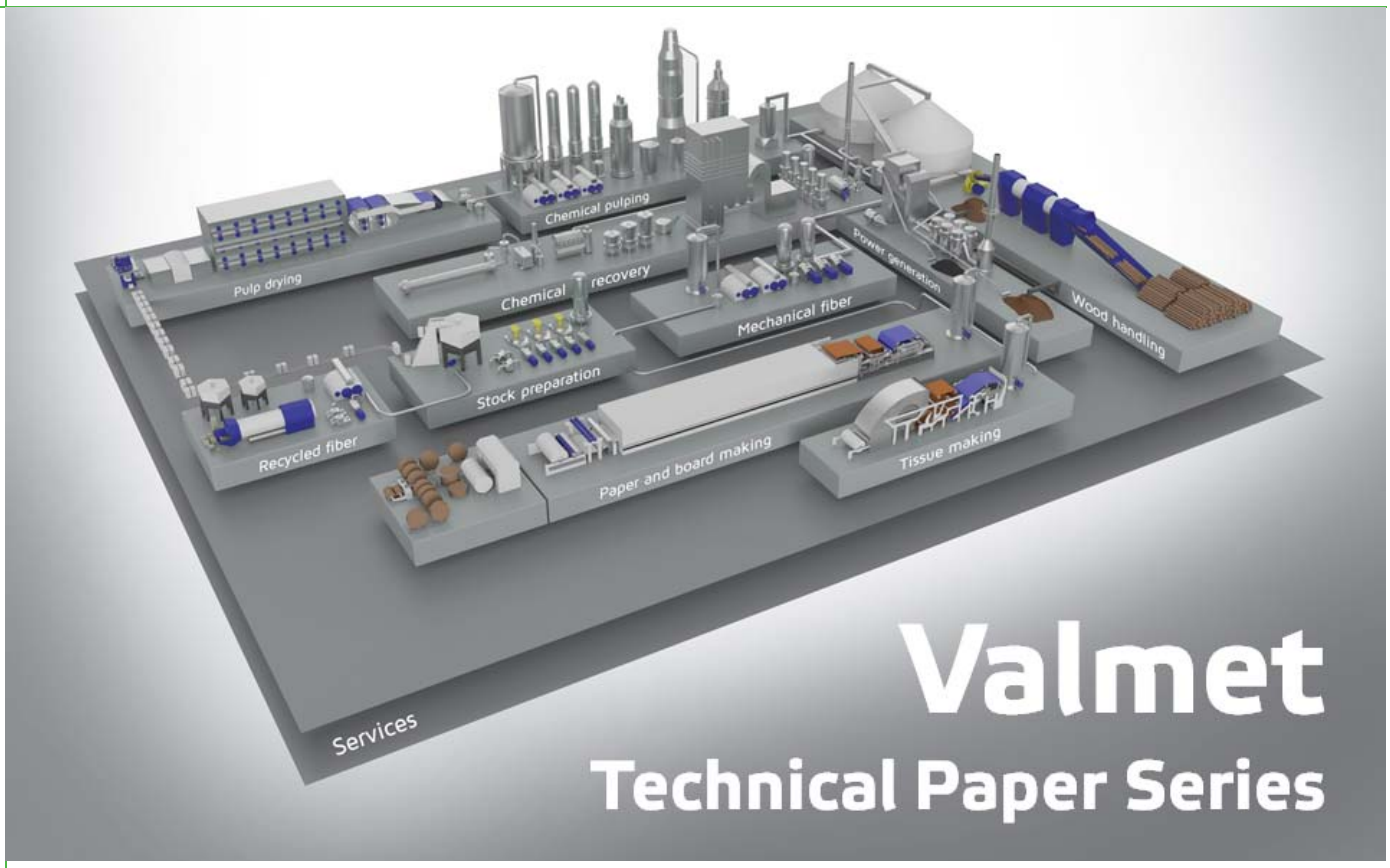

Field Services

Executive Summary

Valmet's expertise and experience are incorporated in all our products, giving us unparalleled insight into all aspects of upgrading processes and machinery. We are committed to continuously researching and developing new technologies, materials, designs and services to enhance the performance of existing equipment and processes.

Valmet's services for paper and board making lines cater to the different needs of mills, ranging from a number of equipment-specific services, such as condition tests and maintenance for a particular machine section, to services covering the entire production line or mill, such as production and maintenance development cooperation, or the outsourcing of mill maintenance.

Our engineering offers specialized field services to maintain or improve the mechanical and process operations of your facility. Our field engineers, supported by design and process engineers, provide mechanical troubleshooting expertise and supervision for maintenance or overhaul programs.

Valmet provides field services that cover a range of offerings, including: reconditioning, overhauls and upgrades; sectional process and condition tests; exchange and workshop services; unplanned and emergency visits and repairs. Specific services that are commonly requested by mills include Finite Element Analysis, Troubleshooting, Machine Analysis, Short Circulation Studies, Online Dryer Balancing, Lubrication System Assessment and Vibration Studies. This white paper will provide an overview of Field Services, as well as a description and examples of some of the preferred services listed above.

