Asset Performance Management for Reciprocating Machinery

PROGNOST®-NT *Swift*

Basics of PROGNOST®-NT *Swift*

General Information

Typical applications:
- Commissioning of new reciprocating equipment (initial start-up)
- Regular operations following substantial overhauls or repairs
- Troubleshooting with extensive root cause analyses
- Gapless monitoring with trending of various analyses (e. g. wear monitoring)
- Record with complete fingerprint of machine operation characteri-stics

Exemplary data analysis performed by PROGNOST Service team:
- Continuously data analysis (2 times per week)
- Analysis report due to machine abnormality or damage
- Machine condition evaluation report

Sensors

- 16 sensors PLUS 2 trigger
    - For a maximum of two parallel machines per PROGNOST®-NT *Swift* installation
    - On request only, more than 16 sensors are available

- The different sensor signals are
    - Dynamic pressure
    - Vibration (acceleration)
    - Piston rod position (displacement)
    - Trigger (phase reference)

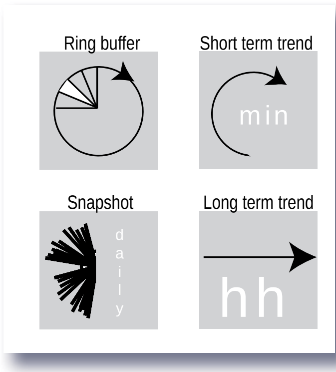
PROGNOST®-NT Server

Notification (alert and report)
- Alerting via E-mail, fax, network, SMS, pager, voice mail

User access and visualization (VISU)
- Visualization via network or modem (LAN/WAN/Internet)
- Administration of user rights
- Tree structured views

Data storage

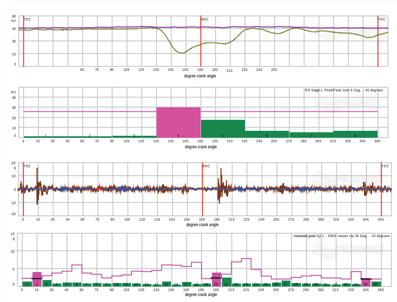
- Simultaneous storage of all on-line signals at a sampling rate of 25 kHz
- Storage of all on-line signals in the ring buffer in case of damage (event triggered) or if it is triggered manually by a user
- Trend value storage for:
    - Short term trend (resolution: minutes - available 1 year)
    - Long term trend (resolution: hours - available data of the entire system lifecycle)
    - Daily snapshot (resolution: every day one revolution with 25 kHz - available for the last 5 years)

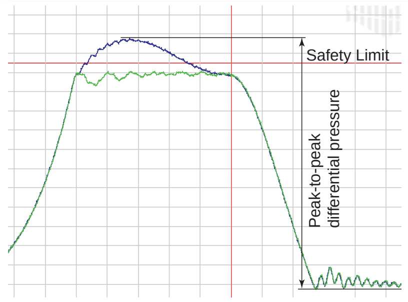


Analyses and Diagnoses

Safety Protection

- Vibration analyses of acceleration, velocity and displacement (segmented, fast, crankangle referred)
- Monitoring of the cylinder internal pressure
- Automatic machine shutdown (optional)



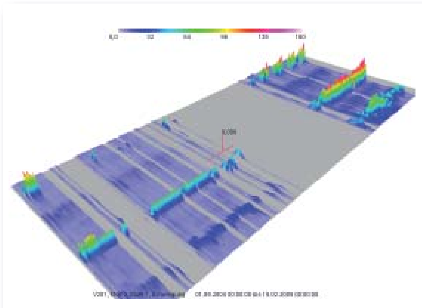


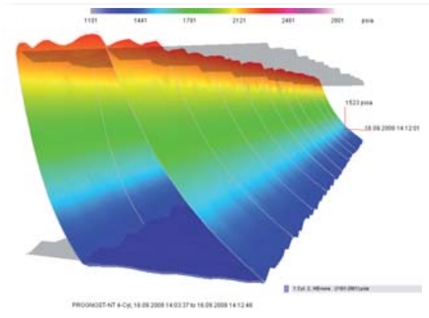
Safety Analyses

- Event triggered storage of on-line signals in ring buffer for root cause analyses
- Analysis „Rod Load Reversal Period“ according to API 618
- Visualization of all on-line signals and trended analyses

Early Failure Detection

- Vibration analysis based on 36/8 segments for each crank revolution
- Monitoring of on-line signal amplitudes by using the upper and lower thresholds (set by the automatic threshold setting) to get alarms in case of changing signals (threshold violations).



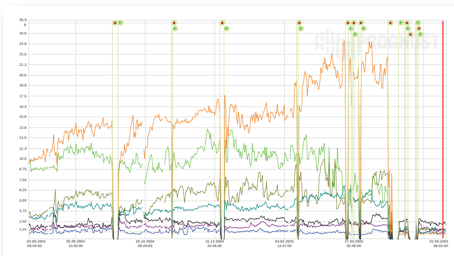


Performance Optimization

- Monitoring of dynamic pressure signals
- p-V diagram analysis
- Comparison with theoretic p-V diagram
- Calculation of “Rod Load”
- Combination with analyses of other signals
- Integrated gas database

Wear Monitoring

- Piston rod position monitoring (displacement)
- Measurement and calculation of rider ring wear
- Monitoring of piston rod position also for vertical compressors
- Combination with analyses of other signals



PROGNOST Systems GmbH
Birkenallee 177
48432 Rheine
Germany
Phone: +49 (0)59 71 - 8 08 19 0
Fax: +49 (0)59 71 - 8 08 19 42
Email: info@prognost.com

PROGNOST Systems, Inc.
1020 Bay Area Blvd. Suite 105
Houston, TX, 77058
USA
Phone: +1 - 281 - 480 - 93 00
Fax: +1 - 281 - 480 - 93 02
Email: infousa@prognost.com

www.prognost.com

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