Success story

MIXING PUMP

Condition monitoring | Wireless | Airius LTE-M

Wireless sensor Airius LTE-M detects bearing failure

Using cellular data transfer technology, the Airius LTE-M wireless vibration sensor warns of vibration-related problems as well as gear and bearing faults. The sensor detected a bearing fault in a production-critical mixing pump at a Swedish paper and board mill with a three-month prewarning time.

Application

Mixing pump in a paper machine.

Background

The mixing pump moves the stock to the paper machine's inlet box. There is no redundancy, and disturbance or failure in the pump will invariably disrupt production. This pump, therefore, has an A criticality rating, and carefully monitoring its running condition is essential.

Condition monitoring solution

The mixing pump was selected for a proof-of-concept installation with the Airius LTE-M wireless vibration sensor for the above reasons.

Case

During the proof-of-concept period, bearing damage was found in the mixing pump in one of the mill's paper machines. Increasing acceleration levels alerted the maintenance department of a budding problem and justified monitoring the development more closely. Over the following two months, speed vibration and health score trends also increased. About three months after the first signs of damage, the maintenance personnel stopped the pump and replaced the bearing.

The vibration measurements with the Airius sensor allowed the mill to detect and follow the course of damage in this A-rated pump, thus enabling the planning of the bearing replacement to be carried out during a planned maintenance stop.

Benefits

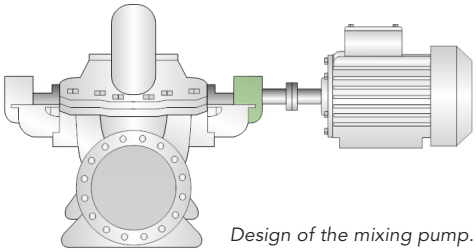
For the mill, wireless condition monitoring on the production-critical pump provides the following benefits:

- Minimized risk of breakdowns
- Maximized availability
- Retained production pace
- Time savings thanks to automated monitoring instead of route-based manual measurement

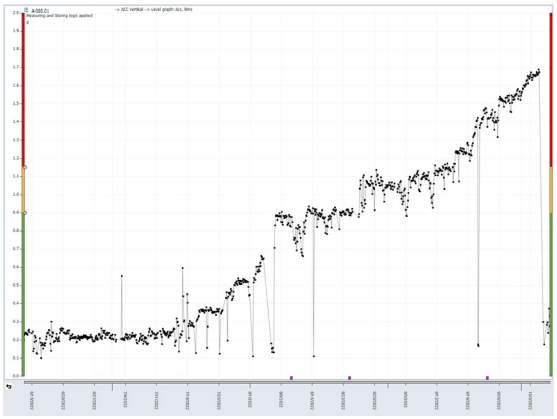
The Airius sensor

Airius LTE-M

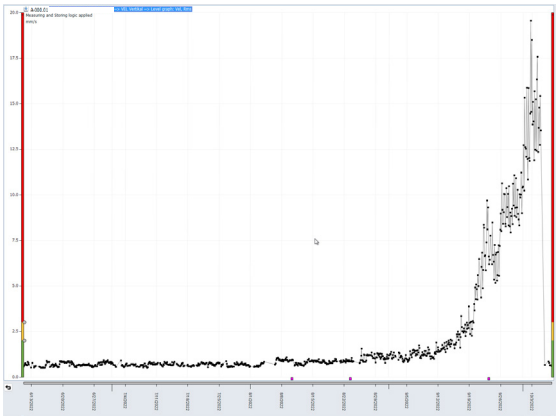
- Measures triaxial vibration and temperature
- Communication over cellular networks
- Local or cloud-based data storage
- Secure IoT connectivity
- Replaceable battery



Design of the mixing pump.

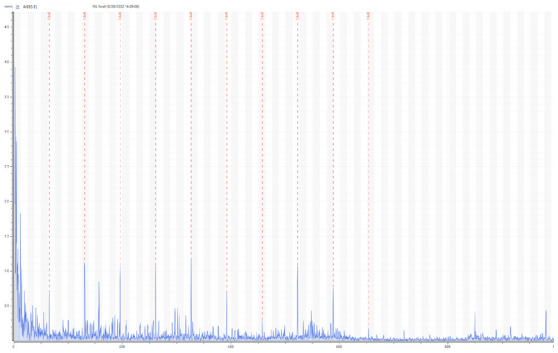


The acceleration measurement trend started to rise in mid-July 2022.

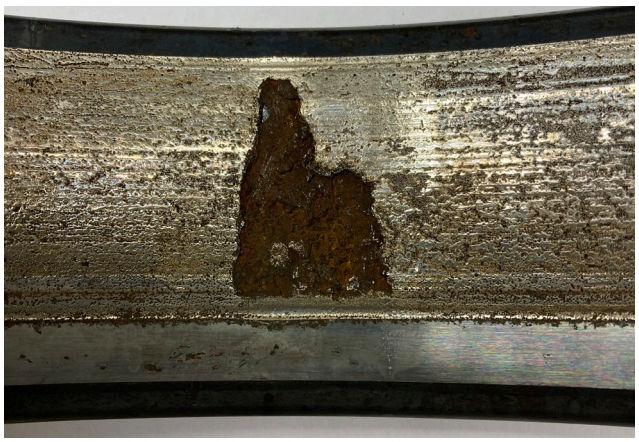


The velocity measurement trend started to rise in mid-September 2022.

The Health score shows a sharply rising trend before the bearing replacement.



Spectrum showing outer ring frequencies (BPFO).



The outer race damage that was revealed upon bearing replacement.