Operational Efficiency through Integrated Automation

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Valmet

Moving your performance forward in a competitive business environment

- Minimizing the area losses
  - The amount of broke
- Minimizing the idle time
  - Number of breaks, duration of the breaks
- Utilization of the speed potential
  - Maximizing the speed and production
- Preventing unplanned shutdowns
  - Availability of the equipment
  - Managed services
- Cost management
  - Savings in energy and raw material

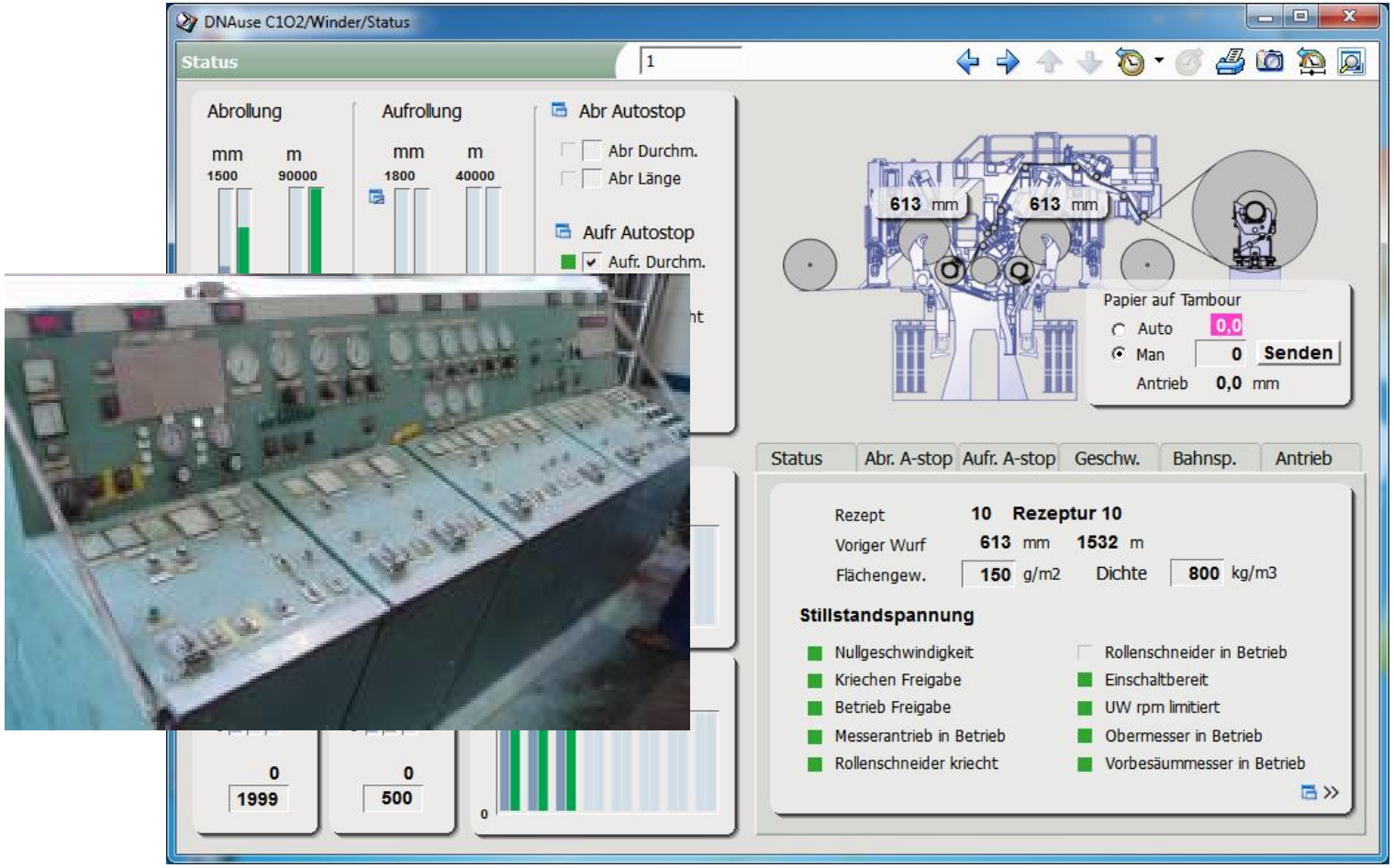
Conventional automation on a paper machine

Typical problems

- Limited operator interface
  - Many different types of operator interfaces
  - No information on interlocks available
  - Limited trending and history data collection
- Reliability problems
  - Aging hardware
  - Complicated data links between various systems
- Maintenance problems
  - Many different types of engineering tools
  - Difficult to find faults and identify intelocks
  - No more people who can do programming
  - Difficult to add new loops in the old system
  - No spare parts available

