



## Condition Based Maintenance

(Or How To Avoid Unexpected Breakdowns!)

**C**ondition Based Maintenance (CBM), using tools such as vibration analysis, thermal imaging, ultrasonic detectors and oil analysis, is now clearly recognised as being the key to running an efficient maintenance program. By comparison, planned

maintenance, or worse still breakdown maintenance, strategies are expensive and unreliable, and particularly in these harsh financial times could prove to be the death sentence for a production facility.

Whilst they are using CBM tools, service and maintenance personnel bring another valuable skill to the job – they use their eyes and ears! For example, a vibration analyser indicates that a pump bearing is likely to fail prematurely sometime in the next two months - but why has this happened? A simple inspection may show that the drive coupling is misaligned, which can then be remedied along with the bearing change. This is Proactive Maintenance, identifying the root cause of the problem and correcting it. What if the misaligned coupling hadn't been fixed? – The bearing may simply have been replaced, only to prematurely wear out again!

It is generally accepted that the three main causes of premature bearing failure in rotating equipment are:

- Out of balance
- Misalignment
- Lack of lubrication

Fortunately, thanks to modern technology, all of these



conditions can be detected very easily using extremely affordable, simple to use handheld vibration analysers. For example:

**Out of balance** shows up as a **large** amplitude vibration at the **running speed (1X)** of the machine.

**Misalignment** on the other hand generally shows up as an additional large vibration at **twice the running speed (2X)**.

**Lack of lubrication** will result in high frequency vibration (bearing noise) that is not necessarily audible to the human ear but can easily be detected by a vibration analyser.

Finally, **machine looseness** will typically generate vibrations at higher harmonics of the machine running speed e.g. **three times running speed (3X)** and above.

These days, once diagnosed, all these faults can easily be remedied in-house using affordable easy to use tools such as laser alignment systems, in-situ rotor balancers or even a simple grease gun!

#### Technology to the rescue

Not so long ago CBM tools used to be expensive and difficult to use. But thanks to modern technology, these tools are now not only extremely affordable; they are also very easy to use.

The TPI 9070 (pictured) is a simple to use, incredibly low-cost vibration analyser that records, analyses and displays vibration signals at the push of a button. The unit displays colour coded alarm levels based on internationally agreed (ISO) vibration values and bearing condition. It also incorporates a fully zoomable vibration frequency spectrum (FFT) display with cursor, and diagnoses out of balance, misalignment, looseness and bearing faults.

TPI manufactures a complete range of low cost, high performance, easy to use vibration analysis tools for maintenance engineers. All are incredibly easy to use, from the simple one-button-to-press, TPI 9070 to top-of-the-range CBM units that include machine balancing.

The TPI 9085 (Intrinsically Safe ATEX/IECEX/US/C version also available) is the latest in the line of easy-to-use high

specification maintenance products. The TPI 9085 offers high level functionality and capability, including instantaneous bearing temperature measurement, at extremely low cost. The TPI 9085 can automatically download machine routes (as simple lists) that can be followed by even the lowest skilled operative to collect and store vibration and temperature readings for automatic upload to the included, free-to-use, C-Trend II trending software. This powerful but highly intuitive windows-based software, with its ability to automatically generate reports and email alerts, allows faults to be identified well ahead of when they start to become a problem that could result in unexpected breakdowns.

For more information, please contact TPI Europe on

+44 1293 530196 or

[www.tpieurope.com](http://www.tpieurope.com) or email [cbmsales@tpieurope.com](mailto:cbmsales@tpieurope.com)

