



WindEnergy

NETWORK

COMMUNICATION HUB FOR THE WIND ENERGY INDUSTRY

ICE DETECTION

COLLABORATION

SPOTLIGHT ON
EAST
ANGLIA

UNLOCKING OPERATIONAL PRODUCTIVITY IN 40,000 WIND TURBINES WORLDWIDE

Windfarm operators constantly look for innovative ways of boosting productivity and reducing operational costs to increase competitiveness with traditional power sources. To achieve this, the industry is looking to drive energy efficiency as well as minimise the risk of unscheduled downtime and maintenance costs. As a result, more operators are relying on highly effective next-generation lubricants that can improve equipment reliability and extend oil drain intervals. Additionally, challenging weather conditions in cold, remote locations create additional complexities – so lubricants that are formulated to perform in these environments are also proving to be an essential part of modern turbine operations. This growing trend has been noted by leading lubricant manufacturer, ExxonMobil, whose advanced lubricants are being used in 40,000 wind turbines worldwide.

PROVEN PERFORMANCE

A US-based energy company realised significant performance and cost benefits by switching to ExxonMobil's gearbox oil, Mobilgear SHC XMP 320. The mountaineer wind site operates forty-four turbines with a 66-megawatt (MW) output. The Flender Model PEAS 43090.5 gearboxes (60 gallon capacity) within the 44 NEG Micon 1.5MW turbines were filled with Mobilgear SHC XMP 320 gear oil in 2002.

EXTREME CONDITIONS

These gear boxes operate in an extreme four-season climate with temperatures ranging from -25°C in winter up to +40°C in summer. The operations, therefore, require a lubricant that could perform in tough applications across a wide temperature range, whilst also providing protection against micropitting and gearbox deposits.

HARD COST SAVINGS

As a result, the operator has reported hard cost savings of US \$176,000 over seven years of service. This was largely achieved by extending oil drain intervals to twice the industry average for wind turbine gear boxes, saving \$4,000 per turbine in reduced oil change maintenance costs. As part of its Signum oil condition monitoring programme, findings from the used oil analysis also showed excellent gear box cleanliness and better overall gear condition than expected, thereby helping to manage costs.

40,000 GEARBOXES WORLDWIDE

Due to results like this, Mobilgear SHC XMP 320 is now used to protect 40,000 gearboxes of wind turbines worldwide and is the initial-fill gear oil of choice for many of the world's top wind turbine builders. In addition to its ability to maximise equipment performance and durability, the ability to extend the interval between oil changes from 18 months to three years or more can potentially make a big impact on reducing costs and difficult maintenance logistics. For example, this helps operators avoid the expense associated with replacement parts, labour and chartering specialist vessels to carry out the maintenance of offshore wind turbines.

UK'S GROWING WIND POWER INDUSTRY

Closer to home, the latest additions to the company's global customer base are three North Sea-based wind farms – Alpha Ventus, Borkum West and Thornton Bank, which demonstrates how these specialist lubricants are being relied upon by the UK's growing wind power industry.

GETTING WARMED UP

To complement the improved functionality of gearbox operations, Mobil SHC 500 hydraulic oils have been proven to offer energy efficiency benefits in hydraulic equipment. Compared to standard mineral hydraulic oils, Mobil SHC 500 can help to reduce hydraulic system energy consumption by up to 6.2 percent. This series was engineered to help protect hydraulic equipment operating in extremely cold conditions in offshore wind farms such as the North Sea or in remote onshore locations. At low temperatures Mobil SHC 500 is four times thinner than similar viscosity grade conventional mineral hydraulic oils*, allowing it to circulate around the hydraulic system faster at start up, ensuring the lubricant is in place to protect machine components. Although wind farms are unlikely to be exposed to such extreme arctic temperatures, the extent of the lubricant's cold temperature performance demonstrates that operating within UK weather conditions and wind chill factors can be easily met.

COLLECTIVE RESULTS

When combined with application expertise such as ExxonMobil's Signum Oil Analysis Programme, which monitors the performance and health of the oil and components on an ongoing basis, the considered application of advanced lubricants to different components of wind turbines can achieve significant results.

Mobil Industrial
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Signum Oil Analysis
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* Based on comparative -40°C Brookfield, ASTM D2893 test results, between Mobil SHC 525 and Mobil Univis N 46. For very low temperatures Mobil Aero HF or Univis HVI 26 may be considered depending on the Equipment Manufacturers Minimum Viscosity Startup requirements.