Production Planning and Optimization for the Pulp and Paper Industry

Industrial IT tools for Production Process Optimization

Meeting the unique needs of the Pulp

Managing the production process

Production Planning System is ABB's Industrial IT solution for controlling a full spectrum of production planning tasks in the paper and board industry. With Production Planning System, your planners can build production plans that optimize machine capacity and minimize inventory, while ensuring on-time delivery to customers. In addition, Production Planning System - together with the ABB's Value Chain Convergence concept - provides unique means for enterprise-wide exchange of production data for enhanced business process optimization and e-business solutions.

Increased efficiency and customer satisfaction

Production planners make important decisions every day. Arranging production in the most appropriate way can lead to considerable economic savings through decreased set-up costs and reduced waste. In addition, production information can be shared effectively within the enterprise to provide additional value for both the enterprise itself and its customers.

Production Planning System improves the production planning overall and leads your operations towards increased and more controllable production with higher customer satisfaction. The decreased production costs result in more profitable business and high return on investment.

Production Planning System provides the following concrete benefits:

- Minimized grade change losses at the paper machine
- Minimized delays in customer deliveries by providing the right delivery date at the sales phase, and by being able to respond to the unexpected situations at the mill
- Dynamic Profitable-To-Promise information exchange with ABB's Value Chain Convergence concept for online order confirmation
- Excellent trim results with minimal losses, taking into account multi-stage trim problems
- Improved finishing line operations by indicating possible bottleneck and overload situations in advance
- Enhanced customer service by providing real-time access to the production and planning status of the orders, with dynamic re-scheduling for late orders
- Advanced schedule optimization maximizing the efficiency of each machine in multi-mill environment

and Paper Industry

Advanced tools for production planning and scheduling

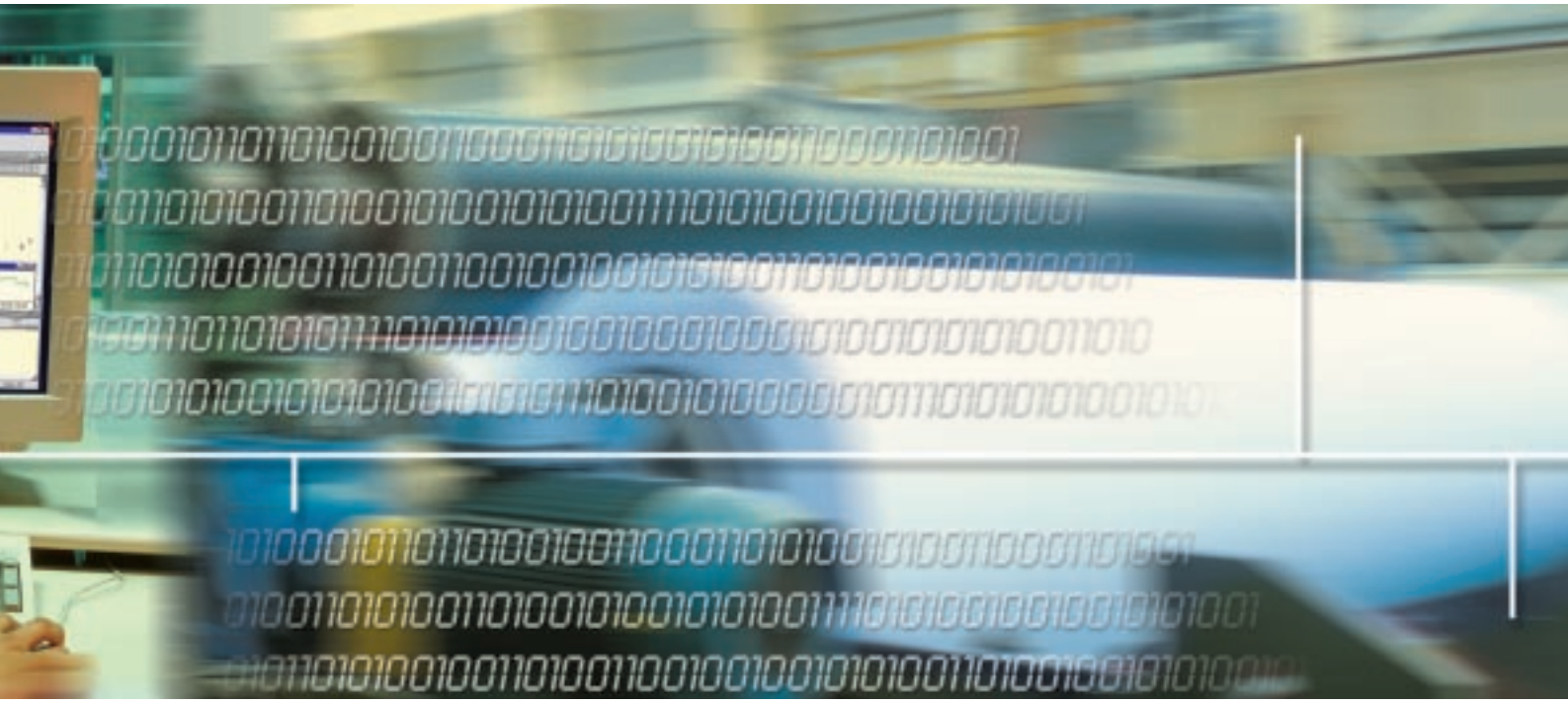
Production Planning System is highly scalable and modular providing your planners with world-class tools and functionality specifically designed to meet the advanced needs of the pulp and paper industry. It covers production allocation and run order assignment, and extends through trim scheduling. The functionality and features include the following:

