

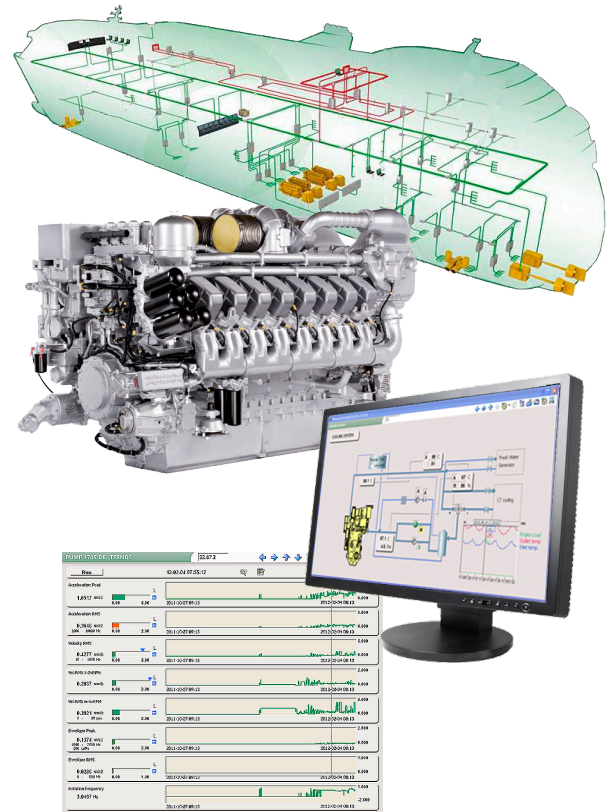
Valmet DNA Machine Monitoring

Online condition monitoring system for maritime industry

DNA Machine Monitoring measures and analyzes the mechanical condition and performance of machinery units, based on vibration measurements and other machine parameters. DNA Machine Monitoring provides both protection and diagnostics for critical machinery, as well as condition monitoring and analyzing tools for the predictive maintenance of auxiliary machinery. Online machine condition monitoring enables 24/7 monitoring, thus providing the fastest possible way to act on problems and to secure safe sailing, protect assets and increase working environment safety.

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

Online machine condition monitoring is based on fixed installed sensors on the machinery, cabled to remote I/O stations where measurement data is collected in real time for critical machinery and cyclic intervals for auxiliary machinery. Alarms are generated when pre-set alarm limits are exceeded. Fault analyzing is performed with comprehensive signal analyzing tools. Defect development is monitored by tracking historic trends, thereby providing the tools for predictive maintenance and for scheduling service.



Machine condition monitoring enables the detection of mechanical faults like

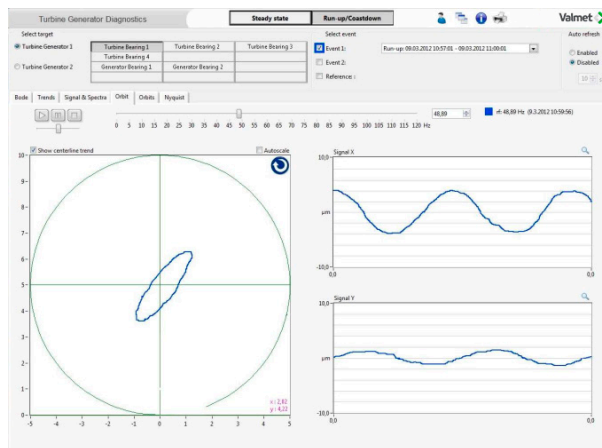
- bearing wear and instabilities
- unbalance
- misalignment
- thrust bearing wear
- shaft defects
- wear and looseness
- gear mesh problems
- resonances.

Machine condition monitoring

Auxiliary machinery like fans, pumps, separators and gearboxes, etc., can be monitored with efficient condition monitoring tools. The application provides alarm handling and spectrum/envelope spectrum and time signal analyzing tools for fault diagnostics. The application integrates with Valmet DNA Historian, and the history trends of vibration characteristics are available for tracking fault development. While operating integrated within the same Valmet DNA user environment, vibrations are easily correlated to other machine parameters like rotational speed, temperature and pressure, etc., to determine the correct cause for changes. Machine design parameters like bearing data and gearbox ratio/mesh information, etc., are implemented in the analyzing tools to make the fault diagnostic process fast, easy and accurate.