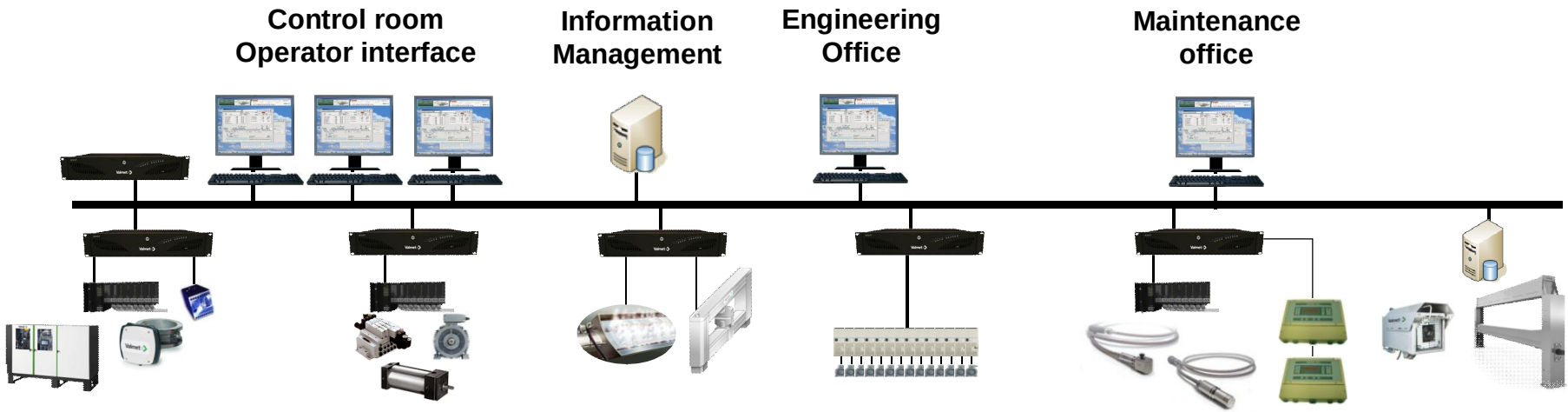
Winder Operator Interface with DNA Operate

Main display



One system for all automation in pulp & paper

Valmet DNA (Dynamic Network of Applications)



DCS Process controls

MCS Machine controls

QCS Quality controls and optimizations

Drive controls

Condition, lubrication runnability monitoring

Web break & web inspection analysis

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Automation is a strategic tool to improve operational efficiency

- Manages the process and production
- Provides the window into the process and to the end product
  - measurements
  - visualization
- Optimizes production line performance
- Shares process knowledge
- Provides a tool to manage assets
- Secures the HSE targets

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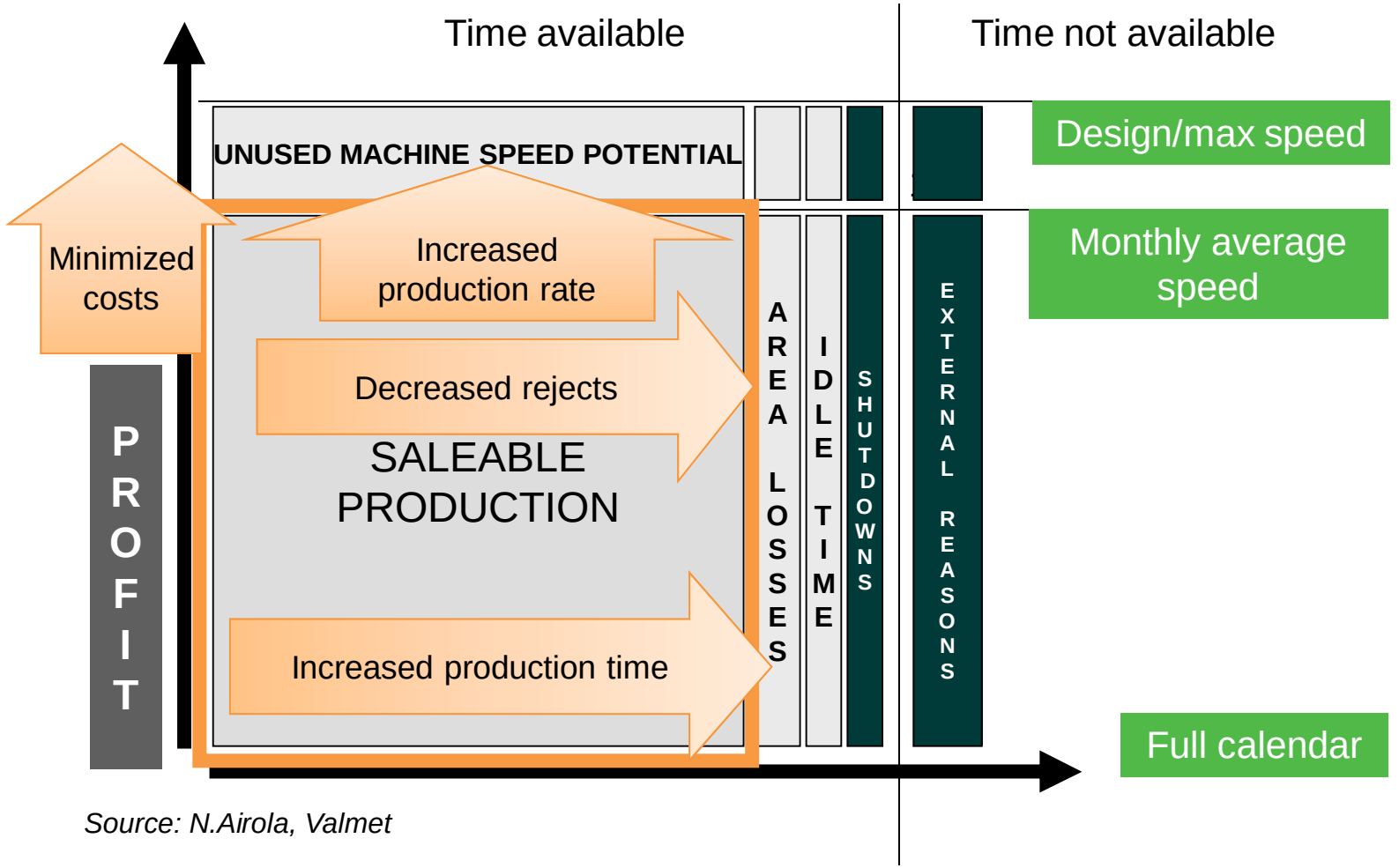
Operational efficiency and cost savings