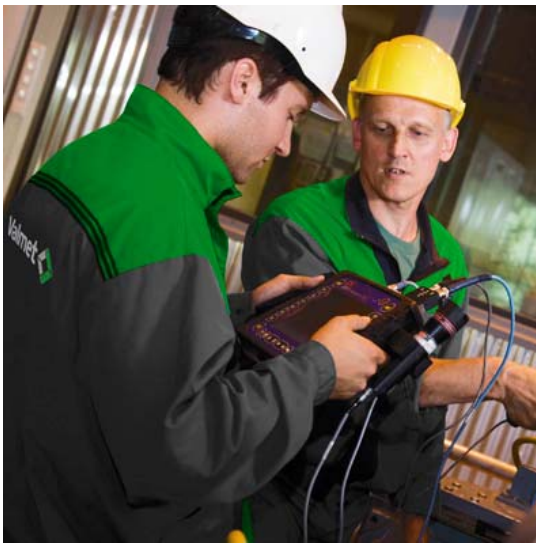

Figure 1. Valmet Field Services bring our expertise into your mill.

Short circulation study

How well is the wet end process of your production line performing? Valmet's short circulation study sheds light on the origins of short circulation-based problems. It helps improve the stability of the paper and board making process. Valmet has over 30 years' experience in performing short circulation surveys. Analysis of hundreds of paper and board machines has created a solid background of knowledge.

The Short Circulation Study discovers and provides recommendations for solving wet end issues such as pulsation. First, Valmet's experts perform field measurements of short circulation, including: pressure, consistency, rotation speed, vibration, gas content level and variations. Additional studies are available for capacity study and jet flow speed measurements. After all measurements are compiled, Valmet will give a formal report to the mill that documents all measurements and proposes improvement actions for the mill to take.

The benefits of a Short Circulation Study include: a deeper knowledge of the effects of process variability on paper or board quality, a reduction in process instabilities, and improvement in machine runnability and product quality.

The short circulation study identifies the origins of those significant short- and long-term variations in the short circulation process and headbox which cause excessive basis weight, ash or caliper variations. Often these variations occur at such a frequency that they cannot be managed by machine MD controls or printing machine tension control. They may lead to calender barring, web weaving problems at printing houses, or problems in converting, for example.

The study focuses on those factors that cause variations, such as the functionality of pumps, screens and the control of their drives or vibrations, chest levels, poor retention aid mixing or piping design.

Paper and board analyses are included in the short circulation study. Laboratory analyses show the real effects of the disturbance on paper or board quality and enable benchmarking with other similar machines. Additionally, we provide a capacity survey which studies the operational adequacy of the short circulation and its components at targeted higher production speeds by using balance calculations.

The content of a short circulation study includes all of the following elements:

- Pressure level and variation measurements
- Consistency variation measurements
- Rotation speed variation measurements
- Vibration measurements
- Air content measurements
- Signals from field instruments
- Analysis of the measurements
- Paper or board variability analyses
- Full reporting including prioritized recommendations

Figure 2. During a Short Circulation Study, Valmet engineers take comprehensive measurements of your process.

Finite Element Analysis

During the design process, an engineer must determine that the assembly will stand up structurally to loads it is being asked to support; and then some. And, preferably, they need this information before manufacture to ensure that time and money is not wasted building something that will inevitably fail. And once the machinery is performing in the field, having a good system to predict failures becomes invaluable; and will make life much less stressful. Finite Element Analysis addresses both of these issues.

What is Finite Element Analysis?

Finite Element Analysis (FEA) was first introduced around 1943 as a way to study vibration using a complex mathematical model. Basically, if you know enough about the structure, and all the elements that make up the structure, you can build a three dimensional model and apply stress to it. The way your model responds will guide you in designing for better reliability.

The problem, in the 1940s at least, was lack of numerical processing speed. Today, computers are so powerful that FEA is a standard part of any serious machinery manufacture.

Valmet performs FEA on new designs of many different types of equipment, from papermaking to minerals processing. However, one of the more interesting applications for FEA is on pre-existing equipment. Valmet can accurately model the machinery in question - we can predict failure points, help to forestall failure and prolong machinery lifetime.

How does Finite Element Analysis work?

The first step in FEA is to construct a 3D model using many nodes which are connected in a mesh. Typically, in areas that see high stress levels more nodes are added.

The mesh is then provided with information about the material and structural properties that relate to load, vibration and stress levels. It may help to think of this mesh of nodes as a spider web, whereby any movement or stress at one point in the web can affect a web location far away from the point of stress.

After the model is prepared, several types of analysis may begin. Structural analysis can simulate pushing the model beyond its elastic limits to determine what deformation occurs. Vibrational analysis will look at random vibration, as well as the effect of impacts (such as cranes colliding with framework, or parent reels

descending too quickly to rails), and how this relates to the resonant frequency and failure. Fatigue analysis will examine the potential for cracks and corresponding failure points in the structure.

When is Finite Element Analysis appropriate?

There are many cases where FEA is warranted. Some examples from Valmet customers are: studying the existing corrosion on a particular machine section, and predicting future corrosion expansion; determination in advance of the effects of a desired nip load increase on the machine framework; discovery of the natural frequency of the machine and its main sections; and applying a new design to existing machinery to help prolong life or improve production.

Case Study: FEA used to solve vibration problem

A Canadian paper mill employed Valmet to perform a machine audit. High vibration occurring at the dyer section prevented operation at high speeds. The machine was thus limited to 4018 fpm (1225 m/min). Valmet's audit engineers identified a main frame resonance with peak amplitude occurring near 4477 fpm (1365 m/min).

