

Customer Case Study

Automatic Vibration Analysis Detected Misalignment And Unbalance In Critical Blower

BACKGROUND

Hindustan Zinc Limited (HZL) is an integrated mining and resources producer of zinc, lead, silver and cadmium. It is a subsidiary of Vedanta Resources PLC. HZL is the world's second-largest zinc producer. It's FY2018 revenues were Rs 22,084 crore.

THE CHALLENGE

The SO₂ Blower is one of the supercritical blowers in the zinc manufacturing process. It must run most accurately as the rpm of this equipment is above 5600rpm. Moreover, all bearings in this equipment are journal bearings. Therefore, it is challenging to monitor and identify the faults by offline monitoring techniques.

Nanoprecise Sci Corp was asked to implement a predictive maintenance solution to detect faults early and provide a reliable prediction of Remaining Useful Life (RUL).

THE SOLUTION

We proposed our RotationLF system under which we installed wireless sensors on 4 acid pumps and on 2 supercritical blowers as part of a three month pilot project.

FEATURES

- RotationLF has several features including:
- Vibration, Acoustic Emission, Temperature, RPM & Humidity based measuring principles.
 - Anomaly detection, Fault characterization and RUL Prediction Automatic Notifications & Real-time monitoring



HZL Mines in Ramapura Agucha, Rajasthan. is the second largest zinc mine in the world with a production of 3.9million MT in FY 2018. It stands apart as a world class ore body with zinc-lead reserve grade averaging 15.7%. Total Reserve are 46 million MT and mineral resources are 50.5 million MT as on March 31, 2018.

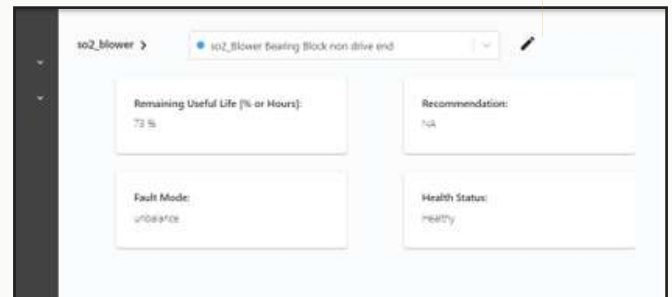
The specific placement of the RotationLF sensors is selected to monitor:

1. Non driven Motor Bearing
2. Drive Motor Bearing
3. Gearbox input drive and non-drive bearings
4. Gearbox output drive and non-drive bearings
5. Blower drive and non-drive bearings



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

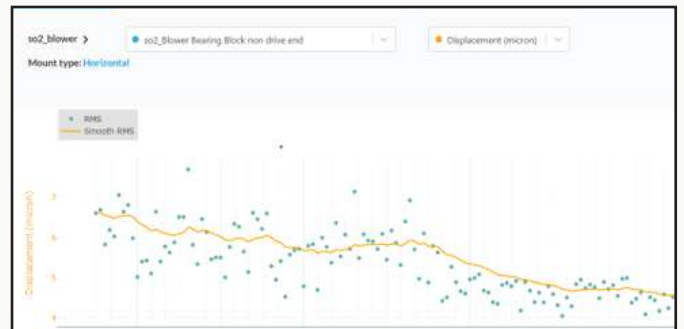
After 3-months of sensor installation, suddenly, an increase in vibration amplitude values was observed in blower drive side and non-drive side bearings. It was detected that there was a fault due to unbalance in the Blower and misalignment between Blower and gearbox. The severity of unbalance was higher than misalignment. The fault was detected at an early stage and the RMS trend is shown in the image below.



Remaining Useful Life, Health State and Fault Mode along with Recommendations mentioned on Dashboard

THE RESULT

The RotationLF analytics sensed & detected the anomaly in the pattern and alerted HZL plant staff through mobile text and email alerts regarding this unusual trend automatically. As a result, the HZL maintenance inspection team took immediate lubrication action on both bearings of the motor, planned a short term shutdown and cleaned the blower resulting in reduced unbalance and its effect on the gearbox is shown in the fig. here.



The above fig. indicated the decreased RMS trend in Blower bearing non-drive end after maintenance was done.

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

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