



# Vibration monitoring of gas turbines using the internet

**Remote monitoring of plant and machinery is becoming increasingly important. High demands on machine availability and quick breakdown response times require the uninterrupted access to machine and process relevant measurement data.**

The German company Delphin develop autarchic measurement data acquisition systems for both vibration and process measurement data. The TopMessage devices have a modular design and are equipped with process and control interfaces. They have Ethernet TCP/IP interfaces for connecting evaluation PCs. Remote operation takes place via modem, Internet or GSM. In the event of a breakdown, alerts via SMS or email can be automatically transmitted to service personnel.

A vibration monitoring system was installed on FT8 gas turbines from MAN TURBO AG in order to prevent costly damage taking place as well as for cause diagnosis in the event of breakdowns. Vibration data is acquired and recorded at the turbine and then automatically transmitted via the internet to the main plant in Oberhausen where detailed evaluation can be performed. In the event of a malfunction personnel are informed via email.

A clear benefit of the system is its ability to obtain long term information on the state of plant and machinery. Measurement data is regularly downloaded and automatically evaluated. The TopMessage's internal data logger guarantees independent and uninterrupted data recording. This enables the saving of up to 128 million characteristic values, process values or FFT analyses.

## **Gas turbine monitoring**

The devices process the signals from existing vibration pick-ups. This system distinguishes itself from other standard measurement systems in that unfiltered measurement data is processed. The system processes vibrations in the range 0 to 1 000 Hz. If limit values are exceeded an email will be sent to personnel in MAN's main head quarter.

Data is regularly transmitted via the internet to MAN's central server. This provides a centralized collection point for measurement data to be accessed. Visualization is performed using Delphin's VibroLab software. The personnel responsible then have the opportunity to process the transmitted data as cascade, spectrum or trend diagrams. This provides all the requirements for immediate fault diagnosis.

The software enables measurement data to be evaluated at a PC. Vibration data is saved and analyzed using a database. Online monitoring and analysis is possible so long as online connection exists, e.g., via Ethernet TCP/IP. Online visualization via telephone or internet is also possible providing an adequate band width is being used. A variety of diagrams are available, e.g. polar, orbit and FFT.

A major feature of the TopMessage device is its wide functional range. Vibration signals are immediately transformed into meaningful characteristic values and can then be correlated with other process data. The devices can perform and record FFT analyses, and they can carry out alert procedures in the form of SMS and email transmission or shutdown procedures.