Qatar workshop vibration analysis

MAN PrimeServ

Vibration measurement and analysis are of vital importance in machinery condition monitoring and predictive maintenance strategy. They contribute significantly to early detection of defects that are the root cause of unexpected breakdowns of critical equipment and prevent catastrophic damages and costly unplanned downtime.

Vibration of a machine is the movement of the machine about its equilibrium position and it can be in various directions, linear, nonlinear, periodic or non-periodic.

Causes of machinery vibration

At any given time, one or more factors can cause excessive vibration in machines, out of which the most common are as follows.

- Misalignment
- Imbalance
- Looseness and foundation flexibility
- Wear

Misalignment is one of the major causes of machinery vibration. It takes place when the shaft centerlines of two directly mating components intersect at angles and/or are offset from each other. Misalignment of couplings and bearings typically leads to high radial and/or axial vibration.

Imbalance occurs when the center of rotation of a rotating object differs from the center of mass. This situation exerts a force on the center of rotation, which is in fact the direct result of Newton's second and third laws. The force victor is always directed towards the center of mass, and therefore, it is rotating about the center of rotation as the center of mass is. The force magnitude is proportional to the square of the speed of revolution (RPM). This force crates movement about the center of rotation, which in other words, is called vibration.

Run smoothly

Operate as planned

We provide industry with vibration measurement and analysis as a part of our machine health monitoring services.

Imbalance usually causes the bearing to carry a higher dynamic load than its design specification.

Looseness and flexibility of foundation are most often resulted from loose bearings, loose hold down bolts, corroded or cracked mounts and weak base plates and / or foundations beneath them (for instance, cracked concrete bases). Looseness let the machine vibrate more freely in the direction where the looseness is greatest (generally horizontal).

Damaged or worn machine parts such as gears, ball or roller bearings, and drive belts can produce vibration and noise. For instance, when a ball bearing race becomes pitted, the bearing balls will cause vibration each time they travel over the damaged area. A gear tooth that is worn, bent or chipped, or a drive belt that is cracked or chunked out, also can cause vibration.

Effects of vibration

- Accelerated wear and reduced life on such crucial components as bearings
- Sudden breakdowns of critical machines
- Disruption to plant working condition
- Damaged and defective products
- Excessive noise
- Excessive consumption of power
- Increased safety risks

Machines requiring vibration monitoring

- Gas and steam turbines
- Diesel and gas engines
- Gearboxes
- Propeller and cardan shafts
- Compressors
- Pumps
- Electric motors
- Alternators
- Blowers

Benefits of vibration measurement and analysis

- Enhance reliability and efficiency of the operation
- Extend equipment life
- Prevent catastrophic damages
- Minimize unplanned downtimes
- Eliminate unnecessary repairs
- Reduce overall maintenance cost
- Reduce the need for redundancy
- Reduce noise level and power consumption
- Increase product quality
- Increase plant safety

Please contact us for a competitive quote.

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