SKF paper machine optimization

Increasing overall machine efficiency and productivity

Run it faster, run it better

The effective and efficient operation and maintenance of your paper machines has never been more difficult. Production and quality goals continue to increase, while safety and environmental restrictions get tougher. Yet, despite these challenges, you are expected to maximize machine uptime to increase productivity – and usually with a reduced budget and staff.

SKF offers a powerful array of solutions developed to overcome these obstacles. Our paper machine optimization programmes are specifically designed to identify problems in key equipment such as press sections and spreader rolls, and to maximize their overall machine efficiency (OME) through the strategic collection and analysis of machine condition data.

SKF paper machine optimization programmes incorporate the knowledge, technology and application know-how that comes from over 100 years in the business of optimizing machine performance in the pulp and paper industry.

Problems

- Sheet instability
- Roll failures
- Drive failures
- Felt lubrication problems
- Felt plugging
- Felt wear
- Felt moisture distribution
- Dewatering problems
- Press load distribution
- Shower condition
- Uhle box condition
- Mechanical problems detected by lubrication analysis

Optimize

Startups
- Grade changes
- Detecting process problems
- Speed changes

- Detecting wear problems
- Condition monitoring

Results

Increase:
- Profitability
- Process problem detection
- Machine efficiency
- Spreader roll service life
- Productivity
- Machine speed
- Planned shutdown intervals

Decrease:
- Unplanned downtime
- Costs
- Sheet breaks
- Off-quality product
- Bearing failures

The right combination of products, services and know-how

Every SKF paper machine optimization programme starts with a standard pre-configured solution, which is tailored to your plant's machines, and includes:

• SKF @ptitude Decision Support, which includes embedded knowledge to guide you in what needs to be done and when. The system is configured specifically for your machine components.

• SKF Multilog Online Condition Monitoring System, which collects critical data, and SKF @ptitude Analyst software, which helps you to analyze the condition of your machines. This information is displayed on-screen using a graphical human machine interface, making it easy to identify problems instantly. Data is rapidly transformed into valuable information for accurate and reliable decision-making, so your team can respond immediately to changes in machine condition as they occur.

Two solution modules are available:

