MAINTENANCE TECHNOLOGY IN ROLLING MILLS

SOLUTIONS FOR LONG ROLLING MILLS
Wire rod mills

Product sizes
• 5.0 – 28.0 mm plain rounds (typical range)
• 6.0 – 16.0 mm ribbed (quenched and tempered or fine grain rebar)

Production
• Up to 150 t/h (typical maximum for single-strand configuration)

Configurations
• Single-strand rod mill
• Two-strand rod mill, with side-by-side strands
• Combination mill – roughing and intermediate trains feeding a wire rod outlet, plus a bar in coil outlet and/or straight bar line
Safety Goals in the Mill

Reduced possibility of roll failure & cobble.

Simplified & decreased hands-on work.

Reduced time spent near the rolling line.

“There’s no better policy in society than pursuing the health and safety of its people.”

– Ralph Nader
Application of Digitalization for long rolling

**Production Management System**
Dynamic planning and tracking of production for optimal plant utilization

**Through-Process Optimization**
Know-how based identification of faults and immediate definition of corrective measures

**Maintenance and Asset Technology**
Definition of maintenance protocols for efficiency

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**The players (and examples)**

**Process improvement by knowing more**
- Imaging systems, laser measurement
- Billet measurement
- Shear crop optimization
- Laying head ring pattern monitoring

**The plant and its digital twin**
- 3D model of flow through cooling nozzles

**More focus on the essentials**

**Knowing how the plant “feels”**
Robotics applications in wire rod mills

Challenge
• Cut non-confirming rings from head and tail of coils before compacting, accurately and consistently without safety risks to operators

Solution
• The patent-pending TrimRob system; an autonomous robot for trimming within the coil handling system, guided by an intelligent vision system to separate, trim and remove rings

Benefits
• Provides a means to trim coils consistently, without operator safety risks

Features
• Flexible design for virtually any coil handling system

Other Applications
• Automated roll changing
• Product sampling at in-line shears
• In process of more robotics in the mill
NEW TECHNOLOGY – Digital Caliper monitoring system

Challenge
• Accurately measure product dimensions while maintaining a safe distance from the pass line.

Solution
• The dimensional, portable, non-contact, Digital Optical Caliper

Benefits
• Accurate within +/- 0.1 mm
• Removes inaccuracies due to variations in operator-to-operator measurement methods
• Continuous monitoring, taken over several minutes rather than once an hour, product or shift change
• Measurements can be recorded and stored to analyze trends and alert for situations such as roll change requirements

Features
• Lightweight design with IP67 rated camera enclosures
• Fixed version available – Data can be stored and exported to external systems for further analysis
• Can project display to additional screens wirelessly
NEW TECHNOLOGY – Next Generation Guide

Challenge

• Reduce downtime and increase operator safety

Solution

• Advanced Smart Guiding equipment with smart sensing technology

Benefits

• Hands off safety approach to the machinery while rolling
• Removeable module component allows guide to be operated as a stand-alone mechanical guide

Features

• Remote adjustment to guide roller parting
• Real time feedback and alerts for bar size and guide data
NEW TECHNOLOGY – Advanced water header

Challenge
• Improve roll life and reduce OPEX costs

Solution
• Additive manufactured Advanced water header with quick change and smart sensing technology

Benefits
• Quick-change design with no tools required
• Removable non-handed cartridges, leaving the mounting block permanently in the mill

Features
• Real-time feedback and alerts for wear and clogs
• Provides more consistent optimal cooling long term which gives the potential for reduced mill roll wear
NEW TECHNOLOGY – Advanced Uploopers

Challenge
• Overcome tension in the mill
  - Reduced Quality, unplanned downtime and increased wear
• Unsafe operation

Solution
• Enclosed motorized Uploopers achieve tension-free rolling

Benefits
• Robust 20mm plating to protect mill equipment and personnel
• Reduced maintenance time and cost
• Improved finish product quality

Features
• Remote operation distances personnel from pass line
• Bolt-on snap shear enclosed inside
• Tool-free wear-plates and troughs
• Loopers to be tailored to the specific product mix
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