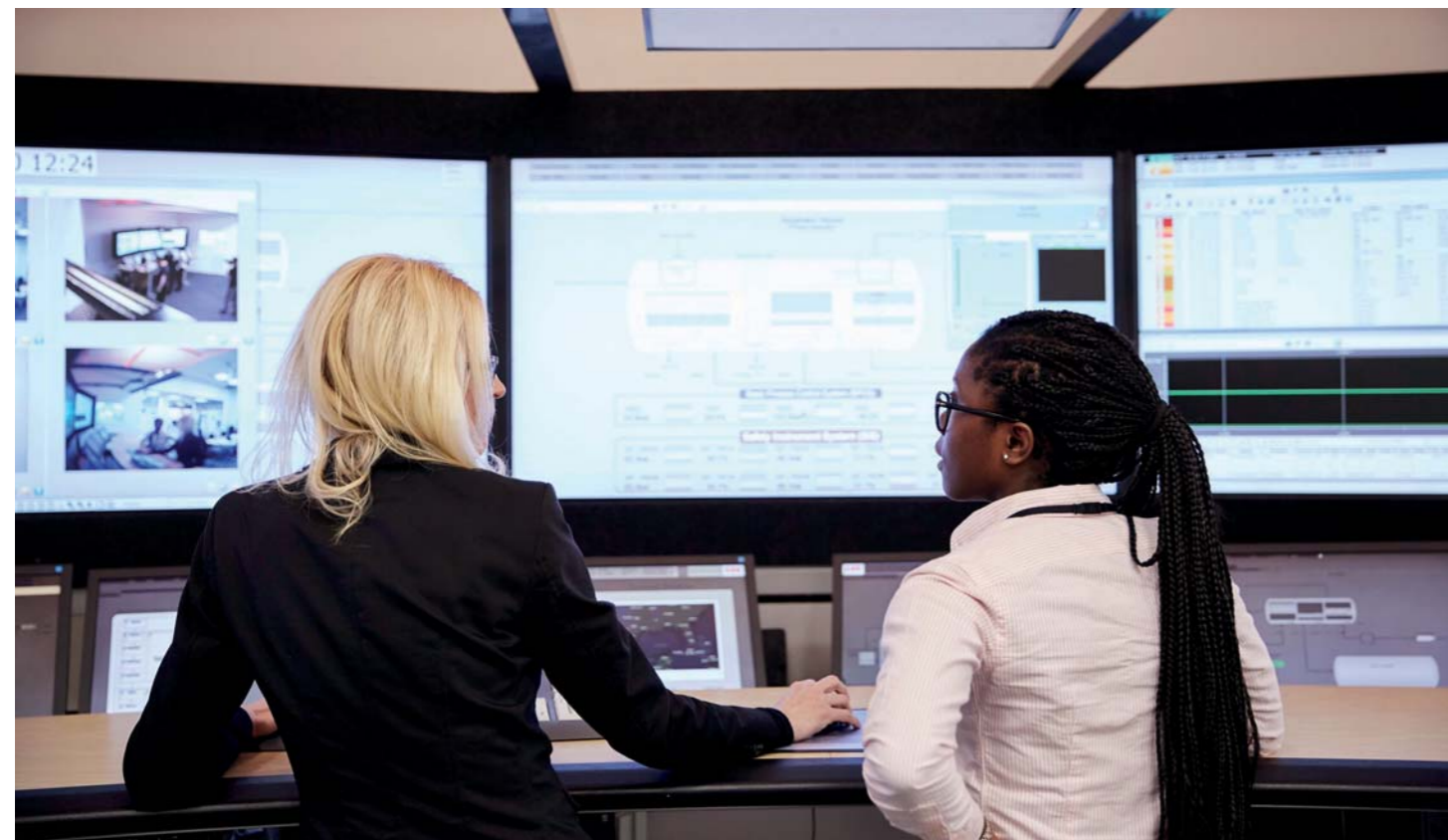
### Summing up

A collaborative approach enables services to be delivered more effectively with continuous access to data and experts for proactive problem finding, better preventative maintenance that focuses on where the issues really are and increasing optimisation opportunities to make on-spec paper at lower cost with less raw materials.

In our highly-competitive environment, especially in the current challenging times, all

pulp and paper producers have to consider how to continually improve performance, efficiency and returns on their operational expenditure. We also have to explore ways to unlock the potential of our processes and equipment to further improve productivity and quality. We can only achieve this by taking advantage of not just IoT technology, data, and analytics, but also – and perhaps more importantly – the continuous monitoring and expert support available by using remote collaboration services to ensure the opportunities made available through digitalisation are adapted for the complexities of the pulp and paper process.

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