THE MOSQUITO AND THE ELEPHANT – NETWORKED SENSOR MONITORING

One is tiny and inconspicuous while the other is frighteningly large and loud. A similarly unequal pair are the huge generator in a gas-fired power plant near the French border and the small sensor that will now monitor the generator's function.

This power plant contains more than a dozen systems, each with an output of over 3 megawatts. The generators are powered by huge combustion engines with 20 pistons while they create the electricity that consumers tap for their washing machines, lights or TVs.

Supply security is the highest priority. That is why the Baumüller repair facility has equipped the generators with tiny vibration sensors. The small sensor sits on the enormous generator like a mosquito, but its effect is huge: It reduces failures, prevents idle time and recognizes possibilities for improvement. All this is performed by the little sensor that monitors the vibrations in the system and then uses a server to send the data to the operator or directly to the service provider Baumüller Reparaturwerk.

The operator can decide between three strategies for the maintenance of the machines and facilities. Failure-oriented maintenance, which only "puts out fires" when there is an actual machine failure, can result in high expenses due to long downtime and potential secondary damages. Preventive monitoring, which involves the inspection and potential replacement of such parts as bearings according to the expected lifespan, is unable to catch any damages that occur outside of these intervals. Furthermore, this version probably leads to a higher consumption of spare parts and thus a higher expenditure than is really necessary. Status-oriented monitoring is therefore expedient for maintenance-intensive machines and systems.

Sensor-based vibration control with support and monitoring by the maintenance service provider is the most reliable solution, and the one which results in the least expenditures by the system operator.

NETWORKED SENSORS

In these kinds of condition-monitoring solutions, vibration sensors that are attached to the machine monitor the vibrations in the plant system. This monitoring system makes it possible to recognize machine errors, such as imbalance, drive errors or damage to the roller bearings at an early stage and thus reduce idle time.

This solution can be retrofitted in existing machines and systems, as was the case in the power station generators, or it can be planned directly during the project development stage. As an experienced maintenance service provider, the Baumüller repair facility offers qualified consultations from the start. The Baumüller repair facility also handles the installation and start-up, especially in the case of retrofitted systems.

BAUMÜLLER SERVICES

The installation of the sensor on the power station generator

Using a separately installed server, the data are transmitted directly from the sensor without connecting to the company network

USING EXPERIENCES

The cooperation throughout the system runtime is particularly important. For long-term monitoring, the machine operator can select self-determined monitoring. In that case, the sensor can transmit the data directly to the control unit or station, or to a service center operated by the machine manufacturer or machine operator. It is often advisable for the maintenance service provider to perform remote monitoring. Then the sensors are equipped with a router that sends the data directly to the service center. "The operator won't have any safety concerns here," says Patrick Zander, in charge of condition monitoring at the Baumüller repair facility. "The networking of the sensors is performed completely self-sufficiently by the operator's company network." Only legible performance data enter into the network via the sensor router. This ensures a complete separation between control data and status data. As the service provider, the repair facility therefore does not interfere with the customer's company network; it exclusively collects the data required to monitor the machine. Thus the operator's know-how is protected.

The transmitted data are analyzed by the vibration specialists of the Baumüller repair facility. In case anything stands out, they inform the customer and immediately provide recommendations for actions.

The small sensor successfully monitors the huge generators