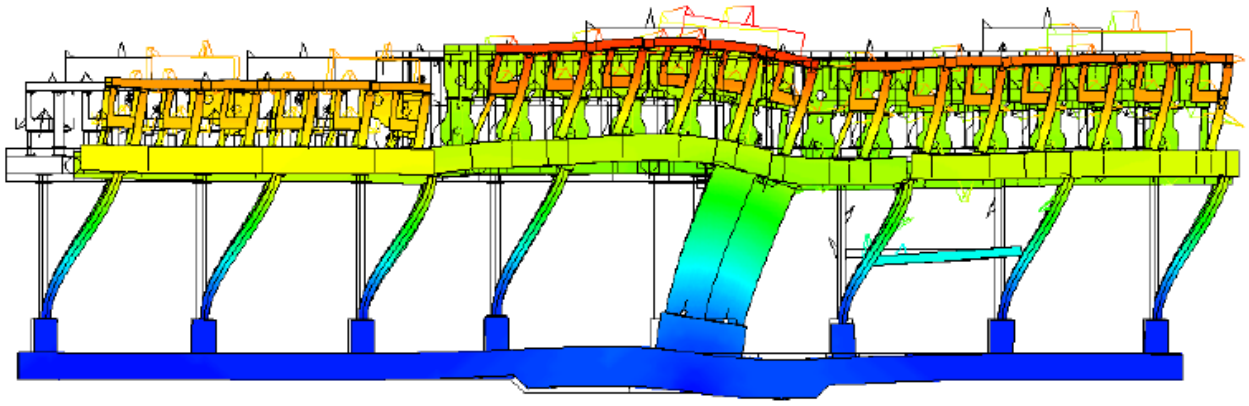

Figure 3. Dryer section modeled with Finite Element Analysis, showing expected deformation at target frequency of 3.52 Hz.

Valmet performed the FEA, engineering, manufacturing and installation of reinforcements during four shutdowns. Vibration amplitudes were reduced to normal levels, allowing a speed increase to 4290 fpm (1308 m/min).

The mill's production gain after reinforcement was $3,250,000 per year. They also achieved significantly better paper quality. In addition, mill personnel were surprised to find that the calender section and winder sections now ran much better. Their project payback time for the Valmet machine audit, FEA analysis, design work and installation of reinforcements was only a few months.

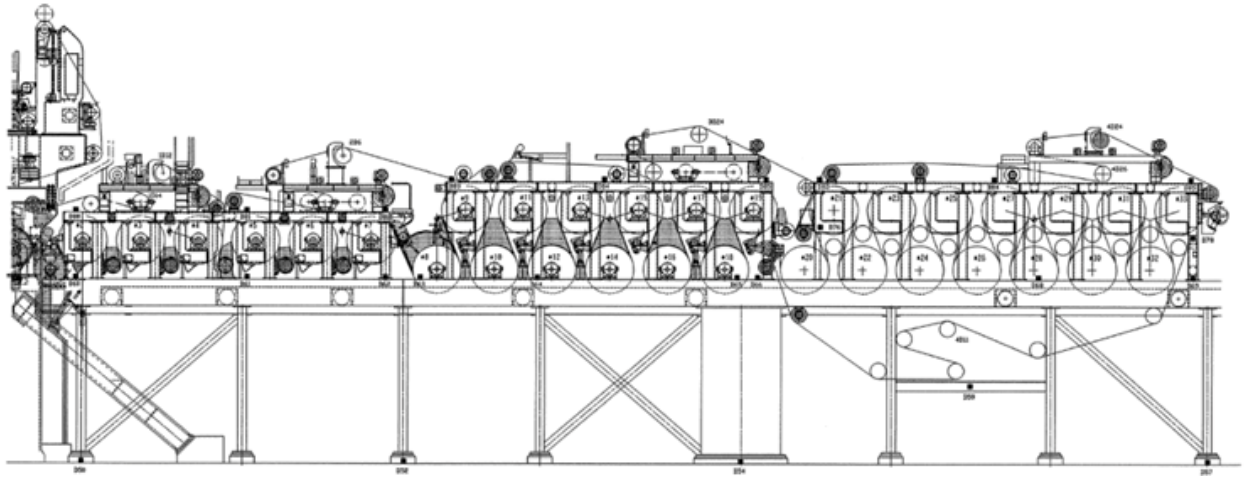

Figure 4. Dryer section after reinforcements installed.

Why choose Valmet to perform Finite Element Analysis?

The paper machine is a constantly stressed structure. Weld joints are subject to fluctuating loads. Failure due to fatigue is common and plays a dominant role in the machine's lifetime. Valmet has successfully used state-of-the-art FEA software for many mills to evaluate high stress areas to increase reliability, enhance performance and maximize fatigue life. Our specialized expertise in the proper application of computer-aided tools is supported by lab testing and empirical data gathered over the years on our equipment in the field.

As an original equipment manufacturer, Valmet already has the drawings for hundreds of paper, board and tissue machines - whether they were originally built by Valmet, Valmet, Beloit or other manufacturer now part of Valmet Corporation. This drawing availability, combined with our engineer's experience both in FEA and onsite support of paper making equipment, uniquely qualifies us to know when and how to best apply FEA techniques to support your process.

Troubleshooting

Perhaps the most powerful service is general troubleshooting – helping you solve a chronic, immediate problem by working at your side with your running machine. Valmet has helped mills solve many problems, a few of which include: roll resonance or imbalance, structural flexibility, supercalender and press barring, fatigued dryer gear trains and poor machine calender offset.

