earthmill maintenance

NEWSLETTER

Summer 2020

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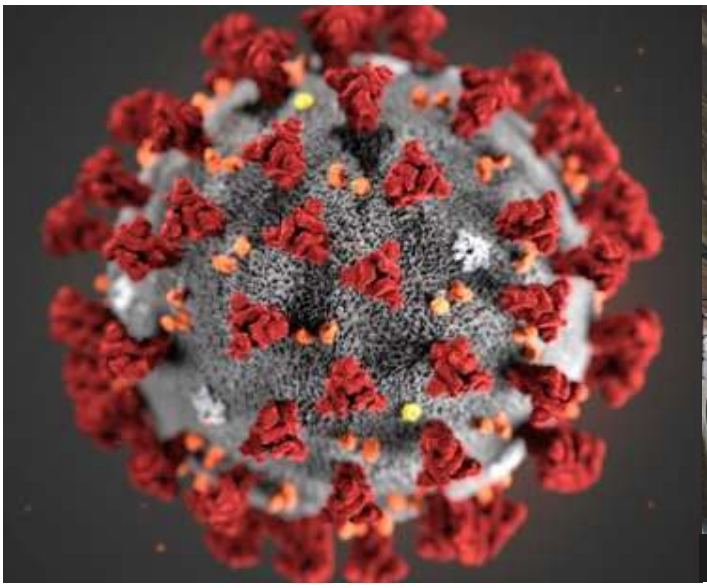


Strong storms battered the UK in the first part of 2020

C-19 business as usual

As the Coronavirus virus pandemic swept across the globe in the early months of this year, businesses nationwide have had to adapt to changes.

Here at Earthmill Maintenance we have been working hard to ensure that it is business as usual for our clients meanwhile behind the scenes we have had to alter the way we operate in order to maintain high standards of customer service.

Our engineers have been teamed up into pairs and follow strict social distancing rules. Our IT systems have been updated to make working from home easier when necessary. Our office staffing was temporarily reduced to promote social distancing however most staff members have now returned to the office. Extra hygiene measures have also been put in place across all parts of the business.

This meant that while other O&M providers temporarily halted operations leaving their customers unable to service or repair their turbines, clients of Earthmill Maintenance continued to enjoy the same outstanding customer service as before the pandemic as operations remained largely unaffected.

If our engineers visit your site to repair or service your turbine, we implore you to follow social distancing guidelines at all time to keep yourself and our staff safe.

Record breaking start to 2020

With storm after storm sweeping across the UK in the early months of 2020, wind turbine owners are enjoying record-breaking generation figures. During Storm Jorge at the end of February, the Earthmill fleet peaked at 21MW instantaneous production, enough to power over 15,000 homes.

A boost in FiT earnings will be most welcome to turbine owners after a relatively calm start to the winter in 2019.

General Manager Dave Broadbank commented, “we have seen stronger storms in the past, but we have never seen strong winds for such a sustained period. As soon as one storm was over, another one was on its way. The storms provided a welcome boost in generation figures but they also made it very difficult for our engineers to safely climb turbines to perform routine maintenance. It’s a credit to our engineers who have worked hard and utilised the longer daylight hours this Spring to catch up on servicing and they have now cleared the backlog.”

Front Cover Photograph Competition Winner

Congratulations to our photo competition winner, Kim Hodgson of Hutton Hall Farm, North Yorkshire.
Kim submitted the fantastic shot used on the front cover of her Endurance E-4660 with it’s very own moat after heavy rains last year. Kim a bottle of bubbly is on its way to you!

"Earthmill Maintenance are constantly investigating new products and materials that come to market for the Endurance fleet."

Beware of 'service provider' correspondence

We recently sent out an email about clients being approached by other O&M providers. Unfortunately this is becoming a common occurrence. Recently a customer was told by another company that they required new gear box and generator which proved to be untrue.

