OFFSHORE

Magazine

Commercial Content

NOVEMBER 2018

Nordiske Medier
news to use – in business

Welcome

Welcome to the first international edition of our OFFSHORE magazine. As some of you may have heard - we at Nordic Media Group are the niche business press in Scandinavia with multiple publications and offices in Norway, Sweden and Denmark.

We have dedicated this maiden issue to the life cycle of OFFSHORE wind farms.

It will be read by Wind farm owners, Maintenance companies and the armada of service & supply companies that work on, with and at the OFFSHORE-wind farms in Europe. Be it software optimization, floating crew hotels, or the lubricants in the drive chains and gearboxes - we have got it covered.

We would like to thank the Danish energy company Ørsted, which literally back in the day, when it was called Dong Energy had the appetite, curiosity and audacity to actually go through with putting up the world's first offshore wind farm. You will meet this wind farm later - because it has been decommissioned - and now serves as a showcase of the opportunities in the last part of a wind farms life cycle.

Without the goodwill and acceptance of key people in the Ørsted organization, this magazine would not have been possible.

You will get meaningful insights into the world´s largest wind farm: Walney extension The key participants in the process, the production and logistics of this majestic endeavor and last but not least the companies, which had flippers & propellers in the water - so to speak.

You will meet the backbone companies of the everyday nitty gritty of running, optimizing and maintaining a modern offshore wind farm. Be it how drones with sophisticated measuring equipment can inspect a wind turbine working at full capacity for wear and tear issues - without production stops - or how the choice of lubricants can be make or brake in the long service contracts that characterize the wind farm industry.

We portray how the world's first OFFSHORE Wind Farm was decommissioned - We walk you through the highlights of the actual process. What is of real practical and financial interest is that the owner points out whole areas of the scrapping process which if handled correctly - can turn into new world covering recycling industries.

Finally yet importantly, we give you a complete overview of all the wind farms in Europe - with birth dates - this is almost a blueprint for doing business in the decommissioning industry.

Steffen Villadsen &
Christian Ahlers

OFFSHORE MAGAZINE

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Introducing a new, fully integrated solution for your **operations and maintenance** requirements. The Fred. Olsen related companies have aligned to provide a single interface, reducing operational risk, contractual complexity and cost.

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- **Decommissioning repowering and life extension**
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www.windcarrier.com

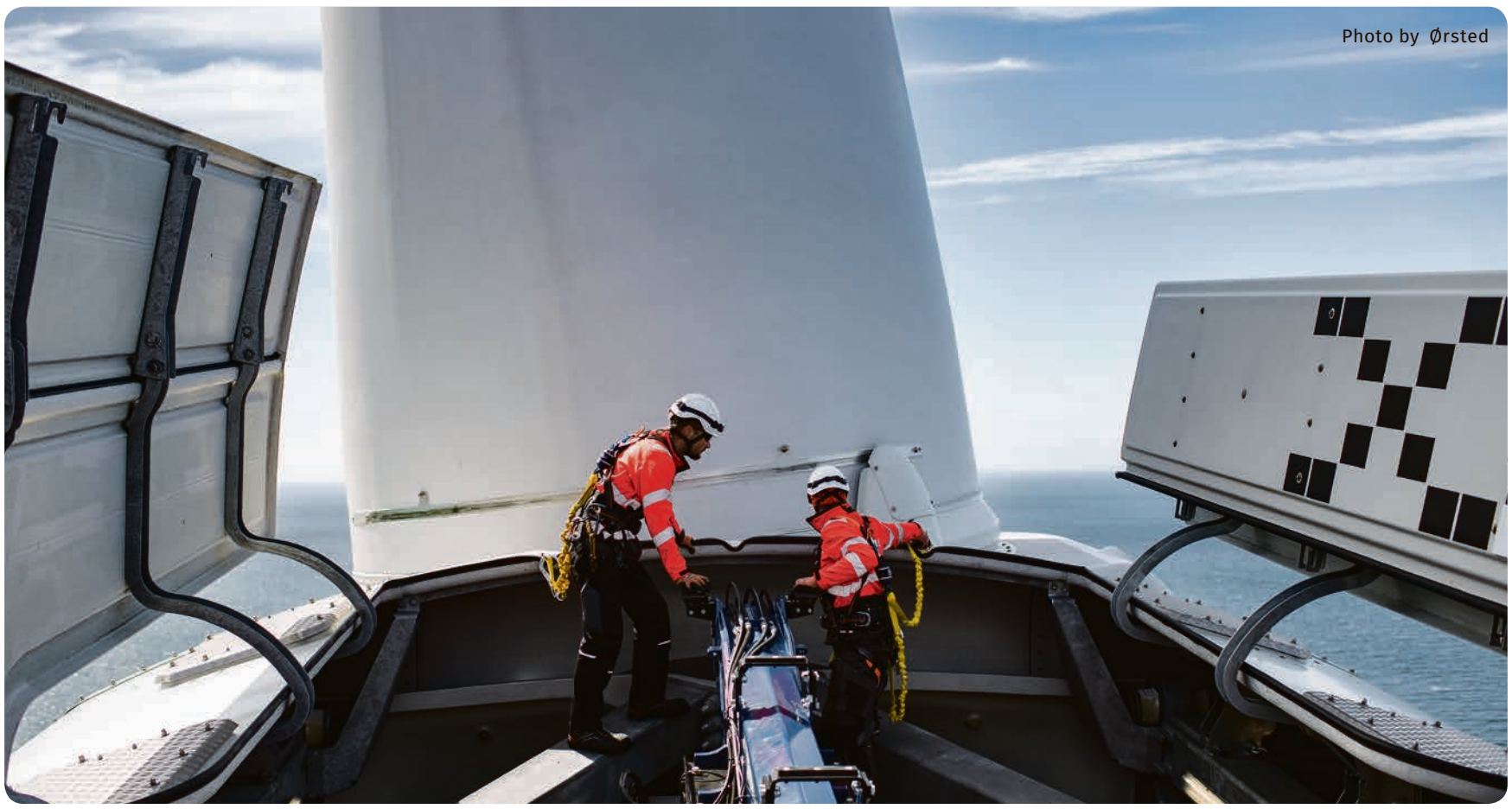


Photo by Ørsted

Walney – the world's largest offshore wind farm

Commissioning the world's biggest offshore wind farm requires the cutting edge by all involved parts. Especially by Ørsted, who has orchestrated the entire construction.

By Lene Steinbeck

When the Walney Extension was inaugurated in September earlier this year, it became the world's largest operational offshore wind farm at 659 megawatts (MW) – taking the crown from the previous largest, London Array.