Press section application
This module is designed to detect and diagnose problems in this complex and changing environment. The module provides information to support decisions on felt steering, washing, cocking, speed reduction, as well as press load adjustment. It also diagnoses bearing and roll cover problems – all to keep your paper machine operating optimally.
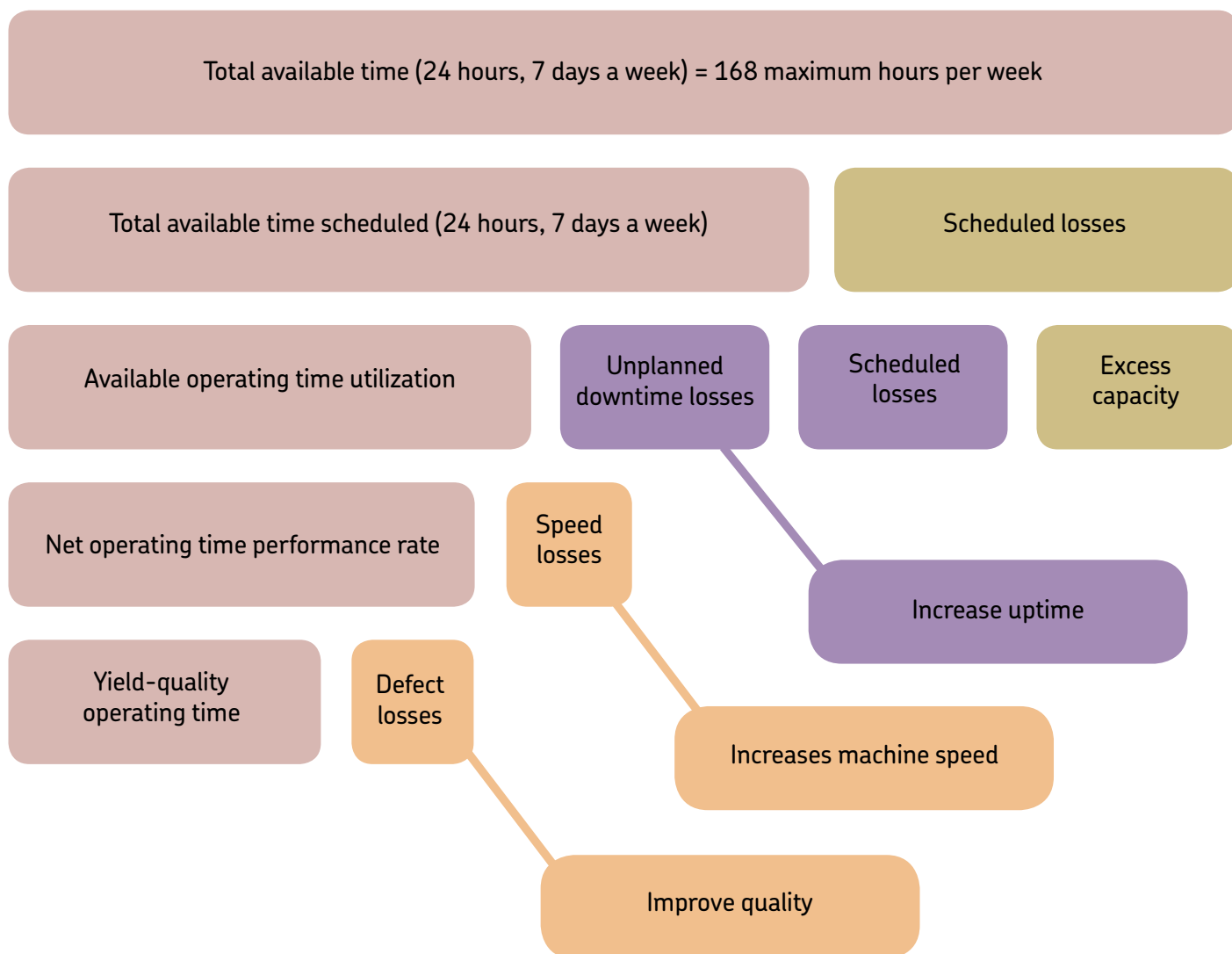
Spreader roll application
This module can help extend the service life of your spreader rolls. It facilitates early detection of bearing problems as well as impending problems in the inner or outer covers of this traditionally difficult to measure component – before a catastrophic failure occurs.

Maximize efficiency, improve perform

A key performance indicator, overall machine efficiency (OME) measures several parameters to determine how well a paper machine is operating. OME is a product of uptime and saleable product and higher OME values mean more efficient machines. OME can be improved by reducing downtime and increasing speed as well as by reducing defect losses.

The SKF paper machine optimization programme helps to increase OME by improving performance. Here are some improvements you might expect from a typical implementation:

Total available time (24 hours, 7 days a week) = 168 maximum hours per week

Total available time scheduled (24 hours, 7 days a week)

Scheduled losses

Available operating time utilization

Unplanned downtime losses

Scheduled losses

Excess capacity

Net operating time performance rate

Speed losses

Increase uptime

Yield-quality operating time

Defect losses

Increases machine speed

Improve quality

Overall machine efficiency = uptime x saleable product

Increase uptime

Uptime is impacted by paper machine operations, including planned and unplanned downtime. The SKF paper machine optimization programme helps to increase uptime by providing early detection of faults and by giving you the right information at the right time to make an informed decision on appropriate corrective actions. It also provides the means to detect and help prevent bearing and equipment failure, and extend usable felt service life.

**Increase in asset availability**
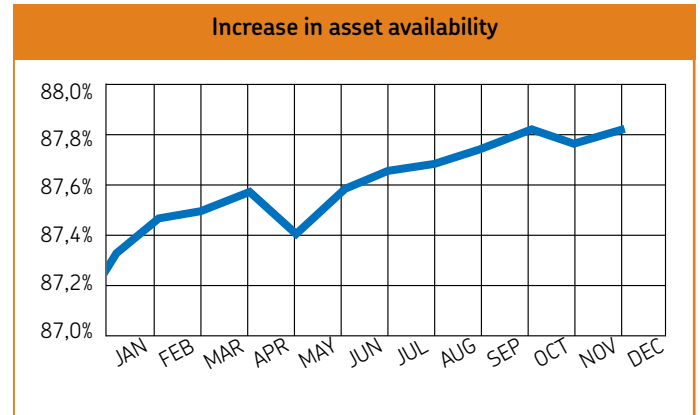
Increase machine speed

OME is directly tied to the machine's ability to produce at a sustained rate. The SKF paper machine optimization programme enables you to increase paper production by providing information and a decision support system to recommend which actions will optimize production processes. Now you can increase running speed to maximize production, while minimizing unexpected failures.