These companies will unfortunately continue to fish for new business, and you will surely receive correspondence in the future offering the next "special solution" or Endurance wind turbine upgrade that comes along. We implore our customers to be vigilant as unfortunately there are companies out there who are disingenuous and do not have your best interests at heart.

We wanted to reiterate that the team at Earthmill Maintenance are constantly investigating new products and materials that come to market for the Endurance fleet. We are proud to maintain the UK's largest fleet of Endurance wind turbines and work closely with other similar service providers sharing data from over 80% of the UK Endurance fleet that is serviced between us. This allows us access at an early stage to jointly assess any new developments and once tested and approved we will ensure they are available to our customers, but most importantly only as required.

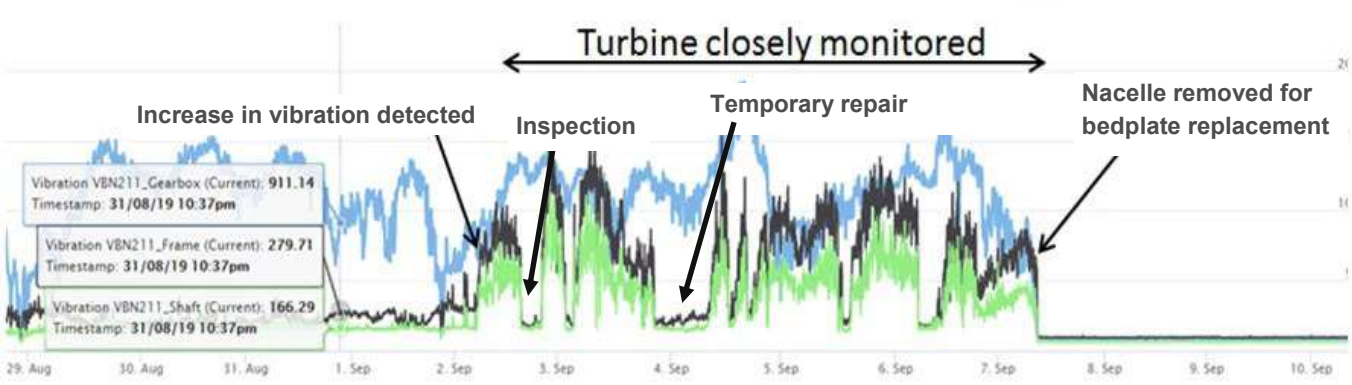
ALoMCP (relay upgrades)

All Earthmill clients with a G59 relay on their turbines have now had the funding for ALoMCP works applied for and approved to be completed. Correspondence from other companies can be disregarded.

There was a short halt to the programme due to Covid-19 but it has now resumed and deadlines have been extended by 3 months. Our electrical engineers are currently working their way around the country performing the upgrade work which should be completed on all turbines by the end of the year. There will be no charge to clients for this work as funding has been granted by the ENA.

I'd also like to take the opportunity to thank you for your continued custom. Our company values are centred on being honest and providing the highest level of customer support possible. That's why we don't take part in targeting/bothering other service providers clients as we know that's not how you win business in agriculture, it's through customer service.

If you ever have any questions about turbine upgrades, please don't hesitate to contact us. In the meantime, you can rest assured that you and your wind turbine are in safe hands and we will ensure you get the very best upgrades as and when needed.



Above: Turner MHAS Condition Monitoring detects a failed bedplate

Condition Monitoring proving valuable to clients

The role out of condition monitoring for E-Series turbines has continued to surpass all expectations. Earthmill Maintenance have employed the assistance of the system's developers Turner Icini to meet demand and help install the systems on turbines across the UK. As quickly as possible.

Around half the Earthmill Maintenance fleet has now had the MHAS monitoring system installed with more clients still signing up. It's all ready proving of benefit to turbine owners:

Drive coupling failure:

M-HAS was installed at a site near Keighley on the 4th of September 2019. Vibration levels on the generator, main bearing and bed-frame were monitored along with the turbines operational parameters. The system detected a fault developing around the start of December 2019, and alarmed due to high vibration on all accelerometers - gearbox, shaft and bed-frame.

