Bently Nevada
a Baker Hughes business

Condition monitoring solutions for the pulp and paper industry

Why partner with Bently Nevada?

We have earned your trust. For six decades the Bently Nevada product line has supported the most demanding applications in multiple industries. And even as we protect and monitor your machinery, we constantly strive to refine and improve our offerings—and help enable your success.

We design and deliver solutions for all of your monitoring needs—including sensors, distributed and rack-based monitors, software, and supporting services—with the following goals:

- Increased availability and production
- Lowered maintenance costs
- Reduced risk in terms of safety, environmental, and asset upsets

Quantifiable, proven results:

- Over 60 years of innovation in asset protection and condition monitoring
- More than 240 international patents issued, including over 150 in the U.S.
- More than 360 international patents pending, including over 95 in the U.S.
- Over 85,000 3500 Series monitoring systems installed globally
- Over 4 million sensor monitoring points
- Services support globally
- Over 1,600 System 1 software users worldwide

Industry challenges

Pulp and paper mills are under incredible pressure to remain profitable in the face of rising costs associated with lumber, process chemicals and energy, while competing in the market with low priced pulp and paper products. With each new cost increase cutting into your bottom line, there has never been a more important time to maximize your asset output while also optimizing your mill processes to reduce waste wherever it may be occurring. Bently Nevada has the combined products and services to turn challenging times into opportunities that position you for future profitability year over year. We've been partnering with customers around the globe and in every industry to do just that for decades, and no company has a broader range of products, services and knowledge to get the job done right.

Reliability: the key to a successful future

Rising costs and an increasingly competitive business environment have one thing in common: if your production assets are unreliable, it has enormous consequences.

What if you could make your assets more reliable while spending less money on maintenance? That's exactly what today's best companies have discovered how to do.

Industry studies show that the average facility spends approximately 6% of its Replacement Asset Value (RAV) on maintenance each year. In comparison, best performers spend 1.7% of RAV (70 % less!) while enjoying better uptime, efficiency, and profitability. Thus, it's not about simply spending less on maintenance, it's about working differently—working smarter—to achieve a more reliable mill.

Help is available

Closing the gap between your reliability "goals" and what you are actually obtaining from your efforts typically involves the following three categories:

- **Processes:** Bently Nevada can help customers assess their goals, identify the reliability gaps in their current operations, and then implement the appropriate corrective actions.
- **Tools:** Our Bently Nevada product line is world-renowned for unsurpassed quality in machinery condition monitoring. Everything needed to address the assets in pulp and paper mills is available, from sensors to continuous monitoring systems to portable data collectors and analyzers. And, it's all brought together in a unified platform for asset condition monitoring and diagnostics –System 1® software. We also assist customers in integrating and using their already installed tools, such as computerized maintenance management systems (CMMS) and reliability software.
- **People:** Reliability is about more than just technologies and processes. Armed with even the most sophisticated tools and effective strategies, companies can fail to reach their reliability goals unless they are able to successfully change the way they work. Reliability is a company-wide effort that touches operations, maintenance, planning and scheduling, purchasing, management, and engineering. Bently Nevada is able to help customers change the way they work by addressing the organizational culture issues that keep companies mired in ineffective processes, helping them transform their businesses and balance sheets.

Because Bently Nevada is able to fully address each one of these, we are able to help you solve the whole problem—not just bits and pieces. Our tailored condition monitoring solution can help you close the gap.

Condition monitoring

While condition monitoring may not be the only element in a successful reliability program, it is nonetheless an essential part.

For years, we've been taught that the older an asset is, the more likely it will fail. As such, many mills have evolved elaborate and finely tuned maintenance schedules based on calendar intervals or running hours.

There's just one problem with that approach: it's only valid for about 15% of the assets in most facilities.

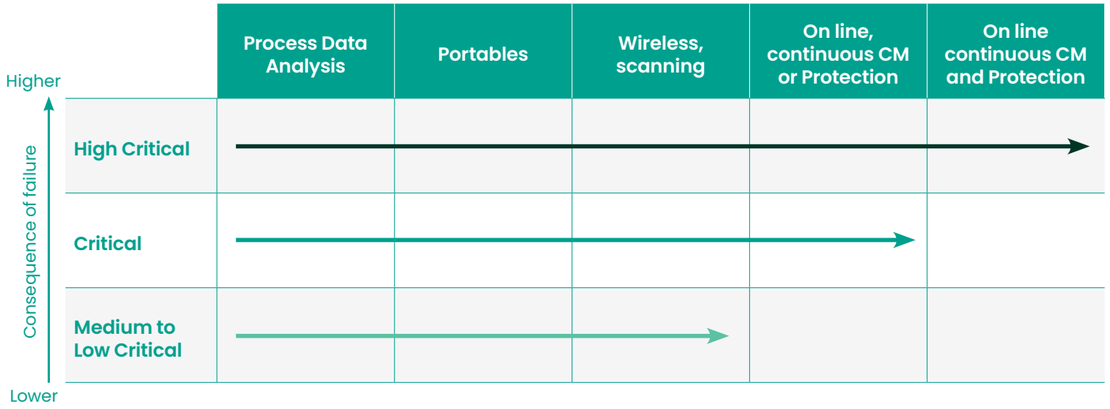
In other words, if you've applied this strategy to the majority of your equipment, most are getting "maintained" when they don't need to be. That's wasteful, and it's one of the major reasons that many companies are overspending on maintenance.

