WindEnergy NETWORK

COMMUNICATION HUB FOR THE WIND ENERGY INDUSTRY

WindEnergy Hamburg 2016 Preview

WORKING AT HEIGHT

Focus on Whitby & Scarborough

Foundations

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A time of change!

No matter what your political views are there can be no argument that we are going through a time of radical change.

We are very much a company that looks to the future with the emphasis on the positive no matter what is thrown at us. It is for this reason that we have made some changes of our own.

TWO MAGAZINES TOGETHER

You will find that we have combined both our publications giving our readers the opportunity to see how each of the two sectors work together - it has been carried out in a very different way to the norm in that our Wind Energy readers will receive their printed copy with the front cover related to the wind industry and our Wave & Tidal Energy readers with the front cover related to the wave and tidal industry.

So if you wish to read the other sector's magazine you just turn it over and read from there.

CHOICE

We have found that our readers in both sectors have a common strong interest in renewable energy and therefore a passion for the future energy needs of the world. In sending out this new magazine format to both the sectors' databases we feel that it will help both industry areas communicate more and share their experiences.

FEEDBACK

Please feel free to comment on our changes – they will not be ignored!

ED'S NOTE

Please read the accompanying article which describes both sectors successfully working together already.

Duncan McGilvray
Editor | **Wind Energy Network**

Combine wind and tidal power

Atlantis, a global leader in the tidal power sector announced recently that an agreement has been reached between the company's majority owned MeyGen project and a nearby windfarm development to facilitate access to the distribution grid for other renewable energy projects.

FIRST PHASE

The first phase of the MeyGen project was recently connected to the 33kV Ness of Quoys distribution network and is on track to deliver first power in the second half of 2016. The part of the distribution network to which MeyGen is now connected is constrained, such that there is no additional capacity for other generators until wider transmission upgrade works are completed over the next few years.

UNIQUE OPPORTUNITY

However, as a result of the predictable and cyclical nature of tidal generation, there is a unique opportunity for other energy projects to gain access to the grid at those times when the MeyGen project is not generating at maximum output, thus facilitating increased generation in the near term from the area's rich renewable resources.

LOCHEND WIND ENERGY LIMITED

("Lochend") is developing a 4 turbine windfarm close to MeyGen's onshore site in Caithness, and Lochend has reached agreement with MeyGen to allow these wind turbines to deliver electricity to the grid whenever the MeyGen tidal project is not making full use of the available export capacity.

IMPROVED UTILISATION

This will result in improved utilisation of the existing grid network without affecting MeyGen's generation, and is believed to be the first such combination of a wind and tidal project of its kind in the UK. The arrangement is an important step in demonstrating the feasibility of a diverse blend of sustainable sources of generation as a long term solution to our need for clean, predictable and secure electricity, and shows the potential for optimising the use of existing grid infrastructure assets through intelligent matching of different generation profiles.

WORLD FIRST

Tim Cornelius, CEO of Atlantis, commented: *"We believe this to be a world first, and to show that the predictability of generation from the tides can also benefit other forms of renewable energy by allowing those generators to accurately forecast and access spare grid capacity. Tidal power makes for more efficient grid use and management, and we are delighted to have been able to assist a local windfarm in getting connected.*

"Sharing transmission assets in this way and capitalising on the predictability of tidal power will ensure that, in the long term, our energy needs are better served whilst also maximising access to a constrained network in the immediate future."

ADDITIONAL VALUE

"This announcement demonstrates the additional value of our secured grid capacity around the UK and the importance of tidal power as a predictable cornerstone of a diverse and sustainable electricity mix. Whilst we cannot claim tidal power is able to lend the same predictability to the current political climate, we are pleased to say that our project remains unaffected by recent events." Tim concluded.

Atlantis

Working at Height

A necessary skill in the industry with turbines getting taller and taller you need a good head for heights.

The cover image was supplied by Prontoport Ltd a company which provides independent engineering support services within the renewable energy and oil & gas sectors with 10 years' experience since their inception.

The company has been particularly active in the renewable sector and have carried out servicing and repairs on well over 50% of the UK's windfarm assets – a record to be proud of by anyone's standards.

Bureau Veritas accreditations are assurance that their team will deliver the highest levels of HSE responsibility in any of their onsite or offsite activities.

Find out more in their interesting article in our 'Working at Height' feature.

OTHER FEATURES INCLUDE…

- **Foundations** – a varied collection of articles covering the different options available
- **Simulation Training** – when safety is the most important issue training in a safe environment is paramount. Modern technology makes the experience even more realistic
- **Whitby & Scarborough area spotlight** – often thought of as 'just a resort destination' the Borough took the lead when offshore wind in the UK was in its infancy. That early decision is now reaping rich rewards.

Duncan McGilvray
Editor | Wind Energy Network

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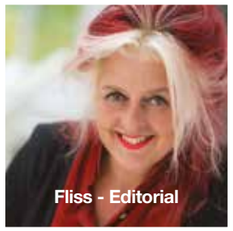
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Second Rolls-Royce designed offshore windfarm support vessel

Rolls-Royce has signed a contract with the yard Astilleros Gondan in Spain to design and equip a second service operation vessel for shipowner Østensjø Rederi. The vessel will support windfarm operations for DONG Energy.

The repeat order is for a new ship design from Rolls-Royce developed specifically to support operations in shallow waters at offshore windfarms. The order also includes an extensive equipment package.

DEVELOPING ADVANCED VESSELS

Helge Gjerde, Rolls-Royce, Director Offshore & Merchant Solutions, said: *"We are delighted that Østensjø Rederi and DONG Energy have chosen to exercise an option with Astilleros Gondan for a second vessel of our new concept. Developing advanced vessels for the renewable energy sector is a perfect way to make use of our vast offshore experience and diversify our Marine business."*

The award winning UT 540 WP was developed in close cooperation with the customer and benefits from over 40 years of UT ship design experience across 800 vessels. The new design for offshore windfarm support has a high focus on seakeeping capabilities, station keeping performance, improved comfort and safety on board and reduced fuel consumption.

BESPOKE MAINTENANCE EQUIPMENT

The first windfarm vessel contract to Astilleros Gondan was announced in October 2015 and both vessels will serve as the base for wind turbine technicians while they perform maintenance work on offshore windfarms.

A motion compensated gangway system with an adjustable pedestal will be installed to ensure safe operations and optimal uptime. The first vessel ordered will work on Race Bank Offshore windfarm, while the second will work on the Hornsea Project One windfarm, both off the coast of the UK.

ADDITIONAL SUPPLY

As well as designing the vessel, Rolls-Royce will supply the diesel electric main machinery, consisting of frequency controlled electric driven azimuth thrusters, super silent mounted transverse thrusters, DP2 dynamic positioning system, power electrical system, deck machinery and the latest generation Acon automation and control system.

Rolls-Royce Holdings plc

Success at the underwater centre

Tekmar Energy, which supplies cable protection systems (CPS) to the offshore windfarm industry, has successfully carried out a full-scale demonstration of its products at The Underwater Centre, the subsea training and trials facility based in Fort William.

OBJECTIVE

The objective of the demonstration was to prove the ability to rapidly and reliably remove a CPS without the need for divers. This is particularly key for the future as offshore windfarm projects are being installed in increasingly deeper waters where diving becomes more dangerous and costly.

With numerous offshore wind industry leaders in attendance – including DONG Energy, VBMS, Jan de Nul and CWIND – Tekmar and The Underwater Centre carried out the installation and removal of a CPS from mock-up offshore foundations.

MAINTENANCE FREE

Cable protection systems are designed to be maintenance free for the full service life of the windfarm. However, for decommissioning purposes and in order to reduce risk within the industry it is important that any equipment that is installed subsea has a proven and robust method of removal.

The Underwater Centre provided a Workclass Remotely Operated Vehicle (WCROV) which was launched from an offshore vessel and carried out the operations in Loch Linnhe.

DEMONSTRATION DETAIL

The demonstrations were carried out over a two day period in March 2016. On the first day the removal operation was performed on a mock-up j-tubeless monopile foundation, whereas the second day was reserved to carry out the same operation on a mock-up j-tube. Both demonstrations were considered successful with operations being completed considerably quicker than expected.

TESTING FACILITIES

Steve Ham, Commercial Director of The Underwater Centre, said: *"In today's market, it's increasingly important that new technologies and techniques are developed more quickly and in a cost effective way; the facilities we have on offer at the centre help achieve this by providing an alternative to having to test offshore."*

Jack Simpson, Senior Manager for Offshore Wind at Tekmar said, *"We were impressed with the extensive and realistic set up that The Underwater Centre provided. The equipment and conditions were fully representative to what would be expected offshore and the team there were extremely knowledgeable and supportive of the operations."*

The Underwater Centre is a purpose-built subsea training and trials facility and is based on the shore of a seawater lake, Loch Linnhe, well sheltered by the surrounding mountains. The centre's unique location allows it to provide year-round training and testing in an open-water environment, while still being centrally located in the largest town in the Scottish Highlands.

MARKET LEADER

With more than 30 years' experience, Tekmar is a market leader in the design, manufacture and supply of subsea cable, umbilical and flexible protection systems for the renewable energy and oil & gas industry.

Tekmar

First ever UK built offshore wind turbine blades arrive at Belfast

The first six 80 metre long blades for the 258 MW Burbo Bank Extension project have arrived at the MHI Vestas Offshore Wind pre-assembly facility in Belfast, Northern Ireland. The blades for the V164-8.0 MW turbines – which were designed, tested and manufactured at the MHI Vestas blade factory on the Isle of Wight – will be the first locally built blades to be installed at a UK offshore wind power plant.

The MHI Vestas factory on the Isle of Wight is where the unique skills and processes were developed that are necessary to produce blades on a large scale.

SIGNIFICANT MILESTONE

CEO Jens Tommerup said, *"It's a significant milestone for the industry to see the world's largest blades in serial production arriving in Belfast ready for installation. This marks the first time locally manufactured major components for offshore wind turbines are being used in the UK."*

INVESTMENT AND COLLABORATION

"Through investment and collaboration with our partners in the Solent region, we have created jobs, increased training opportunities and stimulated growth throughout the entire supply chain.

"We believe that our efforts reflect the stimulation and growth that the UK has targeted with the continued investment in offshore wind power." Jens concluded.

PROVIDING CERTAINTY AND CONFIDENCE

UK Secretary of State for Business, Energy & Industrial Strategy, Greg Clark commented: *"By building a strong, competitive UK supply chain we are creating jobs, attracting investment and providing the certainty and confidence businesses need.*

"We are committed to our world-leading offshore wind industry and now we have the first ever offshore wind turbine blades built in the UK by MHI Vestas."

FIRST BESPOKE FACILITY

Belfast Harbour's Commercial Director, Joe O'Neill, added: *"Belfast Harbour is delighted to welcome MHI Vestas and to have the privilege of handling the world's largest blades in serial production. In 2013, we completed the development of a 200,000 m2 offshore wind terminal, the first bespoke facility of its kind in the UK in order to facilitate this style of operation.*

"Supporting the growth of the renewable energy sector is something we are proud to be a part of and look forward to working with MHI Vestas to ensure the successful completion of the Burbo Bank Extension project."

Work at the pre-assembly site commenced in April 2016 and since then the first towers have been fully assembled, tested and pre-commissioned, ready for offshore installation.

MHI Vestas

NEXT ISSUE

(editorial deadline 5th September)

WindEnergy NETWORK

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Sponsored by Hughes Sub Surface Engineering

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Sponsored by Huttons Group

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PLEASE CONTRIBUTE YOUR STORIES TO THE MAGAZINE. YOUR EDITORIAL TO THE FEATURES ABOVE WOULD BE MOST WELCOME.

Windtex FEATURE SPONSOR WORKING AT HEIGHT

ROPE ACCESS EQUALS SAFE ACCESS

Phil Turner (from Windtex Engineering Limited) shares some helpful insight into a concern that affects all businesses (not only in the wind energy industry) that have engineers working at height and how he responds as a responsible business owner to this very real risk to his workforce.

STATISTICS – CHALLENGE AHEAD

Health and Safety Executive statistics for 2013 show that 31% of fatal injuries were the result of falls at height, with an estimated 750,000 working days lost from non-fatal injuries. A total reported 5713 falls from height in the UK, (HSE - slips & trips and falls from height in Great Britain, 2013) a grim warning indicating that there remains a serious occupational Health and Safety challenge ahead.

Despite numerous campaigns designed to raise awareness about the concern, working at height still remains the most common cause of workplace fatalities/injuries in the UK, costing industry tens of millions of pounds in lost productivity, sickness pay and expensive compensation claims.

WIND INDUSTRY

The wind turbine industry is no different to any other sector when it comes to the risks of working at height. As new inexperienced technicians move into this demanding workplace, standardised safety practices and the need for continuous improvements and regular reviews, has never been more crucial.

The growing use of rope access as a means of maintenance and inspections of wind turbines is no exception when it comes to working at height safety issues. When entering a wind turbine, a rope access team will initially employ standard fall arrest equipment to access the nacelle and rotor. Then using specialist ropes in the same way that they might use them to work on a chimney stack or offshore oil rig, the rope technician can make preparations to begin their maintenance task.

GETTING DOWN TO DETAIL

After connecting the double ropes to anchor points and then isolating the rotor, the technician is able to safely descend down the tower or traverse around the turbine blades using standard techniques. If this all sounds somewhat precarious, then consider how it feels to be undertaking work on Big Ben or working inside a cooled waste incinerator utilising confined space practises. All of these tasks are routinely and regularly dealt with by rope access engineers. For the well-trained and experienced IRATA rope access worker, the wind turbine holds no surprises.

TRAINING AND SUPERVISION

It is without doubt that the extremely high level of training and supervision must be continually given to the rope access workforce within wind energy companies (without compromise), this will maintain our safety record that is unrivalled throughout the working at heights industries.

WORKING TO ESTABLISHED INDUSTRY PROCEDURES

Just as rope access technicians clean the windows of the largest hotels across the world, they also routinely carry out maintenance on windfarms that are becoming increasingly more widespread on the UK landscape, both offshore and on land. They do this in the knowledge that a skilled rope technician is trained to work safely and efficiently to a set of established industry procedures. A recognised procedure that is statistically safer and not as restrictive or expensive as the use of access platforms and baskets.

Rope access is undoubtedly the way forward!

Phil Turner
Managing Director
Windtex Engineering Limited

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IT'S ALL IN THE PLANNING...

Ask yourself this question...
'Do you have the plans, resources and training necessary to preserve life, if an employee was to become injured working at height or in a remote location?'

Are you comfortable with the answer?

Appropriate Planning is the cornerstone of any company, but we are not talking about key targets, financial gain or profit margins, we are talking about people's lives.

WORKING AT HEIGHT

The nature of working in the wind industry means there is a need to work at height or operate in remote, often challenging environments, both on and offshore. Many of these environments force us to part with our safety blanket of being able to call 999 in our time of deepest need and make us responsible for carrying out our own advanced rescues.

It is standard industry practice to have emergency response and rescue plans in place, but are you truly confident they are suitable and sufficient? Remember, in the event of an incident people will be under sudden and remarkable pressure - are they relevant, accessible, clear and concise. Most of all, will they go right on the day when everything else is going wrong?

REVIEW AND IDENTIFY

It is never too early to review your current plans and identify what can be improved. To take the steps necessary to ensure that the vast array of credible scenarios have been covered. By carefully examining risk factors, contingency plans can be put in place to deal with the emergencies which will arise. You are putting yourself in a better position to be able to respond efficiently and most importantly preserve life. These are perhaps amongst the most poignant legal and ethical questions any organisation can ask itself.

DON'T FORGET THESE SIMPLE QUESTIONS...

- Are all the possible risks accurately reflected in your plans?
- Have you tested them? If so, how? Is this realistic?
- Is your rescue equipment current and fit for purpose? How do you know this?
- Is your training relevant to your risks but adaptable enough for the spectrum of scenarios?
- Are you training on purpose built facilities designed with you in mind?

REGULAR HANDS ON FAMILIARISATION

Suitable and sufficient rescue equipment needs to be to hand and people need regular hands on familiarisation along with training in advanced rescue techniques.

Ian Marritt, Service Delivery Manager at HFR Solutions CIC comments, *"Planning for incidents at height or in remote locations such as wind turbines is essential when you are considering the welfare of your employees. Training is not enough, practice in the form of exercises is an essential component in preparing to deal with an incident at height or in a remote area."*

HFR Solutions CIC

DON'T HAVE YOUR HEAD IN THE CLOUDS WHEN WORKING AT HEIGHT

More than a million businesses and ten million workers are estimated to carry out jobs at height every year. The HSE sets out guidelines and useable advice to ensure businesses and employees are clear on what the law requires. Despite this, falls remain a cause of serious workplace injuries and something that can't be ignored when it comes to protecting employees.

MINIMISING RISK

With work at height often unavoidable, it's important to assess and implement a set of good practices that minimise the risk. These range from ensuring employees are wearing the correct footwear, accounting for wind speeds when on an elevated platform, to regularly inspecting scaffold towers. Although there are overseeing guidelines set out by the HSE, most organisations choose to enhance these with their own safety precautions such as specific kit inspection or buddy systems.

RESPONSE

Of course, the first step in any safety process is preventative action, but, if an accident does occur, companies also need to have a quick and efficient emergency response in place. In many organisations, employees that frequently work at height are required to complete a two yearly working at height and rescue course. Furthermore, even before entering a hazardous site, organisations can establish a paper trail, collecting contact details or providing the necessary emergency device that maybe required.

A reliable method to protect employees is the buddy system that requires any employee working at height to be accompanied by another employee. In this case if an accident did occur, the buddy would be able to call, raise an alarm and get help swiftly. This process depends on the employees having the correct emergency contacts readily available and most importantly a guaranteed mobile signal. If this isn't the case, an alternative solution will need to be formulated.

WORKING IN ISOLATION

If employees are working at height in an isolated environment, it's likely that they won't have any signal to call for help on their mobile phone. This can be a problem even when working in pairs as if one was rendered unconscious or became critically ill how would the other person call for help or raise the alarm?

MORAL OBLIGATION

Organisations have a moral obligation to protect employees to the best of their ability. If an accident does occur, the safety measures don't end there, as it's also the amount of time it takes to raise the alarm and the response time to an incident.

With the appropriate communication infrastructure in place for the specific environment employees are working in, the process can be quick and efficient, ensuring the safety of all workers and the business.

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EXPERIENCED PROFESSIONALS

Prontoport have been providing independent engineering services to the owners and operators of windfarms both on and offshore since 2006.