Average tons per year

| Year 1 | Year 2 | Year 3 | Year 4 | Year 5 |
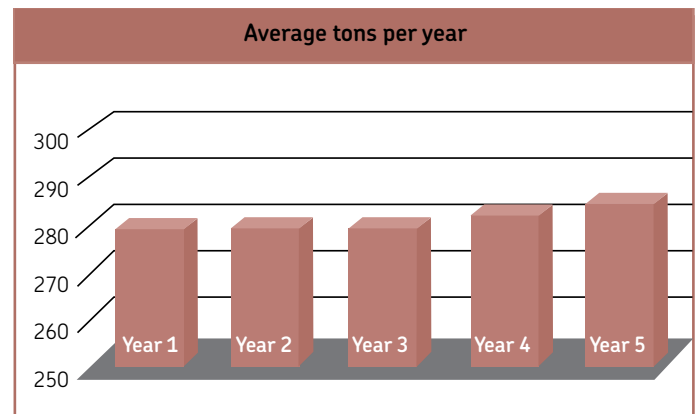
Improve quality

Downstream problems in quality can often be traced to problems in the machine. Barring, alignment, roll cover and felt condition all directly impact sheet quality. The SKF paper machine optimization programme facilitates earlier detection and diagnosis of problems, so that the time between recognizing and correcting the problem – and the amount of broke – is reduced.

Yearly tons of scrap paper before and after implementing SKF paper machine optimization programme

16 800
before

11 200
after
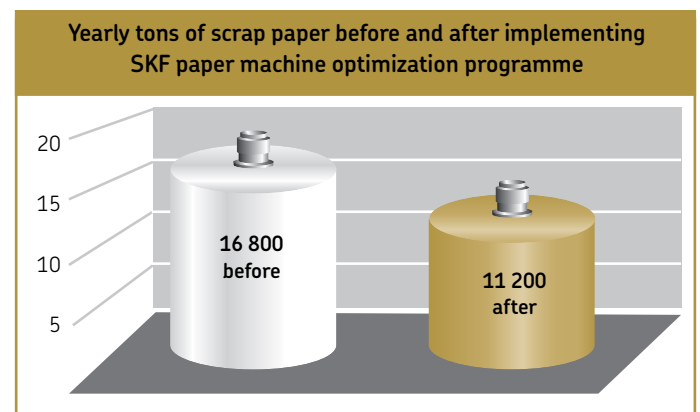
Knowledge and technology for bottom

Through our paper machine optimization programmes, SKF offers the optimum mix of products and services, so mills realize timely and long-lasting results. Each programme is based on the SKF Asset Efficiency Optimization process model, which requires the development of a maintenance strategy that aligns with an organization's business objectives. Our programmes also apply a structured means for ongoing reassessment, so that the plan can be adjusted to organizational and operational changes as they occur.

Decision support for improved asset management
The challenges facing mills today include capturing the knowledge of its workforce about their machine runnability and making a reduced workforce more efficient. SKF @ptitude Decision Support is an advanced, multi-faceted asset management solution that automates the industrial reliability maintenance decision-making process. It provides a dynamic resource for machine and process diagnosis, analysis, reporting and corrective action.

