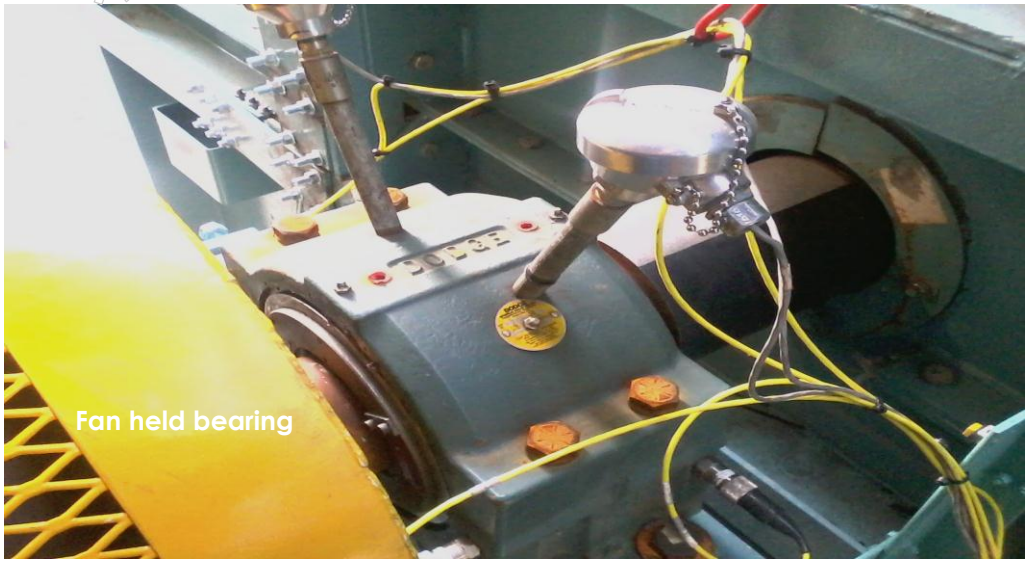
Vibration analysis
Fan Bearing Low Amplitude

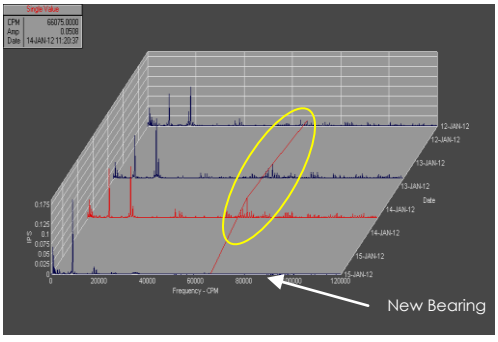


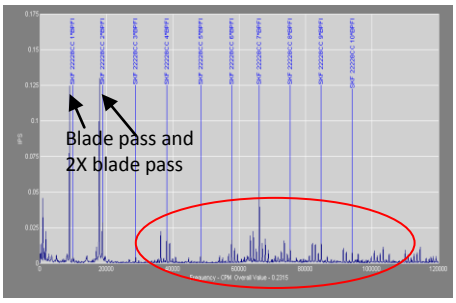
- *Finding the bearing defect prevented unplanned downtime*
- *Prevented further damage to any other mechanical components which would require the entire hub to be replaced.*
- *Planned Asset Management with Predictive Maintenance extends the life of machinery.*

Low amplitude frequencies indicate serious problems

For years we have deliberated over the concept of amplitude alarm levels. Many overall vibration meters only may say the vibration has increased and the spectrums may not have amplitudes above 0.1 ips 0-peak measurements, or particular set limits. Decision is the bearing OK or should it be changed?

The vibration collected on this fan held bearing has low amplitude higher frequency indications of bearing defects. Question then should the bearing be replaced or wait until the amplitudes increase. We feel with our aggressive proactive approach that the bearing should be replaced as soon as possible. The water fall diagram below shows the low level bearing defects which have increased slightly over the last 3 months. Multiple harmonics indicate spalling.

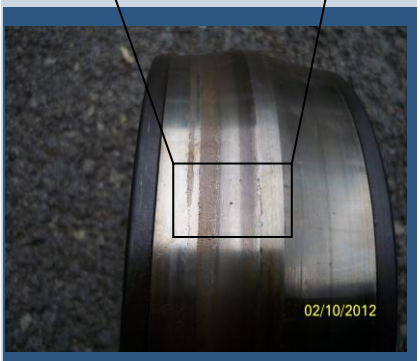




The spectrum above shows the inner race defects. Our concern was that a roller would start to skid and the bearing would overheat and fail. The picture at the right shows the excessive spalling on the inner race. The picture below shows one of the rollers with excessive wear.

Problem corrected with new bearing, no down time, or failure.

Conclusion: If change is present with bearing defects at any amplitude with sidebands then a problem exists and should be addressed before a failure occurs.



Inner race bearing defect of held bearing found through vibration analysis

Any questions feel free to contact Larry Massey
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