Today we understand that the probability of an asset failure is often highest just after it has been placed in service or undergone maintenance. Following this "infant mortality" period, its probability of failure becomes constant and does not rise linearly over time. This means that running hours and calendars are poor "predictors" of failure for many assets. So how do you know when such assets will fail if the time-based intervals can't be trusted? By measuring the condition of the asset using vibration, temperature, efficiency, oil chemistry/particulates, and other physical parameters. In other words, condition monitoring.

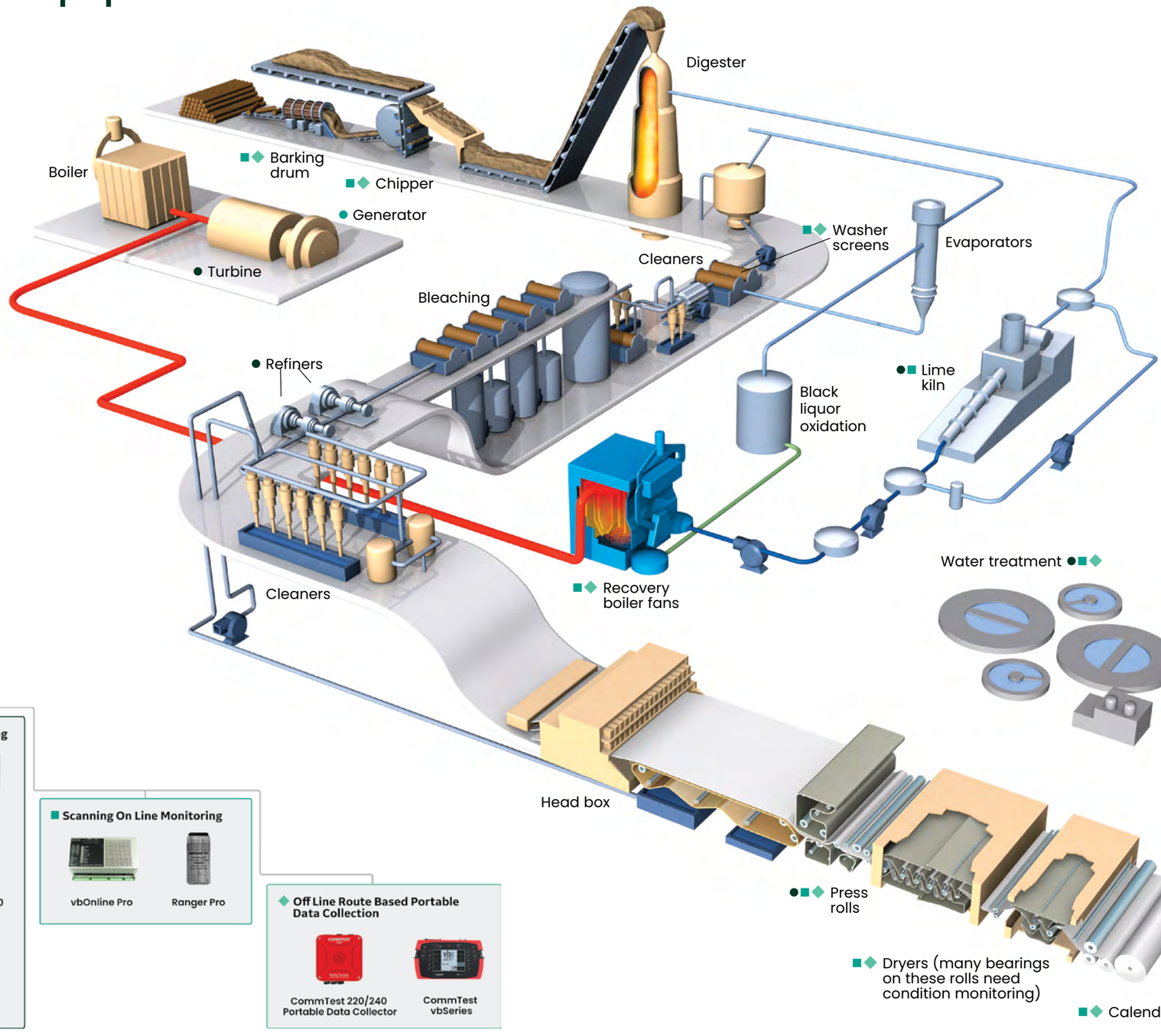
This approach results in corrective maintenance only when. the condition indicates the asset is failing. Further, failure progression can often be trended quite accurately, allowing maintenance intervention at exactly the right time—not too soon, not too late. And, condition data can be remarkably precise, indicating not just that the asset is failing, but exactly what is wrong, even identifying root cause.