This was a rapidly developing fault with little indication in the lead-up to failure however M-HAS was able to quickly detect this rapid increase in vibration which allowed our team to quickly shutdown the turbine. On inspection it was found that the flexible coupling on the high speed shaft had failed but that no other components had been damaged.

The M-HAS system detected the fault quickly enough for our engineers to perform an up-tower fix to replace the coupling.

Without condition monitoring the fault would have progressed and could have eventually caused gearbox and shaft failure. Early detection resulted in damage limitation, huge savings and reduced downtime.

Cracked Bedplate:

Last Autumn, another turbine in Yorkshire showed an increase in bedplate and shaft vibration which indicated a crack on the turbine's bedplate. Earthmill Maintenance was notified by M-HAS as soon as the alarm threshold had been breached. Close monitoring of these levels by Turner Iceni analysts allowed the owner to continue to run the turbine until a repair could be carried out. A temporary repair was carried out and due to the presence of M-HAS Earthmill Maintenance was able to continue to operate the turbine until the frame could be replaced.

If undetected the frame crack could have led to substantial damage to the gearbox, shaft and blades resulting in a £120k replacement of these parts and unplanned downtime of several months.

M-HAS allowed the turbine owner to operate under close monitoring prior to being shutdown for repair and therefore significantly reduced the downtime.

Seeing MHAS alarms on your newly installed system?

With new installs thresholds are set tight which means they often alarm more often in the first few months as the system finds the turbines normal operating level.

Do not be concerned about alarms when your condition monitoring system has just been installed, particularly in high winds. Turner Icini continue to monitor 24/7 and we will be in touch if we feel there is cause for concern.

X-Series CMS ready for client role out

"I would urge all X-Series turbine owners to seriously consider having condition monitoring installed"

The filtration unit (shown in silver) is fitted to the gearbox

The condition monitoring system for X-series turbines is now ready to be rolled out to Earthmill Maintenance clients.

The system uses a series of sensors to measure vibrations and proximity on key components but also provides particular focus on the gearbox.

It utilises a Hydac filtration system which monitors metal particulate in the oil passing into the filtration system. This allows the software to develop a model and pattern for rate of change, indicating when we begin to see increased degradation which could potentially lead to gearbox failure.

Other sensors allow our team to keep checks on the oil temperature and viscosity to ensure the oil is not degrading. Along with the sensor suite added to the gearbox filtration, the filter housing has also been replaced.

The new unit designed by Hydac and using technology from big wind installations allows for greater filtration capacity, whilst also removing the potentially damaging feature of filter bypass incorporated into the original design. The new dual stage system filters down to 10 mirons. A second 25 micron filter acts as a failsafe, protecting the bearings and gears from unfiltered oil if the first stage were to fail.

Gearbox failure has become a known issue for X-Series turbines. Without early intervention a failed gearbox has to be sent to Germany for repair. By catching contamination early we are often able to perform repairs up-tower meaning far less downtime and a significantly cheaper repair bill.

David Smith of the Earthmill Maintenance operations team commented "I would urge all X-Series turbine owners to seriously consider having condition monitoring installed. I understand it is a considerable investment but the benefits of early intervention on gearbox related issues far outweigh the costs of the system which is why we are installing it on all the X-Series turbines in our own fleet."

"The system has been tested on a small number of our own turbines and is currently in the process of being installed on the rest of the fleet. The data we are receiving back from those with the system installed is proving very valuable for identifying issues and mitigating risk."

"It is important when submitting meter readings that you use the reading from the generation meter as the data provided on Windsync is a useful guide but is not Ofgem accredited."

Meter readings important info:

Many turbine owners are required to periodically manually input meter readings on the Ofgem website. It has become apparent that some turbine owners are using the readings on Windsync rather than checking the generation meter itself.