Automation plays a major role



Source: N.Airola, Valmet

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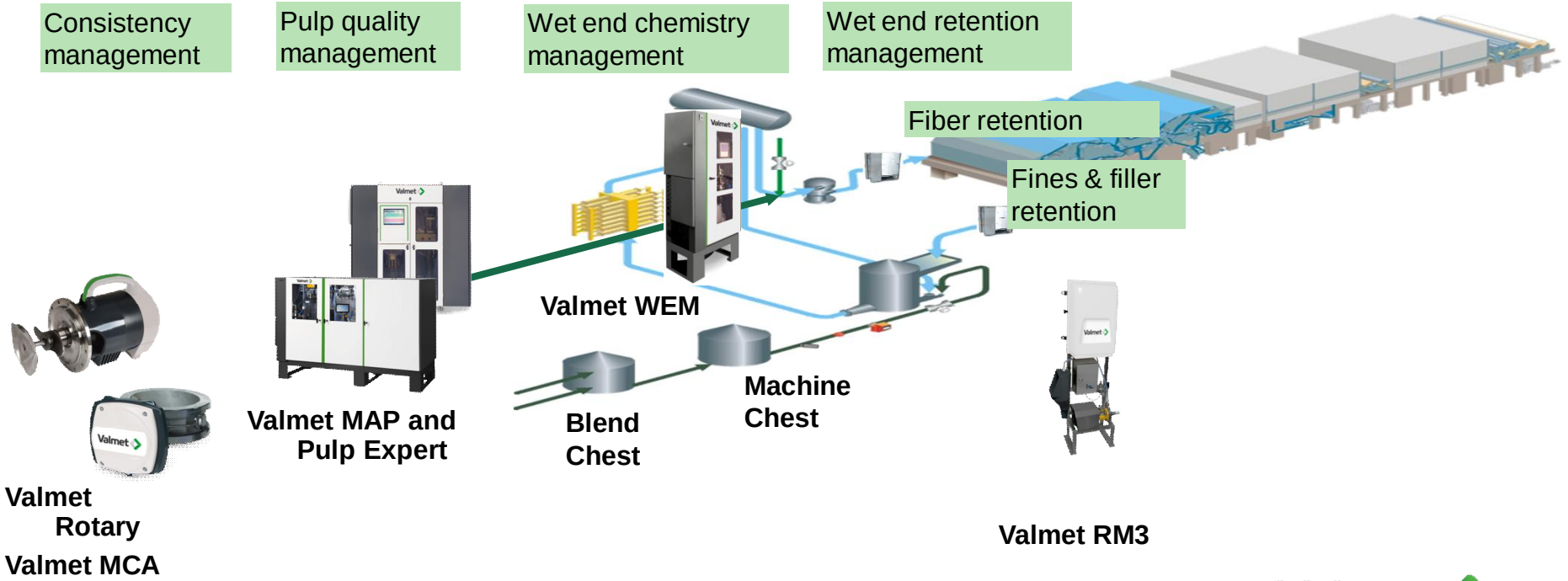
Valmet analyzers for the papermaking line

