WEC GEARBOX INSPECTION

The gearbox transmits the power and converts the high torque at low speed from the rotor blade into a lower torque at high speed to the generator shaft. Unplanned downtimes through gearbox problems in the drive train of a wind energy converter burden the operating company with unexpected costs.
In some cases, they occur with such impact that they can jeopardise the entire financing. The Veltrup TE Bureau carries out special gearbox inspections on behalf of operating companies, investors, planning offices, insurers and wind turbine manufacturers in order to detect these risks at an early stage.

Inspection

The Veltrup TE Bureau inspects the entire gearbox extremely meticulously and with years of experience. We work with state-of-the-art video endoscopes and are always up to date with inspection and documentation technology in order to:
- to minimise the risks of unplanned downtime,
- to detect possible damage, e.g. during a warranty inspection,
- document the condition of the gearbox, e.g. for the insurance company in order to determine the precise cause if a claim is made for gearbox damage.

Scope of inspection

With each gearbox inspection carried out by the expert Veltrup, the entire gearbox is inspected with extreme care, years of experience
In consultation with the client, the following techniques are used during the inspection:
- tooth impression technique (if required) with subsequent SEM inspection (optional - at extra cost)
  An impression of the damaged tooth flank is taken to a precision of 0.1 micrometre using a special impression compound.
  The tooth impression is then inspected under a scanning electron microscope (SEM).
  The severity of the damage (e.g. micro-pitting, false brinelling, etc.) can be documented on the basis of the SEM inspection.

- **video endoscopy**
  All accessible bearings and toothed parts (e.g. planetary gearing, sun pinion) that are not visible through the gearbox service hatch are inspected using video endoscopy. Based on the resulting image documentation, statements can be made about the condition of the inspected gearbox components.

- **laser alignment**
  The gearbox-generator alignment is checked using laser measurement technology and any possible deviation is documented. Timely detection of displacement and fast, professional re-working by the WEC manufacturer prevents bearing damage through excessive restoring forces.

- **vibration analysis**
  During the vibration diagnosis, the drive train is checked using a mobile vibration measurement system.
  The measurement results are subsequently evaluated. Any existing bearing or tooth damage can thus be detected at an early stage.

- **material inspections (on dismantled parts) and metallographic inspection**
  Damage to dismantled gearing parts (bearings, ring seals, etc.) is investigated in order to determine the cause of damage.

Inspection Result

We value your cooperation in reducing the impact on the environment. Therefore, the client/operating company/investor will receive a detailed digital inspection report of every plant in the shape of a Word or PDF file in which all deficiencies identified are named, described and documented to a large extent by photos. This inspection report contains details regarding the condition of the gearbox that was inspected. It certifies that the gearbox is free from defects or points out any defects or damage as applicable.

Over and above this, the report contains deadlines for rectifying defects as well as statements on further operation and adherence with inspection deadlines. If severe damage to bearings or gearing is detected that could result in possible consequential damage, the plant operating company will be recommended to shut the plant down until this has been rectified.

Von der Oldenburgischen Industrie- und Handelskammer
ö.b.u.v. Sachverständiger für Windkraftanlagen

MARTIN VELTRUP
SACHVERSTÄNDIGENBÜRO

Weidegrund 9, D-26188 Edewecht, Tel. +49 (4486) 930838, Fax +49 (4486) 930858, www.sv-veltrup.de, info@sv-veltrup.de