Accessing the components inside the nacelle for routine maintenance and repairs is essential, the company's rope access teams also require access to the external parts of the turbine tower and blades to carry out inspections and repairs. You might hear that rope access is a safer alternative to working at height. When it comes to wind turbines however the rope access technicians use the ladder and fall arrest system on the way to the top of the WTG before they use their rope access kit.

One of the greatest risks identified operational phase of a windfarm project has been identified as working at height. The Health and Safety Executive published statistics for 2013 that showed that 31% of fatal injuries were the result of a fall from height.

REGULATION

Working at height in the wind industry is regulated. All technicians before they are permitted to work on a wind turbine must be certified by Renewable UK / GWO. The course has been developed in consultation with industry representatives, OEM's & training providers. Its objective is to ensure that everyone working on wind turbines can demonstrate the same level of competency.

ISO ACCREDITED TRAINING ACADEMY

The basic working at height standard doesn't specifically cover hub access/rescue, or the entry into blades. Hub access training is not a mandatory but at Prontoport they understand the risks in working at heights, in confined spaces, with high voltage electrical equipment, on high pressure hydraulic controls on large rotating machines. Every Prontoport technician attends this course at their multi ISO accredited training academy.

The company's clients; MHI Vestas, Siemens, Eon and SPR know that they can take on almost any inspection, service, maintenance or repair job. By using experienced technicians, providing world class training and the very best equipment clients know that their assets are in safe hands.

COMMITMENT

As a business the company's commitment to training and safety has led to a 100% safety record. Their Bureau Veritas accreditations are assurance that the team will deliver the highest levels of HSE responsibility in any onsite activities.

Prontoport

ADVANCES IN REMOTE SENSING & MONITORING

A key factor in allowing wind turbine owner operators to make decisions on the running of turbines is the data availability real time. The ability to make crucial decisions on maintenance should be based on accurate sensor data measurements.

Sensor data as connected to turbine gearboxes and generators, bearing systems and shafts allows the measurement system to send data to remote location servers which in turn perform runtime algorithmic calculations and make automated system level decisions and inform staff on these decisions.

By example gearbox deterioration or 'wear' through mechanical issues and oil characteristic changes are measured and predicted real time. The measurement of ferrous and non-ferrous metal particulate gives the system a clear indication of a failure progression.

Wear debris measurement sensors get typically installed between the off line pump and filter on the gearbox and in effect this makes the filtration system metal content quantifiably measured and when the particles within the oil lubrication system are quantified and sized this information is collated or 'fused' with other sensor parameters and a clear indication emerges on the overall gearbox condition. Other sensor data is collected and analysed at the same point in time allowing improved machine health decisions to be made.

TECHNOLOGY SELECTION

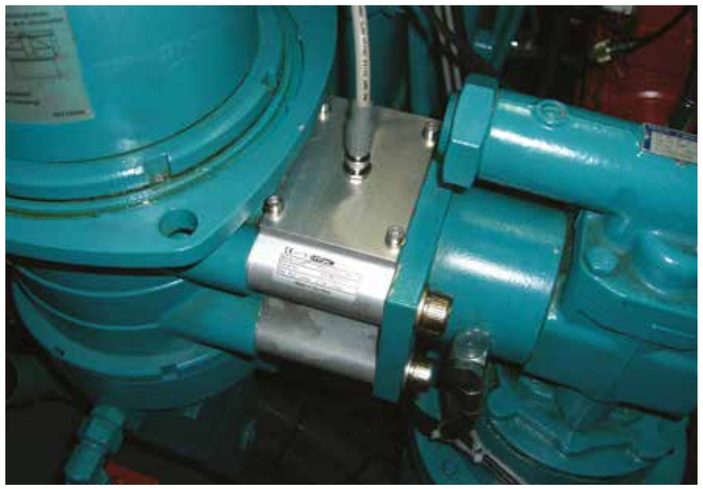
The M-HAS system allows the data from multiple sensors to be collected, presented and processed showing the operator immediate issues or concerns on individual turbine systems.

The adjacent list shows the type of multi sensor data that are frequently used to determine an improved picture on the health of the machine…

- Oil condition and indications on changes in oil due to moisture, changes in viscosity and cleanliness
- Gear and shaft vibration levels at critical points such as the bearings and the gearbox gears
- Mechanical wear through metallic debris in oil for bearings and gears and showing the increase in counts with a progression of machine fatigue wear
- Generator measurements such as temperature and vibration

SPECIFICATION

Instrumentation is selected fit for purpose for measurement and collection of data which when Turner staff analysed in time provide a solution to identifying the customer's problematic plant issues and servicing needs. These instruments also are typically performance proven sensing technologies and were introduced into the system for ease of installation and integration.



Hydac Installed Sensor measuring wear metals in oil – inserted between the system pump and filter

TAILORED SOLUTION

The correct approach for any cost effective and data efficient system is to provide sensing capability to measure and monitor the critical asset parts with enough data sampling to give an accurate picture of the machine condition. No data redundancy is ensured with this tailored type instrument selected approach.

The M-HAS collects data real time and displays on a customised dashboard. The sensor types connected to the asset in the field provide critical data to the system and when the user connects to the system status indicators show immediate notifications and alerts.

FEEDBACK METHODS

The monitored system collects data on the server and runs sophisticated algorithms to summarise and determine the machine health statements. From acquiring and calculating these they are available to download in various formats and displayed on the machine dashboard for the client. The feedback methods can be set up to offer SMS text responses or email and either automatic or by the user logged into the site.

The system data when collected was then used to trigger detailed inspections of the turbine by way of either system automated or user generated fault reports. These typically get emailed to asset managers and operators and are easily read from laptops and portable devices.

Turner analysts provide detailed reports on findings from inspections to the customer and offer services and repair of the faulty system components.

TURBINE DATA VALUE

The sensor data when collected on the turbine and processed through the M-HAS system will be summarised into operational and conditional 'health' statements. A historical trail of information from these sensors will show passive or 'normal' requirements such as optimum servicing to be identified (for example the need for an oil change) as well as dynamic and typically fault driven changes such as gear or bearing wear due to weather related damage. In turn these planned and unplanned system statements and notifications allow operators to plan, adjust and operate the individual turbines in accordance with their condition.

Simon Lorenzo, Turner Data Analyst explained: *"We have found the system when installed, adapted quickly showing a performance baseline or Health statement. This was typical with many turbine system installs and also applicable with many other industrial applications within Turner.*

"The system creates data that clearly shows a maintenance cost saving due to unplanned repair and significant downtime there in. It has shown uptower and insitue repairs versus gearbox replacements and the hundreds of thousands in cost associated.''

CONCLUSIONS

With the increasing development of real time sophisticated sensors and low cost communications methods that can be readily installed into machines and turbines, data collected and from multi sensor information makes more customised approaches possible within budgets for operational expenditure.

This can ensure that the owner operator maintains premium operational performance with minimised downtime and unplanned outages. The new 'tools' offered within M-HAS for feedback methods ensuring that the asset health or useful life can be maximised.

Simon Lorenzo - Data Analyst
Turner Wind

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SENSORS MAXIMISE WIND TURBINE PRODUCTION

Gill Instruments and Gill Sensors & Controls design and manufacture a range of specialist measurement devices including ultrasonic anemometers and oil condition monitoring sensors. The products use ultrasonic, capacitive and inductive technologies to profile possible wind energy sites and increase the efficiency of installations.

The products are installed in wind energy applications world-wide to provide data used for wind profiling, turbine efficiency, gearbox condition and to ensure overall long-term reliability is achieved.

ADVANCES IN CONDITION MONITORING

Profitability of windfarms is based on a number of factors including; accurate wind power predictions, maximisation of wind resources and is largely dependent on efficient operation and maintenance of wind turbines, with drive trains being a major focal point for maintenance issues.

The most common causes of bearing and gear failure within wind turbines are mechanical wear, overloading, assembly/manufacturing faults and lubrication degradation. These can cause a build-up of metallic debris in the lubricating oil which can lead to major catastrophic machine failure.

The company, have developed an oil condition monitoring sensor for wind turbines which significantly increases uptime, reduces operating costs and avoids catastrophic failures – which on an average megawatt class wind turbine could cost anywhere from $225,00 to $300,000 to remediate.

EARLY INVESTIGATION AND PREVENTATIVE MAINTENANCE

Being able to detect the type and quantity of metallic debris enables early investigation and preventative maintenance to be undertaken. The company has the technology from their first generation of oil debris sensors to produce an advanced device that alerts machine operators of debris in the oil at the earliest possible stage to prevent mechanical failure. The oil condition monitoring sensor, which uses both induction and capacitive technology, provides a continuous, real-time indication of potential maintenance issues.

The sensor works by using powerful magnets to capture both fine debris (wear particles from bearing and gears) and coarse debris (failure parts of bearings, sheared teeth and parts typically 0.5 mm² upwards). An inductive coil within the sensor probe and Gill's innovative electronics enables the sensor to differentiate between the debris types and report on two separate channels.

REAL-TIME ANALYSIS

The sensor provides real-time analysis as it collects ferrous debris directly from the lubrication system. The sensor's voltage output increases when debris is detected on the magnets indicating an event has occurred. Operators are alerted of this change via the sensors output data reading, prompting an inspection to check the condition of the bearings and gearbox.

Furthermore, the sensor also offers a third channel providing the additional functions of oil temperature measurement or a change in oil dielectric, which will indicate either water contamination in the oil or loss of oil, giving operators even more insight into the health of the gearbox and two additional causes of component failure. When the condition monitoring sensors are properly implemented they significantly increase uptime, avoid catastrophic failures and deliver a low cost of ownership by helping to maximise wind turbine efficiency and reduce maintenance overheads.

ULTRASONIC ANEMOMETERS

In addition to wind turbine gearbox maintenance, efficient optimisation of the wind power is also a key factor to increasing profitability for owners and operators. Gill (Gill Instruments) has designed and manufactured ultrasonic anemometers used within the industry for over 20 years. The solid-state instruments are chosen as they are low maintenance, have long term reliability and because they are highly accurate and have an instantaneous response to small changes in wind speed and direction.

The company offers a range of options with many different features including networking, heating and some are tested to Measnet standards IEC 61400-12-1:2005.

The output power and cost effectiveness of wind turbines is crucial, as windfarms are financed on the basis of a return on investment. This is strongly influenced by the amount of wind available and calculations are based over a prolonged period of time to determine on how much wind is available all year round. Any errors in these predictions can have an enormous effect on the output power and viability of any site. Therefore, accurate wind profiling, optimising efficiency and reducing maintenance are critical to the success of wind energy installations.

COMPREHENSIVE AND ACCURATE WIND PROFILE

To calculate wind in the area, large profiling towers are erected with anemometers mounted at varying height. Gill 3D WindMaster's have been networked into numerous sites to provide a comprehensive and accurate profile of the wind. The sensors profile wind within the site record data on horizontal and vertical wind components and the data is used to calculate whether a proposed site is suitable for wind energy generation. The company's anemometers offer high data output rates of up to 32Hz, which is validated via an automatic data quality message so users can have confidence that the data can be trusted.

Maximising the output power from turbines is extremely important to the efficiency of windfarms, so ensuring turbines are facing into the direction of the wind maximises efficiency. Gill 2-axis anemometers (WindSonic, WindObserver) are usually installed on the nacelle and perform a key control function in positioning the nose cone. Data from the anemometer helps direct the turbine into the wind and verifies the efficiency output of the turbine relative to the wind conditions.

CHALLENGING ENVIRONMENTS

Onshore and offshore wind energy locations can be challenging environments so Gill anemometers are tough and reliable with little or no maintenance. The solid-state designs achieve a longer service life than mechanical instruments and with no recalibration required, which reduces downtime and maintenance costs.

The products are extensively chosen for projects in the wind energy market due to their high reputation for quality, easy installation and confidence that the data will help improve the efficiency.

Gill Instruments

WORLD FIRST WIRELESS REMOTE MONITORING SYSTEM FOR BOLTED JOINTS

For the first time ever it is now possible to implement true continual remote monitoring of bolted joints with wireless transmission of data.

As wind turbines increase in size and their locations both on and offshore become increasingly remote, maintenance and safety checks are requiring increasing resources, growing in complexity and as a result becoming increasingly costly.

REVOLUTIONISING MAINTENANCE REGIMES

An award winning British invention however is set to revolutionise maintenance regimes particularly where important bolted joints are difficult to access because of location or operational environment.

The system, which has taken over five years to research and develop, is capable of automatically monitoring bolt preload over extended periods of operation. If the preload drops below a pre-determined level, a report will be automatically sent via email or SMS to key stakeholders. This ensures maintenance is only conducted on bolts requiring attention and allows immediate action to be taken on bolts installed in mission critical applications.

SPECIFICATIONS

Each monitored bolt contains micro instrumentation, a coin-cell battery and a wireless transmitter. The instrumentation periodically reads bolt tension, critical to the integrity of the joint, wirelessly transfers the information to a local transceiver, which collects the data from any number of bolts and then transmits the report via the internet, or GSM network, to a secure server. Dependent on the frequency of data transmission, the battery should provide up to 5 years of continuous unattended operation.

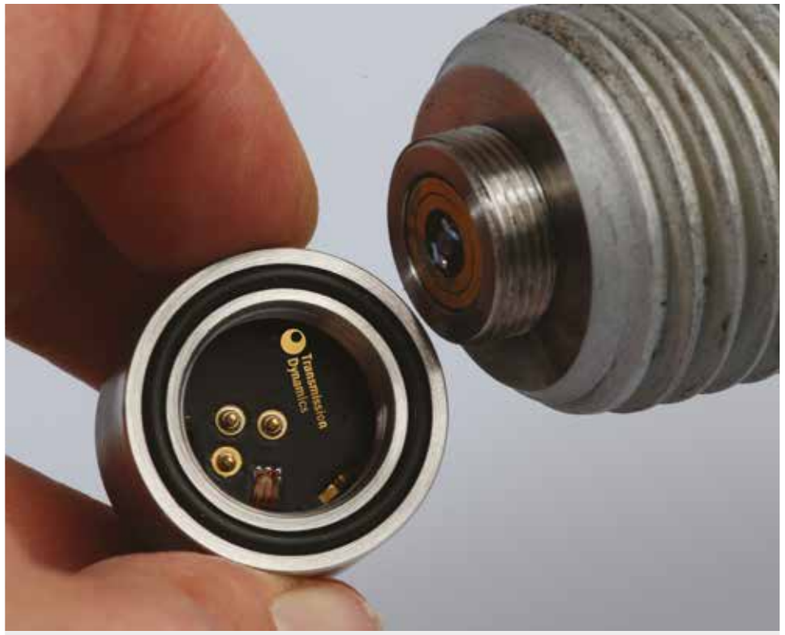
The system is the product of technology and thinking of two UK companies, combining established RotaBolt tension measurement bolting technology from James Walker with state of the art instrumentation and data automation from Transmission Dynamics.

INDUSTRY DEVELOPMENT

Whilst originally designed around the needs of the wind energy industry to potentially allow monitoring of all the important bolted joints in an offshore windfarm from your desk or a single mobile phone, the system has also attracted significant interest from industries as varied as rail, nuclear power and offshore oil & gas, where similar issues of carrying out checks and maintenance in remote or hazardous locations is a costly and time consuming activity.

ADDITIONAL BENEFITS

Outside the obvious benefits to maintenance programmes, operators and manufacturers of turbine structures and key components are also being attracted to the monitoring system for its capability to provide data which can indicate the behaviour of other components; for example the chance to gain an understanding of the stresses and forces at work on blade roots and turbine tower joints under different loads and wind conditions -all from the comfort of a desk without the need to install, maintain and check specialised monitoring equipment on site.

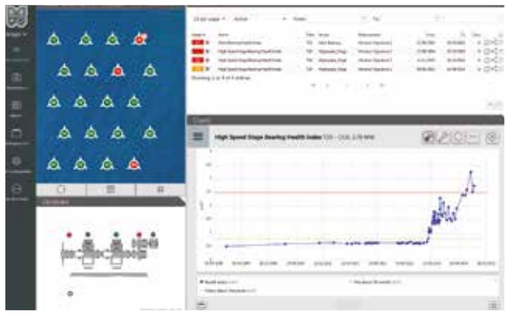


James Walker

LOW-COST CONDITION MONITORING FOR WIND TURBINES

A few years ago, the benefits of condition monitoring systems (CMS) were being debated strongly and many operators were unsure whether to retro-fit CMS.

Thankfully, the technology has now become widely accepted – the industry has recognised the benefits and CMS is here to stay. However, there are still some big challenges that need to be overcome.



MAIN BENEFITS

The business case for CMS is complex, but ultimately boils down to three main benefits…

1 Catastrophic failures can be avoided
2 Crane costs are minimised by combining operations
3 Downtime is reduced; improved annual energy production

Quantifying these benefits is possible by looking at previous detection examples, failure rates and cases where money has been saved through the early detection of faults. ROI models of varying complexity can be constructed based on this information and used to help in the decision making process.

SUBSTANTIAL COSTS

The technical benefits of CMS are very clear, but windfarm owners and operators still face big challenges when it comes to justifying the ROI to their senior management. The fact of the matter is that the cost of most CMS products available today is just too high and therefore the majority of onshore turbines still don't have CMS installed.

Recent figures show that in the US, in the sub-1.5 MW range, over 95% of turbines do not have CMS installed [source: MAKE Consulting, 2015]. In the 1.5 - 2.29 MW range, the majority of turbines (59%) still do not have CMS. Only for larger machines of 2.3 MW+ is CMS the norm; installed on over 91% of turbines of this size – mainly driven by factory-installed systems such as on the Siemens 2.3 MW. Similar trends are observed in Europe, the main difference being that CMS is installed as standard on all new offshore machines, typically above 3.6 MW.

MAKING CMS MORE AFFORDABLE

One solution to deploying condition monitoring more widely is to make it more affordable – exactly what Romax InSight has done with ecoCMSTM. In recent years much has changed in the field of CMS and data acquisition. The idea of putting 'intelligence' in the data acquisition box or in the sensors has proved to be unnecessary – this drives up cost and the limitations on data storage and transmission are not relevant these days.

Also, the explosion in embedded computing means that high performance systems can be deployed at very low cost, particularly compared to other systems in the market – most of which are based on outdated and expensive approaches to architecture.

ADDITIONAL CONSIDERATION

Another factor that has hindered CMS is the ability to detect faults in low-speed components such as the main bearing and planetary stage. Many condition monitoring systems from other vendors struggle to detect these failure modes.

