Valmet DNA Machine Monitoring

Integrated online condition monitoring for paper and board production lines

Valmet DNA Machine Monitoring continuously monitors the mechanical condition and performance of critical machinery, components and processes in paper and board production lines. Online machine condition monitoring enables 24/7 monitoring, thus providing the fastest possible way to act on problems and secure the production, protect assets and increase working environment safety.

Based on the measurement of vibration and other critical process parameters, DNA Machine Monitoring provides the diagnostic tools for detecting vibration problems originating from bearings, rolls/roll covers, gearboxes, doctoring/ coating blades, press fabrics and process equipment, to prevent and minimize unscheduled shutdowns.

DNA Machine Monitoring can work as a fully integrated application in the Valmet DNA automation platform or as a stand-alone monitoring system.



Integrated application provides machine condition information for process operators and maintenance personnel through one common user interface.

Predictive maintenance to increase reliability and availability

Immediate alerts define the location and indicates the severity and development of the vibration problems. Comprehensive analysis tools are available to define fault specific problems, such as:

- bearing defects
- gearbox faults
- roll cover defects/delamination
- resonance/barring
- misalignment
- unbalance
- wear and looseness
- insufficient lubrication.

Time-trending allows personnel to follow the fault development of a mechanical defect and helps in planning corrective actions and shutdowns.



Mechanical problems with machine components are detected, analyzed and time-trended. This ensures that problems are recognized quickly, their causes are correctly defined, and corrective actions are taken at the right time.

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Monitoring, analysis and follow-up

DNA Machine Monitoring provides a comprehensive set of tools for alarm handling, fault analysis and fault trending. Machine condition parameters are measured in variable frequency ranges to ensure developing defects are detected. Alarm/alert limits can be set manually, e.g. for machinery with fixed speed, and with speed adaptive intelligent alarm handling (IAH) tool for machinery with variable speeds. Additionally the IAH tool provides information about the machines' dynamic behavior at different speeds.

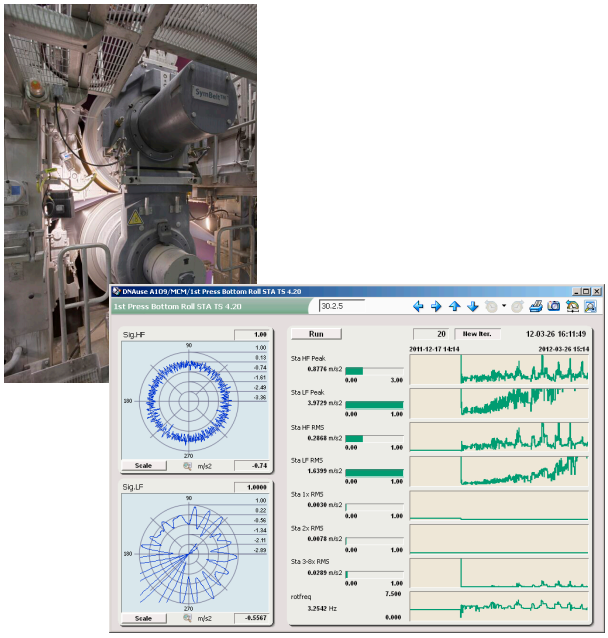
Analysis tools for fault diagnostic are:

- Spectrum and time signal (acceleration and velocity)
- Envelope spectrum and time signal
- Synchronized Time Average (STA) circular diagram, spectrum and time signal

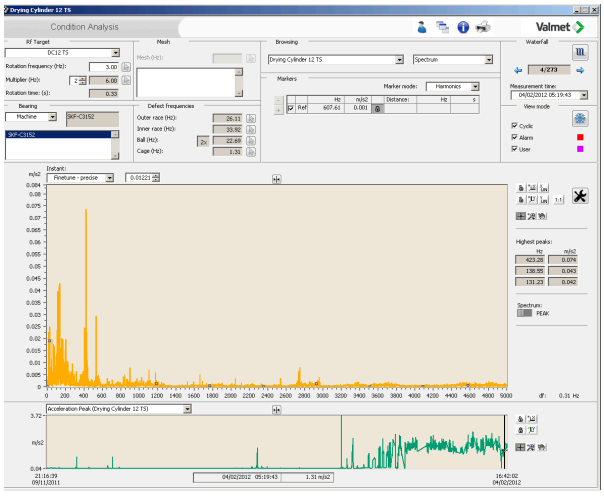
Machine related data like bearing type, number of gear teeth etc. are entered into the analysis window to make analysis fast, easy and accurate.