It is important when submitting meter readings that you use the reading from the generation meter as the data provided on Windsync is a useful guide. Ofgem can perform audits to check that meter readings that have been submitted are accurate and therefore it is important that only genuine Ofgem accredited meter readings are input.

If physically checking your meter at the turbine is inconvenient, you can upgrade to a smart meter through your meter operator which will automatically send you your meter readings. This usually costs around £350.

Meter reset to Zero?

In recent months we have received a number of calls from clients concerned that their generation meter has reset to zero. If your meter does the same there is no need to panic. Some of the older meters installed have displays that only show up to 6 digits. Therefore after the meter reaches 999,999kWh the next reading will be 000,001kWh. Simply submit your reading as usual adding a 1 at the beginning to show that the meter has reached 1 million kWh.

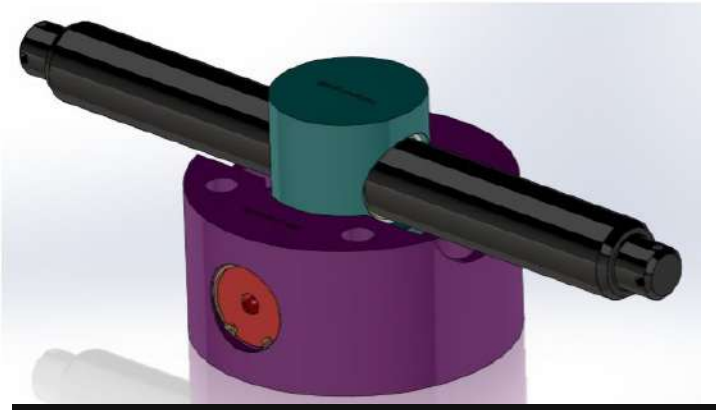
An example of a generation meter that resets to zero at 1,000,000 kWh

No Shows this Summer….

At this time of year, we are normally preparing for the upcoming summer shows. Covid-19 however has seen the cancellation of this years show calendar. Shows such as the Royal Welsh, Great Yorkshire and Driffield serve as fantastic way to catch up with clients and discuss all things relating to the wind industry. Whilst you will be missed, we'd like to remind you that if you want to discuss anything relating to your wind turbine please don't hesitate to pick up the phone and call us on 01937 581011.

Export rates update

Export rates continue to stagnate with oil prices hitting record lows in Spring and gas reserves remaining largely unused due to the global slow down caused by Covid-19. The knock-on effect of this is that recent quotes obtained by Earthmill Maintenance were as low as 3.8p per kWh. We are therefore continuing to advise our clients who are renewing their export contract to explore all options but ensure you consider the FIT export tariff which can only be paid quarterly by your FIT providers (alongside your FIT payments) and will lock in a rate of 5.5p per kWh.



Rod end fixture incorporating a pivot pin used in AEM Spring Tubes

Earthmill Maintenance launch new AEM spring tube solution

The spring tubes on an Endurance E-Series turbine act as part of the rotor overspeed protection at the base of the blade. A tensioned threaded rod regulates the pitch of the blade under centrifugal force in order to regulate the speed the rotor is able to turn. In the original Endurance design this rod is prone to fatigue failure which can result in reduced functionality, nuisance noise and even irreparable blade damage.

Some of our clients recently received correspondence from another service provider who claimed to have revolutionary new spring tube upgrade. We must stress we don't feel this is the best solution available.

The solution that Earthmill Maintenance are pleased to be able to offer has been designed by US based All Energy Management. AEM have of 30 years of combined experience working at the highest level of the wind turbine industry and a state of the art testing facility that gives the crucial ability to accelerate fatigue testing of components and systems, forecasting problems long before they occur.

An in-depth study by AEM found that the threaded rod failures occurred due to a combination of two key factors. The first is that the original Endurance design constrained rotation of the blade only perpendicular to the blade guide pin resulting in a high amount of stress passing through the threaded rod. Secondly, finite element analysis (FEA) showed the fixture that fits over the end of the threaded rod had a sharp corner serving as another point of stress.