Case Study – Press barring reduces felt lifetime

In one example Valmet's wide experience with all aspects of papermaking helped solve a multi-million dollar problem. A Canadian mill was experiencing 2nd press barring near 116.4 Hz excited by the press felt. The barring was causing the felt to wear prematurely, reducing its normal life from 6 weeks to 2 weeks. The bottom roll cover was also barred and required frequent regrinding.

The problem had been present for several years. Because of this problem the mill used an additional 17 felts per year as well as two press cover rectifications per year and the downtime for felt changes and roll replacement. Total mill-estimated loss to date had been 5.5 MCAD.

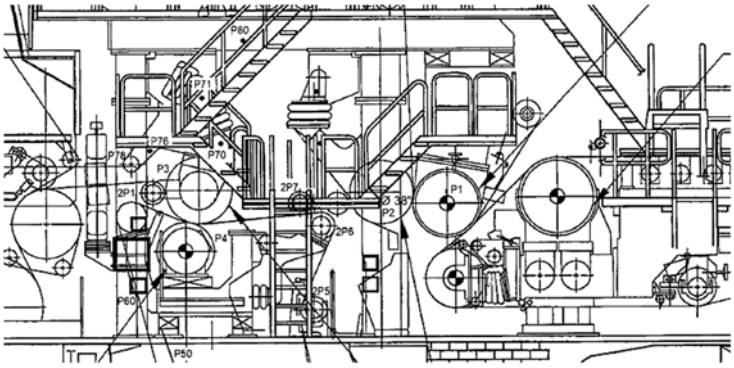

Figure 5. Valmet troubleshooters solved this mill's press section felt lifetime problem with a new felt cocking procedure.

A capital equipment OEM and a felt manufacturer had both performed audits – without success.

As a result of Valmet's press section audit a new felt cocking procedure was applied rigorously during the first two days of felt operation. This solved the problem and saved the mill an estimated 790,000 CAD/year. In this case, the payback for the audit was less than one month.

Machine analysis

This service will define an optimized rebuild scope that ensures a cost efficient rebuild with minimized risks. It uses a combination of Valmet's expertise throughout the entire paper machine line, and includes measurements, mechanical, process and automation inspections as well as theoretical calculations. The formal report will document all work performed and provide a detailed itemized analysis with expert conclusions and recommendations.

Valmet's Paper Machine Analysis service provides the analytical tools and the specific expertise to help you achieve your goals, by identifying and isolating production instabilities or bottlenecks and working with you to solve them. We help you to raise the bar on production line performance. And our North American experience, backed up by our global resource network, covers all types of tissue, paper and board machines made by all vendors.

Our machine analysis service combines real-time process and machinery measurements, vibration analysis tools, model-based calculations plus our own interpretation skills to recommend machinery or process improvements that will improve machine speed, efficiency, production line throughput and safety.

The dynamic mechanical behavior of the paper machinery as well as process stability are investigated. Theoretical calculations evaluate the stresses, deflections and natural vibration frequencies in a variety of paper machinery sections and components, from stock preparation to the wrapping line. Capacity calculations define the needs for water removal, drying, drive power and lubrication.

Our team combines all the theoretical and measured results to generate a precise list of recommendations to improve speed, productivity, and paper quality.

Papermaking knowhow supported by the best in data acquisition and analysis tools

Our engineers' best judgment is only as good as the information that they have to work with. Valmet has equipped its analysis teams with an arsenal of technology tools which provide on the spot analysis, adjusted to suit the real-time situation on the machine.

These tools include state-of-the-art 24-bit, 32-channel dynamic signal analyzers used for data acquisition, high speed recording, real time analysis and playback analysis and for export of data to other platforms and modules.

Machinery condition and process sensors include a variety of accelerometers, velometers and displacement sensors, laser tachometers for accurate non-contact roll and felt speed measurement, electro-dynamic shakers, and modal hammers with built-in force sensors. The latest modal analysis software provides modal analysis and operating deflection shape analysis.

With this extensive data gathering and analysis capability we also have the opportunity to share information and discuss problems with other Valmet specialists in our Research and Technology Development Centers with Valmet engineers having specific experience in other locations.

Many common problems are identified by Machine Analysis, including:

- Resonance or excessive flexibility of the machine's main framing and foundations. Studies identify speed ranges to avoid.
- Machinery resonance where operating roll rotation frequencies coincide with natural frequencies of the machine's structural elements
- Inefficient sheet transfers, sheet support and gear train arrangements
- Roll imbalance, sagging and drive train misalignment problems
- Critical speeds and half critical speeds for various rolls in many positions
- Nip barring
- Stock approach pulsation and related sheet barring problems due to poor design or operation
- MD basis weight variations due to pressure pulsations or stock consistency variations
- Poor fiber orientation profiles
- Poor drying steam control, inadequate condensate removal
- Felt tension limitations due to felt roll design
- Inadequate bearing lubrication or too small oil drains
- Insufficient drive train, water removal, winding, or drying capacities
- Components natural frequencies, including drive shafts, doctors, savealls and motor platforms

Figure 6. Machine Analysis uses state-of-the-art equipment and experienced Valmet professionals to identify many common runnability problems.

Case Study – Drying section fires, poor runnability and tail threading

In 2001, the mill's Beloit newsprint machine, installed in 1985, was facing drying section problems - fires due to trapped paper, runnability and tail threading issues.

