

Customer information

Condition monitoring with HYDAC

Drive train monitoring for wind turbines



Lubricant is the indicator for the condition of your drive train

The drive train of a wind turbine transmits rotary movement to the generator, which means that it is exposed to wear and load peaks. Imbalance, misalignment, deficient service and defects in the original components can also lead to premature wear. This causes damage to the drive train, which can then lead to bearing failure and even irreparable damage to the driving gear. Even though the chance of wind turbine gear failure is low, the consequences of prolonged downtime would be financially disastrous for operations.

Although system failures can be rectified quickly in theory, this is often not the case in practice. Access restrictions, logistic challenges and worker shortages can make it hard to complete repair work in good time. This makes optimal use of lubrication oil all the more important, as it reduces the friction between rotating components, dissipates heat and transports wear particles.

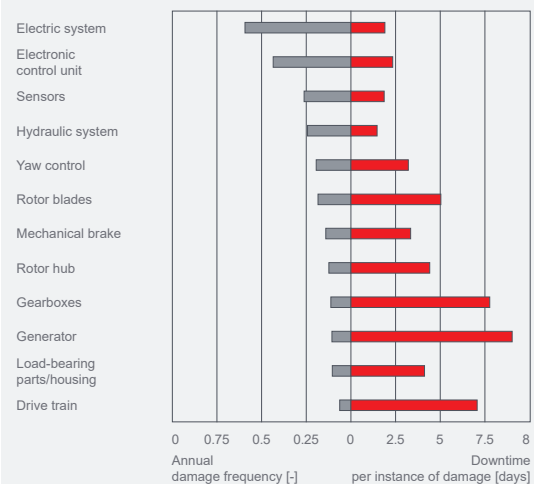
Smart monitoring of lubrication oil with HYDAC

Continuous monitoring of lubrication oil significantly reduces negative economic impact. The Metallic Contamination Sensor (MCS1000) can help here, as it monitors the condition of the turbine drive train. It checks the oil for ferromagnetic particles (steel, iron) and non-ferromagnetic particles (aluminium, copper, etc.). The result is that it can detect early on if wear is occurring or if bearing or gear bodies have suddenly broken off. The sensor therefore makes it possible to intervene quickly and implement service as needed. Month-length turbine downtime is prevented and long periods of smooth operation are enabled. Incorporation into the hydraulic system is also easy, either directly between supply pump and filter or as a retrofit kit. To allow the monitoring system to be supplied with important information on the lubrication oil condition, a smart interface with the customer guidance system is recommended. Complete documentation is always helpful when it comes to in-depth error analysis and is an important step towards predictive maintenance.

Synergy potential with other sources of fluid data:

- 1) The range of functions of the MCS1000 can be supplemented by additional HYDAC sensors, such as the Aqua Sensor AS1000. If the customer requires more fluid-relevant data, HYDAC offers a modular condition monitoring package (CMP) as a plug-and-play system with up to three sensors.
- 2) Complete lubrication oil condition information with small software modules enables advanced data interpretation for intelligent and autonomous systems.
- 3) If the turbine service data is made available in the customer's system, this significantly increases the accuracy of recommendations for action and error analysis.

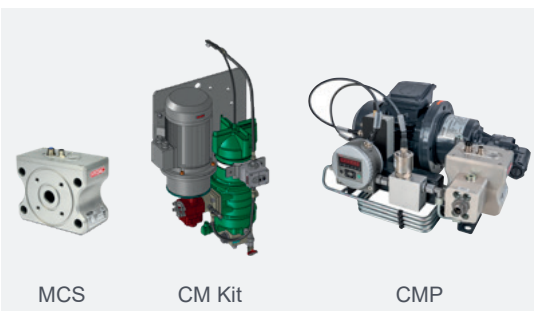
Financial consequences of prolonged downtime



Faulstich S., Hahn B. and Tavner P.J. "Wind turbine downtime and its importance for offshore deployment", 2010

Potential drive train costs

Situation	Costs
Unscheduled oil change	Onshore: €10,000+ Offshore: €100,000+
Unscheduled gear repair	Component change: €20,000+ New gear: €1,000,000+
Manual oil sampling	Onshore: €1,000+ (yearly or half-yearly) Offshore: €10,000+ (yearly)



Are you interested?

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Further information on HYDAC condition monitoring solutions