The system helps to improve overall mill efficiency by replacing labour-intensive data collection and analysis with automatic analysis, fault resolution and work notification. With one easy-to-use application, workers are able to make quick, consistent, and effective decisions, based on meaningful imformation and a pre-determined set of procedures and priorities. The system provides a structured approach to capturing and applying knowledge – integrating data from multiple sources including condition monitoring and distributed control systems, data historians, and computerized maintenance management systems. It also provides the means to capture and retain the knowledge of your most seasoned professionals for use by everyone. This reduces the learning curve for new employees and enhances the knowledge of your team overall.
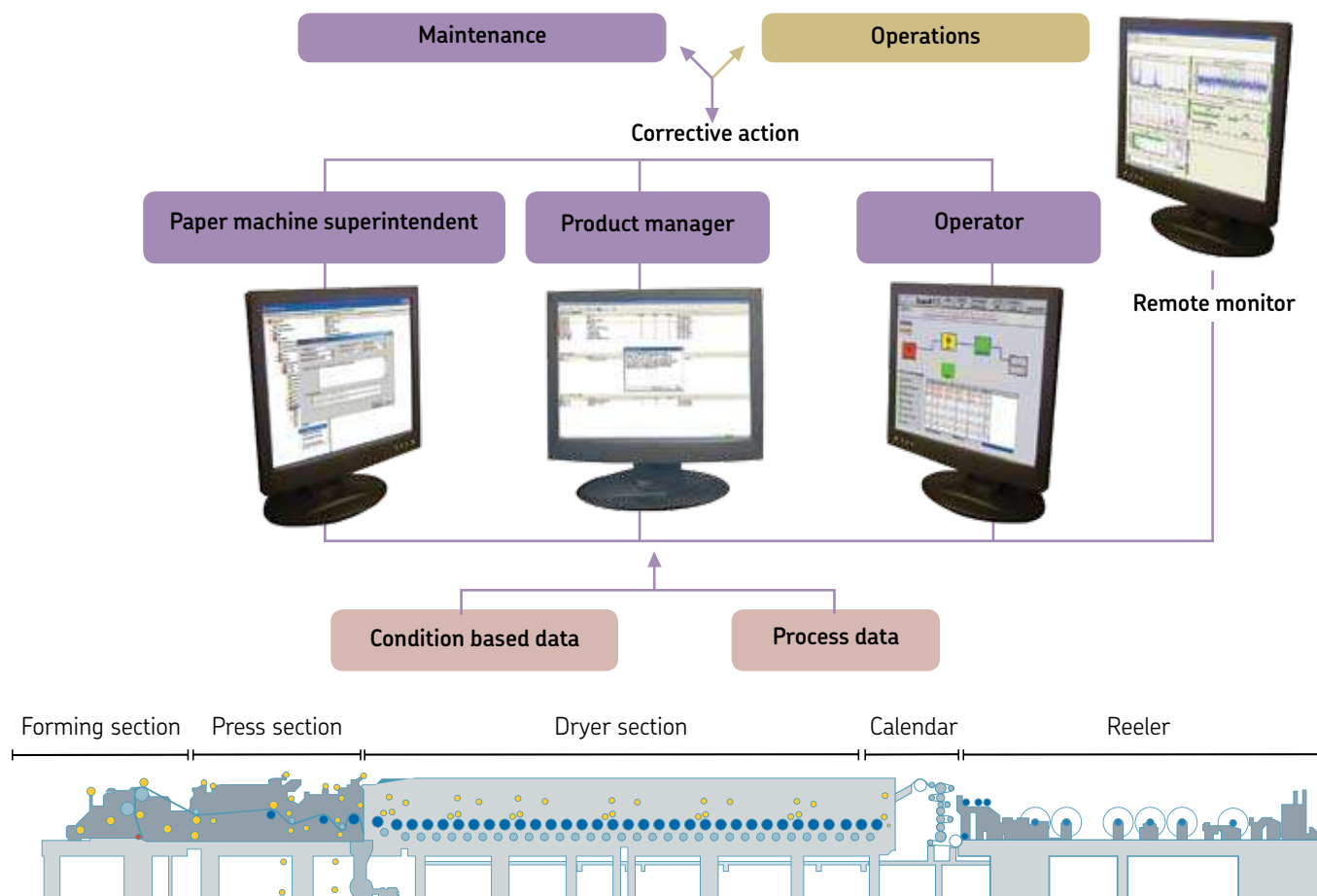
line results

Integration with computerized maintenance management system

To close the loop from decision to action, SKF @ptitude Decision Support can link to your computerized maintenance management system (CMMS) such as SAP, Indus, Maximo and others. This link enables automatic work request generation and work order history tracking for correlation with asset health and performance. By providing a connection to the CMMS, the system transforms the raw data into information and actions, in an efficient process.

SKF Multilog Online Condition Monitoring System

This online system facilitates a proactive approach to reliability with round-the-clock monitoring of machine status. It reduces the need for walk-around data collection, promotes safety and optimizes the productivity of your maintenance and reliability team. The system provides quick and automatic data acquisition from permanently installed sensors to provide virtually instantaneous feedback on machine or process conditions 24 hours per day, seven days per week.