Solution

The dryer improvement plan was based on a dryer operation review by Valmet's Paper Machine Analysis group. These initial improvements included:

- Relocation of felt rolls at a dryer group gap
- Transfer felt rolls were repositioned to improve support sheet
- Repositioning of top felt rolls to reduce air flow into the transfer area

Results

The changes drastically improved threading time and the machine speed was increased by 30 m/min. Also, the fire potential due to paper wads was reduced.

As a result of this good working relationship between Valmet and the mill, further studies and improvements were made in 2002. These included a study of the vibration response of the paper machine at higher operating speeds.

In 2002, all pocket ventilation rolls were relocated to allow the widening of the sheet. Fourteen dryers were re-aligned. The press frame was reinforced by adding additional steel plates. The filler blocks were changed, and additional stronger swing bolts were added.

The press frame stiffening increased its natural frequency, significantly reducing vibration amplitudes. The sheet can now be widened by 2" on the front side. Sheet threading from the 3rd to 4th dryer sections threading has improved.

The program continued, with more productivity improvements since that time.

Online dryer cleaning, polishing, coating and balancing

The key to boosting productivity lies in increasing machine speed, optimizing line efficiency and improving machine runnability. Keeping dryer cylinders, rolls, pope reels and winder rolls continuously in top condition plays a major role in achieving these targets. To make things easy, Valmet offers a wide range of advanced on-site services to improve both cylinders and rolls without removing them from the paper machine – right at your mill.

For a paper machine drying section to operate properly, the dryer cylinder surface and profile must be in good condition. Dryers that are damaged, grooved through doctoring, pitted, covered with corrosion, stickies or coating build-up, or that have a poor profile and excessive run-out are bound to cause operational problems, such as frequent breaks, inefficient heat transfer, and poor moisture profiles.

Such problems can be eliminated at your mill by profile grinding, polishing or cleaning the dryer cylinders – without removing them from the paper machine.

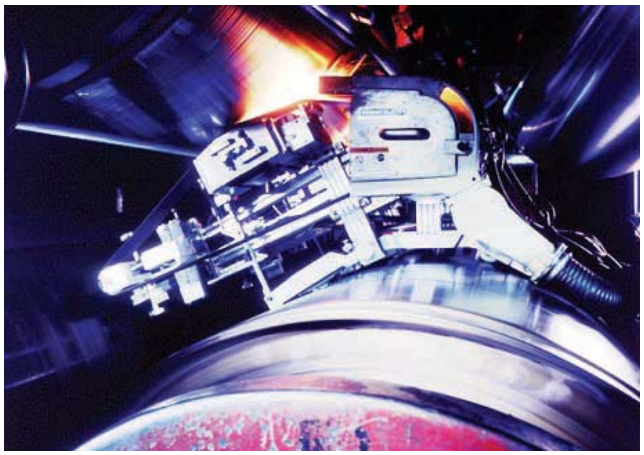

Figure 7. Dryer Profile Grinding is performed onsite and results in a flat CD dryer profile.

Grinding makes dryer profiles as good as new

Dryer profile grinding is recommended when a significant amount of material needs to be removed from the cylinder surface, for example, to eliminate grooves or deviations in profile and roundness. Profile grinding is also used to restore diametrical tolerance between all the dryers in a geared section. It results in a flat cross-machine dryer profile with a surface finish like new.

Dryer polishing and cleaning remove corrosion and surface build-up

The surface finish can be improved, and surface corrosion and build-up can be removed through dryer polishing. This, too, results in a surface finish like new.

Dryer cleaning, in turn, removes light corrosion and surface build-up, such as stickies and coating. This treatment does not change the condition of the cylinder surface but extracts organic build-up very efficiently.

Dryer cylinder balancing on-site

To complement its on-site grinding and coating services, Valmet also provides supplementary services, such as dryer cylinder balancing, dimensional measurements, safety inspections and onsite reconditioning of faulty and worn components.

Imbalance in dryer cylinders creates vibrations that reduce bearing and gear lifetime, affect doctoring negatively, and consequently harm the cylinder surface. Valmet balances dryer cylinders dynamically in two planes (front and drive side) as required by ISO 1940/1, without dismantling them or removing them from the paper machine, to the specifications of new installations.

Balancing dryer cylinders is often performed after profile grinding, particularly in fast paper machines, but it can also be provided separately.

Figure 8. Valmet can apply multiple crews and tools to a dryer resurfacing project to increase the number of dryers that can be cleaned in one shutdown.

Measurement reveals the dryer cylinder condition

Dimensional measurements and visual inspection of dryer cylinders is usually carried out before a grinding service to reveal what kind of grinding may be required (profile or polish grinding). The scope includes, for example:

- Diameter and cylindricity measurement
- Run-out measurement
- Visual inspection of dryer surface for grooves, build-up, corrosion, etc.
- Checking the requirements for the grinding equipment and auxiliary drive installation

Regular dryer safety inspections

Safety is a key issue at paper mills, and thus frequent safety inspections of dryer cylinders are a must. A safety inspection performed by Valmet includes, for example:

- Ultrasonic testing of structural bolts (head-to-shell, head-to-journal)
- Magnetic particle testing of the head, shell, journal etc.
- Ultrasonic testing of the shell including shell thickness measurement
- Visual cylinder inspection (internal and external)

Since dryer cylinders are pressure vessels, periodic inspections ensure a high safety level and enable you to schedule the maintenance actions that will eventually be required for planned shutdowns.

If an inspection reveals faulty or worn components, such as gears, journals and bolts, Valmet can recondition them or supply replacements.