To detect these types of faults, a system needs to use suitable sampling parameters and the analysis software needs to use appropriate signal processing methods, tuned to the specific application – not as simple as it sounds. Although much of the mathematics dates back to the 1960s, using it effectively requires a deep understanding of the application and its operating conditions.

For wind turbines this means gaining experience through many years of condition monitoring and data analysis – in Romax's case, years were spent refining these methods and now Romax monitor over 3.5 GW of assets globally, with access to a huge database of faults and failure modes.

ECOCMS TRACK RECORD

Track record is important – ecoCMS has been installed and proven on many different turbine types including Vestas V80, Siemens 2.3 MW, GE 1.5 MW, Vestas V52.

Figure 3 shows an example of a main bearing during flushing by Romax.

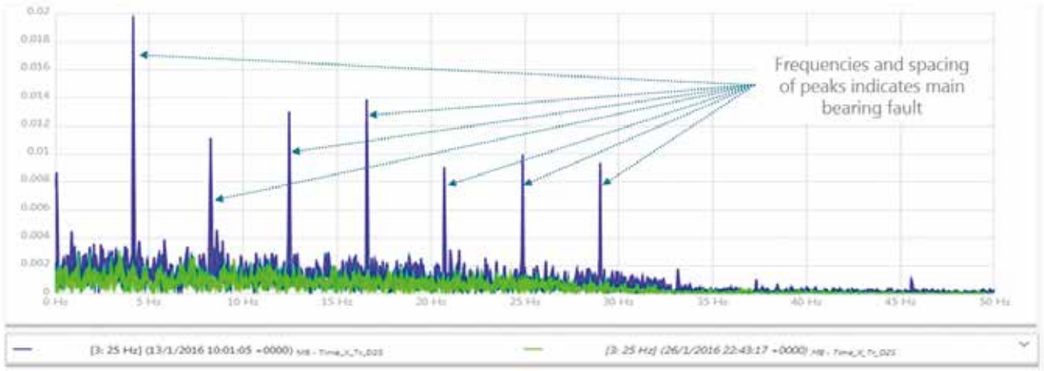


Figure 2 shows an example main bearing fault detected on a GE 1.5 MW using ecoCMS and Romax InSight's Fleet Monitor software.

OPTIONS FOLLOWING DETECTION

When main bearing damage is detected, the operator generally has three options…

1 Continue running the turbine and monitor the damage
2 De-rate the turbine and schedule repair
3 Stop the turbine and replace the main bearing

In the first two scenarios, the turbine continues to run and debris from the damaged bearing typically accelerates the failure – pieces of metal from the damaged bearing surfaces are retained in the grease and pass between the rollers and raceways. This causes further debris indentations and surface-initiated damage which causes more debris to accumulate.

The only way to overcome this problem is to remove the grease, but simply 'purging' grease by pumping fresh grease into the bearing is not effective and does not remove debris in the pockets between the rollers.

A much better solution is to flush out the contaminated grease and repack the whole bearing with fresh grease. Romax developed and patented a unique process and equipment for grease flushing, which has proved to be highly effective for extending main bearing life.

SUMMARY

In summary, CMS is an extremely powerful tool and has proved to be a sound investment for a huge number of multi-megawatt wind turbines. Romax Insight has developed an affordable ecoCMS in order to enable CMS on a wider variety of windfarms and turbine types.

People talk a lot about CMS hardware but, as we have seen in the examples above, the software and analysis methods are equally important when it comes to detecting faults. With solutions like these in place, operators can finally maximise the benefit from CMS without breaking the bank.

Dr John Coultate
Head of Engineering Development
Romax Technology Ltd

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EDITOR INTERVIEWS

ONE-STOP-SHOP

FOR OFFSHORE GOODS AND SERVICES

We met up with Alex Taylor, Managing Director of the Huttons Group, the UK's leading supplier to the maritime industry, at their offices in Hull.

The Huttons Group has been in the maritime and shipping sector for almost 200 years and their history has been concentrated on supplying goods and services to vessels coming to and leaving the UK. They recognised the potential of long term business serving the needs of the offshore wind industry some time ago. The Group have been serving the needs of the oil & gas industry and many of their customers were getting involved in the offshore wind sector. It therefore made sense to follow that lead and take advantage of the opportunities which presented themselves.

SERVICES

With offices in many areas around the UK their main focus is on large vessels and projects with experience of supplying oil tankers, cruise ships and ferries with 95% of their offshore business coming out of their offices in Aberdeen.

Other offices and facilities' locations include…

- Middlesbrough
- London
- Gt Yarmouth
- Edinburgh
- Pembroke
- Lerwick

The supply of provisions and consumables at first comes to mind however there is a bit more to the organisation than that as they also supply maintenance equipment and materials as well as logistics expertise. They have warehouses for storage and can manage a client's needs for spares as an example.

PERSONAL BACKGROUND

Alex's family has been involved in the shipping industry for generations whether going to sea or working in ports. A distant relative by the name of James Bell who worked in the timber industry was responsible for the move into the ships chandlers' trade – a young and very shrewd man who managed to raise considerable finance from banks both in Norway and the UK to purchase a sailing ship. Quite an achievement circa 1885 with very little in the way of communication at that time.

With another member of the family being a grocer the business emerged from that point.

Alex was trained at Trinity House Navigation School in Hull, went to sea as a cadet at 16 with the Royal Fleet Auxillary and trained in both the Merchant and Royal Navy disciplines.

BUSINESS OPPORTUNITY

In 2000 an opportunity arose for Alex and his father to take over at Huttons, which was even back then a long established leader in the UK ship supply industry. Alex ran the business in partnership with his father who retired in 2007 and has been the Managing Director since then.

With Alex's experience in the marine sector, specifically being a trained and qualified Navigational Officer working at sea for 6 years, means that he understands life at sea and the stresses and strains which goes with it and can therefore relate to his clients and customers requirements.

WIND INDUSTRY SPECIFICS

When drawn on the differences between being involved in the maritime sector generally to that of our industry Alex relayed quite an interesting scenario which we had not come across before.

Alex explained that seamen who are used to travelling at sea all year round accept the difficulties in sourcing particular goods and services – they have lived with those situations and continue to live with it!

The offshore wind industry has however had to employ largely shore based workers and technicians who expect and demand the sort of goods/specific brands and services they have experienced wherever they have been based onshore.

This throws up challenges and has brought the supply industry to new levels of service where goods and services have had to meet those demands… wherever possible of course.

Alex has however taken this in his stride and likens the service to the cruise market in which the company is experienced, so is very happy to further develop and embrace future industry requirements.

INDUSTRY PROGRESS

From Alex's point of view he has seen a rapid change in the last few years in that the industry has matured, become more professional, more hi-tech, more organised and the use of better equipment built specifically for the purpose. The influx of companies operating in the oil & gas industry with their experience over decades has also helped enormously.

WORKING TOGETHER

One message that Alex would like to get across is that he wants Huttons to work in partnership with his clients and customers to provide a one-stop-shop to meet their requirements.

Many vessel operators have in the past sourced individual goods and services from many individual suppliers giving the operators logistical nightmares at times. Alex explained that Huttons do all that for them so that all they need to do is make one phone call and they can be assured that their needs will be satisfied.

Huttons can supply a full range of products, provisions and consumables, arrange transport and logistics and therefore when clients are working to tight deadlines and timeframes they can deliver in one hit in any place throughout the UK at any time 24/7 and 365 days a year.

Huttons Group

WEN INTERVIEW

Duncan McGilvray - Editor
Wind Energy Network

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GREEN PORT HULL

EAST YORKSHIRE BUSINESSES CAPITALISE ON SIEMENS SUPPLY CHAIN

Over £1billion of capital investment is currently underway in Hull and the East Riding, following the decision by Siemens, the world's biggest engineering company, to create a £310m offshore wind turbine blade manufacturing facility in Hull.

With joint investment from Associated British Ports (ABP), the site is making good progress, with completion on schedule for early 2017. But what does this key investment mean for local businesses?

SUPPLY CHAIN

Hull and the East Riding is home to a broad range of businesses with renewable energy support capabilities, including engineering, fabrication, logistics, vessel operation and charter, ship build and repair, turbine maintenance, and port and portside services. To access opportunities in Siemens' supply chain, many companies have utilised the support offered by the Green Port Growth Programme.

INVESTMENT

With an investment of over £25m, the Green Port Growth Programme is supported by the Regional Growth Fund and is designed to capitalise on renewable opportunities. It develops indigenous business growth within the renewable sector, securing long-term economic growth for the region.

The programme, developed by Hull City and East Riding Councils and private sector partners, provides continual support to help local businesses recognise and embrace potential opportunities within the renewables sector. It also assists Siemens by identifying suitable manufacturing companies capable of supplying a range of wind turbine blade production equipment.

HULL FIRM WINS £750K CONTRACT

Thanks to the Green Port Growth Programme, Hull-based Turner Timber Frames won a £750,000 contract with Siemens. A family-run business with 30 years' experience in the construction industry, Turner Timber Frames manufactures bespoke timber-framed houses, roof trusses and engineered floor joists. The company won the contract to build elevated platforms around Siemens' wind turbine blade moulds – which will be created at its Hedon Road factory, just a mile away from Alexandra Dock.

Malcolm Turner, owner of Turner Timber Frames, explains: *"We gained funding through the Green Port Growth Programme to boost our marketing efforts, enabling us to launch a website and print some literature, to showcase what we do. This was followed up with advice on how to access supply chain opportunities, resulting in a direct introduction to Siemens. Green Port Hull put our name forward to them, as they were aware of our design, engineering and manufacturing skills.*

"Going forward we hope to work with Siemens to maintain and adapt the platforms to match the needs of Siemens in this innovative field. It may be we look to have dedicated members of staff for this role as it develops."

LOCAL CONTENT

Anthony Granville, Siemens Hull Senior Project Manager, said: *"We have said consistently that we are committed to using local suppliers, wherever possible, and this is another example of delivering on this pledge. We're delighted that a small, family business, based so close to the blade factory site on Alexandra Dock, has won a valuable contract to be part of both our training programmes and production operations."*

A team from Turner Timber Frames visited the Siemens blade factory in Aalborg, Denmark, to see the wooden platforms in action in order to recreate the design back in the UK. Working closely with Siemens and the supplier in Aalborg – who had previously installed 70 of this type of platform – the team at Turner Timber Frames was able to clone the product.

CONTINUED...

COMPOSITES TRAINING CENTRE

Training platforms at the Hull College Composites Training Centre and the Shed 3 facility (the training area on Siemens' Alexandra Dock site) will replicate Siemens' blade factory where the platforms will be used to access the wind turbine blade moulds. The first wooden platforms were delivered to the Hull College Composite Training Centre in March for the 10m tip end mould and 6m root end mould. Also a set of training platforms consisting of two platforms of nearly 50m and a tip end of 15m.

In terms of power generation, Challenger Handling has provided handling equipment for Siemens' manufacturing facility at Alexandra Dock, as well as food handling equipment for biomass systems and a raw material infeed system for a CHP plant. The company also provides equipment for materials recycling across the world.

RECYCLING INDUSTRY EXPERIENCE

John Sanderson, Sales Manager at Challenger Handling, explained: *"We've been involved in the recycling industry for many years and, with the development of renewables projects in the Hull area, it made sense to expand our capabilities and move into this new sector. Our first move was to invest in new equipment, which meant expanding and modifying our premises. The Green Port Growth Programme gave us a grant for this work, which also included making our building energy efficient.*

Malcolm Turner, left, and Helen Turner, of Turner Timber Frames, with Anthony Granville, of Siemens, at Hull College Composites Training Centre

Image: Hull Daily Mail

The platforms for the full-sized moulds have been designed and the team has flown out to Aalborg for a seminar with Siemens and the other trades involved in the blade factory for the smooth integration of all parties during the install phase. Work has started on the first of the six 80m long blade factory platforms.

THIRD SIEMENS CONTRACT WIN

Challenger Handling is another local business that has utilised the support of the Green Port Growth Programme to access its third contract with Siemens to supply one-off pieces of engineering equipment, worth in the region of £70,000.

Designing and manufacturing specialist equipment for the recycling sector, from hydraulic cylinders and balers, to roller conveyors and IBC reconditioning, Challenger Handling wanted guidance on how to access the emerging renewables industry in East Yorkshire. The assistance gained from the Green Port Growth Programme spans financial and advisory, with grants enabling the business to expand its capabilities and achieve ISO 9001.

"The advice and guidance given to us has been incredibly valuable. The Green Port Growth Programme made us aware of the renewables scene in the region and potential opportunities. They put Siemens in contact with us earlier this year and, so far, we've won three contracts to manufacture handling equipment for the factory in Hull. Siemens also required ISO 9001, which the programme helped us gain.

"Hopefully we will tender for more work with Siemens and become involved with new, proposed energy projects in the area."

Green Port Hull

Click to view more info

EXPANSION OF DEVELOPMENT TEAM TO SUPPORT BUSINESS GROWTH

SeaPlanner, the industry-leading marine management solution provider and part of the SeaRoc Group, has announced the expansion of its team of developers to meet the needs of its growing project portfolio.

Since the start of 2016, the group has significantly increased its development team with the hiring of three new software developers and two new test analysts. The recent additions further strengthen the capabilities of the business to provide the most advanced and cohesive solutions for the industry, and maintain its leading position in the market.

CONTRACT WINS

The news follows the recent announcements of the company being awarded two significant contracts. In April, Dong Energy selected the system provider for their Marine and Helicopter Coordination Centre, acting as a centralised hub for their UK offshore wind portfolio. In May, it was then announced that SeaPlanner had been awarded the contract to provide the Vessel and Traffic Management System (VTMS) for the Rampion offshore windfarm off the Sussex coast.

EXCITING GROWTH PERIOD

Roy Dempster, SeaPlanner Technical Manager commented: *"We're thrilled to welcome 5 new developers to the team during this exciting period of growth. The continuous development of our software and the increasing demand from clients for more complex and integrated solutions led us to look for additions to the team that would fit with our strategy for innovation and first-class service."*

The company continues to focus on client satisfaction and is dedicated to providing solutions that fit the needs of the market, today and in the future. This growth of the development team enables the company to be prepared to meet the needs of the industry as it continues to evolve.

SeaRoc Group

Click to view SeaRoc

Click to view SeaPlanner

ALWAYS WITH THE BREEZE

SMOOTH OPERATION OF TURBINES WHATEVER THE WEATHER...

Wind turbines are operated across the world, often under unfavourable conditions and extreme temperatures - arctic cold, tropical heat, storms and seawater – these environmental conditions all impact on the efficiency and performance of the turbine, and can challenge the operational functionality of components resulting in increased maintenance efforts and high costs.

Many problems however can be avoided by using a lubricant that is suited to the particular friction point and its operating conditions. Speciality lubricants designed for operation at low temperatures will ensure the wind turbine works across a wide temperature range.

GETTING THE GEARS GOING IN COLD CONDITIONS

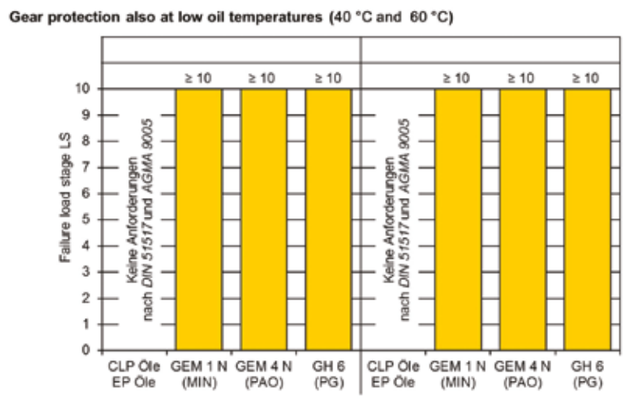
As wind turbines are out in the open and subject to the seasons, the gearboxes therein, unlike industrial gearboxes, require high-performance gear oils which include additives suited to the requirements of the material combinations and loads. Modern high-quality gear oils with additive technology comply with FZG test requirements even at low temperatures to ensure that gears are reliably protected against tooth and bearing damage.

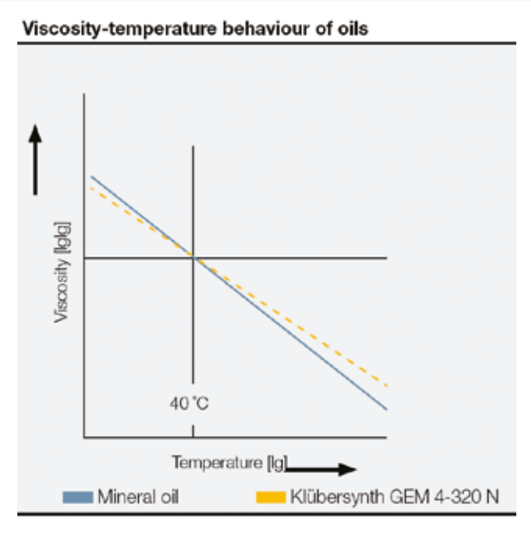
Gear oils from Klüber Lubrication consider the gear and the lubricant components, as well as the advice offered by suitable test methods.

At low temperatures during start-up gear oils are often heated to overcome high viscosity and ensure safe lubrication of components. Once heated the gear oils must deliver a continuously high-performance until the required service viscosity is reached, whilst avoiding overheating and the resulting oil damage.

An important requirement in the development of Klübersynth GEM 4-320 N was low residue formation and good filterability. Comprehensive tests performed together with the oil filter manufacturers showed that filtering installations were not damaged, even at low temperatures and with high oil viscosities.

As the temperature changes, so too does oil viscosity in a non-linear way - the oil becomes thinner with increasing temperatures, while it becomes more viscous as temperatures decrease. The viscosity index (VI) describes the oils viscosity - the higher the viscosity index, the smaller the viscosity change of an oil at fluctuating temperatures.





Klübersynth GEM 4-320 N from Klüber Lubrication covers a wide temperature range without VI improvers.

Operators of wind power stations should use synthetic gear oils with a high viscosity index (VI) exclusively to ensure the load-carrying capacity of the oil is sufficient during cold starts and to cover a wide temperature range.

KEEPING THE BEARING ROLLING

The characteristics of a lubricating grease change depending on the load and temperature conditions. Wind turbine bearings are often operated at very low operating temperatures, sometimes even below the base oil's pour point, which may therefore affect functionality. The generator and main bearings of a wind turbine can heat up during operation; however the exposed pitch bearings are subject to low temperatures, almost the same as the ambient temperature.

