monixo
predictive maintenance & CBM

MONITEUR

SMART SENSORS FOR PREDICTIVE MAINTENANCE. & CONTINUOUS MONITORING

MULTI-SENSORS INDUSTRIAL SENSOR FOR PREDICTIVE MAINTENANCE

TECHNICAL SPECIFICATIONS

Vibrations sensor

- Measurement range : ±16g
- Bandwidth : [0 Hz –10 kHz]
- Axis : Tri-axial (x, y, z)
- Output : Level (RMS or PtoP) & FFT

Temperature sensor

- Résolution : 0.1°C
- Measurement range : –50°C /200°C
- Consumption : 70 uA

Acoustic Emissions sensor (AE)

- Accuracy: 0.1%
- SNR : 63 dBA
- AOP : 120 DB SPL
- Frequency : 100kHz

FEATURES

- Compact design
- Embedded FFT signal analysis
- **Failure diagnosis**
- **Failure prediction**
- **Fix prescription**
- Stud, magnet, or adhesive mounting accessories

BODY FEATURES

- Product Material 316L Stainless Steel, Polymer
- Number of Sensing : Triaxial accelerometer, IR Temperature, Ultrasound
- Product Weight 180 g

USAGE CONDITIONS

Operating Temperature Range (°C) -80 – +250

INDUSTRY STANDARDS

- IP Rating IP67
- Wireless Application : Bluetooth + LTE-M/LoRa + NFC

BATTERY

- Up to 9-year battery life

SYNTHESIS

The moniteur transcends the limitations of traditional sensors, harnessing the power of 5G technology to transform reactive maintenance into proactive insights

FOR MAINTENERS

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PREDICTIVE MAINTENANCE USE CASE: COMPRESSOR C1302 AT ERAMET SLN

Objective is to to enhance the reliability and performance of Compressor C1302 in the SLN plant by implementing predictive maintenance using vibration analysis and anomaly detection. Société Le Nickel (SLN) is a French mining and metallurgical company primarily involved in the extraction and processing of nickel ore. Founded in 1880, it is headquartered in New Caledonia, a French territory in the Pacific, where the company operates several mines and processing plants.

AT A GLANCE

CHALLENGE

Compressor C1302 Block No2 (B312) at Eramet SLN is experiencing recurring anomalies, as highlighted by the predictive maintenance platform. Vibration spectrum analysis suggests potential issues related to rotating components, indicated by specific frequency peaks.

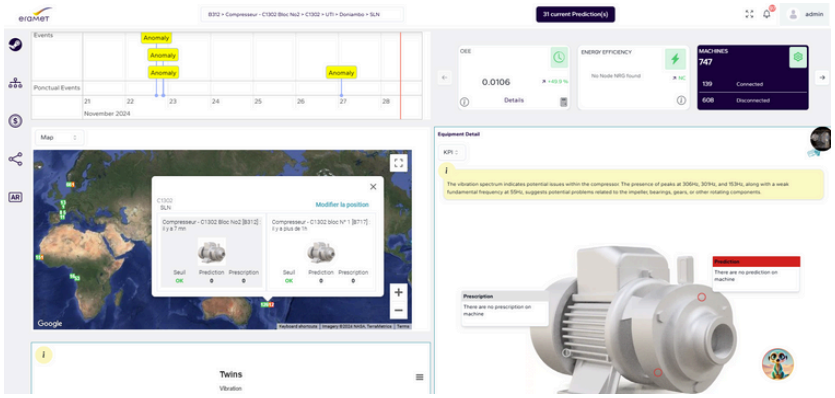
BENEFITS

- Direct Cost: $1300
- ROI: $37750 (in this specific case)
- Significant reduction in unscheduled downtime.
- Improved energy efficiency and overall equipment effectiveness (OEE).
- Extension of the compressor's operational lifespan.
- Enhanced predictive accuracy through continuous learning from anomaly events.

DATA ANALYSIS

1. Anomaly Events:
   - Multiple anomalies detected
   - These anomalies correlate with abnormal vibration readings from the compressor.
2. Vibration Spectrum Details:
   - Peaks at 306Hz, 301Hz, and 153Hz, suggesting potential defects.
   - A weak fundamental frequency observed at 55Hz may indicate misalignment or impeller issues.
   - Likely causes: bearing damage, gear wear, or impeller malfunction.
3. Impact:
   - Reduced operational efficiency
   - High potential for unplanned downtime if unresolved.

SOLUTIONS



1. Advanced Monitoring:
   - Integration of IoT Sensors: Upgrade existing monitoring systems to include higher-resolution vibration and temperature sensors to capture detailed data.
   - Data Analysis: Continuously analyze sensor data for early detection of irregular patterns.
2. Root Cause Diagnostics:
   - Perform a thorough physical inspection of the impeller, bearings, and gears.
   - Utilize ultrasound testing to confirm the extent of wear or misalignment.
3. Prescriptive Actions:
   - Based on vibration peaks:
     - Replace or repair bearings showing damage.
     - Align or balance the impeller to address frequency discrepancies.
     - Inspect and lubricate gears to reduce wear-related vibrations.
     - Schedule minor maintenance to avoid sudden failures.
4. Preventive Strategies:
   - Implement periodic condition-based monitoring to track anomalies over time.
   - Develop a maintenance calendar based on data trends and prediction models.

FEEDBACK

From Ludovic DONATI (Eramet CDO)