Walney Extension consists of 87 turbines capable of generating enough electricity for nearly 600.00 UK homes. Despite its name, Walney Extension is a standalone project and not connected to the Ørsted's original Walney Offshore Wind Farm, which began operation in 2012.

Ahead of the commissioning of the offshore works for Walney Extension, which began in February 2017, were years of planning, consenting, designing, request for tenders etc. to ensure that everything was cutting edge.

Tenders with prequalified contractors

Peter Rom Poulsen, EPC director at Ørsted, was appointed to lead the project in 2014, and as the final approval for executing the project was ready almost a year later, the process of tenders began.

- We issued requests for tenders each with a defined contract scope and a time schedule. The scope for each contract was designed for a selection of prequalified contractors and distributed to them. It was important that the scope matched the contractors' core competences, says Peter Rom Poulsen.

The main components for the offshore wind farm lie within 40 different contracts. Ørsted depended on a big network of international as well as local contractors and suppliers, and a deep knowledge of who could supply these specialized supplier and offshore services.

And they wanted to make sure, that the contractors could meet some basic requirements.

- A high Health and Safety standard is our license to operate, so we have very high demands in H&S. That is essential and always our starting point. Then, of course, competences, experience, equipment and resources are important elements when prequalifying a contractor for a tender, says Peter Rom Poulsen.

In the end it comes down to who can provide the most optimal offer within implementation and cost, assessed over the lifetime of the asset

A good result is good for everyone

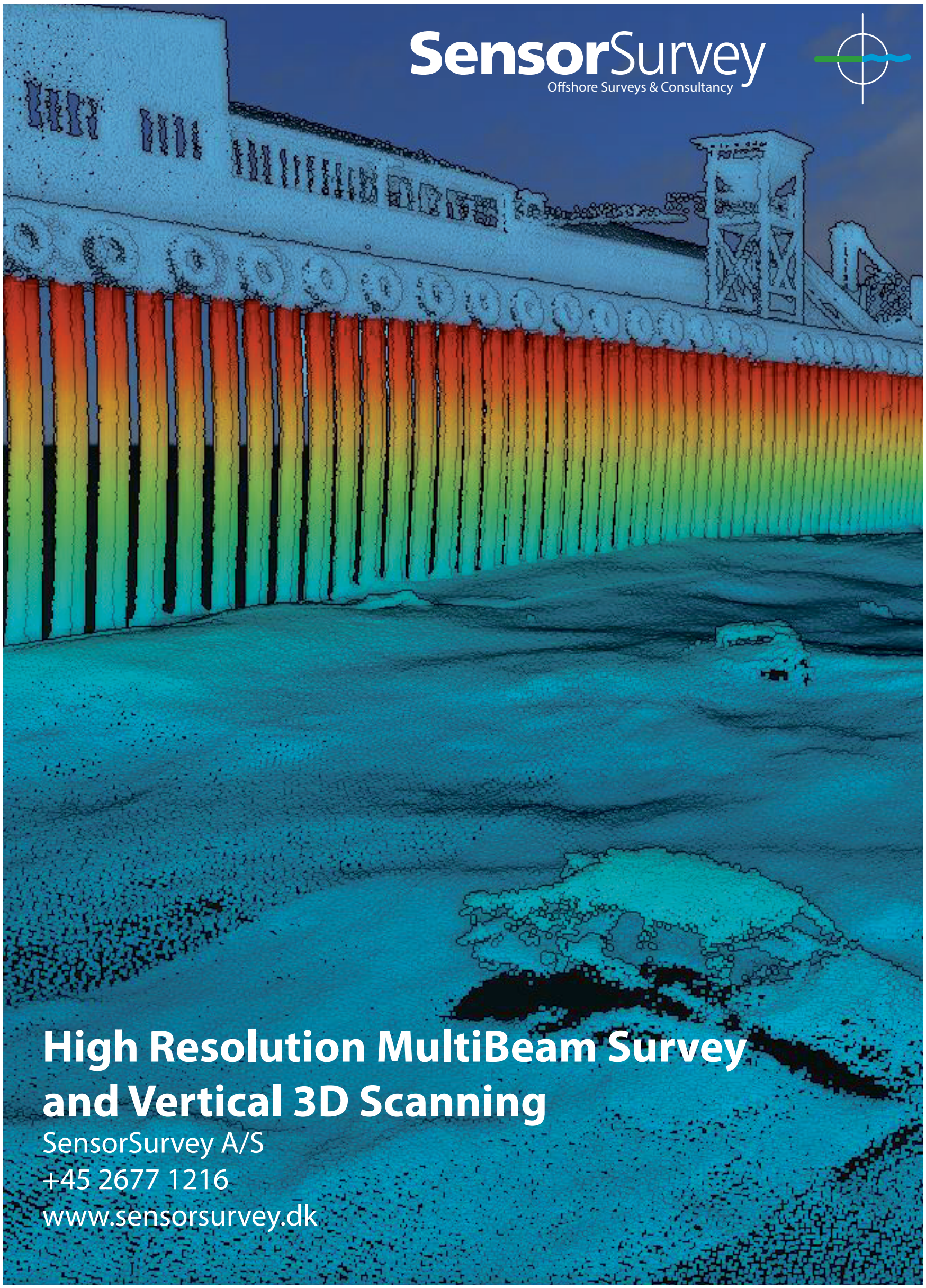
- Most of the main contracts were signed in November 2015 and the following months. Altogether, there were more than 400 contracts on this project. And the cooperation between the contractors and us is essential in getting an end result like this, says Peter Rom Poulsen.

Contractors working with Ørsted are often onboard more than one project, if they do deliver a good performance. A good partner is worth keeping, and Ørsted try their best to be foresighted to avoid conflicts in the process.

- It is important to think of us as two different parties, who both wishes to optimize our business. We are very interested in a reasonable result for our contractors, because we will be depending on them for our next construction project also, says Peter Rom Poulsen.