Different assets, different approaches

Not all assets are created equal. Some, such as paper machines, boilers, refiners, gearboxes, turbine generators and compressors are critical to operations. Others, such as small pumps, fans, motors, presses, mixers, and equipment with spare or backup units installed, are less critical. And still others have less impact on safety or production, with only maintenance costs as the primary consideration. As such, a variety of condition monitoring products and approaches are required.



Condition monitoring applications in pulp and paper



Contact your representative for more information on condition monitoring for these assets.

Additionally, we monitor the following assets throughout the process.

- Pumps ■◆
- Motors ■◆
- Compressors ●

CMMS/ERP System

Plant Data Network

S1

System 1* Condition Monitoring Software

● Continuous On Line Monitoring

Orbit 60

3500 Series

2300 Series

ADAPT 3701/40

1900/65A

AnomAlert

■ Scanning On Line Monitoring

vbOnline Pro

Ranger Pro

◆ Off Line Route Based Portable Data Collection

CommTest 220/240 Portable Data Collector

CommTest vbSeries

Bently Nevada service menu

		Key benefits	
Implementation services	**Get it right the 1st time** • Ensure your assets are protected and monitored when you're ready to startup • Avoid costly delays and rework • One source to design, plan, manage, and execute the installation • Avoid startup trips due to improper installation and configuration	**Up to $1M/day** Avoided cost from lost production, secondary process & equipment damage	**100%** Service work guarantee 1 year warranty standard on all service work
Proactive support	**Keep your system healthy and optimized** • Prevent instrumentation related false trips • Prevent and minimize potential data loss events • Keep up to date and compliant with the best technologies available • Access the expert support you need when you need it most	**80%** Industry wide machinery alarms & events are due to instrumentation	**>90%** Typical reduction in non-actionable alarms & events
Asset health and consulting	**Actionable insights you can trust** • Understand your asset health to optimize outage and maintenance planning • Plug in to our global network of machinery experts with remote monitoring • Professional OEM agnostic machinery diagnostics when and where you need it • Custom analytic development and tuning to pinpoint specific conditions	**100% ROI** A single machine save often results in complete monitoring contract payback and more	**5-10X** Cost reduction for well planned maintenance outage vs unplanned reactive outage
Cybersecurity[1]	**Stay ahead of evolving cyber threats** • Ensure your system is up to date and protected as threats continually evolve • Identify and mitigate cybersecurity risks to your operation • Keep your system both secure and accessible with advanced security technologies and architectures leveraging data diodes and database replication	**29%** Patch management can reduce your attack surface up to 29%	**243 days** Average time before detection that a system is compromised
Training and education	**Critical skills that amplify your machinery management capabilities** • Enable your personnel to operate and maintain your monitoring and protection system • Enable your operation to maximize the value of your system leveraging expert product and application training and knowledge	**400+** Customer courses delivered each year in 10 languages and over 45 global locations	

1. https://www.us-cert.gov/sites/default/files/documents/Seven%20Steps%20to%20Effectively%20Defend%20Industrial%20Control%20Systems_S508C.pdf

You can rely on us

For more than 50 years, we've been supplying condition monitoring solutions to machinery-intensive industries. We also bring two decades of experience conducting reliability improvement projects. Customers turn to us for a simple reason: lasting value. Our solutions demonstrate their worth, day in and day out. We combine the highest quality products and responsive customer support with a service team that takes the time to understand the uniqueness of your plant, your personnel, and your goals.

Our products can be found in many of the world's pulp and paper plants. Today, many of those same plants are turning to Bently Nevada for a more comprehensive solution to their needs, moving beyond just machinery protection instrumentation on a few assets to plant-wide strategies and systems for improved environmental compliance, safety, asset production, quality and reduced operation and maintenance costs.

Leading the industrial world.

Digital technology and the Industrial Internet of Things (IIoT) are dramatically impacting the way processes are managed, operated, and maintained. A second Industrial Revolution is underway, and the future belongs to the companies that tap into the flood of available new data.

Production process data enables more efficiency at lower cost than ever before. To gain the competitive advantage, you need a partner who will not only help you navigate these new capabilities, but will also prepare your operation for even greater technical advances. Bently Nevada is ready to be that partner.

By combining a legacy of deep machine knowledge with our digital industrial vision, Bently Nevada is reimagining the way that people, machines, and data come together—allowing industry to go further.

60+ Years

Bently Nevada has led
condition monitoring

4,000,000+

Machine sensor points
installed globally

135+ Experts

Machine Diagnostic
Engineers worldwide

Baker Hughes

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