



INTRODUCTION TO VIBRATION ANALYSIS

Vibration Analysis provides assessment of the current health of equipment and is used for those assets with rotational parts with bearing frequencies, imbalance, and misalignment issues which will increase vibration, will create consequential damage.

WHAT IS VIBRATION ANALYSIS?

In terms of mechanical vibrations for machine diagnosis, the vibration analysis is a very important technique. It is based on the high information content provided by the machine vibration signals that are an indicator of the machine condition, used for the diagnosis of faults.

Vibration analysis is fundamental in a predictive maintenance programme, being widely used for detection and monitoring incipient and severe faults in machinery parts, such as:

- Bearings
- Shafts
- Couplings
- Rotors
- Motors

Some issues that are detected by vibration analysis are:

- Unbalance
- Misalignment
- Bent Shaft
- Rolling Bearing Faults
- Eccentricity (Shaft Deformation)
- Looseness
- Rotor Rub
- Fluid Film Bearing Instabilities
- Gear Faults
- Belt/Sheave Problems

WHAT IS VIBRATION ANALYSIS?

It is used for early detection of mechanical fatigue and breakdown. All rotating equipment vibrates to some degree, but as older bearings and components reach the end of their product life they begin to vibrate more dramatically, and in distinct ways. Ongoing monitoring of equipment allows these signs of wear and damage to be identified well before the damage becomes an expensive problem. Vibration analysis is one of the most effective ways to detect and prevent equipment failure or costly downtime. It can screen most faults including imbalance, misalignment, looseness and late-stage bearing wear, gear mesh issues providing precipitous warning of impending failure.



VIBRATION ANALYSIS CAN BE USED ON ALL TYPES OF ASSET INCLUDING:

Drillship | Semi-Submersible | Jack-Up | Land Rig | FPSO | Yard | Refineries

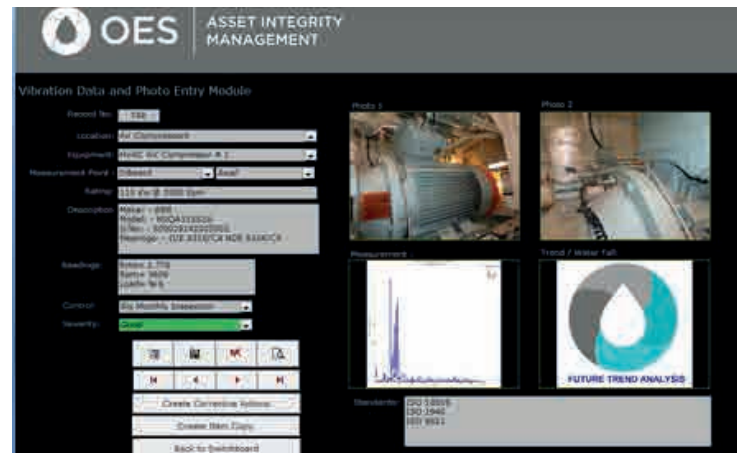
FEATURES

- Will take a snapshot of current equipment health
- Will start baseline and provide continuous trending results in graphical form
- ATEX rated Handheld Equipment allowing to be used at height
- Can be used in all extreme weather environments
- Can be used as part of a Preventative Maintenance Program

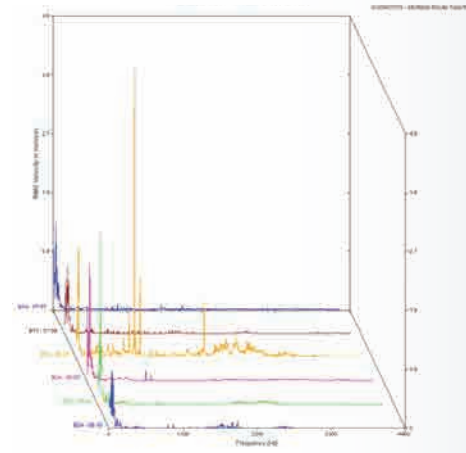
HOW CAN OES MONITOR THIS?

