

Online Vibration Monitoring Pays Off Quickly in Paper Mill

RESULTS

- Saved thousands of dollars by identifying a potential failure immediately after installation of online vibration monitors
- Eliminated roll bearing failures and prevented unplanned stoppages
- Returned original investment
- Enabled predictive maintenance during shutdown periods



APPLICATION

Vibration levels are continuously monitored on 327 paper machine rolls on each of two machines that produce fine printing papers. The condition of bearings, gears, and motors plus some critical pumps is monitored using 1,194 accelerometers as vibration sensors. Approximately 3,490 data collection sets are incorporated in this online monitoring system.

CUSTOMER

This North American paper and packaging company is a world leader. One southern paper mill operates four paper machines, producing paper towels and tissue for consumers as well as printing and converting papers for industrial customers.

CHALLENGE

If a roll bearing fails when a paper machine is operating at high speed, extensive machine damage and the loss of substantial amounts of paper can result. In addition, production stops until repairs are made and the machine restarted. In the past, this mill relied on periodic “walk-arounds” by technicians using portable data collectors to measure vibration levels at various points. However, if a bearing failed between data collection rounds (and a serious fault can develop in as little as eight hours), the result could be very costly. Also, mill safety supervisors favored finding a means of remote monitoring of vibration data so that data collection technicians would not have to go near the operating machinery.

“The online system has essentially eliminated unexpected roll failures, since we’re able to recognize the signs of failure in time to prevent damage. It’s worth the money we spent.”

Vibration Analyst

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SOLUTION

Thirty-nine Online Machinery Health™ Monitor systems were installed at the mill in early 2008 to continuously monitor the 654 paper rolls on the two paper machines as well as a few critical pumps. The bearings on each end of rolls are equipped with highly sensitive accelerometers wired to Emerson's Online Machinery Health monitors in six different machine segments. This provides continuous real-time feedback to six servers – one for each machine segment.

Integration with the mill's process automation system and AMS Suite: Machinery Health Manager predictive maintenance software reduces machinery faults, protects machinery, and empowers maintenance decision-making. Alarm parameters are set in AMS Machinery Manager to raise alarms and notify mill personnel when vibration levels go out of range. When the paper machines are operating, the vibration data is transmitted continuously to a maintenance station where mill vibration analysts watch constantly.

One of the very first monitoring points commissioned revealed serious paper roll vibration, which was diagnosed as an improperly installed roller bearing. That catch prevented machine downtime and saved the mill nearly \$40,000.

The mill's chief vibration analyst can log onto the system from home, so he is on alert 24/7. If there's an alarm, he can immediately access historical data on that point and analyze the vibration, looking at the trend lines to see exactly what happened and when. All the information needed to predict if and when a bearing will fail is available, so maintenance supervisors can determine when to take action to avoid an unwanted machine shutdown.

Asset Optimization Services experts provided full support, including system design, project management, database development, system configuration, and factory acceptance testing. An independent contractor installed the sensors and servers under the guidance of the Emerson personnel, who then supervised commissioning and startup activities.

According to Emerson project manager Steve McNair, "The leaders in the mill knew exactly what they wanted and were very particular about how the Online Machinery Monitoring systems were set up. This machinery health program has become a very successful application of technology to drive cost-effective predictive maintenance."

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“The paper machine operators and the asset availability managers are well satisfied. When they ask if I have noticed anything unusual, I can check it out very quickly.”
Vibration Analyst