Valmet Dryer Roll Cover DOH release coating for dryer and cooling cylinders

Machine runnability can be improved by changing the properties of the cylinder or roll surfaces. Valmet offers various on-site coating alternatives, either applying a completely new coating, replacing an existing one or, if possible, upgrading an older coating.

Corrosion and extensive dirt build-up on cylinders can affect cylinder heat transfer, end product quality, cause breaks and even reduce production speed. Release coatings together with adequate doctoring protect cylinders against these effects and ease paper web release from the cylinder surface.

Valmet Dryer Roll Cover DOH is Valmet's proprietary, high-quality carbide coating, which has a nanopolymer release layer. It is particularly well-suited to on-site application to dryer and cooling cylinders, particularly after sizing and coating stations, and also after the press section on the 1st dryer section group.

In addition, the nanopolymer technology used in the coating results in a significantly shorter coating process.

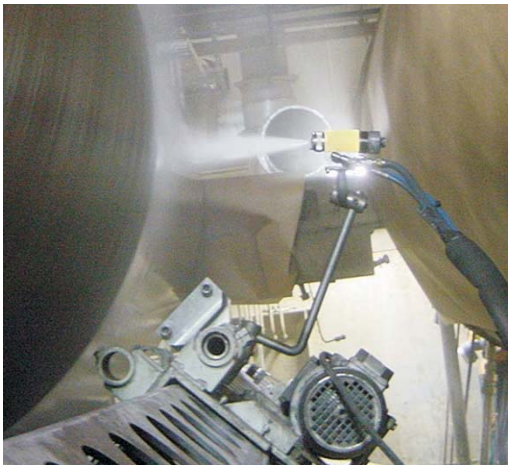

Figure 9. Valmet Dryer Roll Cover DOH release coating is well-suited for onsite application.

Vibration studies

Vibration Studies are commonly performed when mill personnel have reason to believe there is excitation somewhere on the machine, and need to determine specific causes, as well as possible remediation actions to be taken. The mechanical dynamic behavior of the paper machine is a limiting factor for machine capacity. Vibrations in machine equipment cause severe problems in the paper making process and limit machine efficiency and are also a safety hazard.

Valmet vibration studies cover the mechanical condition and the dynamic behavior of the entire machine line from stock preparation to reel, or of specific machine sections in troubleshooting.

Valmet vibration studies typically have one or more of three main objectives. The first objective is a capacity study, mapping the dynamic behavior of the machine from the current speed toward the targeted speeds to yield the most cost effective approach foreseeing any vibration-related problems. The second objective is a rebuild analysis, evaluating how rebuilds will affect the dynamic behavior of the machine

and its consequences at current or increased speeds. Finally, perhaps the most common vibration study objective is troubleshooting, to locate and eliminate vibration sources having a detrimental effect on the machinery or process.

Each objective is based on extensive paper machine building expertise, utilizing top of the line hardware and software for analysis. Valmet's vibration studies combine mathematical analyzes and diagnostic measurements in a distinct aim to make your machine run smoother, faster and more cost efficient.

Now we'll focus on actual results obtained by two North American mills who benefited from Valmet's field service expertise. These case studies involve vibration analysis, both Valmet's findings and the bottom line production impact of implementing our recommendations.

Case Study: Inability to thread causes speed reduction at tissue mill

A southern USA tissue mill was experiencing intermittent severe vibration on the press, Yankee, and creping doctor assemblies at higher production speeds. This caused sheet breaks, moisture variations and excessive wear on the Yankee. The inability to thread forced the mill to reduce tissue machine speed from 5300 to 4700 fpm.

The vibration problem had started after a shutdown. When the mill started up again the press/Yankee assembly was vibrating heavily. The mill had superfinished the Yankee surface and changed their coating suppliers.

In order to resolve the vibration problem, the mill tried:

- changing the blow-through steam flow,
- changing the reel moisture level,
- modifying the load sharing between the pressure roll and Yankee,
- unloading the press,
- stopping and cleaning the machine.

The only parameter consistently affecting the vibration was the machine speed.

Solution

At the mill's request, Valmet performed a vibration study and runout testing. We recommended increasing the distance between the top of the rib inside the Yankee and the bottom of the condensate

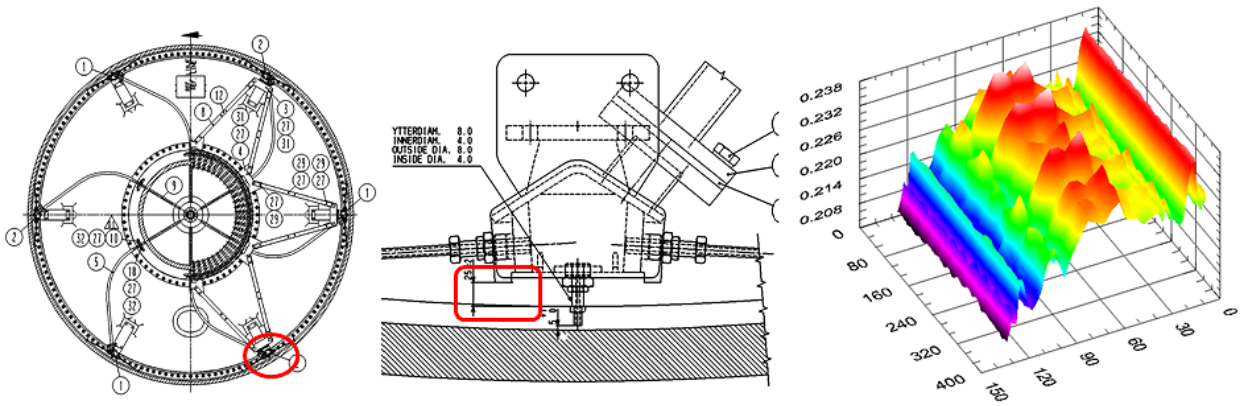

Figure 10. This vibration problem was solved by increasing the distance between the Yankee rib and condensate header.

headers. This resolved the vibration problem. (The same design change was implemented on another tissue machine at the same mill, and it is now running regularly in the 6235 to 6560 fpm speed range.)