OES has the latest equipment and utilises non-intrusive methods (Vibration analysis, Laser alignment, Infrared thermography) along with qualified, accredited personnel to assess and equipment in use to measure all and record vibration signatures using sensors such as accelerometers and tachometers.

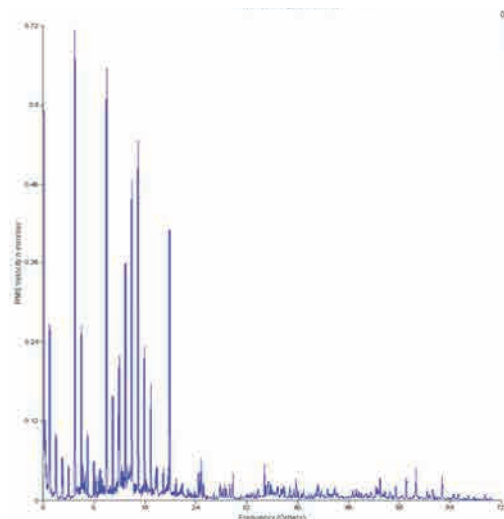
These recordings are analysed at the site and are uploaded and further analysed using our bespoke software, visually displaying vibration spectrums and waveforms. These recordings are uploaded into a Vibration Track which can be trended over time, and the gradual development of the vibration signature which might indicate wear detected at their earliest stages.



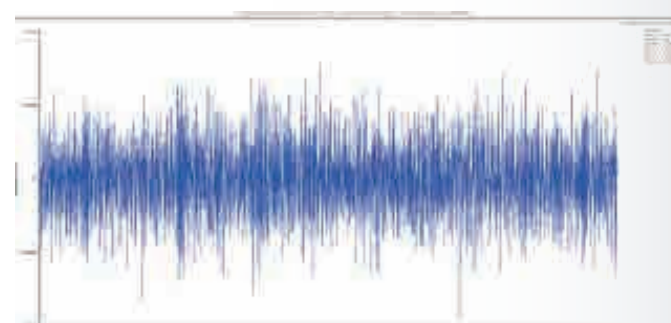
Screenshot of VTrack



Sample Waterfall Trend Pattern



Sample Spectrum Graph



Sample Time Waveform

OES would firstly clarify the requirements to determine with the client whether to be used as preventative maintenance, and to determine the cause of frequent changeouts.

The inspection will comprise of the following:

- The equipment in all areas that are to be inspected is surveyed on a walk around clarifying equipment detail and measure points
- Upon confirmation a database would be constructed with the AMS software which will encompass areas, equipment and measurement points
- This would then be uploaded into the handheld analyser.
- Photographic evidence would be taken of the machinery including the data plate details.
- Machine load will be obtained along with rotational speed, which would be taken either with laser pick up or by sensor placement and recorded into the analyser (essential for diagnosing machinery health).
- Once recorded, photographic evidence or measurement points markings made for future trend analysis, the process would be repeated on all pre-programmed measurement points
- Stored data is then uploaded from the hand held analyser into the AMS software where spectrums can be interrogated and analysed in further detail

INSPECTIONS WILL INCLUDE THE FOLLOWING TYPES OF EQUIPMENT FOR EXAMPLE:

- Motors to include bearing and electrical defects
- Pumps bearing and blade defects
- Engine Generation systems to include bearing and electrical defects
- Drive / Propulsion systems to include gearbox, pump, and bearing defects

WHAT BENEFIT DOES THIS HAVE?

- Predictability. Give maintenance staff time to schedule required repairs and acquire needed parts
- Safety. Take faulty equipment offline before a hazardous condition occurs
- Revenue. Incur fewer unexpected and serious failures, helping to prevent production stoppages that cut into the bottom line
- Increased maintenance intervals. Extend the life of equipment and schedule maintenance by need
- Reliability. Incur fewer unexpected or catastrophic failures because problem areas can be anticipated before failure
- Peace of mind. Build confidence in maintenance schedules, budgeting, and productivity estimates

Vibration Analysis can or is known to decrease downtime and increase savings when applying the correct methods these types of surveys are becoming a 'have to have' survey in the industry and is generally known as 'condition monitoring'. When used correctly, it can result in huge cost savings when compared to traditional maintenance methods.