SKF @ptitude Analyst and SKF @ptitude Analyst /HMI software enable the sharing of important machine information while facilitating effective communication across functional lines. They provide a means to efficiently and effectively respond to changes in machine condition before they impact production or quality. The software makes it possible for plant operations personnel to continuously view machine operation and instantly identify key machine changes detected by the system. Users can view the entire machine or concentrate on a specific section.

Integration with circulating oil lubrication systems and lubrication analysis

Circulating lubrication oil flows, alarms and lubrication analysis data can be monitored from SKF @ptitude Analyst, consolidating all condition-based data in one source for easy analysis and correlation.

Results now

The SKF paper machine optimization programme can help your mill reduce costs and increase the efficiency of your paper machines. Contact your local SKF representative today so that we can help you improve the performance of your operation overall and significantly impact bottom line profitability.
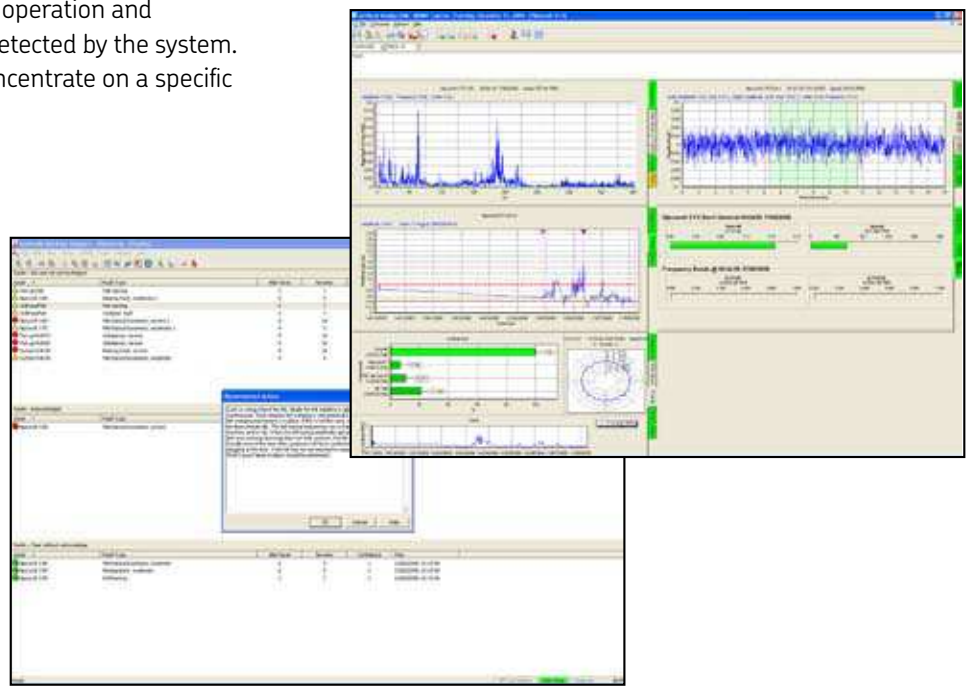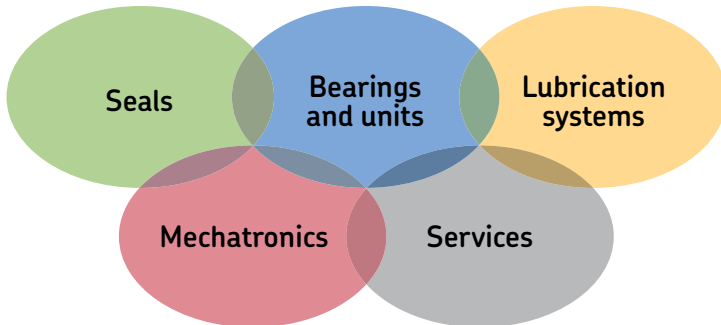
The Power of Knowledge Engineering

Drawing on five areas of competence and application-specific expertise amassed over more than 100 years, SKF brings innovative solutions to OEMs and production facilities in every major industry worldwide. These five competence areas include bearings and units, seals, lubrication systems, mechatronics (combining mechanics and electronics into intelligent systems), and a wide range of services, from 3-D computer modelling to advanced condition monitoring and reliability and asset management services. A global presence provides SKF customers uniform quality standards and worldwide product availability.