Time-trends are shown with a related bar graph and alarm status for each monitored parameter.

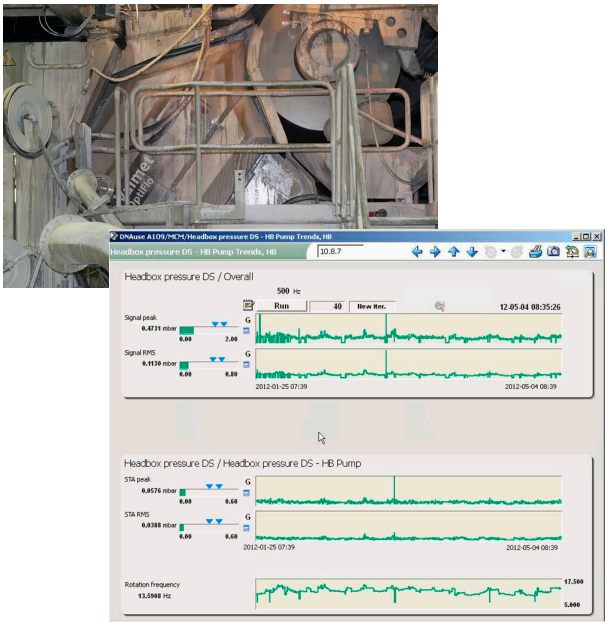
Time-trends shows fault development and helps to schedule corrective actions and shutdowns timely.



Nip roll STA monitoring reveals how much of the total vibration is being generated by the press rolls and/or the fabric(s).



Spectrum analysis with related trend



Head box pulsations are often related to upstream pumps or screens. Fixing these problems provides better process stability, quality and productivity.

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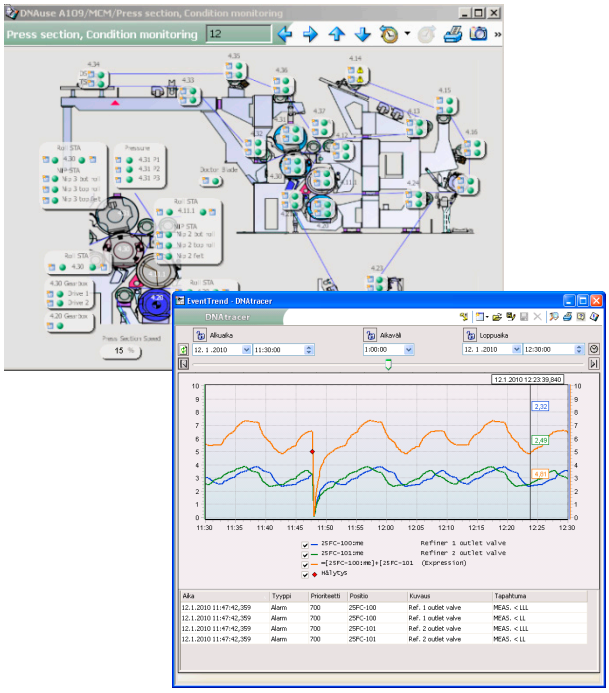
Benefits with integrated platform

DNA Machine Monitoring provides machine condition information for process operators and maintenance personnel through one common automation user interface. Operating in the same user environment makes communication and decision making fast and accurate.

Integration provides also easy and accurate correlation between vibration measurement and other process/ machine condition parameters to determine the right cause to changes.

DNA Machine Monitoring equipment

Online machine condition monitoring is based on fixed installed sensors on the machinery, cabled to monitoring substations where measurements are collected in cyclic intervals or continuously, depending on the criticality of the machinery.