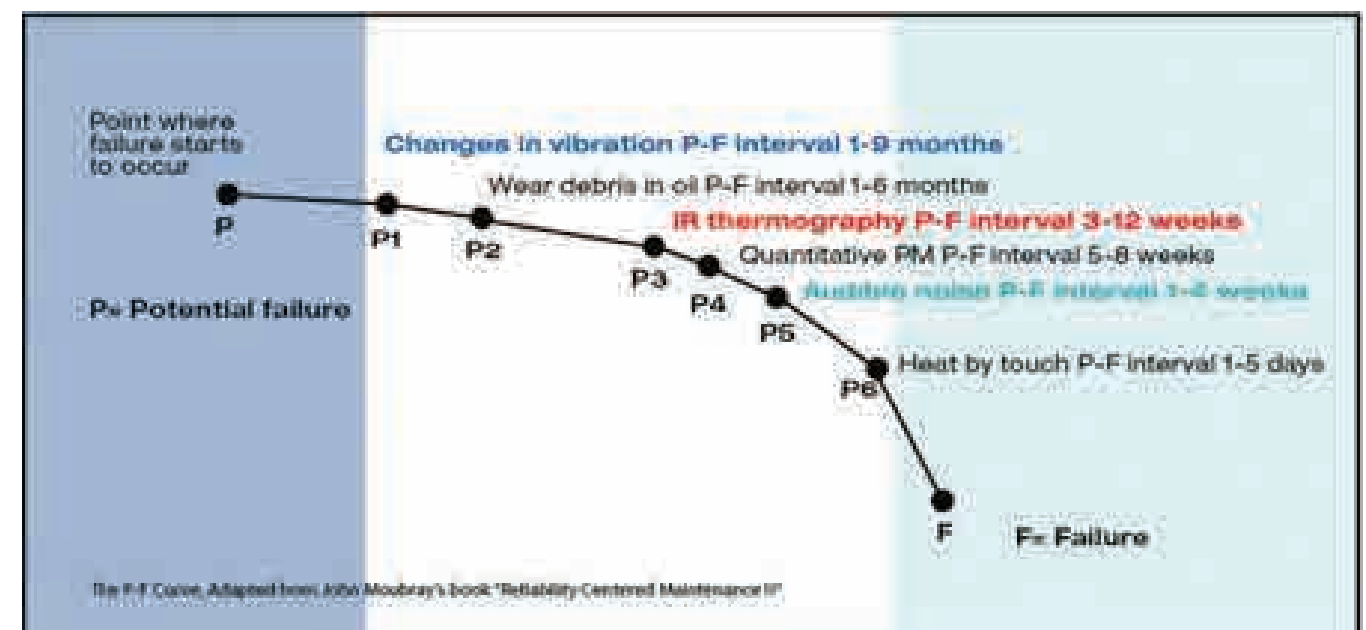
Traditional maintenance methods are predictive: components are replaced on a fixed schedule, whether worn or not; and reactive maintenance: in which components are repaired/replaced only after they have broken down. Neither of these methods is ideal, although both are very commonplace throughout the industry sector, and both tend to incur much higher costs than those methods that use vibration analysis.

CLIENT BENEFITS?

Maintenance departments today are asked to run with fewer staff and smaller budgets than ever before. Maintenance personnel can't afford to continuously chase the next breakdown. They need to quickly and accurately identify developing faults and then get to the root cause of the problem so that it can be fixed once and for all.

Benefits:

- Savings on potentially costly downtime
- Reduces unnecessary replacement of equipment
- Reports can be used to substantiate warranty claims



For further information on Vibration Analysis service and benefits to your company's assets, please contact our specialist team at

info@oesgroup.com

WWW.OESGROUP.COM

[f](https://www.facebook.com/OESGROUP) [@](https://www.instagram.com/OESGROUP) /OESGROUP