- Sophisticated, automatic and optimized scheduling of blocks, runs and orders, with dynamic re-scheduling capability in the face of breakdowns and order changes
- Multi-mill scheduling, i.e. planning against enterprise capacity
- On-line storage planning and trim scheduling during run
- Mill calendar functionality to include shut-downs or capacity reductions
- What-if ability to compare cost impact of any schedule changes
- Optimization of winder, re-winder and sheeter production
- Dynamic Profitable-To-Promise information capability
- An efficiently designed, graphical user interface
- User configurable

The applications run on Microsoft Windows operating systems and can be either stand-alone or integrated to other ABB systems or third party production management systems.

Production Planning System can be flexibly configured to accommodate a wide variety of production processes. Machine characteristics for paper machines, winders, rewinders and sheet cutters can be easily defined and modified.

The system modules are easy to learn and use. In order to ascertain that you obtain the maximum return from your investment, ABB offers comprehensive training for your planning personnel.



Real-time Scheduling and Trim Optimization

Production Scheduling

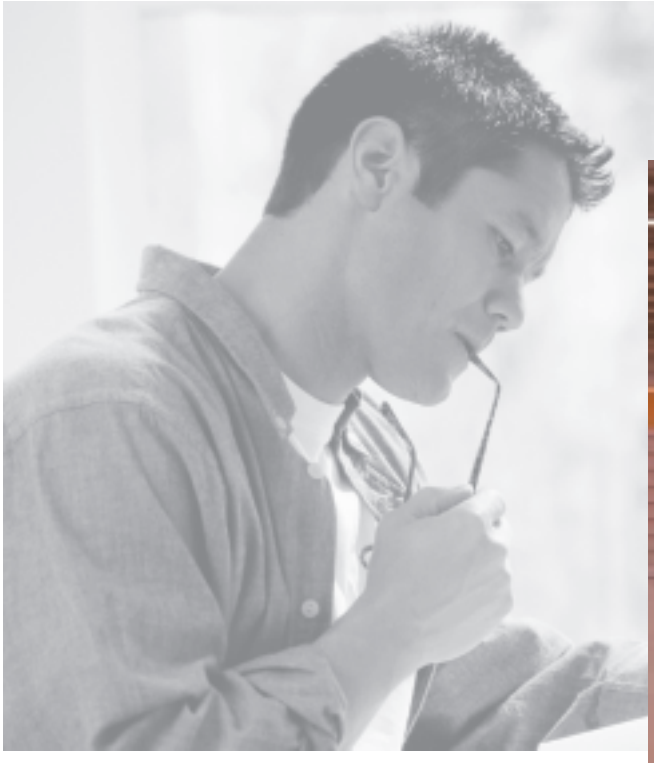
Production Planning System enables real-time planning and control of production schedules. Visualizations in the system make it easy to identify the current production plan and available machine capacities. Configurable on-screen alarms alert planners of conditions, such as late orders, that require special attention.

