



## Success Story

# YAW BEARING SYSTEM FAULT DETECTED

Two case studies demonstrate how an effective remote condition monitoring strategy avoids uneconomical operation, costly downtime and consequential damage of wind turbines.

### MACHINE/INDUSTRY/PROCESS

Machine	Wind turbine yaw bearing
Company/Process	Two different wind turbine operators
Monitoring System	Brüel & Kjær Vibro Wind Turbine Monitoring System: Yaw bearing monitored by Tower accelerometer
Monitoring Strategy	Detection: Acceleration bandpass measurements. Diagnosis: Time signal



### OBSERVATION/DIAGNOSIS

Most of the faults detected and diagnosed by Brüel & Kjær Vibro over the last 10 years from thousands of wind turbines have been in the drive train, not in the yaw bearing system. In these two cases the fault was detected by the vibration bandpass measurement, not by the overall RMS value. In one case, the rocking motion of the nacelle is seen as individual impacts (Figure 1), due to loose pre-tensioning spring packs in the yaw bearing system. These were replaced and the vibrations returned to normal. In another case, the axial bearing plates were damaged due to excessive rocking. After the bearing plates were re-machined and the spring packs replaced, the vibrations returned to normal. The time signal was useful in both cases.

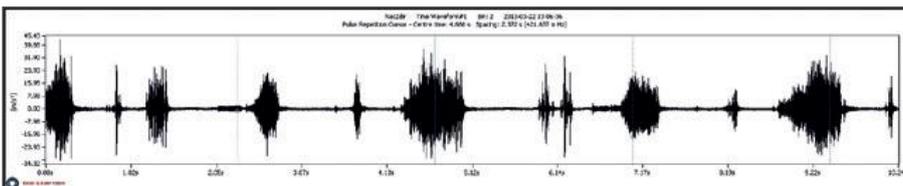


Figure 1. Random impacts seen on time signal from tower accelerometer of one wind turbine.

### BENEFITS

The yaw bearing system plays an important role in the wind turbine. It allows the nacelle to rotate on the tower to align the blades in the direction of the wind to produce maximum potential energy, and also to bear the entire static weight of the nacelle plus all dynamic loads that occur during rotation of the drive train. Condition monitoring is imperative for the detection and diagnosis of these faults, and to avoid a catastrophic failure of the yaw bearing system could have rendered the entire wind turbine non-functional.

### CONTACT

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