The Walney Extension:

- Inaugurated September 6, 2018
- 87 turbines - 40 x MHI-Vestas 8.25 MW turbines and 47 x Siemens Gamesa 7 MW turbines
- Shared ownership: Ørsted (50%), PFA (25%) and PKA (25%)
- Total capacity of 659 MW, enough to power almost 600,000 homes in the UK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Offshore Surveys & Consultancy
High Resolution MultiBeam Survey
and Vertical 3D Scanning
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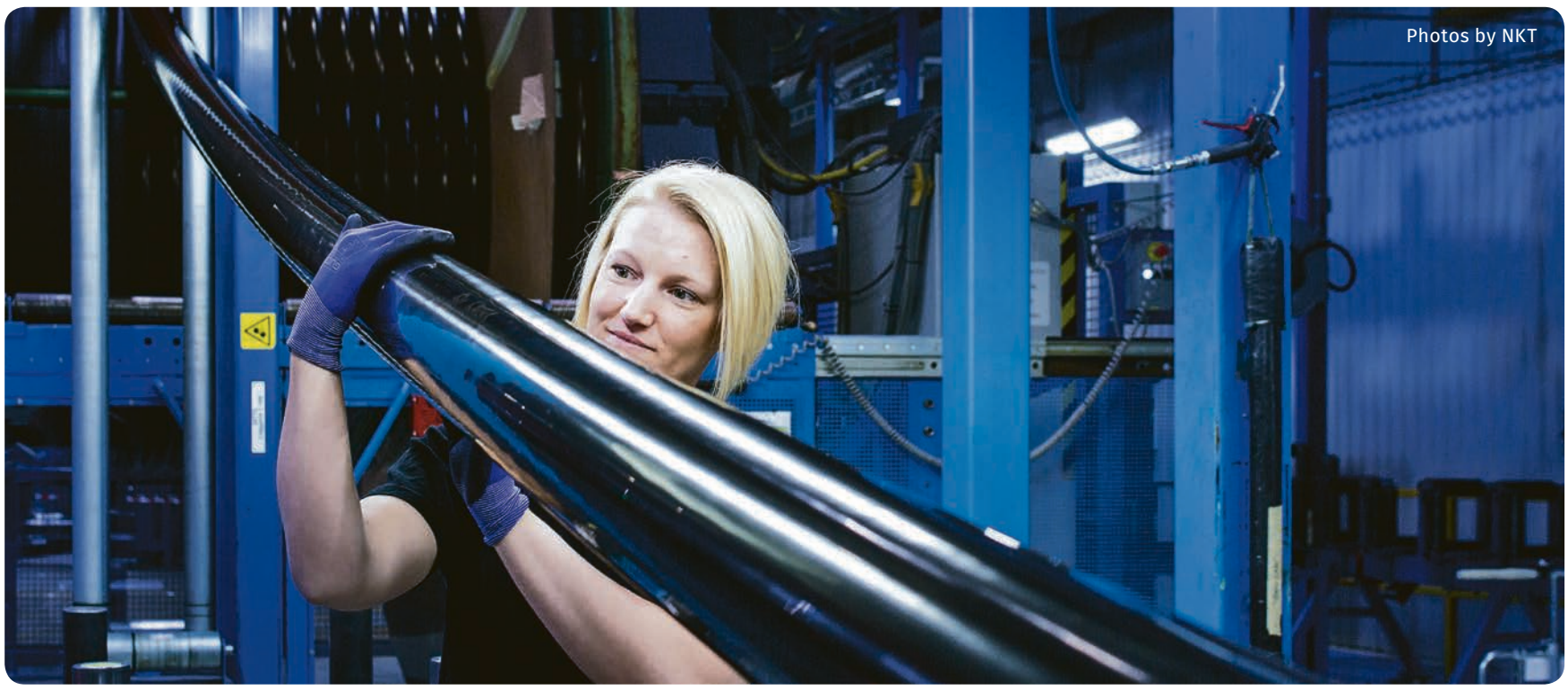

Photos by NKT

Preparation is key in cable service

Most offshore plants are not prepared for a cable failure, and a cable outage can be very costly. By offering their expertise and service NKT can help customers reduce expenses drastically in case of cable failure.

By Lene Steinbeck

As the Walney Extension was inaugurated in September 2018, the export cable work was done by NKT, who designed, manufactured and commissioned the cable systems to connect the Walney Extension wind farm to shore.

- We are proud to be part of the ambitious project generating renewable energy in UK and we have seen great collaboration with Ørsted and other suppliers to the Walney Extension. In NKT, we are committed to the sustainable development of the global energy production, and this project reinforces our position as a leading provider of advanced high-voltage cable solutions connecting offshore wind parks to the power grid, says Stefan Persson, Head of Service & Installation at NKT.

Strong on cable service

The company's long history and expertise in all aspect of cable supply makes them an obvious choice for handling the cable service afterwards as well. Stefan Persson is one of the co-founders of the company's service business, which alongside cable solutions is a key offering for NKT.

> ***"About 80 percent of the claims hitting the insurance companies comes from cable failure, so I think that it is an industry problem that we are trying to address in that way.***
>
> - Stefan Persson, Head of Service & Installation at NKT

- We have been working actively on building a dedicated service department for close to a decade now. And we have a track record of at least 25 offshore repairs within the last few years, so we are very strong on power cable services, says Stefan Persson.

Cable failures are rare. But when it happens the expenses are often comprehensive.

- The key cost in the repair is the time when you cannot use your cable to transmit power. And the normal cable outage is 60 days, for offshore even up to a market average of 107 days. We are usually able to cut that by 70% and get the cable back in business in 30 days, says Stefan Persson.

Addressing an industry problem

Most companies are not prepared for cable failure, because the modern cables are usually totally maintenance free, says Stefan Persson:

- We experience maybe 10 offshore cable failures a year in Europe, so, it happens very, very seldom.

That means that the plant owners have no experience and competence to repair a cable failure.

- You need to know where your spare parts are, you need to have your documentation ready, and you need to know that you have access to the right people, the right tools and the right expertise. That is what we are providing, says Stefan Persson.

He believes that big expenses concerning cable failure is a general problem in the offshore market.

- About 80 percent of the claims hitting the insurance companies comes from cable failure, so I think that it is an industry problem that we are trying to address in that way.

NKT and Walney:

- NKT has designed, manufactured and commissioned the two 220 kV AC extr uded export cable systems to connect the Walney Extension wind farm to shore.
- The links include over 139 kilometers of submarine cable to connect the two wind farm transformer platforms, WOW03 and WOW04, to the shore.
- In addition, and for increased redundancy, a 20 km interlink cable was provided, connecting the two platforms to each other.
- All 220kV joints and terminations were also supplied and installed by NKT.

The high-quality eye in the sky

A huge merger has helped ALL NRG gain new competence. The company has specialized in drone inspections, defying weather conditions and getting high quality photos every single time.

By Lene Steinbeck / Photo by ALL NRG

In 2014/2015 four companies merged to form one big and stronger business under the name ALL NRG.

- This consolidation was a way to maintain and strengthen our position. Now we have the volume and the set up to handle much bigger assignments, which is essential for us in relation to our customers, says Hans Schneider, CEO of ALL NRG.

One of the four original companies specialized in turbine inspection. Among the services was blade inspection which at the time, was mostly performed by rope access, but rather quickly ALL NRG started looking into the drone technology.

- Because of our increased set up and large scale we were able to look at new industry and at our customers' requests. They wanted better and more secure solutions for turbine inspection, which could be solved with the use of drones, says Schneider.