Machine protection and diagnostics

Real-time measurements for the machine protection of critical machinery can be performed with four-channel I/O units. The protection monitoring I/O units are designed in accordance with API 670 standards to fulfill the demand for fast measurement cycles. Measurement monitoring of rotating machinery with both slide and roller bearings can be performed.

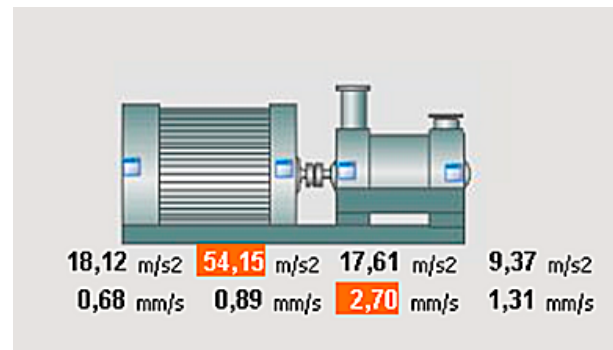
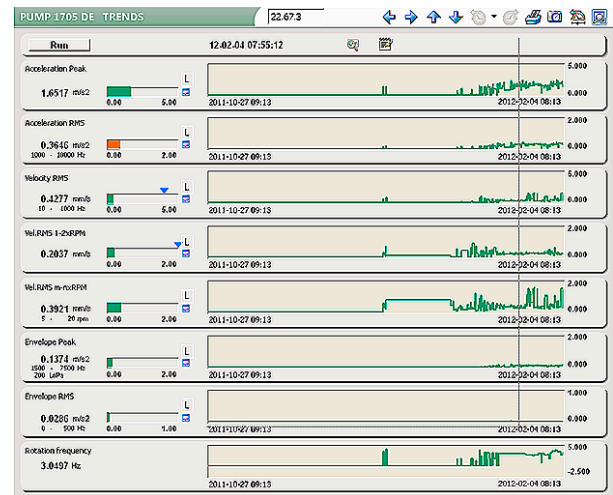


Fully integrated in the Valmet DNA automation system

The operators and maintenance personnel can monitor rotating machinery condition data directly on their workstations. The most important vibration characteristic values are shown directly in the process displays. Alarms will bring attention to machinery in question. The system provides advanced tools for more detailed analyzing of machine faults.

Remote diagnostics

The remote connection to the Valmet DNA system ensures fast support in problem situations. The specialized services with expertise are available for both mechanical condition monitoring and system maintenance. Signals can be connected with external interlocking units as well as to Valmet DNA interlocking units.



One-stop supplier offers all components needed

Valmet is a one-stop supplier for vibration-based condition monitoring, offering everything from sensors, system hardware, application software, engineering and start-up services to training, system maintenance and condition analyzing and reporting services.

DNA Machine Monitoring components

I/O units for condition monitoring

- AIF8V unit for vibration and DC parameter measurement
- AIF8T unit for trigger and status signals
- eight-channel parallel measurement
- 16 bit AD converter
- 20 kHz sampling frequency
- 50 s continuous signal ring buffer
- 4 mA constant current supply for IEPE sensors
- continuous power supply for all sensors
- galvanic isolation between field and system



I/O units for protection

- AIF4 units designed in accordance with API 670
- AIF4E for Eddy current probes
- AIF4V for velometers and accelerometers
- 20 kHz sampling frequency
- <100 ms update for protection parameters
- four-channel units
- 4-20 mA output for each channel
- 10 s sample buffers for diagnostic application
- buffered diagnostic output for each channel
- works independently after power-up (protection)
- galvanic isolation between field and system as well as between channels



ACN process controller for diagnostics

- ACN MR high-performance process controller
- no moving parts (HDD, CD, etc.)
- 2 GB SD card
- five Ethernet ports
- two USB ports
- redundant power supply
- self-diagnostic
- communication to third party (Modbus TCP)
- an integrated part of the Valmet DNA system network
- configuration of I/O units with standard Valmet DNA engineering tools



ACN process controller for condition monitoring

- ACN RT for centralized installation, ACN CS for field and centralized installation
- Intel Celeron Processor 2 GHz or higher
- 512 MB of RAM memory (max 2 GB)
- two Ethernet ports, 10/100 Base-T
- two USB ports
- no moving parts (HDD, CD, etc.)
- two serial ports, RS-232