Impact

During the 5-1/2 months from the appearance of the problem until the Valmet testing, the mill had lost approximately $928 KUSD in production ($15K/day x 2-3 days/week x 5.5 months). The payback time for the Valmet field service was slightly less than three weeks.

Case Study: Vibrating stretcher roll prevents high speed operation

At another southern USA tissue mill, there was high vibration occurring at the tissue machines former top stretcher roll and adjacent equipment. This vibration prevented the machine from being operated at high speeds.

The stretcher roll had previously been balanced by a capital equipment manufacturer, as had their spare, and no problems were found. The balancing was done to ISO G1.0 balance quality. The mill had also had vibration analysis and finite element analysis performed, without resolving the problem. Finally, the mill upgraded the vacuum box material and added stiffeners to the stretch pivot arm. No luck.

Solution

Valmet was called in to propose a solution, and gave the mill two options:

- Install four plates over the two former K-frame access doors to stiffen the structure and reduce vibration (cost included installation and estimated downtime cost)
- Perform more field tests to determine the root cause (cost included testing, lost production during animation/speed tests and lost production during hammer tests, about 10% more than the previous option)

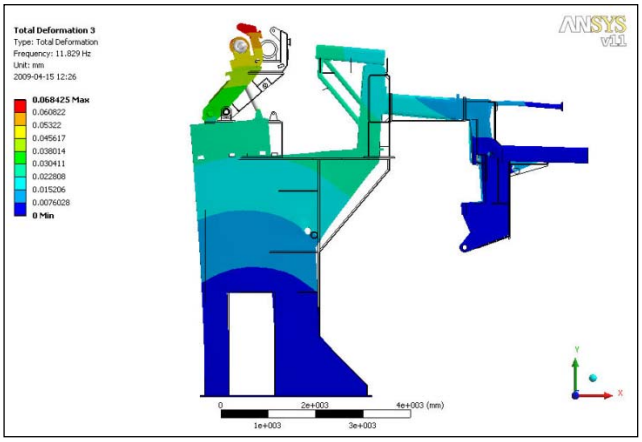

Figure 11. Solving this vibration problem required creating a computer model of the stretcher roll and framing.

The mill chose to have Valmet further investigate and find the root cause. Valmet performed twenty hours of animation and speed tests and ten hours of hammer tests and found the stretcher roll was in need of balancing. After both the primary and spare stretcher roll were balanced at Valmet's Columbus, MS shop the vibration problem was solved.

Impact

Before Valmet testing determined the root cause, the mill had spent $88K on various analyses. In order to operate while the vibration was a problem, the mill had to reduce machine speed from 5850 fpm to 5741 fpm. Since early 2007, this resulted in a loss of $488,160.00 of production per year (24 hours / day x 60$ / hour x (352-13) days). The total cost to the mill in lost production and unsuccessful analyses, before Valmet solved the problem, was 1.3 MUSD. The payback time for the Valmet troubleshooting that finally diagnosed the problem was a little more than three weeks.

It's apparent in these case studies that a relatively small amount of investment in Valmet field services can have a major positive impact on a mill's profitability.

Case Study: Supercalender filled rolls requires frequent regrinding

Abnormal vibration on one of two filled roll supercalenders at a Canadian fine paper mill was causing barring on the cotton filled nip rolls. This resulted in the cotton filled rolls requiring premature regrinding and replacement compared to polymer rolls operated on two other supercalenders in the mill.

The stack rolls were mounted to frames on both filled roll supercalenders. There was no noticeable difference in barring between grades. Mill personnel had observed significant vibration amplitudes around 58 to 63 Hertz. Barring had also existed on the two polymer roll supercalenders, when using filled rolls, but ceased when the mill switched to polymer covered rolls. Both the polymer roll supercalenders were of the OptiLever system design, with typical running speeds of 2800 fpm.

Solution

Valmet investigated the situation and decided that a software solution would be the most economical and effective. The Valmet field service engineer inserted new program logic to vary the calender speed setpoint to the drive. As a result, the drive speed is varied +/- 25 fpm from the setpoint entered by the operator. The speed setpoint changes 1 fpm every 10 seconds during the time the calender is running.