Performing in harsh conditions

Offshore, the weather conditions make it very difficult to secure the quality of the photos.

By combining a professional drone set up with the company's huge offshore experience, strict quality and safety awareness, ALL NRG ended up with a high-quality solution, that satisfies their customers every time.

One of the inspection projects this year has been routine blade inspection of 177 offshore turbines in Belgium. A school example on how to run a drone inspection campaign in harsh offshore conditions.

- We hear from our customers that no other suppliers can deliver the same good product every time the way we can. We are very proud of that, and we will keep developing our drone inspection solutions to maintain our position, says Schneider.

- And it evidently increases safety. Replacing a human being at the end of a rope in a rough environment with a drone will of course minimize the risk of accidents. Further, eliminating a boat transfer and the sometimes strenuous rope access work improves the working environment and results in a safer offshore operation.

ALL NRG

- Has more than 20 years of experience in onshore and offshore wind energy
- Employs more than 600 competent people
- Had employees involved in developing and construction of 90 % of the worlds offshore wind turbines

Merger will strengthen HYTOR on wind services

An imminent merger will leave HYTOR with more manpower and more muscles from January 1, 2019.

By Lene Steinbeck / Photo by HYTOR

Under their new name – HYTOR Tools Solutions – the two companies HYTOR and eptools will be able to offer a much wider set of competences within the wind industry.

- We will increase our knowledge and our level of experience, which will definitely benefit our customers. Instead of one or two specialists in each area, we now have 6-8, says Head of Sales, Martin Sørensen.

HYTOR Tools Solutions will be able to deliver complete packages within specialized tools, from hydraulic to electronic tools and for installation and service of wind turbines.

HYTOR have been working actively on strengthening digital solutions to meet customers demand for full traceability and easy access to documentation. Great examples of this is tools featuring data logging, thus an online system to keep track of tools, a system with the ability to access documentation and service intervals at all times.

- We are even able to trace lost tools, if the tools are equipped with GPS, says Martin Sørensen.

Tools handling

HYTOR offers to supply their customers with fully equipped tool-containers, that can be rented, leased or bought.

- The containers will be equipped individually and designed especially for the assignment of the customer. Every tool they need will be in the container. We make sure that all the tools are serviced and ready for use, we handle the maintenance and we replace tools if something goes missing, a concept we like to call tools handling, says Martin Sørensen.

To lower customers cost of service and calibration of tools HYTOR offers on-site calibration by providing fully equipped service and calibration workshop in a container available at any given site.

- This makes our customers save a lot of time and cost on calibration and service of tools as they do not need to ship the tools back and forth to a workshop for certified calibration, says Martin Sørensen.

HYTOR


Photos by Eltronic

Eltronic's tagline solution: an important tool to ensure the safe and successful execution of the Walney Extension project

Our patented tagline solutions allow for a safe and controlled guiding process when lifting rotors, nacelles, and single blades in any site condition. Our tagline master system controls the horizontal position of a load to make sure the load will not turn, regardless of crane movements or other external impacts and even at high wind speed.

By Lene Steinbeck / Eltronic

A significant increase in wind turbine heights and installations at higher wind speeds cause the lifting of blades, nacelles and other components to be more difficult and dangerous than ever before. Manual handling, an extensive amount of crane work and the risk from suspended loads are only a few areas of concern during lifting operations.

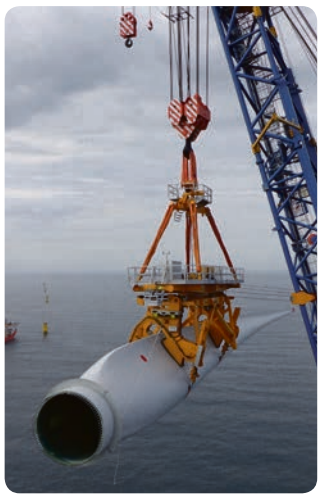
In case of such complex installations, the precise control of wind turbine components during lifting operations is of the utmost importance to ensure the safety of the personnel and no damage to the components and the tower itself.

Health & Security in focus

The authorities and industry organizations promote health & safety with regulations, OEM's, however, try embedding a safety culture and changing the mentality of its employees, which are often challenged by time-sensitivity of the operation.

At Eltronic Wind Solutions, we believe that safety & efficiency do not need to be compromised in order to meet challenging timetables. All our solutions are focused on automation in order to minimize manual handling, installation time and working at heights.

Eltronic designs and manufactures the tagline solutions specific to any crane type. Thereafter Eltronic oversees the mobilization of the traverse system. We also offer training of operators, de-mobilizing of the equipment,



service and storage after use.

- You won't find anyone who did as many mobilizations of Traverse systems as we have. So, we have the knowhow to get the job done. We take pride in following our equipment because we know it inside out, says Rasmus Kjærgård Andersen, Service Manager in Eltronic Wind Solutions.

No waste of time

-Preparation of mobilizing the travers system requires meticulous planning. Once we are assigned a dock, we immediately inspect the dock and the ship – and start drafting a lifting plan.

As soon as the plan is approved by the customer, Eltronic prepares and packs the equipment.

The crew travels to the dock and start preparing the area to assemble and lift the travers parts safely and effectively.

- We usually do a pre-assembly, so everything is ready for when the mobile crane for lifting and mounting the equipment enters the dock. Once we have access to the mobile crane, we don't want to waste time assembling tools, all time should be spent on installation of the traverse system, says Rasmus Kjærgård Andersen

Throughout the process, Eltronic plans one step ahead.

-Time is the most important factor, and the weather is the most unpredictable. So, we try to be foresighted as possible and can adapt on a very short notice. We are in close dialogue with the customer about their plans. And we follow the weather reports closely, says Rasmus Kjærgård Andersen.

Eltronic
WIND SOLUTIONS

Cable failure requires immediate action

Nexans Norway, a supplier of cable systems, knows the importance of quick action in case of a damaged cable.

By Lene Steinbeck

As the number of Offshore Wind Farms grows with higher and higher generation capacity there is an increasing risk of export or inter array cables being damaged by external factors. Such an event makes the alarms turn red immediately. Nexans Norway specializes in reacting fast to reduce downtime.

- If the customer has two or three export cables, a cable damage will mean a loss of energy transfer capacity. In the case of only one export cable, the revenue will stop totally. Either way, in case of damage, all alarms will turn red and we need to move fast, says Maxime Toulotte, technical marketing manager in Nexans Norway.

Agreement prior to damage

Nexans encourages and support it customers to inspect and maintain their cable systems on a regular basis. Nexans' set of services not only reduces the failure risk for cable systems through proactive inspection and maintenance, but also increases efficiency when dealing with unexpected incidents.

