ADVANCED DIGITAL SERVICES

# Stock Approach Fingerprint
## Identify opportunities to improve stock approach



Current process and control performance is benchmarked, to determine stock approach stability improvement opportunities. A comprehensive evaluation report is provided, which outlines recommendations for improvement and associated estimated ROI.

Typical savings potential: $45,000 – $160,000

**Benefits**
- Facilitates management decision process by focusing on high impact opportunities for improvement
- Provides clear path to quickly close the performance gaps by using the proposed improvement plan
- Provides a solid foundation for continuous improvement based on data

**Features**
- Access to ABB optimization experts
- Process performance benchmarking
- Detailed ROI-based improvement plan
- Clear communications during data collection and diagnosis activities

**Stock Approach Fingerprint**
The ABB Stock Approach Fingerprint is a platform independent, non-invasive service that can be applied to any paper machine.

The fingerprint generates both a performance benchmark and an improvement plan, consisting of a set of improvement opportunities, which are prioritized based on estimated economic benefits.

The benchmark measures product variability from the high density storage through the stock approach system, to the headbox of the paper machine. This

benchmark provides the basis for improvement recommendations.

**Process Performance Indicators**
The Stock Approach Fingerprint involves comprehensive testing and analysis including:
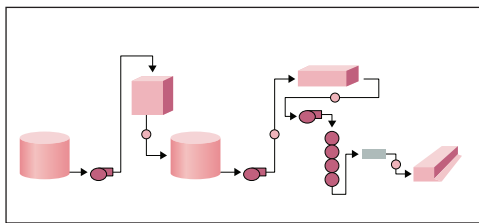- High Frequency Analysis
- Process Stability
- Control Loop Assessment

These Performance Indicators measure stock approach process performance and improvement area potential.

**Machine Testing**
Each performance index is made up of a series of indicators derived from specific machine tests. High speed data is collected from the most upstream online scanner and several pressure taps are monitored in key pieces of equipment in the stock approach area. The resulting performance indices are used to evaluate the performance level of the stock approach area of the paper making process including:
- Mechanical vibration and rotational frequencies originating in the stock approach
- Frequency content of the sheet
- Mechanical issues such as bad valves and cavitation
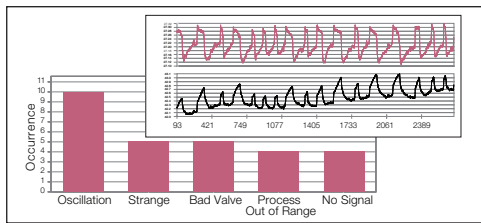- Signal conditioning issues including quantized sig-

**High Frequency Analysis**
Provides information on:
• High frequency content of key process points
• Mechanical issues affecting process

Evaluates process and mechanical disturbances that are affecting process quality and the sources investigated with pulsation analysis.
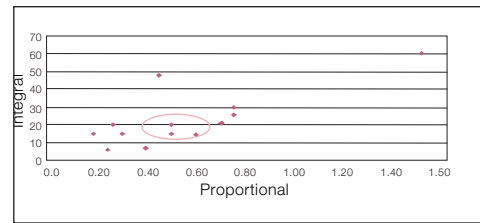


**Process Stability**
Provides information on:
| | |
|---|---|
| • Process upsets | • Over filtering |
| • Root cause | • Quantized signals |
| • Bad valves | • Noisy signals |

Evaluates performance of the DCS control loops within three categories including control, process, and signal conditioning issues.



**Control Loop Evaluation**
Provides information on:
| | |
|---|---|
| • Over, under control | • Limit cycle and manual mode |
| • Output oscillation | • Control loop tuning validity |
| • Offset, out of range loops | |

Data collections plus DCS loop tuning parameters are used to benchmark DCS control performance.

nals and over filtering
• Process control issues including output oscillation and over control
• Control Loop tuning validity

Identifying that a stock approach process area is under performing is the first step in the improvement process. Understanding the problem and having the expertise to provide solutions is assured through ABB's extensive experience in coater controls.

### Reporting
An Executive and Technical Report are provided to disclose the findings and recommendations of the process performance diagnosis.
• Technical Report provides supporting data collected during the machine diagnosis.
• Executive Report provides benchmark results, summary of findings, financial impact of recommendations, and an actionable improvement plan, based on the machine diagnosis.

### Improvement Plan
The improvement plan defines how to resolve the performance bottleneck and improve performance, and provides financial impact for each recommendation.

Based upon the findings, recommendations may include valve replacement, correcting the sources of high frequency machine problems related to: rolls, pumps, screens, machine clothing, cleaning up signal conditioning problems, optimizing or adding control logic, updating standard operating procedures, or re-tuning controls for optimal performance.

The Stock Approach Fingerprint is the first step in achieving and sustaining higher performance levels. Annual Fingerprint, Implementation, and Sustaining services are recommended as part of your service

contract agreement to achieve and continue the improvement process. These can be scheduled within a single- or multi-year service contract agreement.

ABB is the world leader in pulp and paper applications. In depth knowledge and experience in this area allows comprehensive evaluation, diagnosis, remedial recommendations and implementation, and the ability to manage and sustain process performance improvement.

### Delivery Schedule
• Day 1
  - Project introduction meeting
  - Setup data collection software and hardware
  - Begin collecting stock approach
  - DCS data for Process Stability analysis
• Day 2
  - Complete the scanner single point collection for the High Frequency Analysis test
  - Begin setup for pulsation study which requires locating and hooking into pressure taps
• Day 3
  - Complete high speed data collection of pressure tap data
• Day 4–5
  - Finalize DCS data collection and extract DCS PID loop tuning parameters
  - Prepare initial Summary of Findings and perform exit presentation
• Day 6
  - Complete final data analysis and generate Executive and Technical reports
  - Communication with the mill precedes scheduled activities to ensure coordination with ongoing mill activities.

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