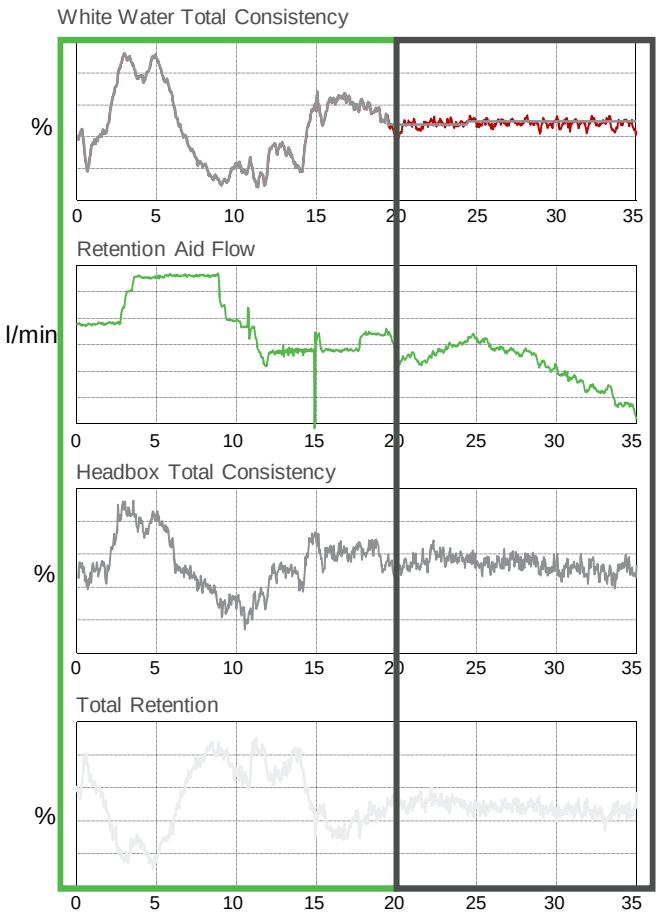
To secure the wet end stability and furnish quality

1. Formation
   - Fiber properties, consistency and head box and wet end dynamics and chemistry
2. Fiber, fines and filler retention
   - Furnish and wet end chemistry and dynamics
3. Water removal and drying
   - Freeness and wet end and press section dynamic and cleanliness

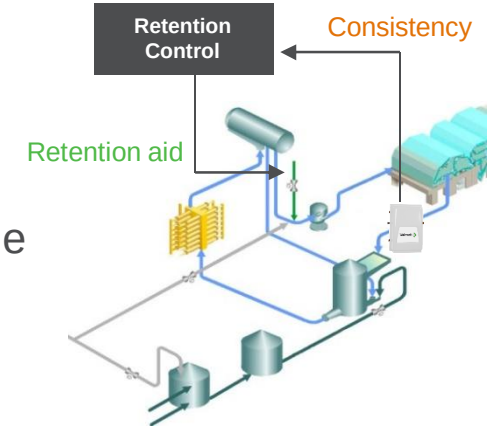


Stable wet end – Closed loop control of retention

Long history of proven benefits



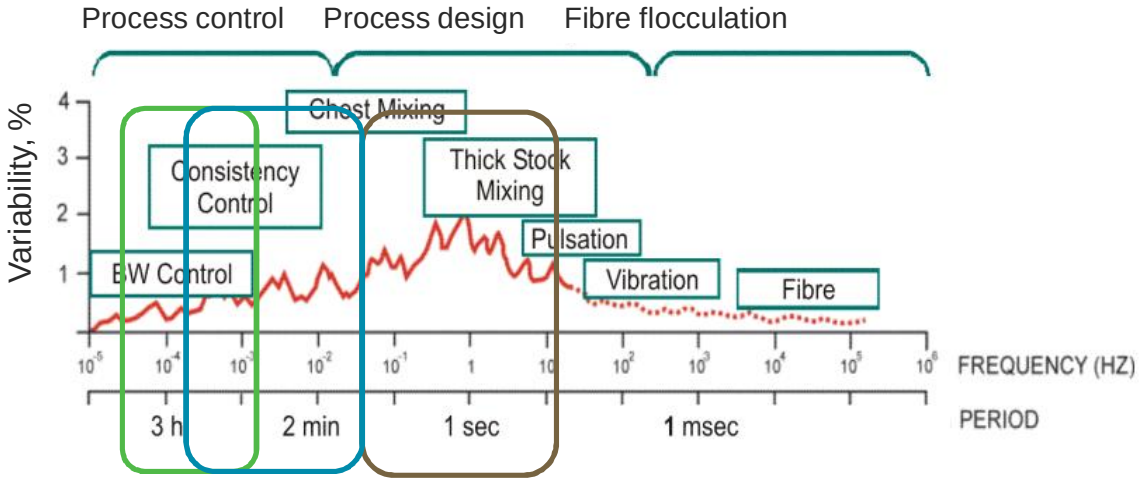
- Fewer wet end breaks
- Faster startups and grade changes
- Enables higher machine speeds