The anti-wear behaviour of lubricating greases in rolling bearings subject to small oscillating rolling and sliding motion can be determined on the SNR FEB 2 rolling bearing grease tester, or "false Brinell test" as it is also known since the wear pattern resembles the indentation caused in the Brinell hardness test.

In this test an axial load of 8000 N is applied, corresponding to a Hertzian pressure of 2100 N/mm2, with a frequency of 24 Hz and oscillating ± 3° angle with a test duration of 5 or 50hours.

Klüberplex BEM 41-141 was tested at ambient temperatures, resulting in less than 5mg of wear, and at -20°C, resulting in less than 20mg – both excellent values, which many other lubricants on the market do not attain.

...and whatever the application

SNR-FEB 2 rolling bearing grease test results

COMPETITOR PRODUCT 1:
Wear limits were exceeded so test had to be stopped after 13.5 hours.

COMPETITOR PRODUCT 2:
Wear limits were exceeded so test had to be stopped after 39.6 hours.

KLÜBERPLEX BEM 41-141:
Attained maximum run-time of 50 hours.

Temperature behaviour depends on the base oil used, which is why viscosity index improvers are often used to increase a base oil's viscosity index, however VI improvers in gear oils have their disadvantages, with the polymers used becoming sheared over time, leading to viscosity loss and reduced load-carrying capacity.

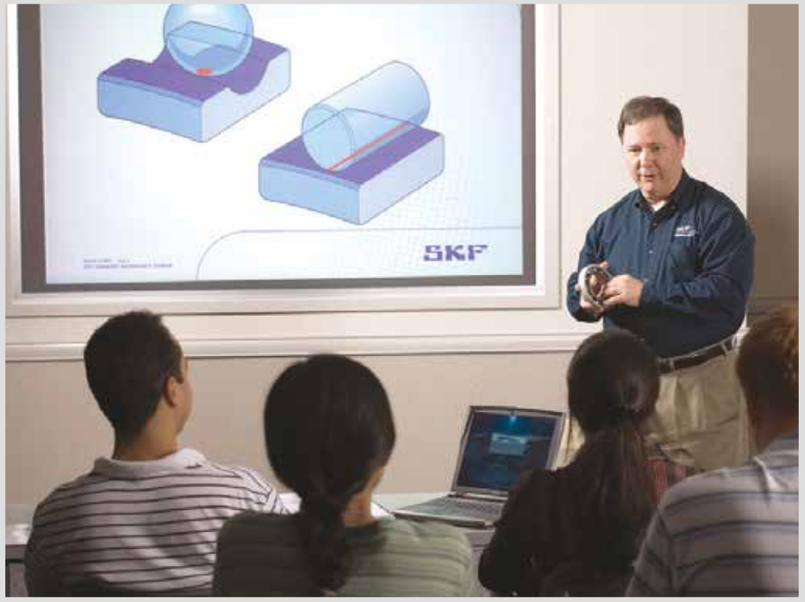
If the temperature sinks below the lower service temperature of the grease, the grease stiffens, however it should still be soft and adhesive ensuring that the grease is not displaced and maintains a good lubricating effect.

Klüber Lubrication

Click to view more info

TRAINING PARTNERSHIP

HES Lubemec is working in partnership with SKF to offer a practical training course which is specific to the lubrication management of wind turbines in the renewable energy industry. The course focuses on automatic lubrication systems, designed to improve efficiency, reliability and durability of wind turbines.



TARGETED TRAINING

This training course will explain the need for lubrication and how the lubricant is applied to wind turbines/renewable energy sources. It is aimed apprentices, technicians, maintenance personnel and operations personnel who require detail on how their system works.

FLEXIBILITY

The course can however be tailored to meet the needs of anyone involved with these machines and will cover the benefits of automatic lubrication, as well as systems components, maintenance and troubleshooting the system.

COURSE DETAIL…

- Background and introduction
- Explanation of why and how automatic lubrication works
- Hazards and safety precautions
- Lubrication types and grades used in wind turbines
- Areas of the wind turbines that lubrication can be found

SYSTEMS AND COMPONENTS USED WOULD INCLUDE…

- Single line grease systems
- Progressive systems
- Multi line and circulating oil systems
- System design and operation of individual components
- System maintenance and fault finding

Group HES Ltd

REDUCING SAFETY RISKS ASSOCIATED WITH WIND TURBINE MAINTENANCE

Wind turbines are particularly challenging to maintain, given the tight quarters and great heights of the gearboxes. So, what can operators do to reduce the safety risks associated with wind turbine maintenance?

It wasn't very long ago that wind turbine gearbox oils had an expected service life of only 18 months. But today, advanced gearbox oils have been shown to last over seven years in continuous service, and performance continues to improve.

MONITORING OIL CONDITION

Implementing a routine oil analysis program is crucial to ensuring successful operations over the long haul and reducing the occurrence of maintenance issues.

There are two major areas that operators can focus to reduce instances of HMI (human-machine interactions) in wind turbine maintenance

1. Choosing the right oil – convert operations to a high-performance synthetic turbine gearbox lubricant
2. Monitoring oil condition – implement a routine gearbox oil analysis programme

CHOOSING THE RIGHT OIL

A high-performance, synthetic gearbox oil can go a long way toward protecting gearbox componentry from wear, thus reducing the need for HMI.

NEW GEARBOX OIL

Recently, ExxonMobil introduced its latest solution for the wind industry, Mobil SHCTM Gear 320 WT. This new gearbox oil has been shown to provide exceptional protection against conventional wear modes such as scuffing, as well as a high level of resistance against micropitting fatigue, even under extreme temperatures and harsh operating conditions. These benefits not only help enhance gear life and extend oil drain intervals, but they can also help reduce unplanned maintenance downtime, minimising the safety risks associated with employee-equipment interaction.

By taking a proactive approach to maintenance and regularly sampling gearbox oil, operators can identify turbine reliability issues and lubricant degradation before they cause critical equipment failure, thus helping enhance safety by reducing the frequency for maintenance personnel to interact with equipment.

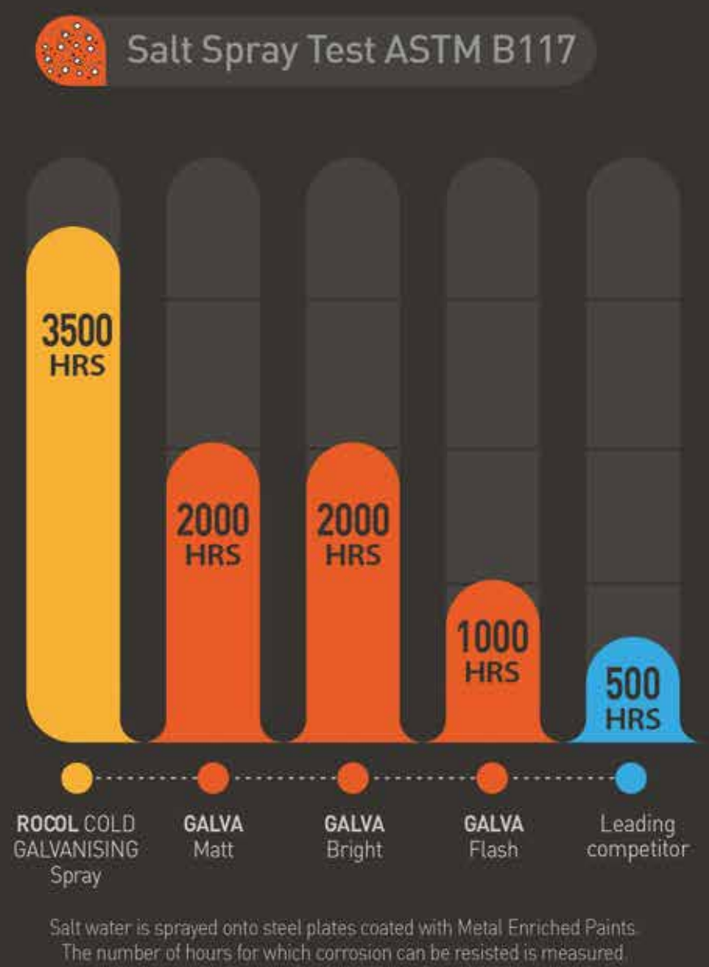
Tom Schiff
Global Field Engineering Support Manager
ExxonMobil Lubricants

Click to view more info

= Click to view video

PREMIUM PROTECTION LUBRICANTS FOR THE OFFSHORE SECTOR

Swan Industrial Drives Limited a Hull based specialist supplier of lubricants, bearings and power transmission product supplies a range of specialist anti corrosion lubricants to meet the harsh environmental demands of the offshore, marine and coastal industries.



AWARD

Their company supplies the highest quality products from the market leading manufacturers. Having recently being awarded the coveted Key Independent Distributor of the year award from Rocol Lubricants they are again working closely with this specialist lubrication manufacturer in offering an unrivalled range of rigorously tested products to protect equipment which is subjected to the aggressive atmosphere present in these working areas.

CHALLENGING ENVIRONMENT

Operating in the offshore and coastal environment comes with a number of challenges, including protecting equipment from the harsh saline atmosphere. High levels of salt and exposure to sea water and spray can cause rapid corrosion of metal surfaces. Inadequate prevention of corrosion can lead to weakened structures, equipment failure and pose a safety risk to personnel. The manufacturer specialises in providing anti-corrosion solutions to protect equipment, even in these aggressive conditions.

PRODUCT TESTING

In-house testing is carried out using a salt spray chamber which can simulate severe marine conditions. Their anti-corrosion products are proven to be effective over long periods of time and offer market-leading performance.

PREMIUM PROTECTION

The coatings delivered by ROCOL Metal Enriched Paints, including Cold Galvanising Spray and its GALVA range, provide triple protection to metal surfaces which are prone to rusting, especially those in marine environments, by combining enhanced water resistance with optimum cathodic defence and mechanical toughness.

With corrosion resistance up to seven times more effective than other products on the market, their galvanising sprays provide a highly flexible way to galvanise metal in-situ.

ROCOL Z30 is available in both fluid and aerosol form and leaves a thin, flexible film which will not crack or chip providing protection for up to two years. The dry film will not attract dust or dirt keeping the work area clean and safe. The effective de-watering and penetration properties of product enable effective protection of hard-to reach areas of the equipment.

MILITARY APPROVED ANTI-SEIZE COMPOUND

Rocol anti-seize compound is a copper-containing grease for all static fasteners and mechanisms. It is designed for use as an assembly and anti-seize lubricant to prevent pick up, seizure and protect against fretting even in wet, dirty and corrosive conditions.

Being insoluble, it remains effective even in subsea use, forming a seal to prevent fluid and gas contamination. The anti-seize compound is approved to Naval, RAF and NATO standards, and is also approved for submarine clearance.

Swan Industrial Drives Limited

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= Click to view video

Rocol

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= Click to view video 1

= Click to view video 2

Whitby & Scarborough Offshore Wind FEATURE SPONSOR FOCUS ON WHITBY & SCARBOROUGH

OFFSHORE WIND TAKING SHAPE ON THE YORKSHIRE COAST

After 6 years of work alongside the offshore renewables sector things are taking shape on the beautiful Yorkshire Coast.

As Local Authority and Port Authority for the North Yorkshire Coast Scarborough Borough Council have been determined that this stretch of coast and the surrounding hinterland aka 'God's own country' benefit from the round 2 and 3 investments in the northern North Sea.

SIGNIFICANT PORTS

The historically significant Ports at Scarborough and Whitby are well placed to provide support to the next generation of offshore wind developments.

Geographically the closet ports to the Dogger Bank and with excellent transit times to the Hornsea sites these regional ports intend to become significant once more.

Alex Richards: Economic Project Development Manager at Scarborough Borough Council commented: *"There is a significant amount of 'action and traction' now building around our ambition to become a service hub for the offshore sector.*

In Whitby, Dalby Offshore Services, are setting forth on establishment of the Yorkshire Offshore Renewables Operations and Maintenance Centre, a circa £4m port facility which will house the offshore service sector & supply chain cluster necessary to support Round 2 and 3 activity off our coast."

AND THERE'S MORE!...

- **54 North Maritime Training** – (a branch of the highly acclaimed Whitby Fishing Industry Training School) are proposing the development of a brand new Maritime Training Facility in the Borough
- **Engineering UTC** – will open in Scarborough in September 2016 providing education and inspiration to the next generation of renewables engineers and technicians
- **Coventry University** – are opening a new campus in Scarborough and are in the process of developing a bespoke maritime, renewables and offshore syllabus and qualifications
- **Over 200 acres of serviced business space** – has been made available and business support packages are in place to assist supply chain companies in serving the sector

Alex concluded: *"Industry association Team Humber Marine Alliance (THMA) have recognised the opportunity and interest occurring in this part of the world and are opening a regional office in Scarborough to support and expand their membership in the area."*

EMBRACING THE OPPORTUNITY

Cllr Derek Bastiman Leader of Scarborough Borough Council stated: *"In our role as Harbour Authority and as authority responsible for the economic development of the wider area we are embracing the significant opportunity that offshore renewables brings.*

"We have over £40m of proposed port improvements and supply chain investment in the pipeline for the coming months to support of our maritime sectors.

"We pride ourselves on being an approachable, entrepreneurial and customer focused team who will work with partners to deliver the best outcomes for the industry, our communities and the economy."

PERSONAL INTERVIEW

As the area had grasped the opportunities while others had been 'waiting to see what will happen' we then interviewed Alex Richards to find out more…

CONTINUED...

Whitby & Scarborough Offshore Wind FEATURE SPONSOR FOCUS ON WHITBY & SCARBOROUGH

FROM STRENGTH TO STRENGTH

We met up with Alex Richards in the Town Hall in a recent visit to Scarborough. Alex is the Projects Manager for the Borough Council which covers a vast area from close to the Redcar and Cleveland border in the North down to just south of Filey, as well as inland incorporating a large swath of the Yorkshire National Park.

As the local authority their responsibilities are twofold in relation to the renewables industry and maritime industries in general…

1. Economic development and progression of the area
2. Management of the Port, Harbour and Coastal authority which encompasses Filey, Scarborough and Whitby

We have known Alex and the Borough Council right from the beginning, some 7 years ago, highlighting their ambitions for the industry in our very first publication.

His role over those years has been to oversee the positioning of the region and specifically the ports to take advantage of the opportunities available within the offshore wind sector with a focus on the operations and maintenance following construction.

With sights set on serving the Hornsea and Dogger Bank projects they are strategically and geographically positioned as the nearest onshore ports.

HIDDEN ECONOMIC BENEFITS

Not widely known outside the area is that Scarborough particularly and the Borough as a whole is that it has a very strong manufacturing and engineering sectors which can serve the wind industry in its wider sense.

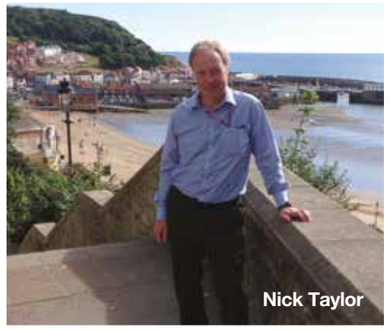
They can therefore concentrate very hard on not only what their ports can do but also what the available supply chain can do for the offshore industry.

PERSONAL BACKGROUND

Alex lived in Scotland in his early years, moved down to Scarborough with his parents when a teenager, joined the armed forces for three years and following various working experiences decided to attend University studying engineering and latterly achieving an MBA in Industrial Management.

HEADY DAYS

His position within the council started off as a Project Officer in the then called Yorkshire Board Renaissance Unit when it was very exciting with large budgets to achieve transformational infrastructure projects triggering investment from the private sector. This ensured the future success of the area, in particular Scarborough in the economic heydays of the mid 2000s.


Nick Taylor


Alex Richards

Those days soon disappeared with the onset of the recession however because of those successful early projects the benefits are still felt today and will continue to be felt well into the future.

FOCUS

The council's focus since those days and Alex's responsibilities within it are many – as a local authority it had to…

- Position itself in this new world and understand what it's role was
- How it could best deliver services and amenities for our economy and communities
- Achieving goals in a different environment with a far more commercial approach in everything that they do
- Taking a far more entrepreneurial approach to business
- Working much more closely with industry and the private sector

ONGOING SUCCESS

This approach has brought much success over recent years utilising public and private sector funding and are now in a position to receive £3 billion worth of investment over the next 10-15 years to completely transform the local economy and therefore greatly improve the community's way of life generally.

Scarborough is often understood to be 'just a seaside tourist resort' but it is however very much more than that with major blue chip companies and organisations choosing to move there because of its diversity and ready-made supply chain – some of which our readership will find have contributed editorial within this spotlight feature.

WORKING WITH OTHERS TO ENSURE FUTURE SUCCESS

One of the subject areas which Alex was keen to express was the council's keenness to make itself known outside of its area, recognising the importance of working and learning from others – this has included being instrumental in the setting up, some 4 years ago, of an APPG (All Party Parliamentary Group) which meets at Westminster regularly.

Scarborough Borough Council

WEN INTERVIEW

Duncan McGilvray
Editor
Wind Energy Network

Click to view more info

NEW UNIVERSITY TECHNICAL COLLEGE

In September 2016 a brand new University Technical College (UTC) for 14 – 18-year-old students is opening In Scarborough. With a specialism in Advanced Engineering and Computer Science this facility will bring a revolutionary change to education and training in the area.

£47 MILLION DEVELOPMENT

Scarborough University Technical College is funded by the Department for Education and is open to everyone aged 14-18. The college is part of a £47 million development combining Coventry University's new Scarborough Campus and state-of-the-art sports village development which will create an outstanding educational and recreational campus in the heart of Scarborough.

Scarborough UTC is sponsored by employers and companies from the region, including blue chip international companies, the marine and renewables sector and their supply chain along with The University of Hull.

EDUCATIONAL CURRICULUM

The UTC has worked closely with its sponsors to ensure that the curriculum will not only cover the standard school GCSEs curriculum for 14-16 year olds, but much more. The UTC will deliver well rounded, motivated, inspired and business ready young adults with the technical and personal competencies to ensure their future employability. To date 99% of graduates leaving a UTC have gone directly in to employment, University or further training.

SUBJECT AVAILABILITY

In Scarborough there will be 3 engineering pathways available, Engineering Design, Engineering Manufacturing and Electronics & Control Systems, these subjects will be taught alongside the national curriculum. These pathways have been endorsed by the regional companies including those working in the offshore renewables maritime sectors and notably the Royal Navy, who are officially affiliated with Scarborough UTC.

