The Power of Synchronous Time Averaging

What the heck is synchronous time averaging and why should I care? Synchronous time averaging is a technique using a speed trigger to a vibration data collector. This technique is very useful in isolating a single machine in areas where numerous machine trains are operating at near synchronous speeds. This technique is ideal for balancing and vibration analysis. Synchronous refers to data collector being triggered by the speed sensor. Time Averaging refers to a technique in the data collect, which takes many vibration readings over a time period and averages them together. This technique helps to isolate the vibration from the machine under test.

In practice it is simple- place the vibration sensor on the machine to be diagnosed and use a remote optical sensor or stroboscope with a trigger output to accurately determine the exact speed of the machine (Fig. 1). This external trigger will tell the vibration data collector when to collect vibration information and with the use of a high number of averages, will eliminate the "cross-talk" signals of near-by machines, providing precise vibration data on only the machine under test. You do not have to shutdown near-by machines. Using a stroboscope you do not even have to shutdown the machine to be tested!

Common setup for Synchronous Averaging

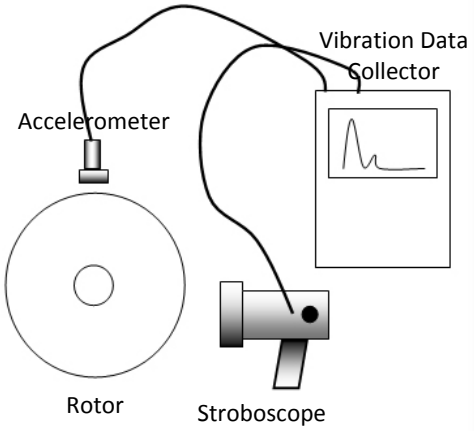

Fig. 1

Case History

Several years ago a Power Generation Station had a severe structural vibration problem in a bank of cooling fans. The structure had 12 fans all operating near 1800 rpm (Fig. 2). The company had paid for a complete structural analysis and the engineering firm had recommended modifications to the fan bank which would have cost tens of thousands of dollars and taken weeks for construction. Through synchronous time averaging the vibration analyst was able to confirm a sever imbalance in (1) fan, which was the source of vibration exciting a structural resonance in the fan bank. The Power Company gave permission to have the fan balanced and in less than 1 day the problem was corrected. Modifications were eventually made to the structure during a planned outage.

Fan Bank

All fans operate at 1800 rpm. Vibration readings alone could not determine which fan was imbalanced? Each fan was tested using time averaging and the problem was quickly found and corrected.

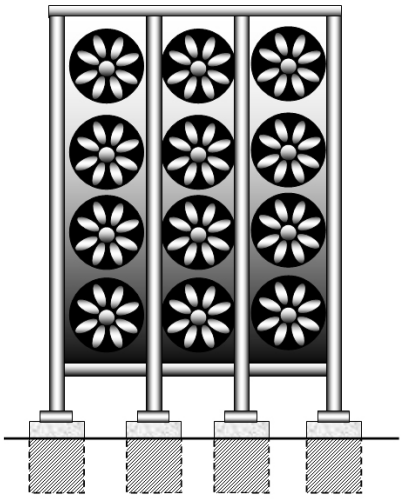

Fig. 2

Synchronous time averaging will allow you to collect accurate vibration and speed information from your machines, while the plant continues to operate normally. The techniques and instruments are simple, fast and precise.

Monarch Instrument builds world-class Stroboscopes and Remote Optical Speed Sensors. Our products are compatible with virtually every vibration data collector.
Please visit our website at www.monarchinstrument.com for detailed information about our speed measurement products

MONARCH INSTRUMENT

Made in USA

03/2010