Vibration and process sensors



RVT105,
acceleration sensor,
low profile



RVT120,
acceleration sensor,
top exit

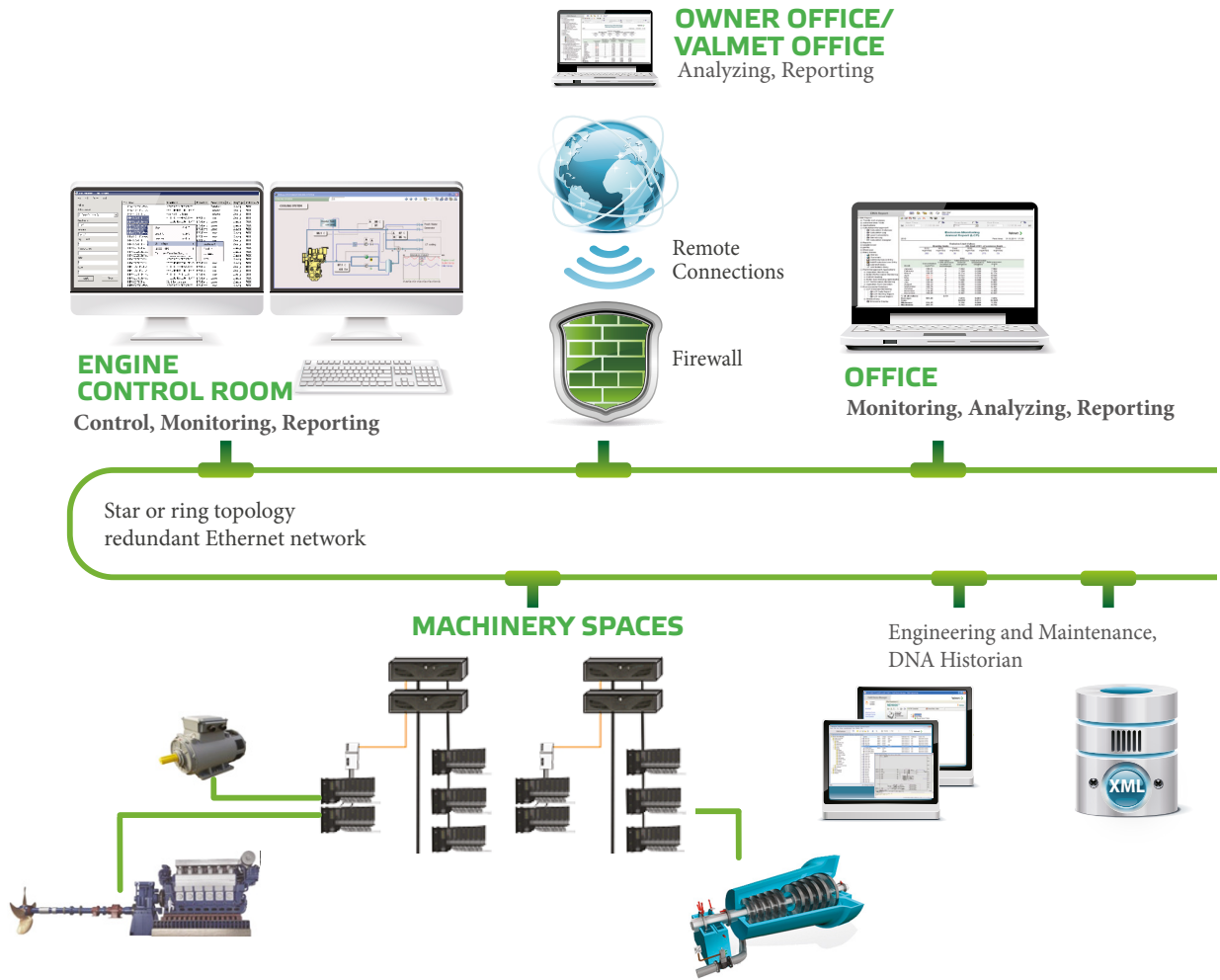


RTS-226,
magnetic trigger
sensor



RPT-133,
dynamic high pressure
sensor

Valmet DNA ship automation – total offering



System integration brings cost benefits

An integrated solution allows shared system resources to be utilized for control and condition monitoring applications. The same operator workstations, history databases, system networks and engineering tools can be used by all applications.