BESPOKE STUDY PROGRAMMES

For learners who have completed their GCSEs (aged 16) a programme of study is offered with one of more of the engineering pathways at the heart of the programme which is enhanced with A levels including maths alongside a specialist project qualification.

To ensure learners study to current industry standard the UTC will be equipped with modern engineering and specialist equipment that reflects that used by local employers.

This is a full education programme for both age groups and to fit this in the UTC will operate a longer school day and year than most schools or colleges. The day will commence at 9 am and finish at 4.30pm. This is also planned to replicate industry working practice which will help to prepare graduates for their future working careers.

Scarborough UTC is open to learners from a wide catchment area which includes; Scarborough, Whitby, Bridlington, Pickering, Malton, Driffield and all the surrounding areas.

Scarborough UTC

DEDICATED TO TRAINING

54 North Maritime Training are dedicated to providing the most comprehensive theoretical and practical maritime training for today's seafarers. The company has the industry resources and expertise to support you every step of the way.

BESPOKE FACILITIES AND COURSES

The company facilities and expertise are structured make career advancement as smooth and beneficial as possible with a wide variety of short courses in the following areas…

- Complying with STCW certification requirements, for personnel serving aboard merchant ships or commercial yachts
- Continuing professional development for seafarers at all levels – from new entrants to ships' pilots
- Approved by the Maritime Coastguard Agency (MCA) and Royal Yachting Association (RYA)

(R to L) Arnold Locker, Anne Hornigold, Andrew Hodgson

LOCATION

Their maritime courses are held at their well-equipped training facility in Whitby, North Yorkshire. They also conduct bespoke training packages at external venues across the whole of the UK.

REPUTATION

All training staff at 54 North Maritime Training are specialised in their subject areas and have a reputation for their maritime knowledge, professionalism and quality of lesson delivering.

Whether training is required in maritime and offshore safety, firefighting, first aid, radio communications, ship handling, bridge-watch keeping, marine engineering, or training in the application of navigation and radar techniques, the company is there to help career progress.

PARTNER ORGANISATIONS

The company is working hard with its partner organisations in the Scarborough Borough region in developing and providing a first class service to the offshore renewables sector.

Relationships have mutual respect and shared venture, with a future of supporting both the local region and wider maritime industry.

The company is currently investigating possibilities for a new maritime training centre and work to date shows that the need is great, especially with the future development of the renewables industry at Dogger Bank. A new maritime training centre will not only provide a world-class facility in the region but will also help meet the demand of the offshore renewables sector.

54 North Maritime Training

YORKSHIRE'S NEW CAMPUS BY THE SEA

In 2014, a report by HEFCE (Higher Education Funding Council for England) named some parts of the country as 'HE cold spots' – areas where, one way or another, higher level skills required by industry are not being covered by available HE provision. The report, not for the first time, named North Yorkshire as one such cold spot.

UNIVERSITY OF THE YEAR

Coventry University, the current Times Higher Education Awards 'University of the Year' and Good University Guide's 'Modern University of the Year' 2014, 2015 and 2016, then moved to help address this imbalance, opening the Scarborough Campus in 2015, initially teaching in iconic Scarborough locations.

PURPOSE BUILT STATE-OF-THE-ART CAMPUS

From September 2016 teaching begins in a brand new, purpose built state-of-the-art campus at Weaponness, wherein all course areas offered are linked to careers, in subjects where there is evidence of a demand for graduates in the region.

INDUSTRY INPUT

Wherever it is possible, input has been sought from major industry institutions and local business to help inform the curriculum, to best ensure relevance.

Course areas on offer include Law, Business, Early Years, Accounting, Engineering, IT, Counselling and Biological & Chemical Sciences. The BSc (Hons) Combined Engineering degree, launching in 2016, includes a 30-credit module on Renewable Energy Engineering.

Coventry University

SHARING INDUSTRY KNOWLEDGE AND EXPERTISE

Industry group Team Humber Marine Alliance has been backing Scarborough Borough Council's efforts to help local business reap rewards from the North Sea offshore windfarms.

Clockwise from centre: Melanie Onn, MP for Great Grimsby; Andy Raey, A2Sea; Jason Ledden, Dong Energy; Maf Smith, Renewable UK; James Cotter, RWE/Stratkraft; Blair Jacobs, Blair Jacobs Communications; Mark O'Reilly, THMA and Gareth Russell, ABP

The relationship between the two organisations goes back to 2009, with Team Humber assisting the council through its expertise and network of contacts in the UK and abroad. It now has office space in the council's Town Hall in addition to its main premises in Hull, giving it a base to meet with local members and contacts as well as working more closely with council representatives.

EXCITING OPPORTUNITIES

Mark O'Reilly, Team Humber Marine Alliance's CEO and Chairman commented: *"The maritime heritage and experience in the coastal part of North Yorkshire means that there are exciting opportunities and we want to play a role in helping companies get into the offshore wind supply chain through our knowledge of the industry and through skills development."*

Cllr Mike Cockerill, portfolio holder for Harbours and Land at Scarborough also commented: *"We very much welcome the decision of THMA to expand their presence in our area of the coast. Our economy and communities have a long and successful history in the maritime sector. We are now on the brink of a new age of opportunity, particularly within the offshore renewables sector and we welcome the support THMA can bring.*

"We have an excellent starting point in our existing supply chain with some world class companies operating from the Borough already serving the industry. By working together with THMA we can provide significant additional benefits to our supply chain and their customers."

NEWLY FORMED ADVISORY BOARD

Team Humber has just announced a newly formed advisory board, made up of business leaders and local authority representatives. The board, which includes Nick Taylor from Scarborough Borough Council, aims to build on Team Humber's position as one of the UK's leading maritime and offshore organisations.

OFFSHORE WIND CONNECTIONS EVENT

Team Humber Marine Alliance also runs the hugely successful annual industry conference, Offshore Wind Connections, which has been held just south of Scarborough in Bridlington for the last two years.

This May it attracted more than 300 delegates from all over the UK, Europe and beyond, who came to hear from leading industry figures on the latest developments, challenges and opportunities.

Mark O'Reilly concluded that the event demonstrated the wider region's importance as a centre of excellence for offshore wind as well as the commitment of Team Humber to the coastal areas north of the Humber.

"It was great to hear from speakers about current and impending billion-pound investments and the vital role the supply chain will play in realising it.

"It was highly informative and a celebration of how the renewables industry is transforming the regional economy."

2017 PLANNING

Team Humber Marine Alliance is already starting to plan OWC2017 and is keen to hear from companies that would be interested in taking part in the event, either as exhibitors, speakers or workshop leaders.

Team Humber Marine Alliance

MODAL TRAINING FEATURE SPONSOR SIMULATION TRAINING

WHY 'VIRTUAL' HAS BECOME A 'REALITY' FOR TRAINING EXCELLENCE

Improved technology has brought fully immersive 'virtual reality' simulator-based training into the real world, and many organisations are reaping the benefits.

Early adopters of this type of training have included aviation, military, nuclear, space and medical – a seemingly diverse set of industries, but all where mistakes can have catastrophic consequences.

As technology has progressed and the benefits of simulator-based training have become apparent, other sectors including process and maritime have incorporated it into their standard training practices.

WHAT IS SIMULATOR TRAINING, WHAT ARE THE ADVANTAGES, AND WHERE CAN YOU GO TO GET IT?

What kinds of simulator training are available? – computer based simulator training covers a wide variety of systems from desktop packages to fully immersive experiences.

Recent advances in computer processing power, graphics and other technologies have seen dramatic improvements in simulators and their ability to react in a life-like way to the actions of their users.

Full mission simulators accurately recreate visual scenes, instrument presentations, sounds, motions and other systems in order to create a realistic operational environment for training to take place.

Patrick Henry, Managing Director

MODAL TRAINING FACILITY

When it opens later this year, Modal Training will have an array of computer based simulators at its state-of-the-art facility in Immingham, including a range of full mission ship, crane and driver simulators. In addition, many of the simulators have the ability to interact with each other providing unparalleled opportunities for cross functional team training.

There is widespread academic evidence that simulator-based training not only speeds up the learning process but that it also improves the retention of new information in a controlled and safe environment.

Simulator-based training has been shown to improve performance in three broad areas, functional skills, problem solving ability and team work.

PRACTISE MAKES PERFECT

Whether you're developing the fine motor skills required to carry out a delicate maintenance procedure, or you are learning the complex instrument controls of a ship's engine room, repeated practise is essential to grow competence and confidence.

As well as being an ideal system to allow this, simulator training enables learners to progress in a controlled way and at their own pace, with the opportunity for detailed feedback at every stage.

It also helps companies tackle some of the issues associated with an ageing workforce and the fact that, for many companies, there just isn't the time for new recruits to learn from their more experienced peers.

SIMULATOR TRAINING CAN HELP TACKLE THIS KNOWLEDGE TRANSFER ISSUE IN SEVERAL WAYS…

- Speeds up the learning process
- Helps people retain information more effectively
- Embeds safe working practices
- Allows practise of unusual or emergency events in a much shorter time frame than real life may allow – for instance practicing in a range of weather conditions.

CONTINUED...

MODAL TRAINING FEATURE SPONSOR SIMULATION TRAINING

PROBLEM SOLVING AND DECISION MAKING

Simulator training has also been shown to be an excellent tool for developing problem solving and decision making skills, particularly when it comes to unusual or emergency situations when the pressure to perform is high.

The ability of a trainer to set specific, complex problems is of real benefit to many industries. Being able to pause and even re-wind scenarios, look in depth at someone's responses and provide detailed feedback can't be achieved in real world emergency situations, but simulator training makes this possible.

COMMUNICATION AND TEAM WORK

The final area in which simulator training has proved a real benefit to performance is in the development of the communication and interpersonal skills required for complex team tasks. This is of particular interest to businesses which operate cross sector teams, where traditional training opportunities can be very limited.

WHAT ELSE COULD SIMULATOR TRAINING OFFER YOUR BUSINESS?

Whilst a more competent workforce is an advantage to any business, there are other wider business benefits of this type of training.

Simulator-based training removes the risk of causing harm to yourself or others, or damage to property or equipment. This is important for sectors where mistakes can be extremely costly, in more ways than one.

Many companies have to use their operational equipment and machinery for training, which leads to decreased productivity and increased fuel costs. Using simulator training means that day-to-day operations can carry on unaffected, fuel and running costs are reduced as is your company's carbon footprint. Training isn't hampered by weather conditions and can take place at a time and date to best suit your staffing arrangements.

Simulator training is also ideal for assessing existing competencies and can therefore be a useful tool when it comes to recruitment pre-screening.

For industries that are having to draw their workforce from outside their own sector simulator training also gives potential candidates a chance to experience aspects of the job they may not have been exposed to before.

A SIMULATOR CENTRE OF EXCELLENCE FOR THE UK

Based in Immingham, on the south bank of the Humber estuary, Modal training will be the UK's first simulator centre of excellence, supporting the region's growing energy, ports and logistics sectors.

Along with a full suite of Kongsberg marine simulators, the centre will also boast an impressive range of crane and driving simulators as well as rail safety, warehousing and engineering teaching facilities and the UK's only Freight Forwarding Academy.

Patrick Henry, Managing Director of Modal Training, highlighted the significance of the 5,700m2 training facility: *"Nowhere else in the UK is there this complete approach for businesses operating in the energy, ports or logistics sectors who want to take advantage of the massive benefits that simulator-based training can offer.*

"Here in the Humber we have the UK's largest multi-purpose ports complex and businesses that would have previously had to travel for this kind of specialised simulator training, if they could even find it in the UK, will now be able to benefit from industry leading facilities right here on their doorstep.

"In addition, companies whose operations span several areas of the supply chain now have access to training provision that matches their own multimodal operations. Modal training is able to provide interconnected, cross sector training for the road, rail, air, sea and support industries, with the opportunity to develop bespoke multimodal simulator-based training packages that precisely meet the needs of your business."

Modal Training

Click to view more info

MODAL TRAINING FEATURE SPONSOR SIMULATION TRAINING

SIMULATION TECHNOLOGY TRAINING CENTRES ACROSS THE WORLD

A new 19,000 square foot Maritime and Industrial Training Center in New Orleans, Louisiana, the Delgado Fire and Industrial School offers industry leading training by combining Transas and XVR simulation technology.

WORLD FIRST

Delgado is the first training center in the world to deploy XVR Incident Command simulation solutions in conjunction with their extensive suite of Transas full mission, part task and classroom marine simulators. The centre will be attended by 10,000 students each year.

Rick Schwab, Senior Director of the facility, commented "*We have worked with Transas for nearly fifteen years now, and have always been able to rely on them to support our programmes and deliver the new technologies that we need to solve our clients training needs. When our team was introduced to XVR Simulation by Transas, we immediately knew that it was what we needed to take our Incident Command training to the next level. Transas and XVR provide a combination of products that together can expand the realism and effectiveness of maritime emergency and crisis response training.*"

STRATEGIC COOPERATION

Transas and XVR Simulation are excited by this first major joint project deployment by the two market sector leaders since January's announcement of their new strategic cooperation. The two companies explore the technical integration of their products for a range of training applications. *"The input of experienced experts, such as the team at Delgado, who are thoroughly familiar with industry needs, is a vital component of producing complete solutions that can provide positive contribution to maritime safety, a cornerstone of Transas' THESIS concept,"* commented Neil Bennett, Vice President of Sales and Customer Support for Transas in the Americas region.

NEW WORLD-CLASS CENTRE FOR SIMULATOR AND MARITIME TRAINING

The most advanced maritime simulation and training centre powered by Transas technology, officially opened recently in the Netherlands.

Carnival Corporation's new world-class Centre for Simulator and Maritime Training (CSMART) was officially opened in Almere. The centre is the largest facility in terms of training capacity and utilises the most innovative technology solutions from Transas.

The Transas Integrated Full Mission Simulation Academy Solution implemented at the centre is a significant innovation that moves the capability of the most complex challenge to maritime safety forward.

STEP-CHANGE REQUIREMENT

Carnival recognised that a step-change was required in the way seafarers are trained to improve safety at sea. The interaction of human factors on board cruise vessels are some of the most complex in the maritime industry. Crews empowered with a solid foundation of generic core competencies ensure significantly better safety outcomes than those that rely heavily on established roles and procedures.

As a result of almost two-years of intensive R&D investment, the new training environment concept has now become a reality at the CSMART facility.

FACILITY

The centre houses navigational and engine room simulators in various configurations from classroom stations up to part-task and full mission solutions, interlinked to provide training and assessment for the entire crew.

Through cooperation with Dell, Transas reduced the number of physical machines by 77 percent from 650 to 150 and cut energy consumption by 30 percent compared to a traditional deployment by the virtualisation of simulation tasks into nVidia Grid System.

CAPABILITIES & TECHNOLOGY

Full interswitching capabilities where any task can be available on any screen within the Simulator (Blackbox IP-matrix) allow for a zero percent downtime which was one of the key requirements due to a to high volume throughput of seafarers with defined limited training windows.

CCTV camera technology, similar to the one used at the ESA Space Centre, observes and records everything on the bridges and in the engine room to allow full picture team training. Access is available to any task on any screen within the simulator while the CCTV provides professional broadcast, AV control, recording and archiving system with full synchronisation of all workstations, cameras and audio.

REALISTIC TEAM SITUATIONAL TRAINING

To ensure realistic team situational training for engine room and machinery functions, Transas has implemented high tech 'gamification' technology with 3D Engine compartments walk-through including usage of avatars controlled via large touchscreens or gaming controller. The trainee moves avatar through the machinery compartments and can act as a team with other trainees in case of emergency procedures.

IMPORTANT MILESTONE

Transas CEO Frank Coles commented: "*The CSMART project is an important milestone in the Transas history. We are proud of what has been achieved in such a short time through our close work with the Carnival Corporation, the centre team and our project partners.*

"By applying technological advancements never before utilised within the maritime industry, Transas have created a multi-simulator integrated training that delivers an immersive real world situational environment in which multiple crew members can operate and interact simultaneously, as if on a real vessel. This is the standard by which all training should be measured."

Transas

VESSEL INSPECTIONS

Why inspect a vessel? There are many reasons why you should inspect a vessel before it commences work for you. It can form part of due diligence before the vessel commences work on a project or check its status during periods of long service. Generally a comprehensive inspection is, on average, carried out annually.

RENEWABLE SECTOR

The most common inspections carried out on vessels in the renewable sector tend to be completed using the IMCA templates; either the IMCA CMID (Common Marine Inspection Document) M149, (specialist vessels and vessels over 500 GRT that are ISM compliant), or MISW 189 (vessels of less than 500 GRT or less than 24 metres in registered length).

Commissioning a vessel inspection is to have an impartial expert examine the vessel and its safety management system to ensure that the vessel meets current legislation and safe operational practices. It is a valuable form of due diligence and is a beneficial investment for vessels going on a long term charter.

HIGHLIGHTING AREAS OF CONCERN

A good inspection will identify non-conformances and raise observations that may need attention to bring the vessel up to a safe and legal operational status. The last thing an operator wants is to hire a vessel and find out that it is not what they expected in terms of condition, manning level and safe mode of operation. A good quality inspection will not only highlight areas of concern, but also emphasise (equally important) positive aspects on board the vessel.

OTHER RELEVANT INSPECTIONS

Other types of inspections that are very informative, particularly for specialist vessels used during offshore construction, are Condition Surveys and Suitability or Fit for Service Inspections. If carried out correctly, these will indicate if the vessel is suitable for the role it is being employed to fulfil. This type of inspection may also focus on specialist equipment and the planned methods of use. To be effective, the client must always deliver a clear scope.

APPROVED VESSEL INSPECTORS

It is important to use a reliable, experienced Inspector or inspection company. If you are undertaking an IMCA CMID or MISW inspection, ensure the Inspector is an Approved Vessel Inspector (AVI).

This means that the Inspector has been individually accredited for certain vessel types by the International Institute of Marine Surveyors. It will help ensure that your inspection meets industry standards and regulations.

Specialist Marine Consultants Ltd

Click to view more info

VESSEL AUDIT & INSPECTIONS

CHANGES TO FINES AND SENTENCING GUIDELINES

The Maritime and Coastguard Agency (MCA) and the Health & Safety Executive (HSE) are the main parties responsible for health and safety regulation of the UK offshore wind industry – the MCA for vessel related incidents and the HSE for installation and shore based incidents.

Two recent developments will see higher sentences for those who come before the courts for health and safety related offences.