Schedules can be based on the production budget that can include market- or sales area-specific capacity allocations. Production Planning System supports dynamic calendar calculations based on actual production times, as well as fixed capacity reservations.

Orders can be scheduled manually or automatically by using the advanced scheduling algorithms. Orders, runs, and blocks can be easily rearranged by simply dragging and dropping them on screen using the pointing device.

Should a rush order arrive or other production upsets happen, the production schedule can easily and quickly be re-optimized in real-time with the same high quality results than the previous schedule before the incident.

Machine-specific characteristics and downtimes specified in the mill calendar are also taken into account. This ensures the best possible match between planned and actual delivery dates.



Trim Optimization

Production Planning System provides superior trim solutions and ease of use. Linear programming, mixed integer programming and heuristic optimization algorithms combine with control parameters to deliver the most appropriate solutions for your needs.

The system is based on an easy-to-use and intuitive graphical user interface. Winder trim patterns are visualized graphically with color codes, which makes it straightforward and easy to edit roll positions and trim patterns.

The optimization methods used in the system are based on effective mathematical algorithms and take into account the properties of different paper machines, winders, rewinders and sheeters. The methods support multi-objective optimization considering various goals, such as minimized trim loss, knife changes, or deviation from order tolerances.

Production Planning system supports a variety of control parameters, including maximum number of rolls per set, quantity and width of small rolls, and multiple rolls per pack. These parameters allow effective and accurate control of the optimization process to achieve the results you desire.

Value Chain Convergence

Value Chain Convergence

ABB's Value Chain Convergence concept for pulp and paper industry has the potential to significantly improve your company's performance in terms of enhanced efficiency, automation, and both internal and external collaboration. Together with Production Planning System, the value chain convergence concept enables advanced production data communication and visibility through the whole enterprise.

Dynamic Available-To-Promise

Tightly integrated functionality enables Production Planning System to provide highly accurate dynamic Available-To-Promise/ Capable-To-Promise/Profitable-To-Promise information for the sales and production planning. Using production allocation data and available inventory information along with Production Planning System's management of real time production schedules, order commitments can be made with confidence while the system manages the optimized plans to individual production units.

As the production timeframe nears and blocks are sized to fit orders actually booked, it may not be possible to accept additional orders on the basis of planned blocks. For these situations, Production Planning System provides dynamic Profitable-To-Promise functionality.

Dynamic Profitable-To-Promise

Dynamic Profitability-To-Promise function evaluates the impact of a new order on the production efficiency and orders already booked, and provides a list of possible shipping dates and the associated cost impact of each. This information can be passed back to the supply chain for decision making based on the true profitability analysis.

Multi-machine and Multi-mill scheduling

The possibility to highly accurate Profitable-to-Promise information does not limit to one machine or mill only. The schedule optimizer is capable to optimize or re-optimize several machines on global scale in order to provide the best possible solution on an enteprise-wide basis. In addition to the production costs at each mill, the optimization takes into account also the transportation and other location-related costs when analyzing the most appropriate production schedule for each order.

Seamlessly Integrated Solution

ABB Industrial IT solutions are based on the networking of knowledge, information, process automation and control applications. Applications based on different hardware and software solutions are integrated together, including the business systems.

For more than 30 years ABB has been helping the world's pulp and paper makers to improve mill operations with the Manufacturing Executions Systems. Production Planning System is a member of the Manufacturing Execution System application family. It is a system based on standard software modules, facilitating a flexible solution that can grow with your needs.

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