Change in 2σ	Fine	Board	SC	LWC	News
WW total Cs	-80%	-71%	-68%	-57%	-80%
Basis weight	-9%	-5%	-19%	-14%	-30%
Paper ash	-22%	-38%	-20%	-22%	-25%

Valmet IQ controls

It is all about variability reduction and runnability improvement



Thick stock
Total C

Scanner

White water Cs cationic demand

Multivariable control

- Much variability is too fast to control from the dry end scanner
- Both MD and CD are affected
- It must be controlled at the wet end
  - Wet end sensors and controls
- Need to integrate wet end and dry end controls
- Fast variability requires improved mixing of stock and chemicals

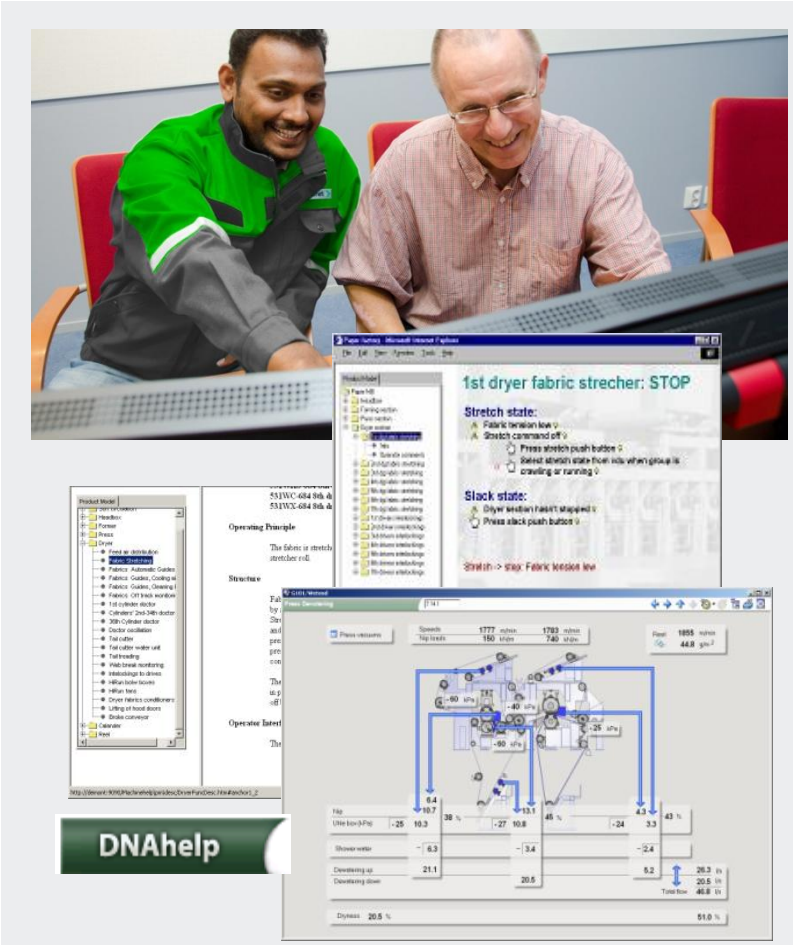
Valmet IQ - Measurement portfolio

State of the art measurement technology, covering all the quality parameters

- Fiber and energy savings with most accurate moisture measurement
- First Blue-ray caliper measurement - No holes, no dirt build up, no marking, low penetration
- IQ Fiber - Infrared based oven dry weight and moisture measurement
- Patented and unique direct coat weight sensor for CaCO3, Clay or Latex based coatings
- Totally new technology for paper structure and surface measurements: Formation, Orientation, Topography and Porosity
- Printability prediction with new IQ Surface Measurement

Valmet DNA machine controls

More production time, faster troubleshooting



- Machine control displays help and guide the operator
- DNAhelp guides and indicates the reason for defects faster
- Functional descriptions can be seen on the monitor

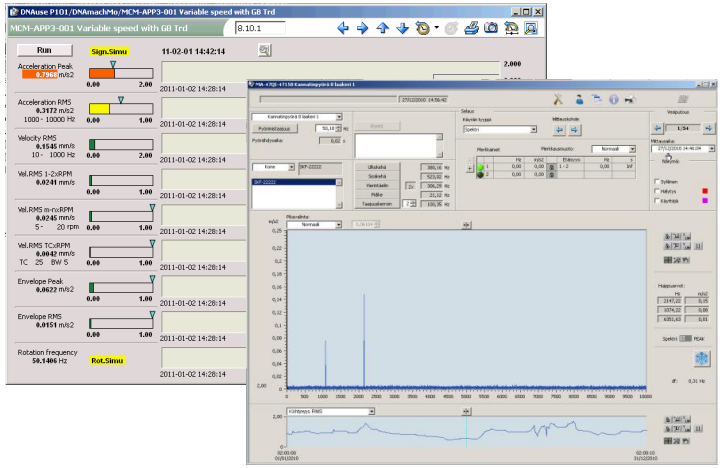
"Clearly the biggest benefit is in our ability to solve problems."