The company has managed to reduce the downtime from cable damages drastically for their customers. First of all, by being prepared. Nexans Norway takes their precautions by preparing for the unexpected, because historically, discussions once the damage is done has occupied precious time.

- Instead, we designed some methods and terms, that we and the customer agreed on up front. Way before the damage. We come to an agreement on the solution, on the tools, on whether we should use our vessels or their own and so forth, says Morten Langnes, Sales Manager in Nexans Norway

Inhouse competences save time

Second, Nexans Norway has a big advantage: Because the company supplies and installs cable, they have practically all competences and equipment for a repair inhouse.

- We have vessels, we have cable jointers, we have tools. Everything is handled with inhouse competences, which makes us able to react really fast. We can quickly provide a project team. Having done a number of cable repairs, we also have the experience, says Maxime Toulotte.

He underlines the importance of a dedicated IMR department (Inspection, Maintenance and Repair), that is prepared to move fast.

With a lot of interest in their services, Nexans Norway has developed very flexible solutions.

- We can provide a full turnkey repair. But we are very flexible and can adapt the offer. If the client has an easy access to vessels or certain tools, we can provide cable jointers only, says Morten Langnes.

VINDEBY The mother of all OFFSHORE WIND FARMS

Vindeby was the first OFFSHORE Wind farm in the world. The backdrop for Vindeby was the recognition that there was not enough room on land if significant percentages of the Danish energy consumption should be covered by renewable energy. Situated close to shore 1- 3 km out in shallow waters was Vindeby -the ideal site for an offshore windfarm.

By Christian Ahlers / Photo by Ørsted

From the beginning Dong Energy Now Ørsted chose Bonus now SiemensGamesa Wind Turbines, because Bonus had developed their turbines to withstand the more harsh offshore environment by putting the nacelles under permanent pressure hence ensuring that salty sea air would not enter the interior causing corrosion and exploding maintenance cost.

After a flawless and fast take down of wings, nacelles and tower components – some trouble began. The paper based “as-built” documentation of the early 1990´ies had been lost in a fire in an archive some years earlier. So the decommissioning of the foundations had to be planned based on limited documentation and good memory of people involved in the construction. Mr Leif Winter cross portfolio manager at Ørsted recalls that an additional 50 M3 of concrete was discovered in the bottom of each caisson. All in all this translated in to a couple of months delay - not critical considering the nature of the obstacle and as the site was not going to be used for offshore wind again.

The Energy World have learned a lot from Vindeby - You could say that the mega turbines of the North Sea today stand on the shoulders of the 450 kw turbines from 1991.

Leif Winther sees huge potential for a decommissioning/recycling industry - because in the coming years the first generations of wind farms will be retired after 20-30 years of operation. All anyone interested needs to do is to be creative about the dismantling and recycling processes.

Decommissioning and recycling of offshore wind farms

Decommissioning an offshore wind project like Vindeby can create a lot of industrial waste. But most of the components can be re-used or recycled.

By Lene Steinbeck

When demounting both onshore and offshore wind farms, Connected Wind Services makes sure that as few components as possible goes to waste.

- We demount the complete windfarm and take the components to our stock as used spare parts. Some, we repair or refurbish to make them as good as new, and we can sell them with warranty. Others, we sell a bit cheaper as used components, says Kent Hougaard, Head of Sales in Connected Wind Service.

They did the project management and decommissioning of the offshore wind parks Vindeby and Yttre Stengrund.

Studying the used components

Connected Wind service has years of experience ensuring their clients a full lifecycle O&M service, including the procurement of discontinued parts.

- From one of our offshore decommissioning we used a lot of the components for the onshore market, where some of our customers had trouble finding spare parts. They were simply no longer in production as the OEM´s no longer can supply spare-parts for these models. So, it is a unique service for our customers, says Hougaard.

When Connected Wind Services decommissioned the world’s first offshore wind farm, Vindeby, almost nothing was refurbished, because the components were from the very early stages of the industry. But for the same reason, suppliers were waiting in line.

- They wanted to acquire samples of everything from concrete foundation, gearboxes to paint. The companies studied them to learn from the products that had been producing electricity off shore for 25 years, says Kent Hougaard.

- This way, the companies gain valuable knowledge of what it would take to make the wind turbines run for another ten years in example.

CONNECTED WIND SERVICES

Connected Wind Services

- More than 30 years of experience within service and maintenance of wind turbines in Northern Europe.
- With more than 1500 turbines of various brands in service and own facility for refurbishment of gears, main shafts and other wind turbine components it is a strong partner for wind turbine owners.

WIND FARMS IN EUROPE

Map of wind farms in Denmark, Sweden, Norway, Germany, Holland, Finland and England.

Denmark

1. Ørsted - Anholt Offshore A/S
Place: Anholt | Year: 2013
Address: Kraftværksvej 53, 7000 Fredericia, Skærbæk
2. E. ON Vind Sverige AB
Place: Rødsand II | Year: 2010
Address: 217 42 Malmö, Sverige
3. European Energy A/S
Place: Sprogø | Year: 2009
Address: Gyngemose Parkvej 50, 2860 Søborg
4. Ørsted A/S
Place: Avedøre Holme | Year: 2009
Address: Hammerholmen 50, 2650 Hvidovre
5. Ørsted Horns Rev 2 A/S
Place: Horns Rev 2 | Year: 2009
Address: Kraftværksvej 53, 7000 Fredericia
6. Horns Rev 2
Place: Horns Rev 2 | Year: 2009
Address: Fiskerihavnsgade 8, 6700 Esbjerg
7. SE Blue Renewables K/S
Place: Frederikshavn | Year: 2003
Address: Langebrogade 1, 1411 København K
8. Samsø Havvind A/S
Place: Samsø | Year: 2003
Address: Museumsvej 1, 8350 Samsø
9. Energi E2
Place: Nysted | Year: 2003
Address: Kraftværksvej 37, 2300 København S
10. Vindenergi ApS
Place: Rønland | Year: 2003
Address: Solbjerg Hedevej 208, 8355 Solbjerg
11. Harboøre Møllelaug I/S
Place: Rønland | Year: 2003
Address: Borgervænget 12, 7673 Harboøre
12. Thyborøn-Harboeøre Vindmøllelaug
Place: Rønland | Year: 2003
Address: Rugvænget 3, 7673 Harboøre
13. Vattenfall - Horns Rev 1
Place: Horns Rev 1 | Year: 2002
Address: Jupitervej 9, 2. sal
14. Middelgrunden Vindmøllelaug I/S
Place: Middelgrunden | Year: 2000
Address: Mælkevejen 77, 1440 København
15. SE Blue Renewables K/S
Place: Tunø Knob | Year: 1995
Address: Vesterbrogade 4A, 1. sal

