Case Study: SKF Machine Condition Indicator

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SKF products undergo rigourous testing and field trials before they are launched. In addition to validating the technology, these trials often help us improve the product by applying customer feedback.

During the beta test of the SKF Machine Condition Indicator (MCI), several units were installed at a German Pulp and Paper factory and supervised by our SKF Industrial Service Division in Schweinfurt.

This study shows the successful implementation and proof of concept of the SKF Machine Condition Indicator.

- Application: Fan
- Speed: 2,980 rpm
- Date installed: September 5, 2012
- Initial vibration values (SKF Microlog):
  - Velocity: 1.8 mm/s *(0.07 in./s rms; 0.1 in./s equivalent peak)*
  - Enveloped Acceleration (FB#3): 1.3 gE
  - Temperature: 30 °C *(86 °F)*

The initial vibration values were low and did not raise any concerns. The 1.3 gE in Enveloped Acceleration was a little higher than anticipated. The values were acquired using the SKF Microlog, a modern data collector and analyzer. The SKF Machine Condition Indicator was stud mounted in a vertical direction and set into threshold mode.

At first the alarm values in threshold mode with 9.0 mm/s *(0.35 in./s rms; 0.5 in./s equivalent peak)* for Velocity and 4 gE for Enveloped Acceleration seemed high compared to the baseline readings (initial vibration values).

One month after the installation of the SKF Machine Condition Indicator, the unit was indicating an alarm, blinking the red LED's once every five seconds. One quick rotation (blink) of the red LED's every five seconds means that an Enveloped Acceleration Alarm is detected, and this was verified by the SKF Machine Condition Indicator several times.

Fig. 1. Actual SKF Machine Condition Indicator installation.

First, a MCI unit failure was suspected by the customer, but measurements by SKF Industrial Service personnel, using the SKF Microlog, revealed an 11.07 gE overall level!

Further measurements with the data analyzer revealed the fan had developed an inner race defect (BPFI = Inner Race Frequency) (**→ fig. 2**).

The customer was impressed by the MCI's performance. The fan has an indirect effect on the production, as in case of failure, an auxiliary unit can be connected. However, it was important to recognize the impeding damage to the fan in order to schedule maintenance and repair it on time. Further feedback assured that the MCI is technically easy to understand (mounting, measurement parameters, alarms, etc.).

Other feedback from the customer was used to make improvements to the user manual and the reference card concerning the changing of alarm modes.

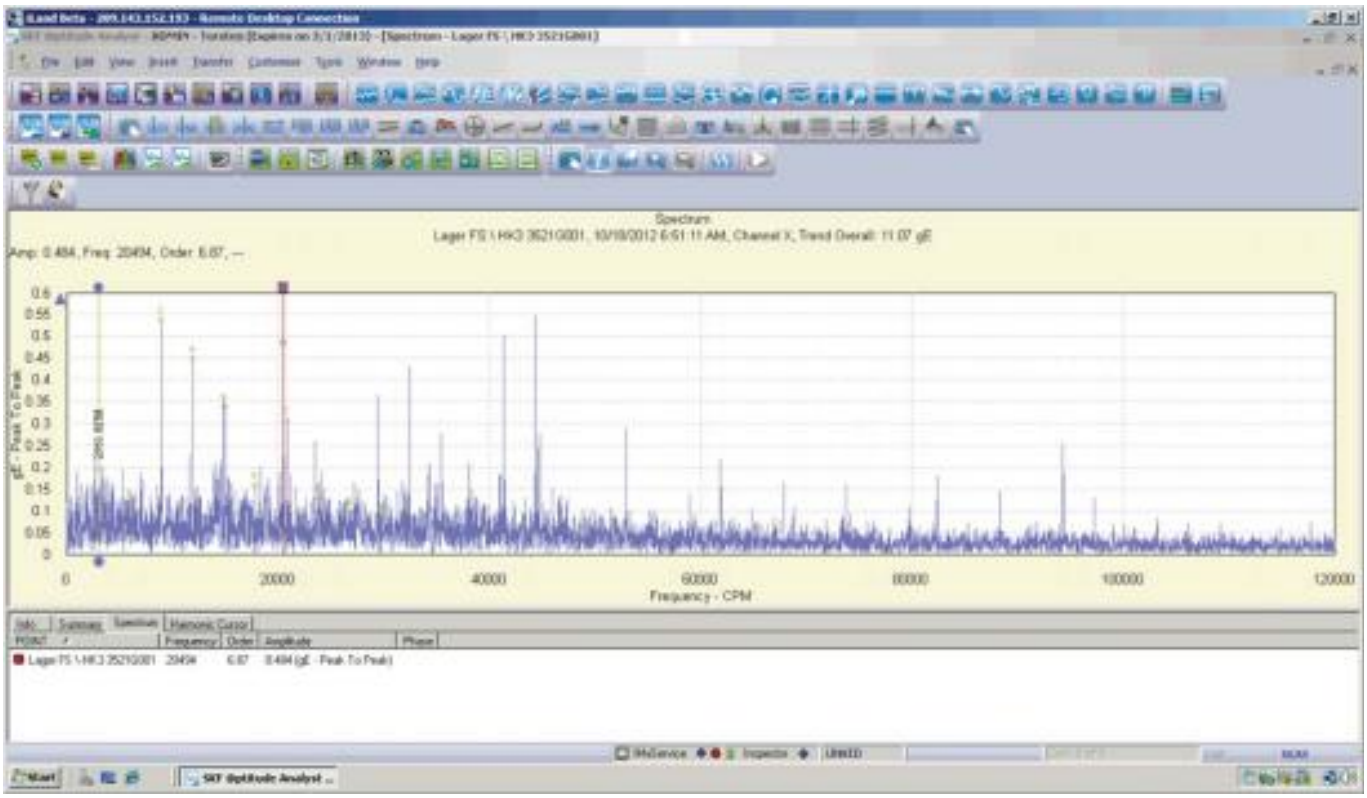
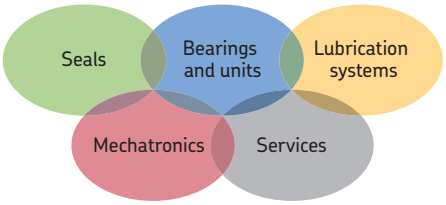


Fig. 2. Snapshot of SKF Enveloped Acceleration spectra in SKF @ptitude Analyst taken with SKF Microlog to confirm the SKF Machine Condition Indicator alarm. Harmonic cursor on 2,981 rpm showing running speed and red cursor at 342 Hz showing part of BPFI signature.



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