1 The Legal Aid Sentencing and Punishment of Offenders Act 2012 (Commencement No. 11 (Order) 2015 came into force during 2015 and raised the maximum penalty a Magistrates' Court can impose to an unlimited fine. Previously their powers had been limited.

2 New sentencing guidelines which came into force on 1 February 2016 have changed the way in which the Courts sentence companies and individuals found guilty of corporate manslaughter and health and safety offences. These are already leading to a significant increase in the sentences being imposed.

The guidelines set out a range of proposed sentences although the actual sentence depends on a number of different factors such as the degree of culpability of the offender, the harm caused and, in the case of companies, their annual turnover.

WORST CASE SCENARIO

Looking at the worst case scenario the proposed fine for the worst health and safety offences by large companies (i.e. those with turnover in excess of £50 million) is a starting point of £4 million within a range of £2.6 million to £10 million. For the worst corporate manslaughter offences, the suggested fine for large companies is a starting point of £7.5 million and a range of £4.8 million - £20 million. The intention is that these fines will have a real economic impact on the perpetrators.

For individuals imprisonment is now a real possibility.

MARINE ENVIRONMENT – CASE IN POINT

Whilst the sentencing guidelines are aimed at offences under terrestrial health and safety legislation the Courts have already demonstrated their willingness to utilise them for similar offences under the Merchant Shipping Act.

In April 2016, one of the authors of this article, Andrew Oliver, prosecuted a case for the MCA relating to a breach of Section 100 of the Merchant Shipping Act 1995, being the unsafe operation of a ship. Mold Crown Court heard how Master Alexander Baird had failed to manage his vessel ST AMANT in a safe manner.

Drills were not completed, crew were not certificated, the deck was cluttered, and safety equipment was not operational. The Court readily applied the new sentencing guidelines and in doing so sentenced Mr Baird to nine months imprisonment.

It is clear that the increased likelihood of more severe sentences for companies and individuals re-enforces the need to be ever vigilant where health and safety at sea is concerned.

Written by Andrew Oliver, head of the renewable energy group and Martin Collingwood a member of the group.

Andrew Jackson Solicitors

Click to view more info

ENSURING MAXIMUM AVAILABILITY OF WINDFARM SERVICE VESSELS

The regular inspection and maintenance of marine diesel engines is key to maximising the uptime and performance of windfarm jack-up and cable-laying vessels, crew and offshore workboats.

As a result, in order to maintain efficient work schedules and ensure that costly vessel downtimes are minimised, service vessel owners are increasingly recognising the importance of thorough engine inspections and assessments to eliminate unscheduled repairs.

SPECIFICS

In particular, continued engine reliability, better fuel economy and lower vessel emissions all rely on regular maintenance checks. However, with vessels in this sector typically carrying very few onboard engineers, there is limited time available for engine health checks to be carried out by crew.

DEDICATED ENGINE HEALTH CHECK SERVICE

To meet this need, diesel power specialist Royston Diesel has introduced a dedicated engine health check service for windfarm service vessel owners and fleet operators using OEM qualified engineers.

Under the new programme, the company's fully trained marine engineering teams use bespoke test equipment, hand-held computers and proprietary software to carry out quick and easy trouble-shooting analysis of medium and high speed engines on offshore support vessels.

COMPREHENSIVE FUNCTION TEST

The engine diagnostics test list includes a comprehensive function test of the engine including a boroscope examination of the combustion chamber taking in liner bores, piston crowns, cylinder heads and valves.

Assessments are also made of peak pressures, exhaust gas emissions, fuel pump timing and laser alignment of the propeller shaft.

PREVENTING COSTLY BREAKDOWNS

Neil Graham, Royston Technical Director, explains: *"Whether as a class requirement or as part of a planned maintenance schedule, regular specialist engine diagnostics can help to prevent costly breakdowns and significantly add to the useful performance life of a vessel.*

"Reducing vessel down-time is all important, but ensuring that engines do not break down at a crucial part of a wind turbine installation or on a maintenance job is also vital for the safety of those on board, as well avoiding damage to the various offshore assets involved in the operation."

Royston has considerable experience of working on all types of diesel engines installed on windfarm construction, maintenance and supply vessels as well as work boats, crew boats and passenger transfer vessels.

The company is an authorised representative for many leading diesel engine OEMs, including, Niigata, Volvo Penta, Cummins, Scania and Napier turbochargers and has worked for 10 years with the Dutch workboat operator Windcat Workboats.

GLOBAL REACH

With operational bases in the UK and Western Australia, the company has over 40 OEM trained engineers who work globally, providing engine health checks and maintenance services as well on 24/7 call-outs for emergencies, fault-finding and engine repairs.

Royston Diesel

RENEWABLE ENERGY A WINDFALL FOR LANDOWNERS

Despite a decrease in the level of feed-in tariffs available for onshore windfarms, and an increase in the capacity of offshore windfarms over recent years, onshore windfarms remain an attractive prospect for landowners. If a site is viable, wind energy can still represent a reliable source of income for a landowner for a number of years.

BENEFITS

One of the main benefits of an onshore windfarm development is that landowners can continue to farm or use the land and so there is minimal reduction in other income streams. Farming, for example, can continue around the turbines.

If a landowner is committed to proceeding with the development of a windfarm, and has established a relationship with the developer, it is important to consider how best to structure this investment. This will likely largely depend to what extent the landowner wants to be involved in the windfarm's activity.

OPTIONS

1 The most straightforward option is to grant a lease to the developer. The developer will then take sole responsibility for the development and will often assume all of the risk, deal with members of the public and pay legal fees. The landowner will simply be the recipient of rental income. Clearly this represents the most hassle-free and lowest risk option for a landowner.

2 Another option is to consider structuring the windfarm as a joint venture (JV) with the developer. This allows the landowner a much greater share in the profits. There are different tax consequences and, for example, relief from inheritance tax (known as business property relief) could be available. Similarly, entrepreneurs' relief could be available for capital gains tax purposes (although rules were introduced in Finance Bill 2015 restricting this relief for JVs in certain circumstances). A JV, while financially rewarding, can be complex, and careful consideration of the structure is needed for the type of entity to be used (for example a company, an LLP, etc) and the tax consequences that follow.

OTHER FACTORS

There are also decisions that need to be made during the early stages of a windfarm development in respect of more general family wealth and succession considerations. For example some of our clients have decided to settle the future income stream into trust, or pass it directly to future generations.

The potential availability of capital allowances for a windfarm development should also be considered carefully.

Landowners should also consider the VAT consequences of the new venture. Depending on the position of the particular area of land, VAT may be chargeable on the rental income received, and VAT on some expenses may be reclaimable.

SUMMARY

Despite the potential complexities, the outlook for landowners in the wind energy market is still promising. If careful consideration is given to the structure of the investment and its consequences, and appropriate advice is sought, investing in wind energy can be an astute long term family investment.

Chris Lawrence
Private Client Tax Team Manager
PwC

Click to view more info

WINDENERGY HAMBURG 2016 PREVIEW

BIBBY HYDROMAP

BIBBY HYDROMAP **STAND NO. B4.EG.423**

Bibby HydroMap provides hydrographic, geophysical, UXO, geotechnical and ROV survey services across the UK and Europe. From a fleet of 5 specialist vessels, the company brings almost 20 years of experience, with involvement on almost every UK Round 1, 2 and 3 wind farm in the UK, in addition to numerous Scottish and European licensing areas.

www.bibbyhydromap.com

DEEPOCEAN

DEEPOCEAN **STAND NO. 219 - HALL B1.OG**

DeepOcean delivers challenging submarine array, export & interconnector power cable projects from concept to completion, whilst providing inspection, maintenance & repair services to offshore wind farm & subsea power network operators. Services are delivered with in-house expertise, a proven & flexible vessel fleet, together with the world's most comprehensive suite of power cable trenching vehicles.

www.deepoceangroup.com

Fred. Olsen Windcarrier

FRED. OLSEN WINDCARRIER **STAND NO. B4 EG 326**

Fred. Olsen Windcarrier provides innovative and tailored services for the transport, installation, and maintenance of offshore wind farms. The company offers a holistic solution including vessel operation, crew and turbine technician supply, in-house engineering and complete project management. The company currently owns and operates class leading jack-up vessels and a fleet of crew/service vessels.

www.windcarrier.com

hauff-technik

HAUFF-TECHNIK **B5 STAND NO. 200**

For 60 years, Hauff-Technik has specialized in the uncompromising sealing of all types of buildings and building functions. For example, for planning and implementation of onshore or offshore wind turbines: Hauff-Technik offers extensive support in individual technical planning, training in-line with requirements, and also on-site offshore service.

www.hauff-technik.com

WIND ENERGY HAMBURG 2016

The world's leading expo for wind energy – this is where the future starts

From September 27-30, 2016, Hamburg will again become the gateway to the world of wind energy. The world's leading expo for wind energy, WindEnergy Hamburg, will provide a comprehensive overview of the current status and future prospects of the sector – along the entire value chain of the international wind industry, onshore and offshore. It will take place on the grounds of the Hamburg Messe exhibition center.

The world's leading trade fair for the maritime industry, the event offers excellent synergy effects for offshore providers.

HAMBURG NATURALLY!

For the second time, in 2016, Hamburg will be the venue of the global trade fair for wind energy. Hamburg is a thriving business metropolis and major hub for the international wind energy sector. It is home to the leading companies in the sector and pools key competencies in both the onshore and offshore areas of business. With the European wind industry capital as its venue, the event provides the perfect setting for presenting your company on a professional and international platform.

MORE THAN JUST A TRADE FAIR

WindEnergy Hamburg is much more than just a trade fair. It provides a special focus for expertise in its section on storage technologies and also has an extensive supporting programme and lots of added value.

MEET THE FUTURE OF THE WIND INDUSTRY

The event can help shape the future of the sectors' businesses. The leading international wind industry fair gives real added value in many areas. It is the ideal information hub to get information on current status and future potentials of the whole of the industry.

Meeting business partners, international experts and leading minds of the wind industry for an inspiring exchange is extremely important. The fair site is centrally located for easy, convenient access. And after opening hours the city of Hamburg has so many attractions to round off a successful day at the expo.

A FOCUSED EXPO CONCEPT BY ESTABLISHED INDUSTRY EXPERTS

WindEnergy Hamburg is organised jointly by Hamburg Messe und Congress and Messe Husum & Congress. As the global leader in its sector, WindEnergy Hamburg is the international meeting point and is held in even-numbered years, while HUSUM Wind is the meeting point for the German-speaking wind energy market and is held in odd numbered years.

CONFERENCE FOCUS

Support from European leaders and industry figures has been strong with German Vice-Chancellor Sigmar Gabriel confirmed to open the event and Michael Liebreich, Bloomberg New Energy Finance, featuring in WindEurope's 'Business meets policy' sessions.

EXTENSIVE EXHIBITION

The whole of the wind industry value chain will be there. More than 1,200 exhibitors from over 30 countries will present their solutions and innovations on 65,000 square metres of exhibition space.

NETWORKING – NEW CONTACTS, NEW OPPORTUNITIES

The exhibition and conference offers a whole range of opportunities to generate new business leads and cultivate existing contacts, with practical workshops, award presentations, get-togethers, parties and receptions, and other special events such as matchmaking sessions to bring business leaders directly into contact with leading experts.

SHARING A COMMON AIM

Hamburg offers countless opportunities to continue discussions in an agreeable setting at the end of a long day at the fair. One of the virtues of this event is that delegates and exhibitors all share a common aim, to grow the sector and drive efficiencies and improvements.

WindEnergy Hamburg

Click to view more info

O&M SOLUTION

O&M SOLUTION FOR LARGE OFFSHORE WINDFARMS

An operations and maintenance (O&M) logistics study by Norwegian software simulation experts Shoreline, for Fred. Olsen Ocean, has found the use of an offshore accommodation platform combined with fast in-field vessels will be key to maximising efficiencies for large, far-from-shore windfarms.

COLLABORATION

The O&M simulation was performed in collaboration with a major developer and based on the indicative layout of a 100, 200 and 300 turbine offshore wind project in the UK.

Three scenarios with different marine logistics combinations were modelled. The three base scenarios were…

1. A single service operation vessel (SOV) with on-board accommodation and access to a helipad
2. Two walk-to work-vessels (converted platform supply vessels) working alongside an offshore accommodation platform such as Fred. Olsen Windbase
3. Three large 30m crew transfer vessels (CTVs) working alongside an offshore accommodation platform such as Fred. Olsen Windbase

All three scenarios included the use of a helicopter for troubleshooting and additional CTVs over the summer period for scheduled maintenance.

MET OCEAN DATA

The met ocean data was taken from weather observations over 18 years – between February 1994 and January 2012 – so factored in seasonal changes, and included significant wave height and mean wind speed.

PHD PROJECT

Shoreline employed its MAINTSYS software tool, developed in 2012 as part of a PhD project at University of Stavanger and the Norwegian Centre of Offshore Wind Energy (NORCOWE) and already adopted by several offshore windfarm developers for marine logistics modelling.

KEY FINDING

The key finding of the simulation, which used a maintenance strategy with specific work order priorities, emergency response time limits and two types of technicians, was that time availability was highest in the third scenario – that of a fixed offshore accommodation platform being used in partnership with larger CTVs.

Fred. Olsen Windbase Project Director David Matthews said that the initial input data for each of the specified base cases was realistic but optimistic, however sensitivity analysis was also included in the report, to consider worst case scenarios as well. *"All three scenarios performed with relatively high time based results, but the best availability – nearly 98% - was with the scenario employing three CTVs combined with an offshore accommodation platform,"* he commented.

FINDINGS

"The main difference was that the scenarios relying on the vessels equipped with walk-to-work access system had less availability when the overall workload was increased because of their low in-park speed in dynamic positioning mode and the limited number of access systems deployed."

David concluded: *"On larger projects the robustness of the solution chosen is tested as the failures rise. We quickly saw which solution started to fail first and quickest. In short the distances between failures on any given day showed that multiple low cost access vessels performed best."*

"The modelling coupled with a site specific day rate and scope, allows developers to model a fixed offshore facility against other solutions in offshore wind."

Fred. Olsen Windcarrier

A POWERFUL HERITAGE

Global Marine Systems Limited is unique in the modern world of subsea cable laying. They were there when the first ever copper cables were laid under the English Channel and Atlantic Ocean in the 1850's in order to enable communication between continents.

Today, the technology has changed but the company continues to build on this legacy by laying copper cable to transmit the power generated by wind turbines on the Wikinger windfarm in support of the Prysmian Group.

DIVERSE CAPABILITIES

Along the way, the team at Global Marine has been able to demonstrate the company's diverse capabilities in the offshore power and renewables markets with a number of firsts and major projects. In fact, in 2002, the company installed 85km of cable at Horns Rev, Denmark, Europe's first-ever commercial windfarm. From there, the company installed the cables connecting the Kentish Flats windfarm, the first UK commercial project and can lay claim to having installed 17% of the inter-array cables in service today.

INTER-CONNECTOR MARKET

In the inter-connector market, the company linked Estonia to Finland with the high voltage Estlink cable. Working with ABB, the company was required to bundle and simultaneously lay two, 77km high voltage cables weighing approximately 4,000 tonnes. Burial depth requirements were precise to take into account the high thermal conductivity of subsea soil. The final stage involved floating the cable end ashore for connection to the Estonian mainland.

FURTHER CHALLENGES

Global Marine faced further challenges when it was chosen to add the Malaysian island of Pulau Ketam on the power transmission grid for the first time. The project involved burying the cable to depths of up to 13.8 metres beneath the seabed, the deepest in the company's history and possibly the deepest cable burial achieved anywhere in the world. Providing power to Margarita Island from the Venezuelan mainland provides another good illustration of the company's expertise in this field.

TRANSFERRABLE EXPERTISE

Transferrable expertise is one of the key reasons behind the company's success in the power sector. With a 165-year legacy in subsea engineering across many markets, customers benefit from access to one of the industry's most capable fleets, in terms of assets and seafarer skills.

Global Marine Systems Limited

Click to view more info

INNOVATIVE SOLUTIONS

SECURE AND RELIABLE SEALING OF POWER CABLES

Whether onshore or offshore Hauff-Technic provide comprehensive support for an entire project…

- Individual technical planning
- Technical project supervision
- Training, if required
- On-site offshore service

The company also offers a whole range of specially constructed solutions for the implementation of difficult offshore projects as well as on-site supervision by specially trained personnel, such as on offshore platforms.

EXPERTISE AND EXPERIENCE

The company is the ideal choice for qualified advice and support – no matter what the sealing task is. Their expertise and many years of experience in the sealing of buildings provide a sound basis for this.

A large number of wind power plants today have already been fitted with the company's systems.

FLEXIBILITY

To the company, flexibility means either: Individual, when and wherever necessary. Or standardised, when and wherever possible.

The sealing of cables in the field of wind power involves some very individual demands. The company's researchers and developers are particularly well equipped for this. They endeavour to clarify client's requirements in the best possible way, in order to realise the most suitable sealing product.

The successful development of made-to-measure solution requires our product components to be extremely flexible. It is this flexibility, in particular, that Hauff-Technik's individually manufactured seals are endowed with.

In this way, the company is able to develop special products designed according to a client's specifications – even for the most specialist of demands.

DEVELOPING SOLUTIONS

Hauff-Technik is one of Europe's leading manufacturers of cable and pipe wall penetrations, and has been developing solutions for the energy supply and construction industries since 1955. With a range of more than 3,000 products, over the next few years, the company aims primarily to intensify its expertise in the energy transformation markets, while continuing to increase turnover.

Hauff-Technik

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ED'S NOTE

This is an abridged version – please follow the QR Code/link to the full article.

HIGH VOLTAGE CABLES

WATER INGRESS

Water ingress is well known for its damaging effect on electrical equipment, often resulting in partial discharge and switchgear failure. Gavin Cornall, Divisional Manager for Power & Process at Roxtec Ltd, explains the findings of a recent whitepaper about humidity to substation environments and outlines practical solutions to mitigate these conditions.

Water is vital to human life, but in the world of cable installation it often causes technological headaches.

PROBLEMS

Traditional seals of mastic or compounds are hard to install on HV single core cables in wet or running water conditions and don't provide adequate cable retention. In the long term, these seals can't cope with the expansion and contraction of cables in operation. Cables are also subject to further forces as the ground settles outside, plus their weight can cause retention issues.