Sweden

16. SeaTwirl AB
Place: SeaTwirl S1 | Year: 2015
Address: Erik Dahlbergsgatan 11A, 41126 Göteborg
17. Vindkraft Gässlingen Ekonomisk förening
Place: Vänern | Year: 2010
Address: Snabbvingegatan 26, 46163 Trollhättan
18. Vattenfall Europe Windkraft GmbH
Place: Lillgrund | Year: 2007
Address: Evenemangsgatan 13C, 16979 Solna
19. E. ON Climate & Renewables GmbH
Place: Kårehamn | Year: 2013
Address: 205 09, Carl Gustafs väg 1, 21742 Malmö

Norway

20. Technip S. A.
Place: Hywind | Year: 2009
Address: Philip Pedersens vej 7, 1366 Lysaker

Germany

24. Ørsted A/S
Place: Gode Wind 1&2 | Year: 2016
Address: Van-der-Smissen-Strasse 9, 22767 Hamborg
25. Global Tech I Offshore Wind GmbH
Place: Global Tech I | Year: 2015
Address: Am Sandtorkai 62, 20457 Hamborg
26. Ocean Breeze Energy GmbH & Co. KG
Place: BARD Offshore 1 | Year: 2013
Address: Flughafenallee 11, 28199 Bremen
27. Iberdrola Energie Deutschland GmbH
Place: Wikinger | Year: 2017
Address: Charlottenstrasse 63, 10117 Berlin
28. Nordsee One GmbH
Place: Nordsee One | Year : 2017
Address: Überseering 3453, 22297 Hamburg
29. WindMW GmbH
Place: Meerwind Süd/Ost | Year: 2017
Address: Schleusenstrasse 12, 27568 Bremerhaven
30. OWP Butendiek GmbH & Co. KG
Place: Butendiek | Year: 2015
Address: Kurfürstenallee 23a, 28211 Bremen
31. Trianel Windpark Borkum GmbH & Co. KG
Place: Trianel Windpark Borkum | Year: 2013
Address: Krefelder Strasse 203, 52070 Aachen
32. EWE AG
Place: Riffgat | Year: 2013
Address: Tirpitzstrasse 39, 26122 Oldenburg
33. EWE AG
Place: Riffgat | Year: 2010
Address: Tirpitzstrasse 39, 26122 Oldenburg
34. EnBW Baltic 1 GmbH
Place: Baltic 1 | Year: 2010
Address: Durlacher Allee 93, 76131 Karlsruhe

Holland

61. Bouwcombinatie Egmond
Place: Egmond aan Zee | Year: 2008
Address: Ringwade 71, 3439 LM Nieuwegein
62. NordzeeWind
Place: Egmond aan Zee | Year: 2008
Address: 2e Havenstraat 5-B, 1976 CE Ijmuiden
63. Van Oord NV
Place: Eneco Luchterduinen | Year: 2015
Address: Jan Blankenweg 2, 4207 HN Gorinchem
64. Eneco Wind B. V
Place: Eneco Luchterduinen | Year: 2015
Address: Marten Meesweg 5, 3068, Rotterdam
65. Van Oord NV
Place: Gemini | Year: 2017
Address: Jan Blankenweg 2, 4207 HN Gorinchem
66. Northland Power, inc.
Place: Gemini | Year: 2017
Address: Amstelveenseweg 760, 1081 JK Amsterdam
67. Van Oord NV
Place: Princess Amalia | Year: 2008
Address: Jan Blankenweg 2, 4207 HN Gorinchem

Finland

21. OX2
Place: Ajos | Year: 2017
Address: Malminkatu 28, 00100 Helsinki
22. Levator Oy
Place: Kemin Ajoksen | Year: 2009
Address: Koppnäs, 10900 Hanko
23. Suomen Hyötytuuli Oy
Place: Reposaaren Tuulipuisto | Year: 2010
Address: PO Box 305, 28601 PORI

England

35. Barrow Offshore Wind Ltd.
Place: Barrow | Year: 2006
Address: Greenacres, Urswick Road, Dalton In Furness
36. Ørsted Burbo Extension Holding Ltd.
Place: Burbo Bank | Year: 2007
Address: 5 Howick Place, London
37. Diamond Transmission Partners
Place: Burbo Bank Extension | Year: 2017
Address: 71 High Holborn, London
38. Ørsted Power (UK) Ltd.
Place: Burbon Bank Extension | Year: 2017
Address: 5 Howick Place, London
39. Equinor ASA
Place: Dudgeon | Year: 2017
Address: 3 More London Riverside, London
40. Flour Limited (Fluor Corporation)
Place: Greater Gabbard | Year: 2012
Address: Sterling Partners Limited Units 15 & 16
41. Balfour Beatty Plc
Place: Gwynty Môr | Year: 2015
Address: Park Square Newton Chambers Road
42. E. ON Climate & Renewables UK Ltd.
Place: Humber Gateway | Year: 2015
Address: Westwood Way, Westwood Business Park
43. Humber Gateway OFTO Ltd.
Place: Kentish Flats | Year: 2005
Address: 6th Floor Balfour Beatty, 350 Euston Road
44. Kentish Flats Ltd.
Place: Kentish Flats | Year: 2005
Address: First Floor, 1 Tudor Street
45. Ørsted Power (UK) Ltd.
Place: Lincs | Year: 2013
Address: 5 Howick Place, London
46. London Array Operations & Maintenance
Place: London Array | Year: 2013
Address: Westwood Way, Coventry
47. Siemens AG
Place: Lynn and Inner Dowsing | Year: 2009
Address: 3 Melville Street
48. North Hoyle Consortium
Place: North Hoyle | Year: 2003
Address: 27-28 Eastcastle Street, London
49. Ormonde Energy Limited
Place: Ormonde | Year: 2012
Address: First Floor, 1 Tudor Street, London
50. Ørsted (UK) Limited
Place: Race Bank | Year: 2018
Address: 5 Howick Place, London
51. Rhyl Flats Wind Farm Ltd.
Place: Rhyl Flatsnk | Year: 2009
Address: 5 Howick Place, London
52. E. ON Climate & Renewables UK
Place: Robin Rigg | Year: 2010
Address: Westwood Way, Coventry
53. Equinor ASA
Place: Sheringham Shoal | Year: 2012
Address: 71-75 Shelton Street, Covent Garden
54. Van Oord NV
Place: Teesside | Year: 2013
Address: Bankside House Henfield Road, Sheffield
55. Walney (UK) Offshore Windfarms Ltd.
Place: Walney | Year: 2010
Address: 5 Howick Place, London
56. Ørsted Power (UK) Ltd.
Place: Westermost Rough | Year: 2015
Address: 5 Howick Place, London
57. Transmission Capital Services
Place: Westermost Rough | Year: 2015
Address: 3 More London Riverside, London
58. Ørsted Power (UK) Ltd.
Place: West of Duddon Sands | Year: 2014
Address: 5 Howick Place, London
59. Ørsted Power (UK) Ltd.
Place: Walney Extension | Year: 2018
Address: 5 Howick Place, London
60. ScottishPower Renewables
Place: Walney Extension | Year: 2018
Address: The Soloist, 1Lanyon Place, Belfast

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The continuous search for cost reductions

The wind industry is continuously looking for ways to lower the O&M costs, which are substantial. By developing new technology and cutting-edge solutions, the industry targets both big and small reductions.

