CPM4Metals
Production planning and execution system
**What is CPM?**

CPM stands for Collaborative Production Management and is a family of solutions from ABB for information sharing, production planning and execution, reporting, asset monitoring, and process optimization (mathematical models) covering all processes from steel production, hot rolling, cold rolling to finishing and treatment in processing lines.

Typical features:

- plant-wide sharing of information between business systems and the shop floor
- production execution (dispatch of production order data/collection of process data)
- paperless production management (online information, less misprinted data, availability of instructions)
- visualization of real-time production and equipment status (line stops, operating time, etc.)
- production performance analysis (time-based and individual-based reporting).

CPM allows users in the organization to increase the efficiency of working by making the right decisions at the right time with fewer mistakes. This information is up-to-date and quickly accessible to users. This allows them to collaborate in a more informed way to ensure maximum productivity and quality.

**Hardware and software**

CPM4Metals is the common software framework for production planning and execution systems within ABB’s Metals business. The framework forms the basis for the different Metals applications and is used for adapting base functionality to customer-specific requirements.

The software package is object-oriented and is based on the MS.NET framework. The application software operates in Windows environments using standard hardware and software components.

“What and why” in your production

- Is your production integrated with your planning?
- Can you back-trace your production?
- Do you know the ‘what and why’ of your plant downtime?
- Are you managing your line set-up parameters optimally?
- Do you monitor material quality during production?
ABB’s CPM4Metals provides the solution
This application is engineered around ABB’s CPM4Metals Framework and provides a suite of modules, which will be tailored to your needs:

- **Production data historian**
  Data repository with long-term storage of production data for the mill output
- **Production performance analysis**
  Production reports and statistics and online production data feedback
- **Line stop/downtime monitoring**
  Recording and analysis of line stops/downtime detailing when, what and why
- **Equipment monitoring**
  Recording of equipment operating time and cycles for planning and maintenance
- **Quality management**
  Inspection, material rejection, recording and analysis of quality set-points versus measured process values
- **Roll management**
  Keeps track of the rolls, monitors the roll wear and supports roll change
- **Set-up models and recipes**
  Calculation of pass schedule and set-up values based on mathematical models or storage in fixed tables
- **Material identity tracking**
  Tracking of individuals (pieces) along the production line.

**Your benefits**

- access to online information giving higher operational efficiency (paperless work)
- filter/search capabilities for quick access to stored information
- optimized equipment set-up for less scrapping, uniform quality and potential energy savings
- knowing plant availability gives improved plant utilization
- direct feedback on production and quality characteristics supports quick and correct decision-making, immediate action and correction.

Roll management

Line stop/downtime monitoring
Plant unit. Application package for production execution

Production planning and scheduling
The main production plan is maintained in the Level 3 system and a sub-set of production data relevant for the actual production line is downloaded to the CPM/Level 2 system. The list/schedule shows production orders for the coming hour(s) and day(s).

The production of the material follows a defined ‘process route’ along the production line from entry equipment to exit equipment. When the material in a production order advances along the production line, it passes through defined states. These states reflect the progress in production, providing a clear view of the order situation.

Production data historian and production performance analysis
Production- and process-related data is collected from different data sources (e.g. Level 1 process control system, lab systems, furnace control systems, etc.). The data is stored in the history database on a time and individual (material) basis.

The production performance analysis provides the means to follow up production performance in periodic reports (shift, daily, weekly, etc.) and individual reports (coil, plate, beam, heat, etc.).

Management of line stops/delay handling
Line Stop Management allows you to handle and classify disruptions in the plant and identify critical reasons for downtime using statistics.
Set-up models
The CPM/Level 2 system offers extensive packages of optimization models such as:

- **Steel Production**
  Scrap Mix, Energy Balance, Alloys, Slag, Melt Down Control, Oxygen, DRI, Vacuum
- **Hot Rolling**
  Hot Strip Mills, Plate Mills, Steckel Mills
- **Cold Rolling**
  Single and Multi Stand Mills, Reduction-, Temper- and Foil-Mills

Management of equipment
Production and quality of the plant output rely on equipment, which has to function in a safe and reliable way. Equipment Monitoring and Roll Management provides support for monitoring operating time, cycle count and rolled tonnage as well as administering maintenance, roll logistics and roll change.

Management of quality defects
The Quality Management allows you to effectively manage and monitor quality-related matters. This function supports the management of:

- quality inspection allowing the user to handle prime/non-prime material, add text remarks and follow test instructions
- rejecting/scraping of material allowing the user to handle reject causes, reject location, etc.
- automatic monitoring of deviations in material property values versus target/nominal values.

Material identity tracking
An accurate identity tracking image of material movements in the production line is crucial for correct reporting, triggering other functions and ensuring the correct setup of the process equipment.

Identity tracking reflects the material movement along the line based on different sensor signals and manual input. The user/operator always has the possibility to make corrections for sensor failure and when unexpected situations occur.

New tracking information is shown when the situation changes and therefore provides an up-to-date image/map of the actual material positions.
CPM4Metals conclusions

- CPM systems bridge the gap between the shop floor and the top floor and provide concrete improvements in terms of product quality, production output, and customer service.

- ABB’s CPM4Metals systems are built on 25 years’ experience and feedback from more than 140 Metals CPM systems.

- CPM4Metals-based solutions help customers to continuously improve and helps them in their drive to become even more competitive.

- CPM4Metals solutions brings tangible benefits, in terms of increased revenues, reduced operating costs and lower capital employed.
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