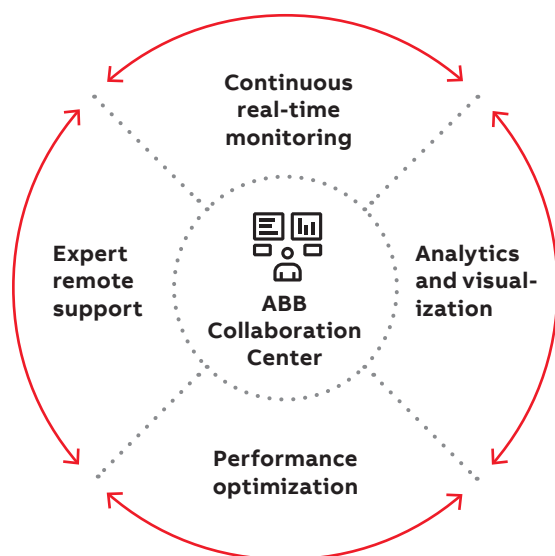—

Performance Optimization Service
for long product rolling mills
Turning insights in action

Analyze, visualize, predict and prevent

Advanced service combining digital analytics solution with continuous monitoring and real-time, expert, remote support enabling metals manufacturers to leverage ABB's process and technology expertise to achieve as yet unprecedented levels of quality, yield and productivity in long product rolling mills.

Continuous real-time monitoring

Analytics and visualization

ABB Collaboration Center

Expert remote support

Performance optimization

Digitalization brings new technologies that allow us to collect large volumes of process data to analyze and visualize operations in real-time, and provide key insights that can be used to predict operations and prevent critical failures. At ABB we understand that success in digital depends, not only on the technologies themselves, but also on the availability of process expertise in implementation, operation and maintenance of these tools, and we believe that a more collaborative approach is the way forward.

ABB solution
Performance Optimization Service for long product rolling mills combines digital solution employing process-specific, machine learning-based technology with remote monitoring and support via ABB's Collaborative Operations Centers, allowing metals manufacturers to leverage ABB's domain, process and control philosophy expertise operationally to detect and analyze deviations, identify their root cause and use the insights to predict and prevent faults before they affect production.

The digital technology at the core of this service is also available as a stand-alone solution called ABB Ability™ Data Analytics for long product rolling mills.

Customer need
In long product rolling, metals manufacturers need to consistently improve performance to remain competitive. Manual monitoring is unrealistic due to the large number of process variables and, though great advances have been made using conventional process automation and control technologies, more advanced tools that help us better understand the trends and inter-relations between process parameters that cause faults and failures are needed to unlock higher levels of optimization.

—
1. Real-time, customizable overview
2. Cobble probability
3. Vital process health KPI's from left to right
4. Shear yield loss
5. Pace time trend analysis
6. Speed profile by stand
7. Analysis views such as root cause and benchmark

—
Main features

- **Collect data in real-time** with IBA or OPC or Modbus/TCP.
- **Analyze operations** with process-specific algorithms for meaningful analysis.
- **Visualize your process** with intuitive, customizable dashboards.
- **Predict failures** with powerful, data-driven root cause analysis.
- **Continuous, real-time monitoring** via ABB's Collaborative Operations Centers.
- **Remote, expert support** to the operator including deviation alerts and reports.
- **Secure, reliable data storage** at customer site using ABB Historian.
- **Modular structure** where analysis type can be added as necessary.
- **Fully scalable solution** that develops in line with need and insights over time.
- **Seamless integration** with ABB and 3rd party process control and data integration systems.
- **System maintenance and updates** from ABB ensures smooth, reliable operation.

Real-time visualization

Data is collected in real-time from data acquisition systems such as IBA, or from process controllers via OPC or Modbus/TCP, and is securely stored onsite at the customer facility using ABB Historian. Information is then visualized in intuitive, customizable dashboards which designated site and ABB personnel can access online 24/7.

Remote monitoring and support

Operations are monitored around the clock from ABB's Collaborative Operations Centers, where experts alert designated onsite staff to process deviations and disturbances and, where appropriate, advise on corrective action, supporting faster, more data-driven decisions that will enhance process performance. To further facilitate continuous improvement ABB utilizes process insights to generate regular reports to identifying focus areas and recommended actions.

Analysis from big data to single billet

With the power to harness big data and the precision to trace KPI's per individual billet, the ABB analytics engine's modular design allows it to be tailored to customer needs.

Advanced analytics provide meaningful analysis including KPI calculations, benchmark analysis comparing current operating conditions with agreed benchmarks and root cause of deviations. ABB experts support the operator in applying these insights to achieve and maintain optimal operations.

KPI's are calculated for a variety of process health indicators including the following:
- R factor variation
- Loop and tension profile
- Pinch roll performance (slippage)
- Shear cut cycle repeatability
- Mill pacing time
- Motor speed and torque profile

Benchmark values are calculated for the above KPIs per product grade and can be used as the basis of comprehensive analysis should a gap between benchmark and current operating conditions occur.

Data-driven breakdown analysis

Root cause analysis, developed using process-specific algorithms, can be applied in the event of a major breakdown (cobble) to interpret and understand relevant process variables and their inter-relations, and accurately identify the cause so that it can be avoided in future.

Machine learning-based breakdown prediction

For every fault and failure that occurs, this self-learning technology collects, logs and analyzes the data using powerful algorithms and modeling techniques to identify trends and patterns and generate risk scores for important variables as they deviate from threshold in order to enhance its predictive capabilities and reduce the risk of breakdown over time.

Benefits

	Drive profitability with faster, more data-driven decisions that improve accuracy and efficiency.
	Increase productivity by predicting and preventing cobbles/unscheduled downtime and reduce start-up time with root cause analysis.
	Improve yield and quality by continuously monitoring critical process parameters, analyzing their performance and taking immediate corrective action.
	Optimize process performance and reduce uncertainty by identifying and utilizing knowledge on benchmark and golden campaigns.
	Significantly reduce the risk of breakdowns with machine learning-based tools that improve themselves, and your performance, the more you use them.
	Enhance operator effectiveness by making use of proactive, expert support via ABB's Collaborative Operations Centers.
	Leverage insights across your enterprise by integrating multiple mills to identify and analyze trends that could be impacting performance at several sites.

—
ABB AB/Metals
Terminalvägen 24
SE-721 59 Västerås
Sweden
Phone: +46 21 3400 00

For contact details please visit our website:
www.abb.com/metals