By Lene Steinbeck

The offshore wind farm Rødsand II, located near Lolland in the southern part of Denmark, is operated and partially owned by E.ON. Allan Topp Petersen is production manager at E.ON Wind Services A/S who is responsible for operation and maintenance at Rødsand II, and along with his team he is aware of keeping costs down and always on the look for new economized workflows.

- For example, we can lower our operations cost by checking the conditions of our components, says Allan Topp Petersen.

- If the supplier prescribes that we change our gear oil and hydraulic oil after five years, we will do yearly lab tests. If the test shows that it needs to be changed after four years, we will of course do so to spare our machines. If not, we leave it. Even if it surpasses the five years, because there's no reason for changing a component that isn't worn out.

Inspecting the blades

Another important, but costly, part of maintaining a wind turbine, is inspection of the blades.
There are three different ways to do that: Rope access, using drones when the weather allows it, and using a ground based camera.

At the moment, E.ON uses a ground based camera on foundation. By analyzing the high-resolution photos, the condition of the blade is categorized and a plan for maintenance is made.

However, Allan Topp Petersen believes drones will play a much bigger role in blade inspections.

- I imagine a drone station near the offshore park, close to the turbines, where the drones can be programmed to automatically doing a wing inspection when the turbine is not turning. Either due to other maintenance or lack of wind.

Drones can minimize downtime

A big part of the maintenance cost is the loss of production once the turbine stops. But if the drone can detect a downtime and exploit that for blade inspection, there's a lot to gain.

- That can minimize downtime. Also, when you do the inspection with camera or by rope access, you need two or three technicians, that could also be cut by using a programmed drone.

Another way of using drones is to carry spare parts.

- We have ships sailing back and forth to the offshore site. They contain some of the most frequently needed spare parts. But of course, they can't have every little thing. So, the drones could be a cheap and fast alternative for that, says Allan Topp Petersen
But, he says, it requires a very reliable technology to handle all the logged data.

Rødsand II

- Was inaugurated on Oct 12th, 2010
- Covers an area of 35 square kilometers
- Comprises 90 2.3 MW Siemens wind turbines.
- Is owned by SEAS-NVE (80%) and E.ON (20%)

From shipping and supply bases to wind

Bringing a worldwide network and the principals from the world of ship management and supply base operations into the offshore wind power industry, NorSea Wind wants to be competitive on a new market.

By Lene Steinbeck

Adapting to a new industry can take a long time. But NorSea Wind, a part of NorSea, enters the offshore wind market with great confidence and anticipates a smooth transition.

- We are a part of Wilh Wilhelmsen, which is the largest shipping network in the world and the overall idea for us to enter the offshore wind power industry is to be competitive from day one due to our scale and network and our proven track record through the Øer companies, says Dennis Jul Pedersen, CEO in NorSea Wind.

The company offers full O&M Services on wind turbines and substations.

Working with a fee structure

Lowering O&M costs always is a point of attention in the wind industry and with a background in the shipping industry, the NorSea Group has a lot of experience in that area.

- It is very noble to be the best at the job. But that alone will not get you any contracts. You have to be competitive as well. This is a criterion we are always facing in the shipping industry.

So, in order lower costs, NorSea Wind brings ship management into the wind industry. That means working a fee structure which can keep costs down.

- In scheduling the assignment, you agree on profit, tasks and KPI. Within your fee you need to get the job done. Everything is very transparent which will help to keep the costs low. It is a very different process because it comes from ship management, says Dennis Jul Pedersen.

Operating in 74 countries

Another way of being competitive is exploiting the Group's scale. Being part of the NorSea and Wilhelmsen gives NorSea Wind various advantages.

- Having operations in 74 countries supplies us with a certain amount of flexibility. Our purchases for maintaining substations are coordinated with Wilhelmsen that every two seconds makes a delivery somewhere in the world. Everything is about economy of scale, says Dennis Jul Pedersen.

- We have 22.000 people, operating in 125 different countries. That means that we can almost always guarantee a worker on a local contract.

Off to a good start

NorSea Wind has had a good start. The company has signed a contract on O&M services on substations.

- We have won one of the largest contracts for maintenance of substations in Europe and have also bagged our first O&M contract for an offshore wind park., says Dennis Jul Pedersen.

NorSea WIND

Sustainable coating solutions for wind power turbines

Teknos, which is headquartered in Finland and operates globally, offers a wide spectrum of coating solutions for towers, rotor blades and components for both onshore and offshore wind turbine systems. It will primarily be innovative paint systems for reducing VOC emissions, processing times and costs which will be taking centre stage alongside repair paints with specific processing features.


Photo Wind Energy Network

By Teknos

With Teknoblade Repair 9000, Teknos has launched a solution which is suitable for both temporary edge protection as well as rotor blade repair.

The high-solid coating with 100% proportion of solids enables layer thicknesses of up to 5 millimetres with just a single application of paint. It can be processed at temperatures between minus 20 and plus 70 degrees Celsius, dries very quickly and forms a strong elastic protective layer which absorbs high levels of energy upon impact with objects. Its impact resistance as per DNVGL-RP-0171 amounts to 10 hours at speeds of 130 m/s, which is significantly greater than that of conventional coating systems for rotor blades. An application of a single coat (as opposed to the usual three), a greater temperature range during processing and its high impact resistance make Teknoblade Repair 9000 a highly productive, sustainable edge protection solution.

Teknos has also launched an advanced solution for coating wind turbine towers. With the ultra-high solid Teknodur Combi 3560 coating, the key also lies in reducing the number of coats applied.

Thanks to its the very high solids content and anti-corrosive pigments, a corrosion protection class of C3-H can be achieved directly to metal (DTM) with just one layer. Higher protection categories are possible with just two layers, while the maximum protection class NORSOK M-501 only takes three. Other benefits are low VOC emissions and fast drying at room temperature. On the whole, Teknodur Combi 3560 can reduce costs for the surface treatment of towers by 30 to 40 percent says Mr Henrik Hansen of Teknos Denmark.

