PeakVue Technology Detects Damaged Bearing and Keeps Cement Mill Running

RESULTS

- Saved $460,000 (USD) in lost production.
- Saved $50,000 in repair parts and labor.
- Avoided emergency shutdown.

APPLICATION

Heavy cement production equipment is periodically monitored for changes in vibration levels at a 25-year-old cement mill in Egypt. This mill is the principal source of cement in the upper Nile River valley, including Cairo and the Delta region — Egypt's main market for cement.

CUSTOMER

CEMEX is a global leader in providing building products, including cement, aggregates, ready-mix concrete, and related products to construction sites worldwide. The company's stated mission is to provide customers with the most efficient and effective building solutions, no matter what the construction project.

CHALLENGE

Any emergency shutdown of a cement mill lasting more than a few minutes can be very costly. At the only CEMEX mill in Egypt, a two-day stoppage results in a loss of 4600 tons of cement, worth about $100 (USD) per ton. The cost is often much greater if heavy equipment is involved. For example, if a faulty bearing goes undetected for too long, it can seize up without warning, causing damage to heavy pinion gears and/or drive shafts.

SOLUTION

An Emerson vibration diagnostics and analysis system has been used for several years as the basis for predictive maintenance to protect critical rotating machinery in this mill. The company's investment in bi-weekly vibration monitoring using the portable CSI 2130 Machinery Health™ Analyzer has paid off in a big way.

"Predictive maintenance is the best way to keep our equipment available, reliable, and profitable."

Wael A. Labib, Predictive Maintenance Engineer, CEMEX, Egypt

For more information:
www.assetweb.com

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Data gathered in early 2010 revealed a condition involving a spherical roller bearing in cement mill 7 that warranted closer evaluation. However, nothing unusual could be seen in a view of the axial vibration at the inboard bearing of the left pinion gear. Two weeks later, additional PeakVue measurements provided the first indication of a serious problem.

The unique PeakVue technology used with AMS Suite predictive maintenance software enables early and accurate detection of roller bearing and gearbox anomalies. This process preserves the peak amplitudes of stress waves emitted by defective bearings or a gearbox.

Analysts at the mill used multi-spectra views to follow and evaluate the development of the bearing fault, confirming its severity and pinpointing its location. Based on this data, mill management decided to stop production to replace the bearing, knowing that the repair would take up to 12 hours. This action precluded a sudden failure that might have caused additional damage and taken much longer to repair.

When field assets begin to show symptoms of impending failure, accurate diagnostic data triggers predictive maintenance. This information enables maintenance supervisors to effectively determine which repairs must be done immediately and which ones can be delayed until a scheduled shutdown or other appropriate time. Actions based on such predictions increase equipment reliability, while costly unplanned interruptions are significantly reduced.

Today, critical machinery is monitored online using Emerson's permanently installed sensors that transmit vibration information. This provides vibration analysts with a continuous picture of the operating condition of essential rotating machinery. The ability to overlay frequencies and match fault frequencies to peaks enables analysts to efficiently determine the condition of a specific piece of machinery.

"When inspected, the outer race of the bearing was cracked and flaking. It was only a matter to time before this part failed during normal operation."

Wael A. Labib, Predictive Maintenance Engineer, CEMEX, Egypt

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