"Now operators can identify the specific causes of a break themselves. The average repair time is definitely shorter."

DNA Machine Monitoring for paper machines

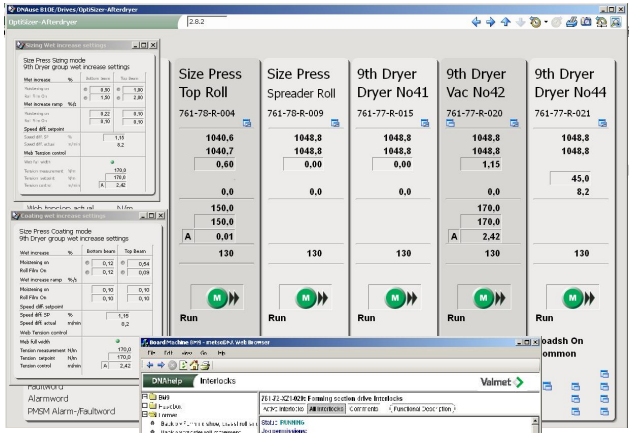
To prevent unplanned shutdowns

- Machine condition monitoring
  - Bearing faults
  - Gear defects
  - Unbalance
  - Misalignment
  - Wear/loosness
- Runnability monitoring
  - Roll and nip vibrations
  - Calender barring
  - Press Felt condition
  - Fast MD variations in paper
- Lubrication monitoring
  - Lubrication flow monitoring



Valmet DNA drive controls for paper machine

Increased transparency through horizontal integration

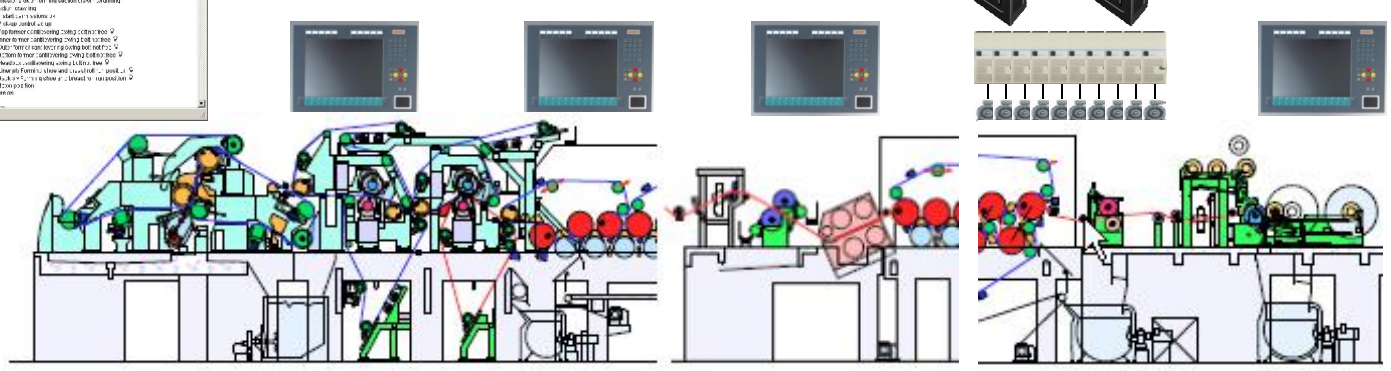


Drive controls in Valmet DNA

- Tuning display for size press drives
  - automatic draw increase when wet
  - torque step when nip and applicator heads are loaded
- Roll diameter settings
- Drive and interlock diagnostics DNA Help
- Web break report with MCS signals

