After a bearing failure caused a loss of production, Ascutec, a manufacturer of nonwoven fabric, decided to implement the Siplus CMS2000 condition monitoring system. Since then, the systematic monitoring of the bearings has been increasing the availability of the entire plant.

A scutec Airlaid-Produktion GmbH & Co. KG, based in Nuremberg, Germany, specializes in what is known as airlaid technology, a process used for the production of materials ranging from papers to nonwovens using cellulose. In three shifts, up to 8 t of cloth are produced per production line per day according to Ascutec customers’ specifications. In this process, the raw material delivered in rolls is shredded in mills and then added to the manufacturing process in “open” form. The shredding takes place in one production line with the aid of a pin mill and in a second production line with a hammer mill. To increase the availability of the plants, the company invested in the Siplus CMS2000 condition monitoring system (CMS).

Finding the cause with the aid of condition monitoring

A failure had preceded this decision. The shaft bearings of one of the pin mills had been replaced with new ones and properly commissioned. “An hour later, the bearings were destroyed,” remembers Kurt Schrepfer, system specialist for automation technology at ATP Pöllmann, the service company responsible for the technology. The ATP specialist reacted without delay and quickly set to work identifying the cause using the Siplus CMS device. The device is able to detect the effective vibrational velocity as well as the bearing parameters, temperatures, and speeds, and, via two analog inputs, additional important values such as current, voltage, force, or flow. Warning and alarm limits can be parameterized so that corresponding signals are passed on. “You can get started with data analysis already with this low-cost device, thus determining the detailed actual condition of a plant,” Schrepfer explains.

In the end, the incident at Ascutec was cleared up with the CMS device: the original replacement bearings had been built with a higher basic load rating, resulting in smaller gap widths – as well as less grease filling. “These changes resulted in a drastic increase in the temperature, which was not apparent to us,” the automation specialist says.

Easy installation of the sensors

Now the condition monitoring device has also been connected to the hammer mills, which turn at significantly higher speeds. There, it measures the temperatures and vibrations of the bearings. The
installation required only the appropriate threads for the sensors in the bearing blocks. The digital output of the CMS2000 was then connected to the input of the Sirius 3RW40 soft starter in a failsafe manner via a Sirius 3TK28 safety relay. An alarm signal is given at a temperature of 70 °C, and a warning at 90 °C. The CMS then shuts down the mill operation directly via the safety relay in order to prevent the bearing temperature from continuing to rise.

The importance of condition monitoring soon became evident at a hammer mill as well. The temperature of both bearings increased suddenly and was immediately reported by the CMS device. The reason: a filter below the hammer mill had become clogged with material, resulting in changed force ratios in the bearings and ultimately in the temperature increase. “This shows that with a well-thought-out condition monitoring system, changes can be detected and dealt with immediately, before they can severely impair production processes,” Schrepfer concludes.

**Increasing availability and profitability**

The Siplus CMS2000 was simply plugged onto the standard mounting rail in the on-site switchbox of the hammer mill and connected. The CMS2000 basic device has two reception channels, for the machine vibrations (RMS) and for the bearing monitoring (DKW). The detailed failure detection takes place via frequency-selective diagnostics. In addition, the device can be extended with temperature modules from the Simocode family. This is an ideal solution for Schrepfer: “With a condition monitoring system like this, we always know how our plants are doing and are able to plan service activities based on the actual condition. This saves time and money. In addition, we increase the availability of the plants, which has a positive effect on profitability.”

“With a well-thought-out condition monitoring system, changes can be detected and dealt with immediately, before they can severely impair production processes.”

*Kurt Schrepfer, System Specialist for Automation Technology, ATP Pöllmann*