

MACHINERY VIBRATION DIAGNOSTICS

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Vibration is a process that can not be measured, unlike its parameters. The machine can have high levels of vibration for three reasons:

- there is a strong source of vibration inside the machine;
- during spreading between source of vibration and the point of observation, vibration weakly damped or even increases due to good conductivity and transparency of the surrounding structures;
- there are two previous reasons simultaneously.

For solving the first problem we have to explore the physical nature of vibration inside the machine. For solving the second problem it's necessary to investigate the spread of vibrations out of the construction. A general vibration problems are divided into three groups:

- 1) the emergence of sound;
- 2) distribution of sound energy;
- 3) monitoring of vibration.

The main attention is directed to a vibration machines. There are many kinds of diagnostics problem, such as: belt drive problems, mechanical looseness, misalignment, resonance, rotor rub, hydraulic & aerodynamic forces, mass unbalance, beat vibration, sleeve bearings, gear related problems, rolling element bearings, electrical problems, stator eccentricity, shorted laminations and loose iron, stator eccentricity, eccentric air gap (variable air gap), mass unbalance, force unbalance, couple unbalance, overhung rotor unbalance, eccentric rotor, cracked or broken gear tooth, hunting tooth problems, oil whirl instability, blade pass & vane pass. Consider a few of them in more detail.

When we are able to detect and correct problems using technical diagnostics it helps us to save working capacity of machinery.

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