Control Room

Drive Controls

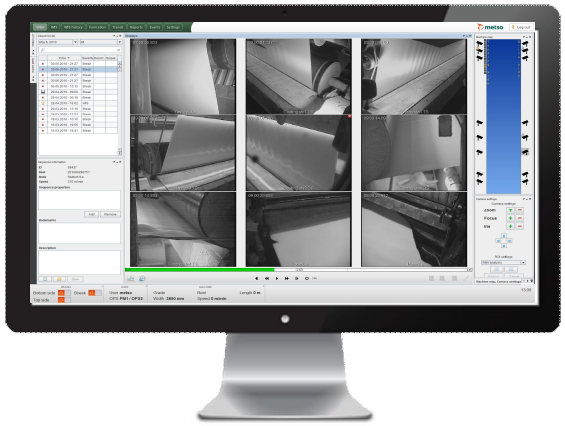


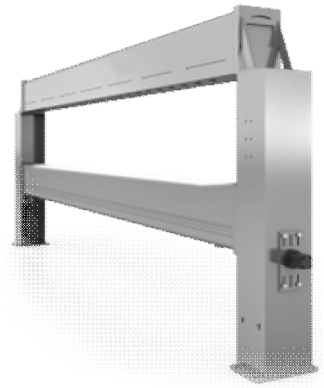
Valmet Process and Quality Vision

To secure the paper quality and increase the machine runnability

Efficiency through integration

- WBA and WIS functionalities together
- Both can be used with the same interface
- Uses the same digital image capture and processing technology in both
- Utilizes the same camera equipment
- Easy and cost-effective to update and extend



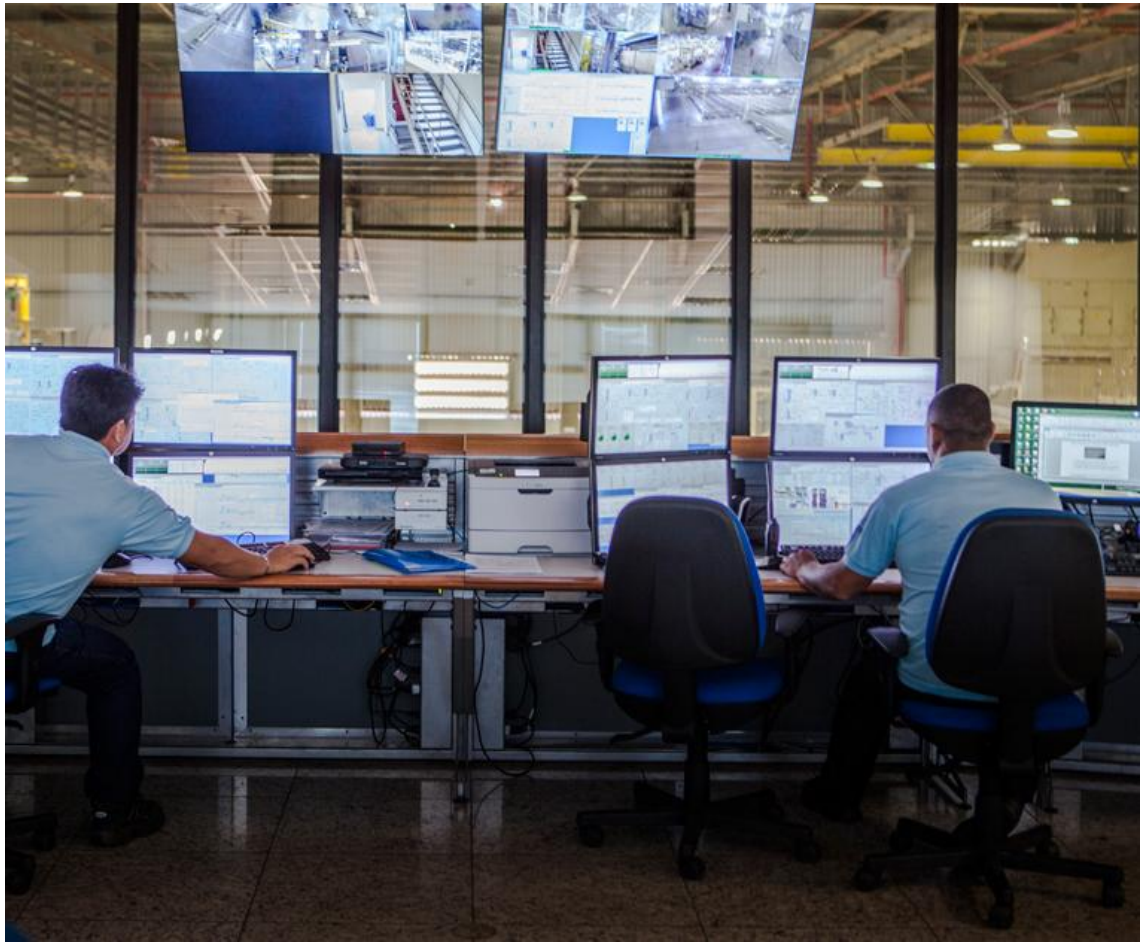


Effective user interface

Clear window to the process to decrease machine down time

Valmet DNA

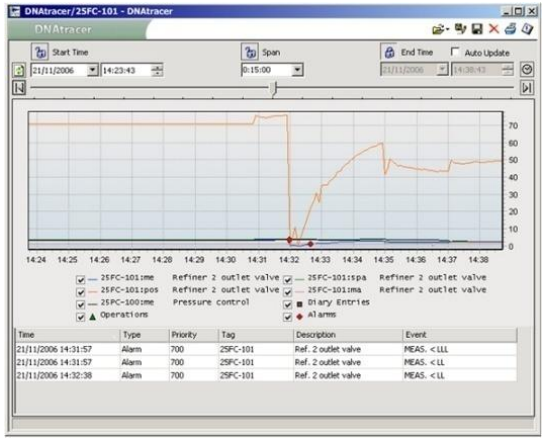
- Scalable from single stand-alone controller to mill and plant-wide systems
- Supports your operations regardless of the size of your process
- Helps keep up high reliability



