



## **Issue 16: Bud's Take on Condition Monitoring**

Condition monitoring is the technique of observing parameters such as vibration and temperature with the intent to find developing faults. The objective is to pinpoint significant changes in equipment, predict failure and have the opportunity to shut equipment down prior to significant component damage.

When performed properly, this form of predictive maintenance is very effective and reduces down time. In my experience I have found this process to be complicated. Often I see bearings removed from service that are capable of running longer.

### **Bud's Epic Vibration Failure**

As an application engineer for a major bearing manufacturer we were developing a new distributor training program. I was tasked with failure analysis. I wanted examples of vibration, misalignment and other failures to show during my presentation. I worked with our technical center to set up testing, they suggested 5 times baseline vibration to shut down the testing.



**Pic 1: All I can see if my reflection.**

Being a true bearing geek I was very excited to have fresh new samples to show during my presentation, then the box came in.....with the naked eye I could not see any damage on the raceway surfaces.

### **What Did I Do Wrong?**

We set the test criteria too low. The system shut down at 5 X baseline per instructions. The issue was that 5 X was too low to produce visible damage.

### **Difficulty of Condition Monitoring in Bearings**

It is my opinion that the difficulty lies in the multitude of types of vibration found in a bearing:

1. Inner ring ball pass frequency or inner ring defect frequency.
2. Outer ring ball pass frequency or inner ring defect frequency.
3. Rolling element axial frequency.
4. Fundamental train frequency (inner ring rotation.)
5. Fundamental train frequency (outer ring rotation.) Inner ring radial frequency.
6. Outer ring radial frequency.

7. Rolling element radial frequency.

And so on! We also have to consider frequencies that could be passes along the shaft or housing.

### **Can Condition Monitoring Work in Bearings?**

Absolutely! It is a difficult task that cannot be taken lightly. I have seen it done effectively in many critical applications.

I have also seen many bearings pulled from service prematurely. It is very important that you work with your **Authorized** bearing distributor and bearing manufacturer to get the basic raw data to best determine your baseline.

Once your baseline is established you can determine your proper shut down point. It may be 5X baseline, 10X baseline or some other amount based from your experience and the critical nature of the application.

### **Conclusion**

I am a firm believer in predictive maintenance. If not performed correctly it can cost you time, money and frustration.

I have been asked many times how to perform this process without manufacturer raw data. I suggest at the first sign of a spike you increase monitoring. If the frequency continues to increase then plan the shutdown. This is a process that you need to modify to the critical nature of your application.



CALIFORNIA

TEXAS

OKLAHOMA

INDIANA

**“KNOWLEDGE THROUGH EXPERIENCE”**

Copyright© 2020