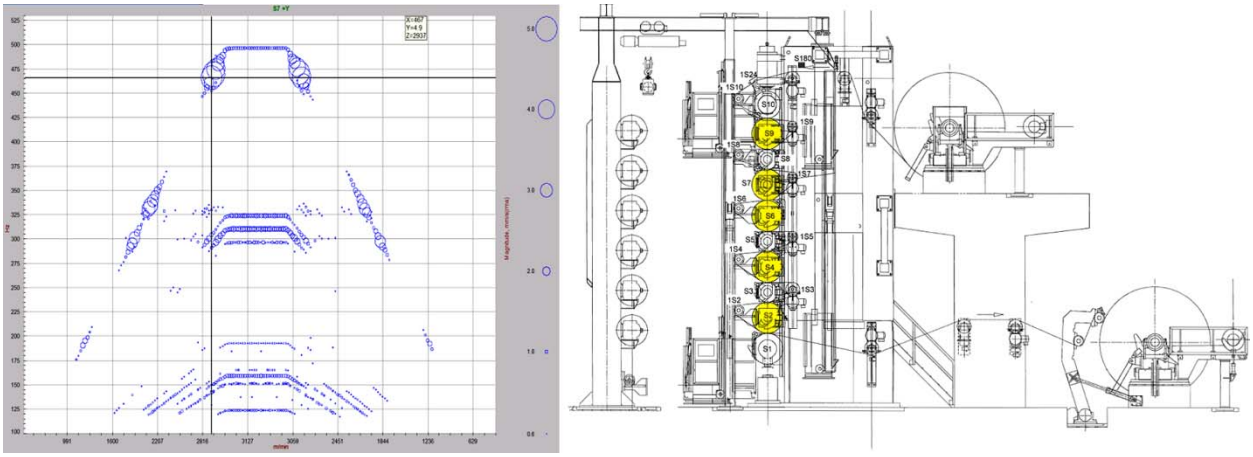

Figure 12. Vibration map (left) and supercalender showing filed rolls (right, yellow). A relatively simple software change resolved this difficult operational problem.

Impact

Prior to this problem, the mill had spent on average $181 KCAD per year on cotton filled roll covers. During the year when this problem developed, these costs increased to $457 KCAD. In the first year following Valmet's testing and software fix, the mill made a direct $276 KCAD cost savings in roll cover costs. This did not include production gains from reduced downtime for roll changes and improved paper quality. The payback time for the Valmet field service was about nine weeks.

Tail threading inspection

Poorly performing threading systems are roadblocks to quick production starts. Valmet can perform regular inspections of your tail threading system.

Much time and energy can be wasted if your threading system is not performing properly. Each production start or restart can be an exercise in frustration for operators if threading fails repeatedly.

Unfortunately, threading components can lose alignment or efficiency over time. Operators may not realize this if it happens gradually. Only regular inspections can keep you aware of the operating condition of your threading components.

Some potential problems can be detected by internal inspections, either by mill personnel or Valmet field service engineers. Here are a few:

- Misalignment of components
- Plugged air jets
- Insufficient air flow
- Improper procedures
- Missing or damaged components

Early detection of the above problems and many others can yield tremendous savings in time and money. In addition, you will be able to monitor and trend performance of threading system components, identify impending equipment failures and safety hazards, and receive Valmet's recommended improvements to your existing equipment and procedures.

Figure 13. Tail Threading Inspection will spot safety hazards and impending equipment failures.

Additional services

All of Valmet's Field Services are designed to get Valmet service technicians into your mill and put our knowledge and expertise at your fingertips. The list of possible solutions available from Valmet is too numerous to provide a complete list, but here are a few additional services that are quite popular and provide a fast return on investment:

Headbox Apron Repair is a common in-mill service provided by Valmet that gives you results right away resulting in a like-new smooth profile.

Non-Destructive Testing (NDT) will give immediate feedback on unsafe and vibration-prone equipment and provides an action plan.

DryOnyx ZL. Valmet's onsite application of thermal release coating reduces breaks while maintaining roll integrity.

Fast Track Refurbishment takes your outdated or faulty equipment and expedites it through a Valmet workshop, rebuilding and updating it to better-than-new condition.

Figure 14. Valmet technicians can repair minor damage to your apron edge, grind, and then polish it to like-new condition. And, it can all be done on-site with the apron in the machine.

Energy Audits from Valmet identify potential energy savings in your papermaking process providing you the means to improve the energy efficiency of your production line. We continuously collect benchmarking data on energy efficiency and use this with consumption and operating data that a Valmet expert will collect from your machine line.

Figure 15. Valmet Field Services provide help when you need it!

Lubrication System Assessment will examine the existing pumps, flow meters, alarm system and filtering to determine adequacy for a given purpose. For example, a mill may wish to know if their existing lubrication system can handle a proposed increase in the number of lubricated rolls due to the addition of a long nip press.

Remote Diagnostics gives you a fully condition-based approach to maintenance. The remote monitoring of machine line operation makes it possible to detect failures early on and react without delay. This is the equivalent of having Valmet Field Services virtually in your mill helping you 24/7.

Training. Knowledge is power. Valmet engineers and field service representatives deliver knowledge to your mill personnel, giving them the power to save time and money by increasing production, reducing downtime and operating more efficiently.

Service Agreements are customized for every mill. Valmet's range of agreements is based on each mill's specific circumstances which, naturally, have a decisive impact on possible performance improvements. Some mills want to increase production volume; others need to cut their costs. An agreement with Valmet is composed of various process, maintenance and personnel support modules which reflect the common goals agreed by the parties.

Figure 16. Valmet provides customized service agreements for every mill.

This white paper combines technical information obtained from Valmet personnel and published Valmet articles and papers.

Valmet provides competitive technologies and services to the pulp, energy and paper industries. Valmet's pulp, paper and power professionals specialize in processes, machinery, equipment, services, paper machine clothing and filter fabrics. Our offering and experience cover the entire process life cycle including new production lines, rebuilds and services.

We are committed to moving our customers' performance forward.