Customer Case Study

Catastrophic Failure Saved In 4000hp Compressor And Motor For One Of The Largest Oil & Gas Company Through Automated Predictive Maintenance

BACKGROUND

Journal bearings are used for radial positioning of the compressor rotor that supports the gravitational load of the shaft and various dynamic forces caused by rotor unbalance, misalignment, and other sources.

THE CHALLENGE

Reciprocating compressors are one of the most serious and expensive assets of a plant. These types of machines can provide a higher compression ratio , and are more costly to maintain. They suffer from high essential-drawbacks such as reciprocating-compressors, and consume many times as much maintenance cost of counterpart centrifugal or axial machines in the plant.

Despite the criticality and importance of the reciprocating compressor, they are sometimes unobserved by the condition monitoring team simply because their typical and primary PDM tool (FFT portable vibration analyser) is routinely used on rotating equipment and is not well suited for reciprocating machines.

Consequently many companies spend more money on maintenance, repair and down times.

THE SOLUTION

We proposed our RotationLF system under which we installed wireless sensors as a part of a pilot project on multiple equipment.

FEATURES

RotationLF has a number of features including:

- Vibration, Acoustic Emission, Temperature, RPM & Humidity based measuring principles
- Anomaly detection, Fault characterization and RUL Prediction Automatic Notifications & Real time monitoring

One of the largest Oil & Gas Company

Once installed, the strong battery-powered wireless sensors start sensing and sending data to our SaaS-based platform through an encrypted & secured network using Edge and Cloud computing. As and when data was received, the RotationLF platform worked on data analysis using highly sophisticated algorithms.

Approximately 15 days after the sensors were installed, 1x harmonic was observed on the spectrum shown in Fig.1.1 on the right. It was also observed that the random change in 1x frequency (rpm of motor) indicated operation- related load fluctuation on the system and led to instability in load carrying capacity of oil and finally an unbalance was detected. The same was notified through e-mail shown in the image below. The amplitude pattern (Fig.1.2) depicted in the below plot is indicative of an early-stage failure.

Fig.1.1

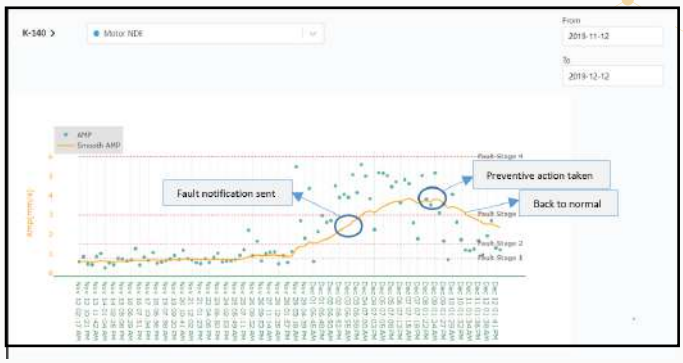
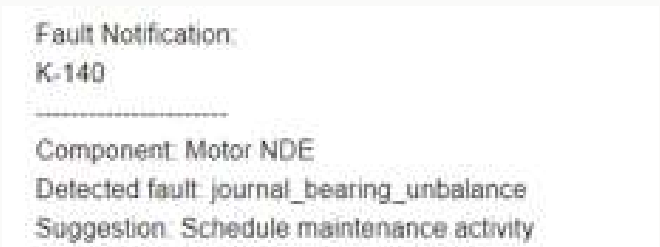


Fig.1.2

THE RESULT

The RotationLF analytics sensed & detected the anomaly in the pattern and alerted plant staff about this unusual trend automatically through mobile text and email alerts as shown above. Unbalance on bearing was detected before the equipment was stopped for maintenance. This gave the plant personnel valuable time to organize maintenance activities. After the shutdown and completion of maintenance, vibration levels returned to normal and the same is shown in Fig.1.2.



ABOUT NANOPRECISE

Nanoprecise specializes in the implementation of Artificial Intelligence and IoT technology for predictive asset maintenance and condition monitoring. Our timely and accurate diagnosis of machine faults provides our clients insights that allow them to make decisions that will save them considerable time and resources. Nanoprecise is headquartered in Edmonton, Canada with branches in Bangalore, India; San Diego, USA, and Newcastle, UK. We have managed to establish ourselves as a trusted solution provider in the asset management industry.

Talk to our experts

solutions@nanoprecise.com

North America
+1 (780) 680-2693

Asia
+91 75681 21121