Correlation and event trending with DNA Tracer tool



ACN processing units for both centralized and field installation



I/O groups and analog I/O units for vibration measurements, and digital units for trigger and status signal measurements



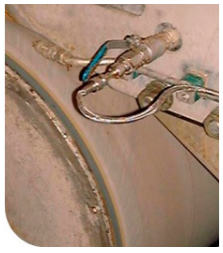
Vibration sensor for wet and humid environment



Vibration sensor for dry and hot environment



Magnetic trigger sensor for roll/shaft rotational speed measurement



Pressure sensor for dynamic pulsation measurement in short circulation and head box

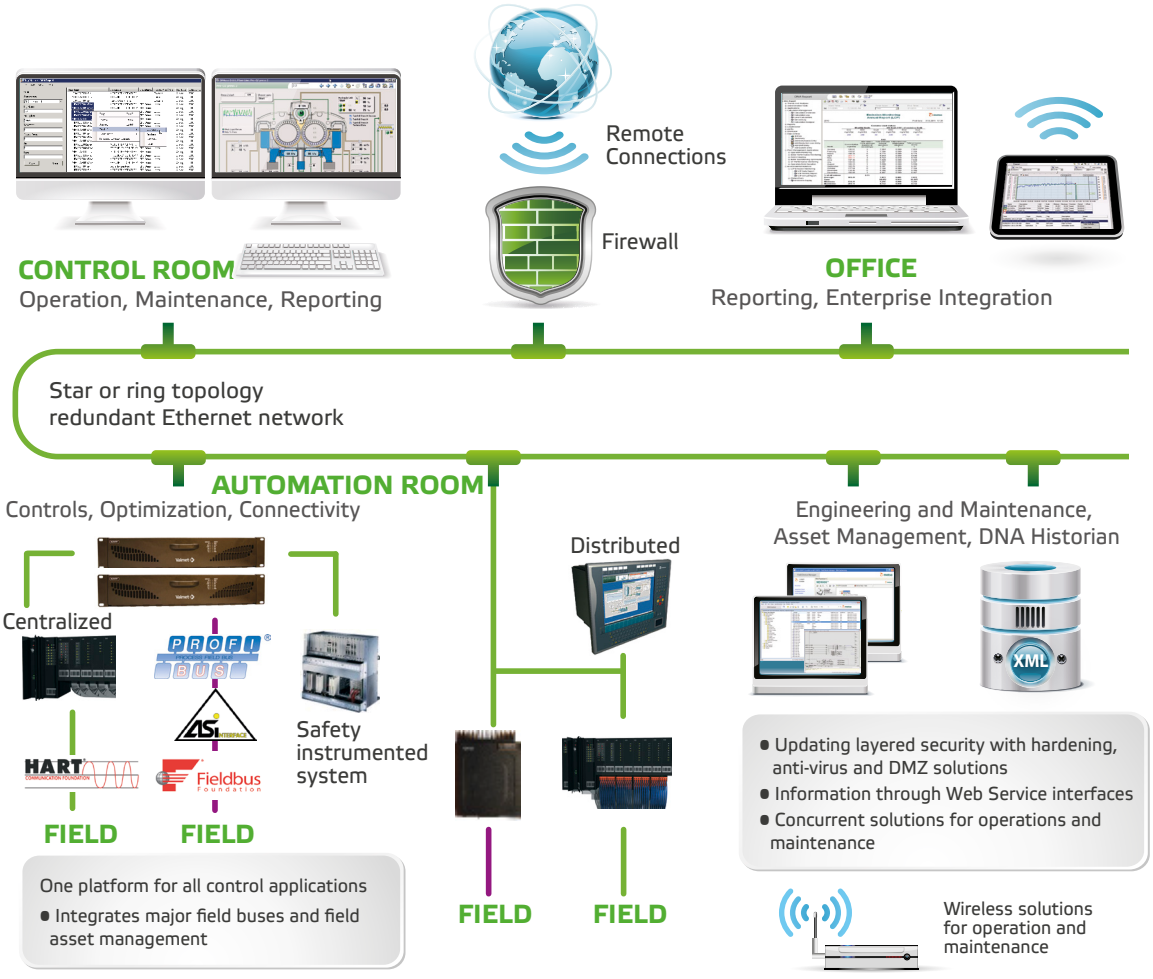


Junction box for terminating field signals and trunk cable

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System integration brings cost benefits

An integrated solution allows shared system resources to be utilized for control and condition monitoring applications. The same operator work stations, history databases, system networks and engineering tools can be used by all applications. System maintenance is easier because only one engineering environment is needed.



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