HELPING OPERATORS OPTIMISE POWER OUTPUT IN HARSH ENVIRONMENTS

In the previous issue Rob Pears, ExxonMobil Fuels & Lubricants discussed viable solutions to address common gearbox performance concerns. In this issue, Rob continues to share best practice insights with wind turbine operators, with a particular focus on maintaining optimum wind turbine productivity in the face of particularly harsh environments, such as those encountered offshore.

Proper gearbox lubrication is essential for maximising wind turbine performance. However, as technology has evolved the burden on lubricants has grown. Because today's gearboxes must support heavier loads than ever before, operators are looking for lubricants that can successfully minimise wear and provide extended drain intervals.

Q1: WHAT ARE SOME OF THE CONSIDERATIONS THAT GO INTO LUBRICATING A WIND TURBINE GEARBOX?

A1: Wind turbine gearboxes have unique lubrication needs compared to other industrial sectors. As well as addressing the standard needs of high load bearing gearbox components, we must also consider the stresses a gearbox endures in this particular application.

Standing hundreds of feet high offshore, and often situated in remote locations, wind turbines operate in wide temperature ranges and are vulnerable to wear, water contamination, rust and corrosion. Furthermore, their hard-to-reach locations can make routine maintenance visits very costly. Therefore, any in-service lubricants must last as long as possible and offer sufficient equipment protection to avoid unscheduled downtime.

Q2: HOW HAS WIND TURBINE LUBRICATION CHANGED OVER TIME?

A2: In the past, gearbox lubricant changes were typically carried out every 18 months for mineral gear oils and every 3 years for synthetic alternatives.

Today, as gearbox technology has vastly improved, wind turbine operators are demanding enhanced performance from their lubricants. Extended drain intervals are of particular concern, as a complete "drain-flush-fill" cost can exceed $5,000 (USD) for a MW mid-range sized turbine for the lubricant alone.

The total cost is further compounded by other overheads such as labour, production downtime, equipment repair and the prohibitively high cost of vessel hire for offshore installations.

So, not only must wind turbine gearbox lubricants provide protection from the elements, but to meet the expectation of operators, they have to do so for an exceptionally long period of time to keep costs down. Some operators are looking for lubricants that deliver oil drain intervals of up to and beyond five years. Regular use of an used oil analysis, such as ExxonMobil's Signum, enables maintenance professionals to monitor the condition of the equipment and the lubricant to increase oil drain intervals.

Q3: IS IT A CHALLENGE TO MEET THESE ELEVATED PERFORMANCE STANDARDS?

A3: It can be challenging. But, at ExxonMobil, we are well-equipped to handle this challenge through our technology leadership and application expertise in the wind sector. Thanks to our scientifically engineered approach to product development, excellent industry insight and technical know-how we have been able to deliver high performance lubricants, optimised for individual applications. We refer to this as "ExxonMobil's Balanced Formulation Approach."

No matter what sector we are working in or what specific performance characteristics the product requires, this process enables us to develop lubricants that deliver exceptional performance across all critical areas—such as oxidative stability, component wear protection, corrosion control, filterability, water tolerance, shear stability and extreme-temperature performance.

The balanced formulation approach is a two-fold concept. First, our team of scientists evaluates the lubricant design in a series of stringent laboratory tests to determine its performance capabilities. Then, we take our lubricant candidate out into the field and conduct a full-scale, dynamic testing on actual industrial equipment. A product has to excel in both tests before it receives the ExxonMobil seal of approval. For wind turbine gearboxes, we recommend Mobilgear SHC XMP™ 320.

Q4: WHAT ARE THE CHARACTERISTICS OF MOBILGEAR SHC XMP 320 THAT MAKE IT AN EXCELLENT PRODUCT FOR WIND TURBINE GEARBOXES?

A4: We work in close co-operation with the Original Equipment Manufacturers worldwide to formulate superior lubricant technology that addresses operational challenges encountered in the most harsh environments such as the offshore energy sector.

A case in point, Mobilgear SHC XMP 320 is designed to provide optimum equipment protection and extend the oil life even under the extreme conditions wind turbines endure.

This high performance gear oil is now being used to protect more than 40,000 wind turbine gearboxes worldwide.

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