

Vibration measurements

The **Machine Diagnostics** department executes on-site vibration measurements on gearboxes and other equipment such as pumps, electro-motors, compressors, turbines and generators, etc.

The measurements can be executed with two systems, a portable Spectrum analyser or a multi-channel real-time analyser.

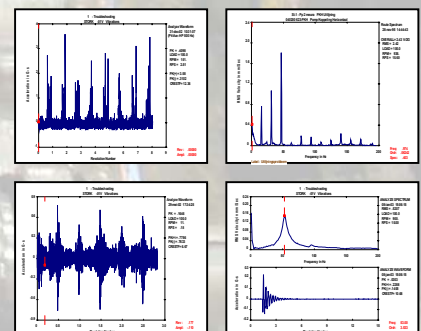
Portable Spectrum analyser

Casing vibration measurements are executed and recorded using this data collector. The measurements can be split into 3 categories, depending on the client's wishes. These are as follows:

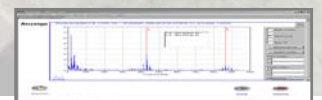
- * Zero point measurements : a one-off measurement is executed shortly after revision or new construction.
- * Trend-based measurements : these measurements are executed periodically so that light increases can be identified at an early stage.
- * Trouble Shooting : these measurements are executed in the event of deviating dynamic tendencies of the installation so that a cause of the problem can be found rapidly.

Given the short installation time required for this equipment, we are able to efficiently execute vibration measurement at our clients' premises. This spectrum analyser is able to detect the following deficiencies and/or faults:

- * Gear defects
- * Bearing faults, which can be split into: inner ring damage; outer ring damage; roller element damage; cage breaks;
- * Alignment errors
- * Looseness and clearances
- * Imbalance (also on-site balancing)
- * Resonance fields (with regard to impact test)



If a possible cause is diagnosed during the measurements, this will be discussed with the client and Stork Gears & Services can take action immediately if necessary. If any further analysis is required, we can perform this on short term and will be processed in a report. The report shows findings, conclusion and recommendations in a clear and 'to the point' manner. If a more extensive explanation is required, naturally this can be provided.



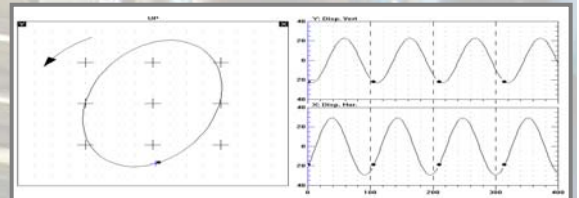
Multi-channel real-time analyser

This multi-channel real-time analyser enables simultaneous recording of the dynamic tendencies of gearboxes and other installation equipment using casing vibration and shaft movement/displacement sensors.

Below are descriptions of several brief data presentation techniques with which a correct analysis can be shown:

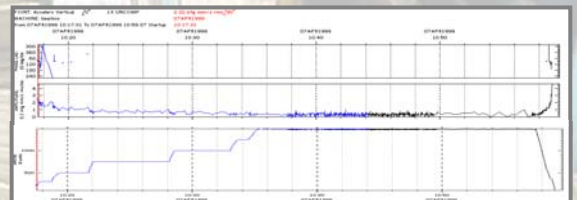
* **Orbit/time basis graphs**

Shows the actual vibration signal in time. These plots provide information about the phase, The unfiltered amplitude, the frequency and the form of the dynamic movement of the shaft.



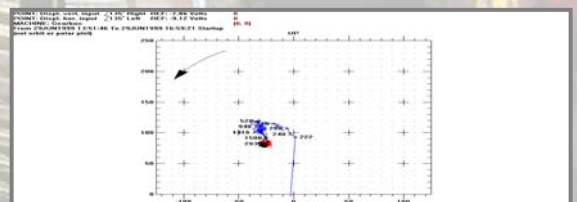
* **Trend graphs**

Are used to chart variables such as vibrations, Pressure and temperature against/in time. Parameter change can be an early indication of possible faults in the installation.



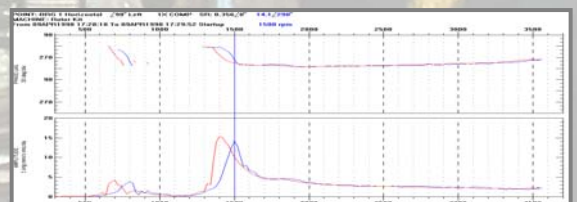
* **Radial Shaft Position graphs**

Show the average radial shaft movement/displacement In 2D. Changes in shaft position indicate possible forces on the shaft, such as those due to alignment errors or process forces, or wear of the white alloy.



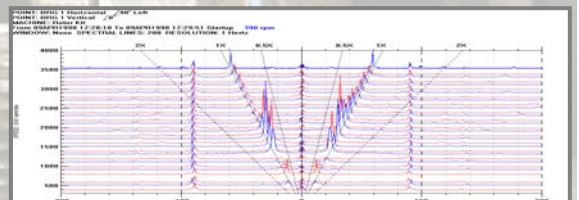
* **Bode and Polar graphs**

These plots show a combination of amplitude and phase of the filtered signal. These graphs are used to make any lateral resonance frequencies that are present visible. The results can show how well a system is muffled by the passing/execution of lateral resonance



* **Full Cascade graphs**

In these graphics, multiple frequency spectra are charted against/in speed. These 3D presentations are used in order to be able to observe changes in the frequency range/spectrum during a start-up/shutdown.



Stork Gears & Services is able to rapidly execute the above mentioned measurements in any part of the world in order to specify and lay down the dynamic tendencies of the client's installations.

