

ADVANCED DIGITAL SERVICES

# ABB Ability™ Performance Optimization for paper machines - Fingerprint

## Benchmark and improve paper machine health



### Issues that cause paper machines to under perform

- End paper users and converters are sending rolls back for poor quality
- Profile problems leading to culled paper
- Too many lab test rejects
- Operators losing confidence in automatic control
- Increase in sheet break frequency
- Takes too long to recover from a sheet break

### Solutions to boost performance

ABB follows a proven three-step methodology to Diagnose, Implement and Sustain improved paper machine profile control. The diagnostic includes a plan with recommendations to improve and close any performance gap.

#### Diagnose

This diagnostic methodology provides the most comprehensive machine study available. It delivers a complete machine analysis, and provides data vital to identifying and capturing higher productivity and improved profitability. This is assured through ABB's extensive experience in paper machine control.

The diagnostic measures a series of key performance indicators (KPI) to determine a benchmark for optimal performance of your equipment and process. Practical actions to achieve the improved performance are provided in an improvement plan, along with the financial benefit the improvements can make to the bottom line.

#### Performance indicators

A series of comprehensive surveys are performed to audit four key performance indicators.

- Product Variability: Generated from the machine di-

rection (MD) and cross machine direction (CD) frequency content of weight and moisture signals, which covers the spectrum of potential cyclic problems in a paper machine. This index reveals problems related to product quality, lab tests, sheet breaks, controllable and uncontrollable disturbances, vibration, sensor accuracy, mechanical rotational problems, and runnability.

- Stock Approach Stability: Generated from the set-point, measured value, and range of the following signals: total head, machine chest level, thick stock flow, and thick stock consistency. It reveals performance issues with paper quality, fiber delivery stability, inconsistent lab tests, scan level control quality, signal conditioning, and sheet breaks.
- Machine Response: Open and closed loop bump tests of headbox pressure, MD weight, and MD moisture provide insight to how the machine responds to step inputs during automatic and manual operation. This survey examines the fitness of response speed, reel to reel variability, machine direction long term variability (MDL), scan level control, sheet break recovery, start-up time, grade change time, and profiling capability.
- Profiling Capability: This is how the profile should look with automatic control. Reveals the need for profile control, process problems, control problems,

profile resolution, choice of actuators, and number of actuators needed.

Complete testing requires three to five working days to collect the data required for the diagnosis and to determine improvement recommendations.

#### **Improvement plan**

The improvement plan is a series of practical solutions designed to raise the performance of the system. Solutions may include:

- Replacing bad valves
- Isolating high frequency machine problems related to rolls, pumps, screens, or machine clothing
- Cleaning up signal conditioning problems
- Optimizing or adding control logic
- Updating standard operating procedures
- Re-tuning controls for optimal performance

#### **Delivery scope**

##### **Preliminary**

- Identify paper machine, DCS and QCS system configuration
- Provide production and machine roll and felt dimension worksheets to mill

##### **On-site**

- Meeting to discuss project and gather information:
  - Complete needs assessment form
  - Complete roll diameters and clothing length worksheet
- Initiate data collection software and hardware
- Begin over-night data collection of scanner information for machine and stock approach stability tests
- Complete single point scanner portion of the Product Variability test
- Complete Machine Response testing
- Complete Profile Capability testing
- Data analysis for summary of findings exit meeting presentation
- Exit meeting

#### **Implement**

Once improvement recommendations have been defined, steps to increase performance, while creating a foundation for continuous improvement, can begin. Services to implement improvement recommendations are in addition to the diagnose service and priced separately.

Improvement recommendations may be implemented all at one time, or scheduled to be completed incrementally over time; beginning with improvements that provide the greatest financial return. ABB is available to implement the improvements, or work along with site personnel to achieve the desired optimization level.

#### **What sets this solution apart**

- **Trusted process:** The paper machine diagnostic consists of well defined service modules that are delivered consistently, provide an accurate assessment, and ensure a practical corrective action plan can be identified.
- **Proven method:** Trial and error methods to achieve results are eliminated, or greatly reduced, when this diagnostic method is used to arrive at targeted corrective actions.
- **Your choice:** The included implementation plan gives you the options to make improvements yourself, employ ABB's Advanced Services team to implement recommendations, or some combination of both.
- **Exclusive tools:** Only ABB has the diagnostic and troubleshooting tools for data collection, and platform and process analysis that allows all ABB service engineers to deliver the assessment and additional implementation services consistently.
- **Return on investment:** The findings quantify the newly discovered performance gap in terms of dollars, showing you the financial benefit from implementing the improvement recommendations.