

Case Study

**7.5 LAKH UNITS
PER ANNUM
(25% OF GLOBAL
OUTPUT)
AUTOMOTIVE
HIGH SPEED SPINDLE**



Customer Overview:

For more than half a century experienced a large automotive industry supplier used SANDS ARGUS vibration monitoring for their legacy types of equipment which would have high cost & maintenance including machining centers, turning spindles, and utility machines to increase the remaining useful life. Measuring and monitoring high speed spindle conditions has become highly important because of the agile production and increased requirements for product accuracy. Increasing the reliability of legacy types of equipment is one of the biggest challenging tasks for the automotive industry, however, the SANDS ARGUS wireless triaxial vibration sensor will show the live status of equipment (Normal, Marginal, or Critical) and stored live TWF & FFT spectrum analysis will diagnose these equipment defects earlier by analyzing overall vibrations from the spindle bearing or more precisely by high frequency technique analysis such as G's peak method makes spindle monitoring is easy. Eliminating these incredible costs ARGUS will ensure that can catch any problems with your spindle before they become worsen.

Application & Root Cause Description:

Decade smooth operation equipment VCO M12090 Spindle, it was one of the high cost & maintenance equipment was monitored by ARGUS analyzer. This spindle has variable speed and load application to machine the product precisely. Vibration measurements were scheduled every day thrice basis for the last 2 months. The automotive company monitoring team has observed that there are progressive increments in the acceleration G's value and the FFT high frequency spectral data indicating that the bearing gets a defect. The defect bearing was replaced with new, and after a few weeks again they got the same bearing issue. Finally, they called the SANDS team for root cause failure analysis.

SANDS team observed the past few years' maintenance data and historical trend of the machine using ARGUS ACE web software. In that FFT spectrum analysis SANDS, the team found that there is a resonance problem that occurred in the machine. Resonance is common in structures supporting machines. When the machine was running at critical speeds, the natural frequency of the vibration becomes equal to the frequency with which the object is vibrating, this causes the object will vibrate at its maximum peak in one direction. SANDS team recommended inspecting the equipment for structural imbalances.

Solution:

The automotive company maintenance team observed that there is structural cracking at the spindle support. Which will cause the spindle bearing defects when it's running at critical speeds. Finally, the maintenance team followed as per OEM suggestion they welded the crack & super finish with grinding. After finishing the maintenance, the vibration team acquired the vibrations from the machines and found that the equipment is now running with normal vibrations levels.

Conclusion:

Vibration monitoring and analysis have become a fundamental element of the predictive maintenance program of most manufacturing & production plants. Keeping an eye on tracking vibration levels of all rotating equipment makes sure that problems are detected early and appropriate actions can be planned. This is to prevent unexpected events/breakdowns happening that can lead to undesired and costly production standstill.