

MONITORING THE LIFEBLOOD OF YOUR WIND TURBINES

As maximising operational productivity and cost-efficiency become ever more critical to the sustained growth and competitiveness of wind-generated energy, turbine operators are increasingly looking at new ways to realise efficiencies.

This has driven more operators to recognise the benefits of switching to using higher performance oils and greases within their turbines. Combining this with a regular and robust oil analysis programme can increase opportunities to extend oil drain intervals, protect against component wear and prevent downtime even further.

OIL ANALYSIS

Oil analysis is one of the most valuable maintenance programmes that turbine operators can implement. As health professionals often utilise blood samples to help determine our body condition, gear oil or hydraulic oil analysis supported by expert interpretation and advice, can also be utilised to help determine the condition of the components the oil is in contact.

Concurrently, the analysis and interpretation can maximise the application of high quality lubricants and identify early warning signs of contamination to help take greater control over managing downtime and extending equipment life.

In order for wind farm operators and equipment engineers to improve productivity and potentially increase profitability through oil and equipment monitoring there are a number of elements to be considered.

START OFF WITH THE BASICS

There is a certain protocol that should be followed to help ensure the accuracy of oil analysis results. First, maintenance professionals should always use a clean, dry container to draw oil samples. Any contamination that is in the container before the oil sample is collected could result in an inaccurate result. Most oil analysis companies will provide suitable and new bottles for the samples to be collected.

Ideally samples should be drawn when equipment is at its normal operating temperature, provided it is safe, and the oil system is being circulated. If however this is not feasible, the oil sample needs to be taken as soon as possible after the turbine is shut down (within 30 minutes).

MAINTENANCE RECORDS

To identify the most appropriate sample point, it is imperative to consult with your oil analysis provider and machine manufacturer for application-specific advice. Once the location has been identified, it should be noted in the maintenance records so samples can always be taken from the same place. This will ensure that results from the analysis of sequential used oil samples can be compared and trended to provide accurate insight into equipment and lubricant condition.

DEDICATED SAMPLE POINTS

Oil samples should always be taken in the same manner and from the same sampling point. Dedicated sample points situated prior to the filter are best though other sample points may also be acceptable including using a 'thief' pump to take a sample from a sump or reservoir using a new tubing of similarly measured length". Consistency is paramount.

Oil samples should always be taken before equipment is drained. If the oil has been drained, samples taken, and then deemed acceptable for continued use, there is no way the hydraulic oil or lubricant should be reused for applications such as hydraulics and gearboxes. Also, do not take an oil sample immediately after an oil change or after a large amount of make-up oil has been recently added.

SAMPLING FREQUENCIES

Sampling frequencies are usually set by the Original Equipment Manufacturer (OEM) which are typically six monthly for wind turbine gearbox oils and annually for hydraulic oils. The more frequent oil samples are taken then the more likelihood there is of detecting any equipment or fluid issues but the practicalities of sampling clearly need to be considered.

Consideration should be given to taking hydraulic oil samples at the same time as taking gearbox oil samples since the additional analysis costs is relatively small to the additional cost of taking the hydraulic oil sample and the relatively high cost should an issue be missed for up to a further six months before the system is analysed again. More frequent sampling is also highly recommended if there are abnormal levels of wear or contaminant elements, if vibration readings are increasing or if there is an unexpected increase in operating temperatures.

SEEK OUT PARTNERS WITH APPLICATION EXPERTISE & OEM RELATIONSHIPS

Selecting an oil analysis partner that has application-specific expertise and strong relationships with original equipment manufacturers (OEM) is extremely valuable. OEMs establish proprietary control limits based on the equipment model, lubricants used, applications and operating environments. When compared against the oil analysis results, these predetermined safeguards can help maintenance professionals make the best informed decision about the condition of the lubricant and the equipment.

ONLINE EFFICIENCY

Just because you participate in an oil analysis programme does not mean that you are going to be inundated with paper reports. The digital age is helping maintenance professionals clean up the clutter in their offices while also successfully managing their oil analysis programme.

Most oil analysis companies have some level of online functionality so it's important to evaluate oil analysis partners based on how these offerings can help expedite the administrative components of an oil analysis programme. Tasks such as managing/updating equipment registration, printing completed labels for sample bottles, ordering additional sampling kits and confirming delivery of samples can be greatly simplified through online tools from leading oil analysis providers.

Online programmes can also arm maintenance professionals with the proper tools to make more informed decisions about oil and equipment suitability. For example, ExxonMobil, a global leader in the field of oil analysis, offers its proprietary Signum oil analysis programme. Maintenance professions can access the Signum web site, and/or be sent, expert oil analysis assessments that identifies potential issues, list possible causes and recommends corrective actions. These files are formatted so they can be easily shared with colleagues. ExxonMobil's Signum website is also equipped with a knowledge library so maintenance professionals have the resources to gain more information about specific equipment issues.

LONG-TERM SUCCESS

By following the recommendations detailed above, wind turbine operators can benefit from optimised equipment performance, streamlined production and minimised maintenance. Selecting an oil analysis provider that has application-specific expertise, intimate relationships with OEMs and a comprehensive online oil analysis offering will help maintenance professionals achieve their company's production goals as well as their own.

Robert Pears
ExxonMobil Lubricants & Specialties
www.mobilindustrial.com