GI monitoring solutions for reliable and cost effective asset management

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Application: Condition Monitoring System (CMS) and Vibration Monitoring of pumps, fans, turbines, piping, vessels, heat exchangers and large machines

Associated Product(s): Q.Station, Q.series modules, GI web portal

Abstract

Gantner Instruments provides monitoring solutions for both static and dynamic equipment in terms of vibration monitoring of piping, vessels, heat exchanger, large machines (static) and pumps, fans, and turbines (dynamic). Based on the robust and flexible Q.series with its decentralized signal conditioning and data acquisition modules, a very reliable and cost effective trend and condition monitoring solution is available.

The Problem

Equipment in power plant or process industries like piping, pumps or turbines are loaded by fluid or steam flow during normal plant operation. Also large machines e.g. for stone crushing or conveyor belts are operated in different load conditions. These loads cause vibration of the equipment sometimes in unwanted ranges that leads into fatigue failures of piping or degradation of bearings.

The Solution

With the monitoring solution of Gantner Instruments the asset becomes smart and delivers detailed status information. Machine based operational data like vibration patterns are acquired by robust accelerometers. These sensors are applicable also at locations with high surface or ambient temperature up to 700°C. Uni- or triaxle sensors with IEPE or charge output are used depending on the monitoring task.

Condition Monitoring

The system use statistic parameters in time or frequency domain like RMS, peak-to-peak, crest or vibration velocity and displacement for trend monitoring. For plain bearings eddy current sensors / proximity probes are used to detect the exact location of the shaft in the bearing shell (Smax, orbit). These trend parameters reduce the amount of stored data and thresholds for alarm and warning can be configured based on these parameters.

The vibration signal is acquired with up to 100kHz per channel and can be processed in real time for trend monitoring or further analysis depending on the monitored asset.
Instruments. The portal gives an overview of the asset health in terms of color coded symbols for the asset in general and all of its monitored components in detail.

The raw data can be exported in standard file formats out of the Webportal. With the direct interface to data analysis tools like FlexPro the vibration raw data can be used directly from the system for detailed assessment and root cause analysis.

**Vibration Monitoring for large machines and static equipment**

For the power plant and process industry a reliable operation of piping and vessels within acceptable vibration limits are essential for long term operation and plant safety. Also larger machines like stone crushing systems or conveyor belts are getting more and more important for a stable and reliable plant operation e.g. on a large construction site or in mining.

For these applications also accelerometers, load cells or displacement sensors and strain gauges are used to detect the load or overload conditions. Often, these type of assets are located in areas where no local network connection is available for data transmission and alarm announcement. LTE routers with a secured connection to the GI web portal server is used to transmit trend and raw data for monitoring a large decentralized fleet of assets. Alarms and warnings can be indicated also locally direct at the machine by use of flashing lights or local display.

This system is used to detect overload conditions on stone crushing machines with robust triaxial accelerometers to reduce repair and maintenance costs. In the cement industry the vibration pattern and load conditions of large grinders and mills is acquired to detect overloads and to protect the machine from being damaged.

For temporary application a mobile version of the vibration monitoring system is available. This mobile system finds it use e.g. for data collection on piping before and after exchange of pipes, valves or supports. In that case the vibration pattern is measured and analyzed to detect eigen-frequencies or vibration velocity and displacement. With that cost optimized version all detailed data is available for stability or vibration fatigue analysis.

**With the condition and vibration monitoring system**

For dynamic and static equipment, the status of a large fleet of different assets can be monitored with a standard web browser. The complete system with its robust and reliable equipment can be installed in short time. With the help of the detailed machine based information, maintenance strategies can be optimized, the asset availability can be increased and operating costs reduced.

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Or visit www.gantner-webportal.com to get your free demo access to the GI web portal.