

Major Chemical Plant Saves More Than \$300,000 with Vibration Monitoring

RESULTS

- \$250,000 loss in production avoided
- \$100,000 critical gear box saved from catastrophic failure
- No machine failures in critical processes in more than a year and a half

APPLICATION

Major plastics manufacturing plant producing packaging plastics for use in the beverage and food packaging industry

CUSTOMER

Voridian Chemicals, Columbia Operations, with 450+ employees and in operation since 1969.

CHALLENGE

More than 3500 motors, pumps, fans, gearboxes, mixers, and blowers are used in this facility to manufacture polyethylene terephthalate pellets which are used in the production of plastic bottles. With only one person to conduct vibration monitoring on that many machines, a fast data collection process is vital.

An interruption in the critical processes in the polymer manufacturing process can mean loss of the entire batch in the digester. Not only is the \$200,000-plus batch ruined, but a large solid mass of plastic material must be hand-chipped and cleaned from the equipment before the machines can be used again.

Many of the critical machine elements of the process are valuable and expensive in their own right. One gear box in which an unusual vibration was found would cost \$100,000 to replace in the event of catastrophic failure



"The simple pure fact is that the CSI 2130 can take consecutive measurements and definitely speeds up the process tremendously"

Billy Wise,
Reliability Technician

SOLUTION

Reliability Technician Billy Wise uses the CSI 2130 Machinery Health™ Analyzer and AMS™ Suite: Machinery Health Manager software to monitor all 3500 production machines in the plant, more than 300 of them each month. While collecting data he found a minor but unusual vibration in a very critical 6-shaft 1650 RPM polymer reactor gearbox used in the polyethylene digester. The digester is regarded as the "stomach of the system" because it contains the molten polymer.

When he reported the vibration to plant staff there was debate whether to interrupt scheduled production runs to examine the slight fault or whether the machine could run for a few more weeks until a scheduled outage.

The technician decided to call an expert at Emerson Process Management with his findings. It turned out that the call was justified. A rash of cage frequencies were visible, showing two definite peaks in the spectrum at 2X and 4X ball spin frequency modulated by the cage frequency. When the Emerson analyst heard the description of the problem, he recognized it as "a textbook example of ball spin defect." The ball spin frequency is not always visible in a small defect on a roller element, but once the concept was mentioned, Wise said "it stuck out like a sore thumb."

The gearing box bearing cage was opened and inspection of the bearing revealed a hairline crack penetrating through the entire bearing. This could have caused catastrophic failure to the expensive gearbox, loss of a large batch of valuable polymer, and shutdown of the manufacturing process to clear out the solidified batch and replace the damaged equipment.

The CSI 2130 Machinery Health Analyzer gives reliability technicians the ability to collect and analyze data rapidly, and AMS Suite: Machinery Health Manager software used advanced Peakvue® technology to reveal vital information your plant needs to stay at peak performance.

Instead of chipping away at a block of solidified polymer in the plant, Emerson's CSI technologies let Voridian continue to chip away at the competition.

"If that bearing would have failed, it would have wrecked the gear box. It would have shut down the production run."

"CSI technology reduces manpower for the reliability program."

**Billy Wise,
Reliability Technician**

**Emerson Process Management
Machinery Health™ Management**
835 Innovation Drive
Knoxville, TN 37932
T (865) 675-2400
F (865) 218-1401
www.mhm.assetweb.com

©2006, Emerson Process Management.

The contents of this publication are presented for informational purposes only, and while every effort has been made to ensure their accuracy, they are not to be construed as warranties or guarantees, express or implied, regarding the products or services described herein or their use or applicability. All sales are governed by our terms and conditions, which are available on request. We reserve the right to modify or improve the designs or specifications of our products at any time without notice.

All rights reserved. AMS™ Suite, Machinery Health™, and Peakvue® are marks of one of the Emerson Process Management group of companies. The Emerson logo is a trademark and service mark of Emerson Electric Company. All other marks are the property of their respective owners.

