

## 521A101 - MOTOR DRIVE END BEARING FAILURE DETECTION

Vibration data collected from Mixing Chest Agitator motor had over the last 33 months exhibited low and acceptable values, typically around 0.9gE throughout. Vibration data collected in December 2003 indicated an upward trend at the motor drive end, indicating a probable fault within the motor, see Figure 1 below.

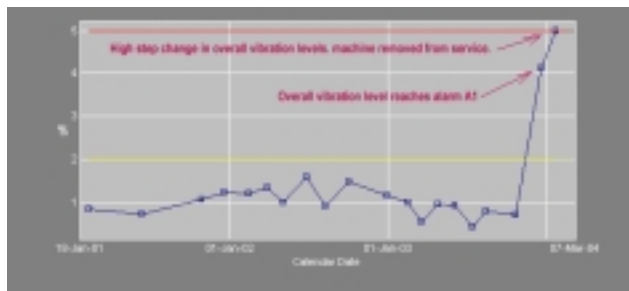


Figure 1 - Continued increase of overall vibration levels at motor.

Examination of the vibration spectrum exhibited a peak at 9075 CPM, along with harmonic activity and tied in to the calculated defect frequency for motor drive end bearing inner race, see Figure 2.

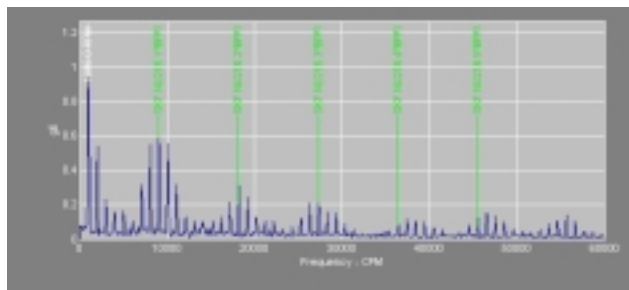


Figure 2 – Acceleration envelope spectrum indicate bearing inner race defect.

Having so many multiples of BPF and number of sidebands grows, this spectrum fits the description of a stage 3 bearing failure as described in the Technical Associates Illustrated Vibration Diagnostic (Figure 3).

It also indicates that the source of the high vibration reported originates with the bearing defect.

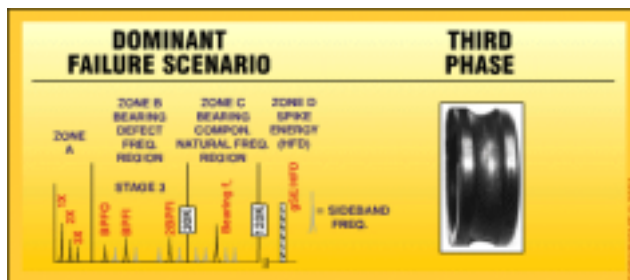


Figure 3 - Stage 3 bearing failure scenario

As per recommendation, the motor bearings were replaced on February 13, 2004.

After replacement of motor bearings, a significant drop in amplitude at BPF. Compare the before and after repair spectra in Figure 4. The amplitude at BPF dropped from 0.5903 gE to 0.0068 gE. In addition, bearing frequencies disappeared.

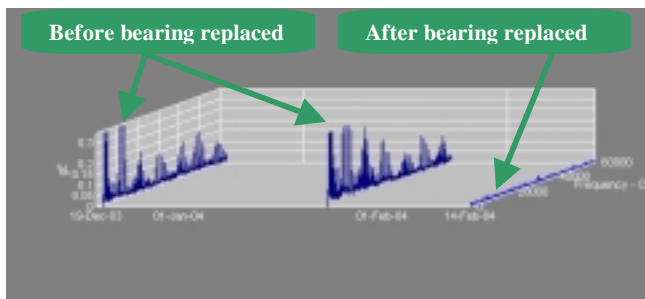


Figure 4 - Palogram spectrum plot displaying measurement taken before and after repair

Unfortunately, the picture of damaged bearing is not available, but the palogram spectrum (Figure 4) clearly shows an improvement to the operation of this machine after bearing replaced.

The agitator was subsequently brought back into service with no disruption to the process, baseline vibration recorded at the pump bearings indicated levels had returned to previous values.

Due to accurate analysis and prompt action, a catastrophic failure to the mixing chest agitator was prevented. **If left uncorrected, would have resulted in the paper machine shutting down for a minimum 4 hours.**