Valmet DNA operator interface

More production time, faster troubleshooting

Data Collection



Functional Descriptions

DNAhelp Displays

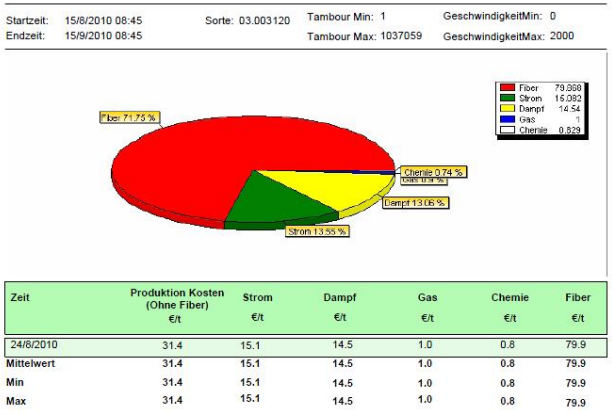
Process Displays

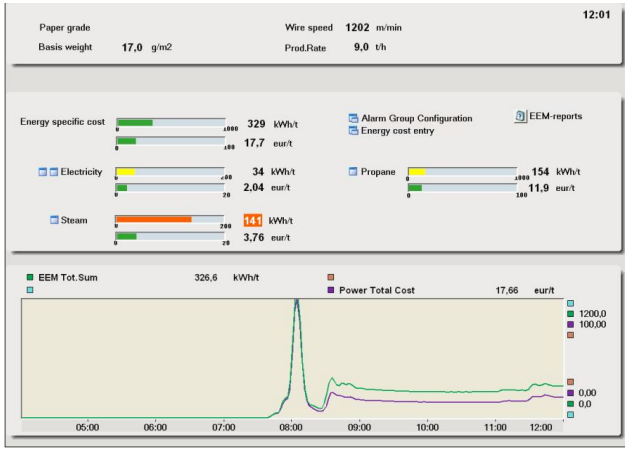
Knowledge Management - Diary

Valmet DNA Paper Cost Monitoring

On-line tool to follow and save costs and consumptions

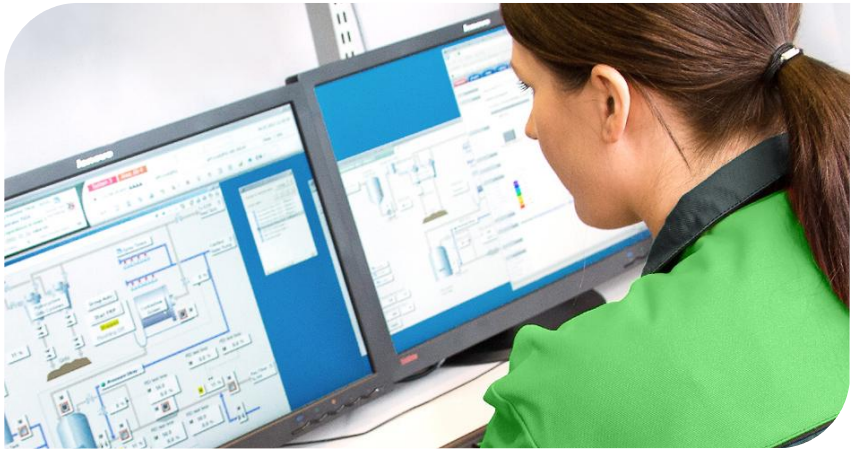
- Real-time monitoring
  - Specific energy consumption [kWh/t and €/t]
    - Eletrical energy
    - Steam energy (also to/to)
    - Gas energy (also m3/to)
  - Specific chemical consumption [€/t]
  - Fiber and filler consumption [€/t]
  - Percents from total costs [%]
- Alarms if production based reference values are exceeded
- Operator guidance to solve energy usage problems
- Energy management according the ISO50001 enviromental standard





Valmet as a strategic Pulp &Paper Partner

- Partner who develops technology and remains active in P&P for many years to come
  - Valmet´s commitment to P&P industry in all levels
  - High level of R&D investments
- Partner who delivers results every day, all around the world.
  - Global sales and service network available 24/7
  - Local support through engineering, availability and performance services
- Market leader in QCS systems and Profilers, knowhow

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FORWARD