SERVICE NOTE

ABB MACHsense-R
Remote condition monitoring service for motors and generators

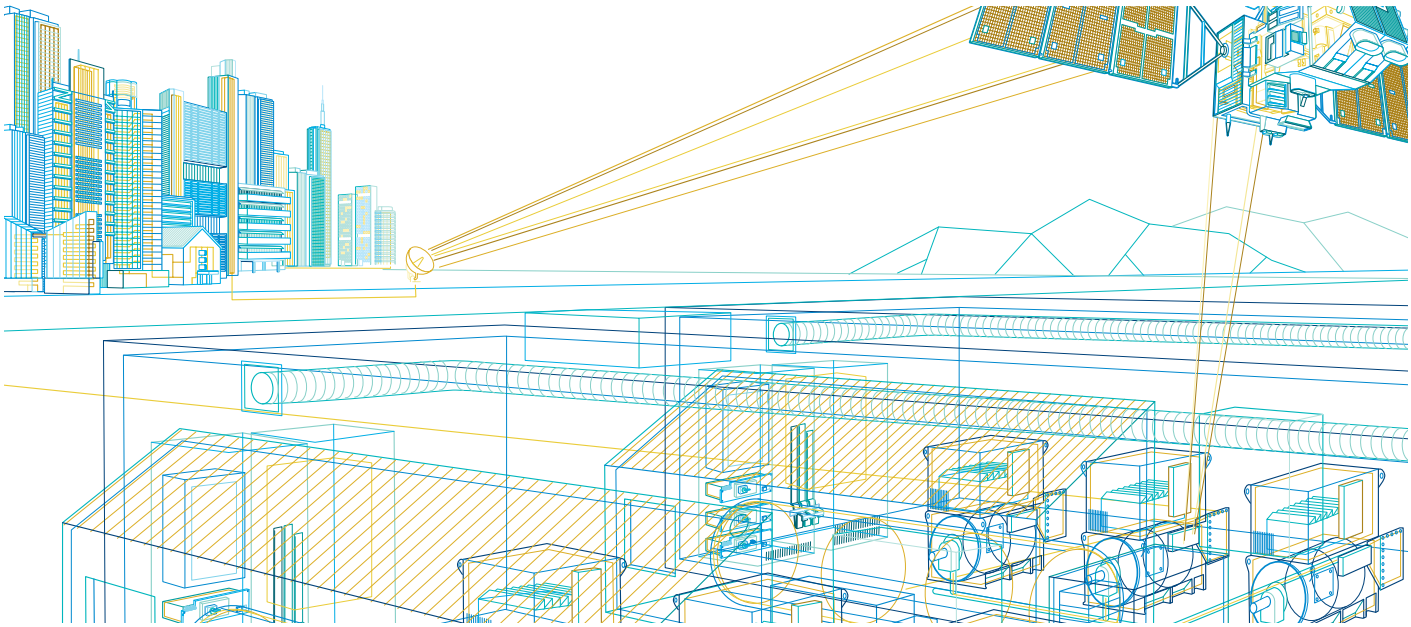

ABB MACHsense-R continuously monitors key parameters related to the condition of the cage rotor, bearings of motors and generators, and it can also address temperature issues. Customers can access operating data and trend graphs via the internet. An alarm is triggered if a measured parameter exceeds set limits, giving the plant operator an early warning that maintenance is needed.

The service is based on a custom Data Analysis Unit that is installed on or close to the motor or generator. Sensors mounted on the motor or generator capture raw data (four channels of vibration data, five of temperature data) and feed it to the unit for processing. As an option, eight inputs for electrical data (four voltage and four current) are also available.

Generating key condition parameters

Installation is performed by an ABB engineer, who uses ABB's walk-around condition monitoring service, ABB MACHsense-P, to perform measurements and analysis with the motor or generator running at its normal operating load. Actual operating slip calculated on the basis of this data is used to configure ABB MACHsense-R to generate key condition parameters (KCPs), and to set alarm levels. At the same time a load versus speed plot is calibrated for the motor or generator, and this can be used in conjunction with temperature readings to monitor possible fouling of the cooling system.

The KCPs are transmitted to an ABB server, generally using the mobile phone network (GPRS or 3G) but the internet can also be used if there is no mobile coverage. The server monitors the KCPs and generates an alarm when an operating parameter exceeds the preset limits.

Authorized users can log on to the server to view trend graphs, overall values and other data, including:

- Overall vibration – displacement, velocity, acceleration
- Overall vibration trend
- Temperature trend – bearing and winding
- Spectrum graphs
- Time waveform
- Speed, load trends
- Number of starts and stops

Timely alarms

When a KCP exceeds its preset alarm level the server alerts the customer by SMS (text message) or e-mail. At the same time the on-site unit exports all the supporting data to the server. The data is available to ABB's local service center and regional and global technical support centers, which can carry out trouble shooting and generate a detailed report for the customer with recommendations for corrective action and preventive maintenance.

ABB MACHsense-R avoids generating false alarms by monitoring KCPs rather than overall values. This ensures that the customer gets accurate information on the problem that caused the alarm.

By processing the raw data in the on-site unit to generate KCPs, ABB MACHsense-R reduces the total volume of data to be transmitted to the server and thus keeps communication costs down. This processing is done by powerful software that was specially developed at ABB's corporate research centers. The software incorporates algorithms for different types of electrical motors and generators, such as DOL connected and VFD controlled motors, slip ring motors, and generators.

Key benefits:

- Motor or generator is constantly monitored during operation
- Model based analysis increases reliability of defect identification and quantifies defect severity
- Motor and generator design and construction taken into account for higher precision
- Multi-channel operation and fast data collection rates increase sensitivity
- On-board processing reduces volume of data transmitted to server for lower communication costs
- Authorized customers can quickly access motor or generator specific data on ABB's server
- Customers can receive regular reports on condition of their motors and generators
- Unplanned downtime is reduced, resulting in optimized cost of ownership

Summary reports

Customers can obtain summary reports on the condition of their motor or generator at regular intervals, either directly from the ABB server or from ABB's local service center. Depending on the type of service agreement, detailed reports including recommended maintenance actions are provided by the local service center following an alarm.

ABB MACHsense-R provides continuous remote monitoring and is therefore recommended for motors and generators which play a critical role in the plant, such as the kiln motor in a cement works or ID fan motor at a power plant. It is also ideal for motors and generators that are difficult to access, such as those used in offshore, mining or wind power applications.

For more information please contact:

www.abb.com/motors&generators

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