An independent report found that partial discharge on high voltage switchgear was occurring over time and interfering with the optimum operating conditions. This was due to cable ducts below ground allowing the ingress of water, dust, dirt, pollutants and gas. In particular, water ingress leads to high relative humidity, which in turn results in partial discharge and failure of switchgear.

These findings were backed up by a white paper report which Roxtec commissioned from EA Technology on the causes and effects of humidity within indoor substation environments and methods of mitigating these factors.

SOLUTIONS

Gavin has worked in the power transmission and distribution market for a number of years, he said the report showed why it is extremely important to control the substation environment and this can be achieved by minimising water ingress into substations and controlling the temperature and humidity within the building.

Roxtec developed specialist substation seals; the IP68 certified solution to the problem is Roxtec UG seals. These strong, mechanical seals can support the weight of cables. In addition, these seals can be used on new build and retrofitted. In particular, the H3 200 UG product was specially designed for sealing trefoil formation cables against constant water pressure.

INNOVATIVE PRODUCT

This innovative product is made from malleable rubber so it is very flexible, it can also seal cable ducts that aren't perfectly round.

It can be installed in running water conditions and provides a high degree of cable retention (tests have proven that this product provides a cable retention that withstands a pull force of up to 3300N which equates to 320kg of pull out force).

WET CONDITIONS

In the early days it became apparent that traditional systems were failing due to cable retention failure and wet conditions. That's why the products fit so well to this application.

Owners are becoming much more aware of the impact of water coming into substations and the serious problems that can cause with switchgear.

Roxtec Ltd

peikko group FEATURE SPONSOR FOUNDATIONS

FOUNDATIONSOLUTIONS

Peikko's Wind Turbine Foundation Technology for onshore wind turbine foundations offers efficient design and use of raw materials to realise economy of construction. Typically the solution includes manufacture and supply of components (post-tensioned anchor cage and ancillary items) supported by design.

COST REDUCTION

In the solution the use of materials is optimised by the use of in-house produced components; for example, within design software anchor length may be adjusted to ensure zero wastage from raw material, which means that overall costs are reduced. In practice for a 2MW base reduction in rebar is 20% and concrete by 20%.

TIMESCALES

Construction times for a 2MW base are reduced from 2 weeks to 1 week – the company's offering is also flexible according to project requirements and the team works closely with clients, developers, main engineer and contractor to ensure all parties requirements are included.

FATBAR

As the move to larger turbines progresses, use of higher capacity fatbar anchors is increasing. The product was developed in 2010 and has European Technical Approval and employs innovative features and was developed specifically to meet needs of dynamic loading to wind environment.

ECO GALVANISING CORROSION PROTECTION

As an alternative to Hot Dipped Galvanised anchors, the company offers ECO Galvanising in a process employing thermal spray technology to achieve comparable corrosion protection to HDG.

As ECO Galvanising is only applied to the exposed part of the anchor, significant material and cost savings are made. This process is technically better as it avoids thermal transfer and potential hydrogen embrittlement which eliminates alcalic reaction between fresh zinc and wet concrete.

STUB FOUNDATIONS

Stub foundations are used to achieve optimum consented height and in sites with varying topography, is cost effective and has an excellent ROI. Peikko designs and supplies components to stub extension of up to 20 metres of gravity base.

FUTUREPROOFING

As the size of turbines increase they generate significant cost efficiencies and help onshore competitiveness then consideration should be given to constructing current gravity bases with a capacity for future re-powering.

The company assists in proposals and costing of futureproofed bases using in-house design software and their experienced team of engineers specialise in the wind sector.

WORLDWIDE RELIABLE EXPERIENCED PARTNER

Peikko is a reliable partner for all onshore wind turbine foundation projects, has supplied connection technology for concrete constructions since 1965, has a proud culture of innovation and employs over 1200 personnel. With 9 highly automated production units and 30 sales offices in Europe, the Middle East, Asia and North America, the company combines a global manufacturing cost base with a local content.

Peikko

Click to view more info

= Click to view video

FOUNDATIONS FOR WIKINGER WINDFARM

On July 21st 2016 Navantia delivered to Iberdrola the first 'jacket type' foundations for Wikinger offshore windfarm, which had been built in Navantia's Fene shipyard by the consortium Navantia-Windar.

SUCCESSFUL CONTRACT

Throughout August it will be carriying out the delivery of the remaining components, and the contract signed on 18 December 2014 between the two companies will be successfully fulfilled.

From left to right: Jose Manuel Revuelta, president of Navantia, Alberto Núñez Feijóo, president of the Galicia region, Ignacio Galán, president of Iberdrola, and Orlando Alonso, president of Windar

The contract, a success in budget, time and quality, involved theconstruction and delivery on board of 29 structures type jackets and 116 piles in Navantia's Fene facilities and Windar facilities in Aviles, Spain.

CONTRACT DETAIL

The project took 650,000 hours, created some 2,000 jobs (direct and indirect). The President of Navantia, Jose Manuel Revuelta stated; *"this contract positions Navantia as a reference builder for windfarm offshore structures, a growing sector in Europe, mainly in the UK and Germany. It also allows Navantia diversify its range of activity and provide a complementary workload to the naval sector."*

Navantia

MADE IN LOWESTOFT DUDGEON JACKET INSTALLED IN SEABED

The offshore substation jacket for the Dudgeon Offshore Windfarm, made in Lowestoft by Sembmarine SLP, has been successfully installed in the seabed on site.

The four-legged jacket, designed and built by Sembmarine SLP, stands at a near-perfect verticality of 0.01 degrees.

UK WATERS FIRST

Pump operators on the four 9-metre diameter suction buckets achieved the almost-perfect inclination in less than two hours' pumping. It the first time suction bucket technology had been used on an offshore substation in UK waters.

SPT Offshore – designers and manufacturers of the suction buckets – performed the installation, pumping the buckets 6m into the seabed 32 km off Cromer, Norfolk. The 1500-tonne steel jacket (the latest of more than 90 offshore structures delivered on time and safely by Sembmarine SLP) had been lifted from its barge by a crane on the Seaway Heavy Lifting vessel, the Stanislav Yudin.

It had been on the barge since its sail away from the Lowestoft fabrication yard recently.

FANTASTIC JOB

Brett Hurrell, Sembmarine SLP's Offshore Manager said the pump operators of SPT Offshore had done a 'fantastic job' performing the suction installation to achieve the 0.01 degrees.

"The jacket inclination is really worthy of note. The SPT operators deserve credit for their work to get it almost perfect. The operators of the four pumps adjusted the pressure after it had sunk under its own weight.

"The design and fabrication of the jacket was crucial too. It was a great combined job by Sembmarine SLP C, who designed the jacket, SLP Lowestoft, who made it and SPT, who made the suction buckets and installed the jacket."

INSTALLATION TIMETABLE

The installation operation was completed over two days. The crane lifted the jacket between 8pm-9pm on a Tuesday evening. It was lowered into sea by 9.15pm. By 10.45, it was starting to sink under its own weight and SPT started to control its inclination and, by 11.30pm, it was corrected.

At 6.40am the next day, SPT Offshore began the suction operation. By 8.10am all pumps were turned off as the final penetration and platform inclination had been achieved.

SATISFACTION

Matthew Wooltorton, Sembmarine SLP's Project Manager for the offshore substation, said: *"There's always a sense of satisfaction to see one of our projects successfully come to its end. Our focus is now on completing the topside for its planned sail away in August."*

Paul Thomson, Sembmarine SLP's Managing Director, said: *"Our ambition now is to design and build more offshore substations like this to stand off our coast as an East of England business delivering top quality work and service to East of England offshore windfarms."*

ONGOING PROJECT

While the topside is under completion at the Lowestoft yard – the UK's only fabrication yard of its capacity in the Southern North Sea – VBMS will be mobilising daily pulling in the turbine and export cables to coil on the jacket's cable deck.

After delivering the jacket to the best quality, on time and with an outstanding safety record, Sembmarine SLP now hopes to win contracts for future offshore substations for windfarms being built off the east coast.

LOWESTOFT PRIDE

Peter Aldous, Waveney MP, and the East of England Energy Group are working with Sembmarine SLP to win the work for the East of England. When it sailed away, the structure bore the banner 'Designed and built in Lowestoft and delivered on time.'

The company was contracted to work with Siemens Transmission and Distribution Ltd (STDL) to design and build the offshore substation for windfarm owners Statoil, Statkraft and Masdar.

DUDGEON OFFSHORE WINDFARM

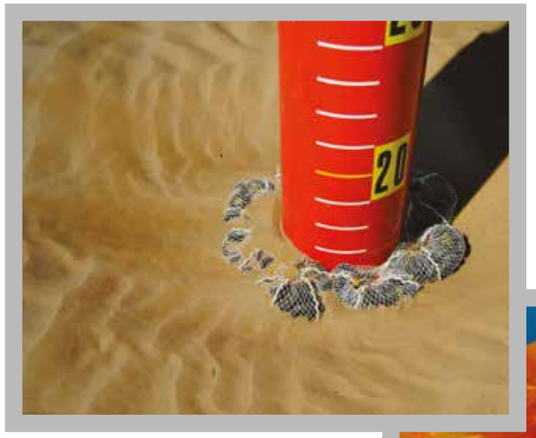
The offshore substation will house all systems needed for the handling and export of power from the 402MW windfarm to the onshore substation at Necton, Norfolk and connects to Dudgeon's 67 turbines by 12 inter-array cables.

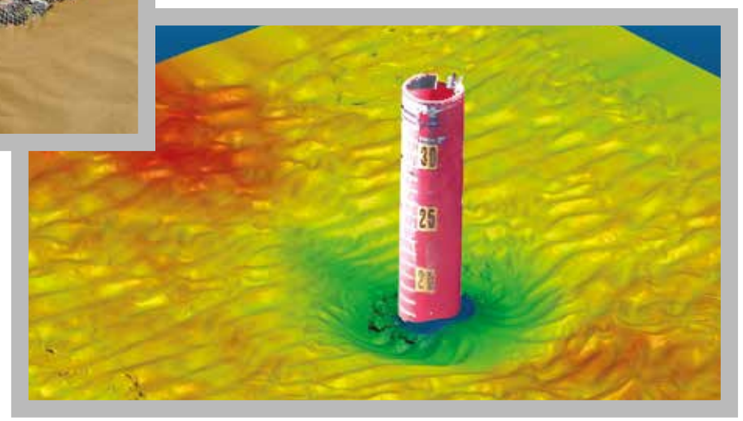
Two export cables will take the power to Necton. The windfarm will generate enough electricity to power 410,000 homes.

Sembmarine SLP

IMPROVING THE FOUNDATIONS OF MARINE ASSET STABILITY

Over the last decade, the drive for developing offshore renewable resources, in particular offshore wind, has led to specific requirements for scour hazard assessment of the associated marine assets (foundation structures and the cabling necessary for in-field transmission and power export).





Whilst a substantial amount of knowledge has been gained over the last 60 years, there is still a need to better understand the scour and erosion processes, particularly with respect to scouring around more complex foundation structures, and in the non-uniform soils that, typically, are found offshore.

WORLD LEADER

HR Wallingford is world-leading in the prediction and analysis of scour in non-uniform soils, and has an active programme of research looking at this, as well as at scouring around more complex foundation structure designs, which is becoming increasingly relevant as we see a drive to reduce the costs of offshore wind developments.

This has to be driven by more efficient foundations as we head further offshore. HR Wallingford is actively working with developers to help deliver the next generation of offshore wind foundations through state-of-the-art physical modelling facilities, as well as advanced computational fluid dynamic models.

EXPERIENCED ADVICE AND RESEARCH

The company has most recently supported DONG Energy to refine the design of a novel suction bucket foundation, as part of a research project to determine how these structures interact with, and impact upon, the hydrodynamic conditions and the seabed.

The action of waves and currents can lead to erosion of the seabed around wind turbine foundations which poses a risk to the stability of the foundation and, in extreme cases, has the potential to cause structural failure. The forces acting on offshore wind foundations will typically increase as water depth increases. For complex foundations, a combination of approaches is used to estimate likely scour, and this introduces a level of uncertainty in the design process.

The research with DONG Energy will help to develop greater certainty in the prediction of seabed response and design more efficient foundation solutions. Ultimately, this will help to make offshore wind developments more cost-effective, and developments in exposed locations and deeper waters more economically viable.

FAST FLOW FACILITY

Designs that have been shown to be reliable in the laboratory are likely to be adopted by developers, as there is also a requirement for the technology to be proven before its application for use in large-scale developments. As a recognised leader in scour around marine structures, HR Wallingford's clients benefit from the latest generation of physical modelling facilities, Fast Flow Facility, which uniquely provides a controlled environment in which to evaluate new and innovative scour protection systems for investigating the performance of novel foundation designs.

RECOGNISING THE CHALLENGES

John Harris, Technical Director at HR Wallingford said: *"We recognise the challenges that continue to face offshore wind developments with respect to seabed hazards and the development of cost-effective and structurally efficient foundations.*

"With respect to on-going and future research, HR Wallingford is continuing to invest in increasing the understanding of scour in non-uniform soils, efficient scour protection measures, the assessment of scour development at more complex foundation types, as well as developing the next generation of computational fluid dynamics models capable of accurately modelling scour in a range of soil conditions.

"Scour hazards will continue to remain a challenge for next generation foundations, and it is important that these are addressed at the design stage, in order to reduce the cost over the lifetime of a project."

HR Wallingford

SECOND SET OF PILE RESTRAINING ARMS ASSEMBLED FOR RAMPION CONSTRUCTION

Marine Equipment supplier Houlder is completing assembly of a second set of hydraulic Pile Restraint Arms. The 256t arms ensure foundation piles are kept vertical as they are hammered into the seabed. Leased to Rampion Offshore Wind, they will operate on the Swire Blue Ocean 'Pacific Orca' installation vessel.

OPEN DAYS

Due to industry interest, Houlder held open days recently to showcase the equipment. A range of organisations attended including MPI Offshore, GE Oil & Gas, Jan de Nul, The Port of Blyth and NOF energy.

The pile handling arms provide the horizontal restraint required to resist environmental forces acting on the large foundation piles during installation. They complement a set already installed and operating on the MPI Offshore Discovery jack up vessel. These currently successfully handle piles of up to 850t in weight, 80m length and 7m diameter

NEW DESIGN CRITERIA

As well as designing the 22m x 8m arms, Houlder has redesigned the vessel attachment and is providing a new grillage support structure. The grillage support structure is to be placed on the main deck at the aft end of the Pacific Orca vessel and is designed to require no underdeck strengthening and intervention. Further, this design enables fast mobilisation and demobilisation of the equipment as a large proportion of assembly and testing is performed on the quayside prior to vessel arrival.

KNOWLEDGE AND EXPERIENCE

James Russell, Marine Equipment Director commented *"The fact we have pile handling equipment on both the MPI Discovery and Pacific Orca during the construction of the Rampion Offshore Windfarm is testament to the knowledge and experience of our engineers.*

They know moving large heavy foundations safely and cost effectively requires ingenious thinking, rigorous analysis and well thought through planning.

By working in partnership with Rampion Offshore Wind and their contractors, we continue to improve our solutions and look forward to solving future challenges as windfarms move further offshore and into deeper waters."

INSTALLATION CONTINUATION

Work in Tyneside continues as the arms are installed. Houlder is managing a full installation and commissioning service as part of Rampion Offshore Wind's equipment lease agreement. The Rampion development is due to be completed in 2018.

Houlder

ACCESS ALL AREAS

Geosynthetics are at the heart of an innovative access road design enabling lorries delivering turbine sections to reach the site of a new windfarm in south west Scotland.

When it comes on line in Autumn 2016, the Glenchamber Windfarm in Dumfries and Galloway will generate enough electricity to meet the demands of about 20,000 homes in the area.

PROJECT DETAIL

Renewable energy firm RES appointed main contractor Luce Bay Group to build the windfarm, which included widening 4.5km of local roads, plus construction of 5.9km of windfarm tracks and a new 2.8km access road across the peat bog surrounding the site. Construction began in 2015, with the sections of the 11 turbines due to arrive on site a year later.

ACCESS

"The windfarm tracks and access road were a critical part of the project." says Luce Bay Group Project Manager David McCracken. *"It was imperative that we delivered them in time for the arrival of the first turbine sections in February this year, so they had to be economical and fast to build; plus they had to perform immediately.*

"Excavating the thick, very soft peat and replacing it with site-won granular material to form a stable road foundation was impractical, as it would have been time-consuming and expensive." he explained.

WORKING TOGETHER

Luce Bay and its geotechnical consultant JNP Group worked with Tensar International to come up with an alternative solution to dig and replace. This comprised of Tensar's TriAx TX170-GD geocomposite that was laid beneath the granular road base and TriAx TX160 geogrid incorporated within it, to form a mechanically stabilised layer.

DESIGN SPECIFICATION

"The TriAx geogrid interlocks with the granular particles, confining and restraining them from moving laterally. This increased the aggregate's bearing capacity and delivered roads able to carry the heavy construction loads," explained Tensar Area Civil Engineer, Drew McCartney.

Drew concluded: *"Not only did the design ensure the access roads were ready for the arrival of the first turbine sections, but it will also enable the road to perform throughout the operational life of the windfarm, with minimal maintenance."*

Tensar

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JACKET INTEGRITY MONITORING

As offshore wind energy developers exploit resources further offshore and in deeper waters, the use of 'jacket' structures as foundations for turbines and transformer platforms will become more common. Jackets are made up of a lattice of welded tubulars members, and are a more efficient use of material for supporting structures in deeper waters than large monopiles.

EXPOSURE

Jacket structures are exposed to cyclic loading from the sea and from the equipment that they support. These loads can lead to failure of the welds that join the jacket components together. If such failures go undetected, and are consequently not repaired, they can lead to the collapse and loss of the structure, harm to personnel, and damage to the business.

It is therefore important that operators are able to identify weld failures when they occur, assess the criticality of the failures, and implement corrective actions.

STRUCTURAL INTEGRITY MONITORING

Historically, jacket structural integrity monitoring has been carried out by divers or remotely operated vehicles. Monitoring techniques have included close visual inspections and flooded member detection to identify structural members that have become flooded because of cracked welds. These types of inspections can be costly in terms of vessel time, and involve risks to personnel.

There are potentially smarter, more efficient means of monitoring the structural integrity of offshore wind energy structures.

ACCELEROMETERS

One approach uses accelerometers to monitor the structure's motion and frequency response as it reacts to forces imposed by the wind and waves. If a weld fails, then the characteristic motion of the structure changes, and this change can be used to alert the operator to the problem. Using motion monitoring in conjunction with computer models of the structure means that it is also possible to identify the likely location of any failure.