The solution developed by AEM utilises 5 key points:

A pivot pin - A spherical bearing was first considered but proved to be excessive in the multiple axes of rotation it provides. Testing of this method showed excessive wear after only 7 months. Instead, a second axis of rotation perpendicular to the blade pin axis provides all the bending freedom necessary to protect the threaded rod from bending stresses. A rod end was devised that employs a second pivot pin perpendicular to the blade pin. Unlike a spherical bearing, a pinned bearing has a relatively large contact which provides contact stresses of less than one third of those of a similarly sized spherical bearing, helping to ensure the surfaces will rotate relative to one another even under large loads. This rotation serves to provide the bending stress relief for the threaded rod.

Self lubricating bushings - Self-lubricating bearings are installed for the female interfaces of all pin surfaces in the new rod end. These bushings employ a fibre lining with a low friction coefficient and high load tolerance and a load capacity rating at least 3 times higher than brass pins.

Flanged Rod - To further improve the ability of the threaded rod to withstand any unintended bending loads, a new threaded rod design was conceived to mate with the new threaded rod end via a forged flange. This design eliminates the high stress concentration of the existing rod design interface with the rod end.

Contained Cartridge – The new design is enveloped in a cartridge style housing. This serves to protect the blade in the event that a failure did still occur, containing the threaded rod and preventing it from firing into the blade in the instance of failure. The cartridge system is also much simpler to replace if and where necessary.

Nitride Finish - Components of the new rod and rod end concept are further improved by introducing a nitride finish to steel components. This finishing process serves several purposes including greater wear resistance, reduced surface friction and improved corrosion resistance. This finish was introduced on components utilized in the E4660 pitch system and has proven to live up to its promises in these areas of improvement.

We assess available turbine upgrades in great depth and only choose those that we feel are right for our clients and never supply anything we wouldn't use on our own turbines. If you have any questions please call us on 01937 581011.

Newest Recruits Strengthen Servicing Capabilities

A recent recruitment drive at Earthmill Maintenance resulted in 3 new additions to its team of engineers. General Manager Dave Broadbank commented “We took the decision to employ 3 new field engineers and have also invested in 2 new vans. This will help improve response and repair times by having more men & vehicles on the ground.”

Phil Gilbert has joined from another wind turbine O&M service provider and brings with him over 20 years of engineering experience.

Gary Smith comes from a background of working in electrical controls in factories and industrial premises. The systems he is used to working on employ much of the same technology as the control cabinets on Endurance turbines. He will therefore strengthen the electrical capabilities of the Earthmill Maintenance workforce.

Finally, Lee McCauley joins from the automotive sector, a skills pool that Earthmill Maintenance have successfully recruited from in the past due to the many transferable skills for the role of wind turbine technician.

If you see any of our new team members at your site, be sure to give them a wave and say hello whilst maintaining social distancing.

E-Series gearbox oil filtration reduces waste oil from wind turbines

Over time the oil in a gearbox can become contaminated. It is therefore necessary to change the oil when required.

E-Series turbines have no filtration system fitted on the gearbox. Checks are done by taking oil samples every time the machine is serviced. The samples are then sent away for analysis and a report is sent back to show if there is any contamination or degradation

In a drive to reduce waste oil produced by turbines, Earthmill Maintenances have invested in a method of refurbishing the gearbox oil up tower. This involves temporarily plumbing in a custom designed filtration rig with a special filtration element and running the system for a minimum of 2 hours to reduce particulate contamination.

Results during testing have seen oil cleanliness return to a serviceable condition. This option is now widely used within our own fleet of turbines to reduce oil usage in the wind industry.

Project Manager David Smith commented “not only does the new system reduce waste oil creating less harm to the environment but it is also significantly cheaper than replacing the oil for new”.

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Earthmill Maintenance Ltd is part of the Arena Capital Partners group