DETECTORS

A second method employs detectors that are installed inside the jacket's members during fabrication. If a crack subsequently occurs in a weld and the member floods, the detector is activated by the presence of salt water and transmits a signal to a detector on the structure's topsides, alerting the operator to the failure.

MMI Engineering has completed projects analysing offshore structures and advising on structural monitoring strategies for clients in offshore renewable energy and other sectors, in the UK and the USA.

MMI Engineering

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TURBINE INSTALLATION ON NORDSEE ONE

MPI Offshore has been awarded the contract to install wind turbines on the Nordsee One Offshore Windfarm. In a short ceremony held recently in Hamburg, the contract was signed by representatives from Senvion and MPI.

CONTRACT DETAIL

Installation vessel, MPI Enterprise, will perform offshore transportation and installation of all 54 Senvion 6.2M-126 turbines. Operations will take place in waters up to 29 metres deep, with work scheduled to commence in early 2017.

When commissioned, the Nordsee One field will provide power to more than 400,000 households. Located approximately 40 km north of Juist Island, the windfarm covers an area of about 41 square kilometres and is expected to be operational in late 2017. Nordsee One is owned by Northland Power Inc. (85%) and RWE International SE (15%).

OPEN AND CONSTRUCTIVE ATTITUDE

MPI Offshore would like to thank the Senvion project team for its open and constructive attitude in working towards this positive outcome and looks forward to starting preliminary work on the project. MPI's preparations will ensure smooth and effective execution of the offshore turbine installations next year.

The company is confident that MPI Enterprise will make a valuable contribution to the realisation of the Nordsee One Offshore Windfarm, a project that will benefit all parties involved and the German offshore-wind industry in general.

MPI Offshore

FROM DIVING TO FULL OPERATIONAL SERVICES

We met up with Mark Whitehead, Sales & Marketing Manager at Hughes Sub Surface Engineering (Hughes SSE), a company which specialises in diving services but has diversified into a one-stop-shop offering a wide range of services for the industry.

Hughes SSE is a company which provides a turnkey service for clients and customers saving time and therefore money by bringing together services like rope access and ROV work.

INVESTMENT

The company has secured work on some large projects like Gwynt y Môr, A greater than £2billion project consisting of 160 turbines situated in Liverpool Bay just off the coast of North Wales and invested the returns into the company so that they were able to grow considerably over the past few years.

HUMBLE BEGINNINGS

When asked what the aims of the company were Mark spoke about why Ian Hughes (Managing Director) had originally offered just inshore diving and civil engineering services, but has moved quickly into what the company is today with a philosophy of offering what his clients and customers want and at the high standards required.

BUSINESS OPPORTUNITIES

Mark went on to say that the company's future focus is breaking into the European wind and oil & gas markets and beyond with no limit on just how large the company will become.

With a full time staff of 32 working out of offices in Merseyside, Middlesex and Aberdeen the company has already grown substantially in the 10 years of operation.

Survey work is also now being offered since the company have just recently purchased their own survey vessel MV Cerys Line.

PERSONAL BACKGROUND

Mark's background is in education through his interest in diving and sailing where he began as an instructor. This then blossomed into a social enterprise set-up to give under-privileged young people opportunities and life skills. This allowed Mark to work with people from all different walks of life.

That was so successful that Mark, along with his team, went on to open two diving and sailing centres attached to The City Of Liverpool College. This was where he met Ian Hughes whilst training some of his team. Ian employed Mark in the technical department at Hughes SSE to assist in creating a system which ensured efficiency in looking after the equipment used in projects.

Ian identified a greater awareness in his new recruit and made the decision to move him into a more involved development and marketing role so Mark went on to oversee the re-branding of the company and now oversees the marketing vision for the future.

SOCIAL MEDIA

As with most companies Hughes SSE is using social media to help the company communicate on many different levels. Mark however impressed the importance of using the right platform within the right area and went on to explain how he is developing Twitter accounts for senior staff to be used to help communication further in management roles.

INDUSTRY VISION

Mark is passionate about the renewables industry and has witnessed massive advances, particularly in the areas of safety and cost reductions and therefore has no doubts about the company's future development and expansion.

SUMMARY

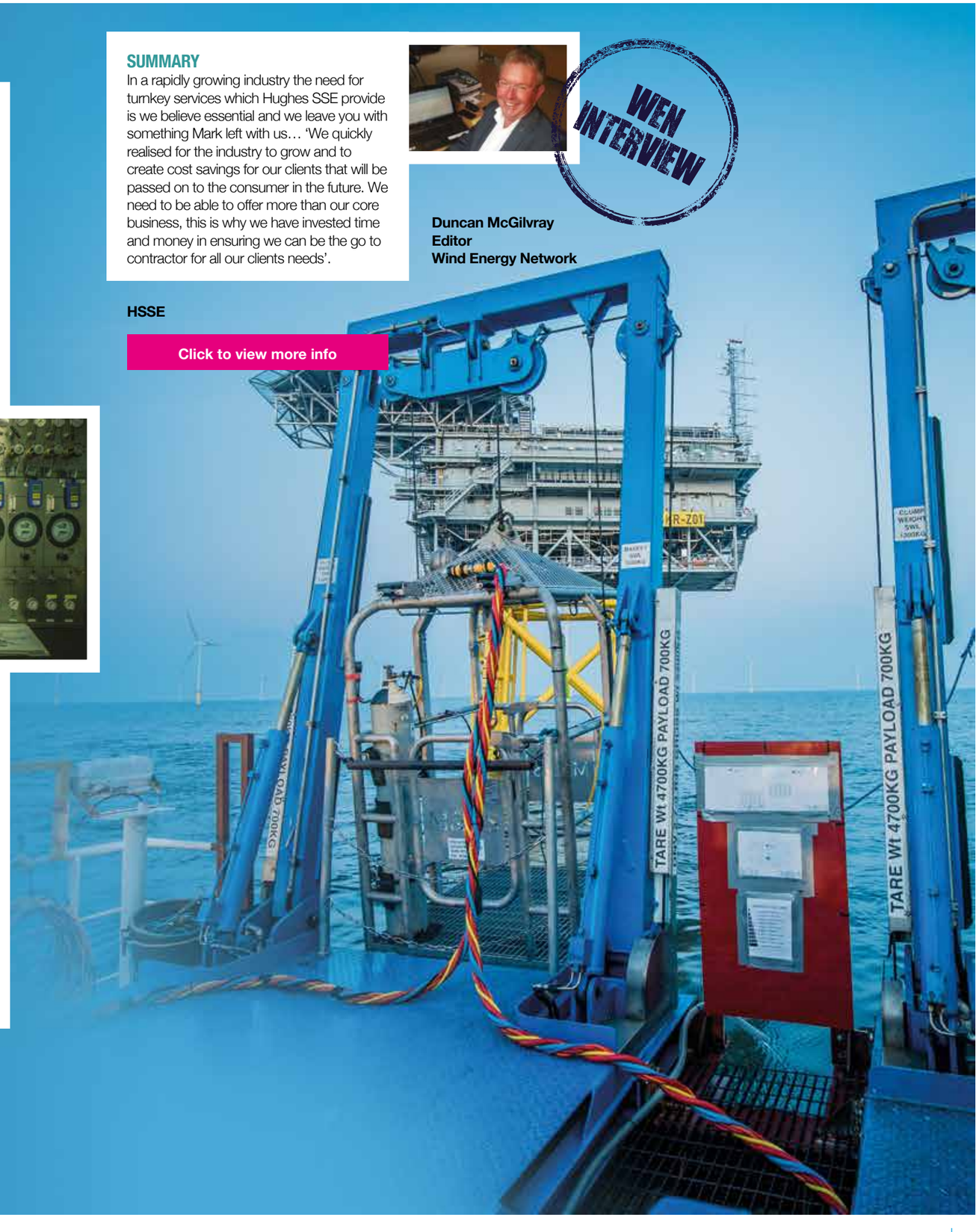
In a rapidly growing industry the need for turnkey services which Hughes SSE provide is we believe essential and we leave you with something Mark left with us… 'We quickly realised for the industry to grow and to create cost savings for our clients that will be passed on to the consumer in the future. We need to be able to offer more than our core business, this is why we have invested time and money in ensuring we can be the go to contractor for all our clients needs'.

WEN INTERVIEW

Duncan McGilvray
Editor
Wind Energy Network

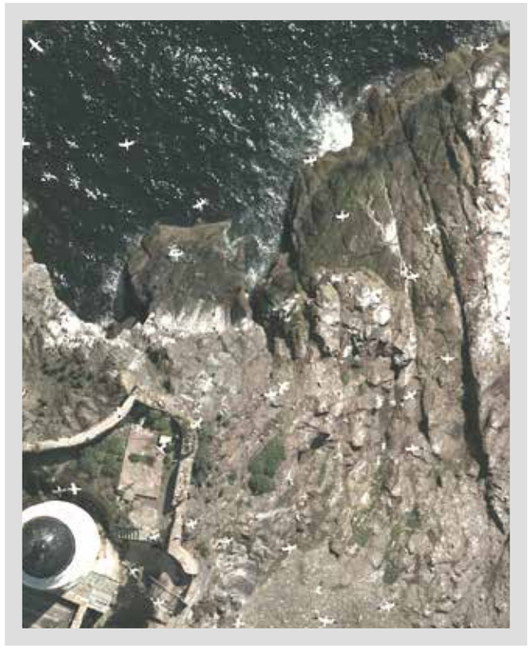
HSSE

Click to view more info



MARINE WILDLIFE SURVEYS FROM THE AIR

Ultra-high resolution aerial surveys have become the industry standard not just for birds, but also for marine mammals. From endangered monk seals and humpback whales in Hawaii, to bottlenose dolphins and harbour seals closer to home, the innovative surveys are revealing new data on the numbers, species and distribution of marine mammals.



BESPOKE EQUIPMENT

The surveys are carried out using a new generation of bespoke high resolution digital cameras fitted to special twin-engine survey aircraft. The aircraft fly a carefully planned pattern of flight lines over the proposed or constructed windfarm area, capturing thousands of images that are examined by experienced analysts.

The data captured in the images is being used by offshore windfarm developers and regulators both before and after construction, and recent independent research has confirmed the effectiveness of digital stills cameras for counting and identifying marine mammals.

These new cameras also work well in low light conditions, such as winter in the UK, North Sea and Baltic Sea, where many windfarms are operational, planned or under construction.

DATA USE

Data from pre-construction surveys is used for environmental impact assessments submitted during the process of applying for consent to build the windfarm. It can also provide baseline data against which future surveys can be compared.

Surveys during and after construction reveal how marine wildlife responds to the construction phase and how they behave in the longer term.

RESULTANT INFORMATION

Dr Mark Rehfisch of survey specialists, APEM, explains: *"The potential impacts of offshore windfarm developments appear to affect birds and marine mammals in almost opposite ways.*

"For birds, most of the potential impacts come once the windfarm is up and running, in terms of whether or not they avoid the area.

"But for marine mammals, any avoidance tends to come during the construction phase of the windfarm, through the disturbance effect of the sound of underwater pile driving or drilling. Once the windfarm is in operation, however, the only sound underwater is usually a low buzz, which the animals commonly get used to quite quickly."

With animals spending a long time underwater and the surveys sampling a representative proportion of the windfarm area, it is impossible to photograph every marine mammal. However, extensive research has generated correction factors that scientists can use to estimate the total numbers of animals based on the number photographed in the surveys.

SPECIES RECOGNITION

The species most often encountered in the waters around the UK and Germany, where APEM has carried out well over 500 surveys, are harbour porpoises, harbour seals, grey seals, common dolphins, bottlenose dolphins and white-beaked dolphins. But surveys around Hawaii captured more exotic species, such as the highly endangered Hawaiian monk seal.

APEM

OPERATING IN A FLUCTUATING MARKETPLACE

The UK offshore wind industry has seen significant flux over the last few years: first the introduction of the Planning Act in 2008 created a step change in the way in which projects gained consent, while setting a higher bar for public consultation and engagement. Secondly, electricity market reform (EMR) and the introduction of Contracts for Difference (CfD) changed the way in which project support was available, driving cost reduction by ensuring that only the most economically viable projects could proceed.

On top of this, the offshore wind industry, regulators and advisers came to a realisation that although post-consent environmental monitoring had been undertaken since the earliest Round 1 projects, no key questions had been answered and much of the early knowledge had been lost through lack of dissemination and large scale changes both in the development and regulator communities.

ENSURING COST EFFECTIVENESS

The drive to ensure cost effectiveness of projects therefore focussed the offshore wind industry on how it could work smarter – after all, if money is being spent, it should be spent resolving the important issues that would help to de-risk future development and consenting.

Too often, post-consent monitoring was focussed on issues not considered significant at the environmental impact assessment (EIA) stage, without proper consideration being given to the fact that avoidable expenditure only served to increase project costs, reduce project viability and impact the cost of energy.

WORKING TOGETHER

Since our inception, HiDef has been working with major UK offshore wind developers, including Centrica and DONG Energy to ensure that meaningful post-consent monitoring takes place at an appropriate scale to ensure that key questions can be answered.

The two most well-known examples of this are at DONG Energy's Burbo Bank Extension and Centrica's Lincs project, where statistically robust survey designs have yielded key data about important and sensitive species such as common scoter, red throated diver and gannet.

DEVELOPING BESPOKE SOLUTIONS

A focusing on developing bespoke solutions in a novel way has also seen British technology play a major role in the development of offshore wind in European countries, including in Germany and Denmark, where HiDef's bespoke technology is recognised by developers and regulators as being the industry standard.

This has been confirmed by recent, industry-led studies, which have demonstrated that the company's system is twice as effective as other contemporary technologies at observing birds, marine mammals and other megafauna in the marine environment.

IMPORTANT FEEDBACK INTERACTION

This important feedback interaction between the UK offshore wind industry and our European counterparts continues to ensure that lessons learnt are fed back into future projects, ensuring that the key questions keep being answered to support the continued growth of our green economy.

Kit Hawkins
HiDef Aerial Surveying

ADOPTING CUTTING-EDGE DRONE TECHNOLOGY

Cutting-edge technology is to be used by leading ecology consultancy Thomson Ecology to map sites and assist with surveying. The business is trialling the use of drones for Phase 1 surveys and mapping of, for example, coasts and invasive species, and in water sampling.

UAVs are not yet in regular use in the UK ecology sector, and the company will be one of the first ecology businesses to use this technology.

MORE FLEXIBILITY

Neil Smith, Senior GIS Specialist, who is at the forefront of the project said: *"The use of UAVs (Unmanned Aerial Vehicles), often referred to as 'drones', will allow us to be much more flexible in the way that we map and survey sites. We will be able to access precarious environments and hard-to-access places more quickly, with less cost, and without risk to surveyors.*

ADDITIONAL BENEFITS

"Data can be collected very quickly, and then shared with project teams and clients via TIM, our interactive mapping system. 3D modelling can also be created from the footage. This is an exciting time for us as we test the new technology and discover its full potential. The fact that we can link to TIM means that data acquisition is very rapid and results can be displayed more quickly than ever before."

LEGAL REQUIREMENTS

There are legal requirements when using drones. You cannot fly a drone within 50m of people, and it must be kept 'within site' – below 400ft (120m) in altitude, for example.

Legislation is in place to prevent people from breaking these laws with fines imposed on those who do; and permission from the Civil Air Authority to carry out aerial work (PFAW – Permission for Aerial Work) is required to use a drone commercially.

Thomson Ecology

CONDITION ASSESSMENT BY HELICOPTER

PDG Helicopters of Inverness are now applying proven aerial techniques for condition assessment by helicopter to wind turbines, by using ultra high resolution digital stills which are acquired by deploying their state of the art GSS Gyro Stabilised C516 camera system.

This system allows for a greater standoff distance from the turbines resulting in superior quality imagery, improved consistency and increased productivity.

BENEFITS

A helicopter survey of wind turbines has a number of benefits for the wind turbine operator. Primarily it reduces turbine downtime from traditional rope access methods or UAV inspection and also allows for access to turbines in weather conditions unsuitable for boat or UAV operations. Also by utilising the helicopter, there is a reduction in risks to personnel.

TECHNICAL ADVANCES

Due to advances in helicopter mounted cameras, we are now able to capture a far superior quality image in a reduced timeframe, meaning an offshore turbine can be surveyed in 30 minutes.

REPORTING

A report including pictures is then uploaded to a secure cloud where the client can access this report from anywhere in the world and share with colleagues. Typically these images are available within 24 hours of a turbine survey. On average 10 turbines per day can be surveyed.

SUMMARY

So condition assessment of wind turbines by helicopter can now be completed in a safe, efficient and cost effective manner.

PDG Helicopters

REMOTE SENSING IS DRIVING DOWN OFFSHORE RENEWABLES COSTS

Remote sensing technology is facilitating new and innovative approaches that aid the offshore renewables sector in meeting environmental consents and driving down costs.

REGULATIONS AND GUIDANCE

Many EU countries have regulations and guidance to meet Marine Strategy Framework Directive criteria, including restricting noise generation within the marine environment, and Habitats and Birds Directives protect many EU species and habitats. The resulting demand for comprehensive, defendable data is increasingly being fulfilled using remote sensing technologies.

OPTIONS

Traditional ecological surveying techniques require a surveyor in the field. In contrast, remote sensing uses automated sensors that provide consistent data, recorded and analysed post-capture, allowing ecologists to collect efficient, cost-effective data.

Remote sensing techniques such as bioacoustics, where recorders can be deployed and left unattended while collecting data, can generate comprehensive data providing a more complete picture of marine mammal activity. Multiple datasets can be combined for corroboration.

UNMANNED AERIAL VEHICLE (UAV)

Baker Consultants' UAV collects high definition aerial photographs of seabirds and cetaceans. When combined with contemporaneous marine bioacoustic recordings, this provides reliable and defensible data, reduces availability bias and gives a comprehensive understanding of how species use a site.

Remote sensing also gives greater accuracy, enhances repeatability (survey transects can be re-flown), is more time-efficient and cost-effective (covering large areas in a short space of time) and reduces disturbance bias.

POWERFUL DATA

"Combined, contemporaneous data is powerful." states Andrew Baker, Managing Director of Baker Consultants who have a comprehensive remote sensing service. *"Identification of seabirds and marine mammals from aerial photographs can be problematic. But, combination with sea-level observations and complementary use of bioacoustic recorders gives more reliable data in a greater range of weather conditions and a clearer understanding of the species present."*

Baker Consultants