TEKNOS

The Correlation Between Lubrication and Safety is Closer Than You Think

When it comes to the safety of your wind turbines, lubrication can have a bigger impact than you might think.

By ExxonMobil

Maintenance teams sometimes ascend the tower to elevations as high as 400 feet to carefully inspect the equipment – no easy task.

That's why small changes, such as switching to an advanced lubricant, can help enhance both the productivity and safety of a wind turbine operation.

Here are our key tips to help optimise your lubrication programme and enhance the safety of your operation.

Use high performance, synthetic lubricants
Synthetic lubricants can enhance the safety of your operation by extending service intervals, versus conventional gear oils, and reducing human-machine interaction. The right lubricant, such as Mobil SHC™ Grease 102 WT, can help extend equipment life, reduce maintenance costs and increase uptime – protecting their business from within.

Proactively monitor the health of your equipment
There is no better way to monitor the health of your equipment than through used oil analysis. Services such as ExxonMobil's Mobil Serv℠ Lubricant Analysis helps you better understand how your equipment is performing and identify potential pain points. Armed with that information, you can then prevent unplanned downtime.

Take advantage of your lubricant supplier's expertise
Your supplier's team of highly trained field engineers can help you identify and execute technical services – such as used oil analysis or gear oil flushing services – and optimise the performance of your equipment. Suppliers can also provide training to help ensure your staff are knowledgeable and informed.

In summary, while optimising your lubrication programme is typically used to drive productivity, it can also meaningfully enhance the safety of your operation.

For more information visit **www.mobil.com.**

ExxonMobil

State-of-the-art lifting solutions


Photo by PALFINGER

As a global partner for innovative and reliable deck and lifesaving equipment, PALFINGER MARINE supplies high-quality products to fulfill standardized and customized demands. Supported worldwide by a network of experienced and skilled specialists, PALFINGER provides flexible and efficient service solutions.

By Lene Steinbeck

With more than 80 years of crane experience and over 3.000 delivered cranes for the offshore wind industry – including a little over 100 for the Walney Wind farm – PALFINGER has an impressive track record in the business.

- With our cranes we provide innovative state-of-the-art lifting solutions to endure many years offshore under harsh conditions, says Søren Gert Larsen, Managing Director in Palfinger Marine Denmark A/S.

PALFINGERs long history of designing and manufacturing cranes gives them indispensable experiences when it comes to maintenance of the cranes in the years following the commissioning.

Meeting the customer's needs

- We keep meeting our customer's demands for new solutions by manufacturing a variety of different cranes for the marine, offshore and wind industry. For example, Active Heave Compensated cranes on wind farm service operation vessels, says Søren Gert Larsen.

From the beginning of every contract, the customer's needs are in the focus.

- We need to be a team and having a good dialogue. Once they hire us, it is our job to give them as little trouble as possible. So, we put a lot of effort into improving the skills of our employees.

Providing customized solutions on a high technical level requires skilled experts, from in the development phase to commissioning and installation as well as service and maintenance.

Training is a key success factor for PALFINGER

- We have a training center featuring all of our cranes, and our service engineers are educated before going on a service job. We would never send a service engineer, that hasn't been trained on the exact crane, he is about to service, says Søren Gert Larsen.

PALFINGER

M/S Sea Comfort – a floating accommodation for technicians

Instead of sailing back and forth, technicians can stay on the M/S Sea Comfort while doing an offshore repair.

By Lene Steinbeck / Photo by TP Offshore

When offshore wind farms use technicians for repairs on their site, the technicians are normally accommodated in hotels onshore and sailed back and forth to work every day.

That means a lot of time is wasted on transportation.

- But by simply accommodating the technicians offshore, very close to the wind farm, they can be much more efficient, says Tom Poulsen.

He is CEO of TP Offshore and the owner of M/S Sea Comfort, a floating accommodation for technicians.

- If they stay at the M/S Sea Comfort, they save a lot of time on transportation. And the longer they can stay out there, the more work they get done.

Room for 12 technicians

The contractors also save the logistics of booking hotels and arranging transportations to the offshore site.

The M/S Sea Comfort have room for 12 technicians at a time and offers private cabins with bathroom and TV for each guest.

Aboard, there's also a comfortable lounge, a kitchen and a big dinning room. So, it is ideal for a longer stay.

- At the moment, we can stay offshore for up to 14 days, if the weather is good, says Tom Poulsen.

TP Offshore is working on offering a better comfort, so the M/S Sea Comfort can defy the weather to an even higher degree. Because technicians are often landlubbers.

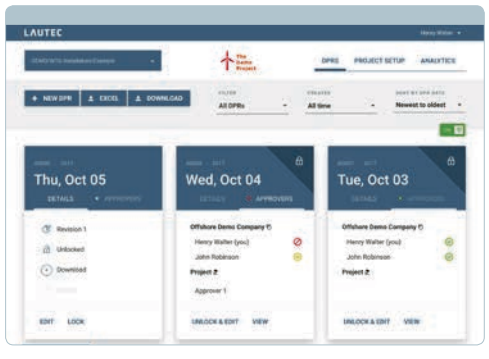
- They are not used to being and working offshore. And a seasick technician really isn't worth much, says Tom Poulsen.

Progress reporting in the cloud

A cloud-based progress reporting system provides immediate transparency and data driven decisions.

By Lene Steinbeck / Photo by Lautec

On most construction projects, one specific task recurs: The creation of a daily progress report from the construction site. The reporting is typically based on spreadsheets or text documents, now it can be done more streamlined and more digitalized.



Lautec has taken it to the next step – away from individual documents, slow reporting and time lag from recording to understanding data.

- Over the last 3 years we have developed a modern cloud-based solution, which allows you to create a daily progress report on a very flexible, yet structured platform, says Henrik Søgaard Iversen, a partner in Lautec.

With the Daily Progress Reporting (DPR) Lautec has created a tool that collects and handles the valuable data from the daily reports to point out patterns in progress and deviations.

- The system gathers data and provides immediate, detailed insight in the situation on site. And it is very transparent. Everyone has access to the same data, and it allows them to optimize continuously, says Henrik Søgaard Iversen.

Tailored for the wind industry

- A wind farm is typically designed to operate for 25 years, and the DPR offers a very easy access to a deep knowledge of your time performance across all activities, says Anders Greve Pihlkjær, also a partner in Lautec.

- Having detailed data makes it possible to improve short- and long-term planning and it enables contractors to calculate the right price for fixed price contracts that are becoming more and more normal as the industry matures.

The DPR system is tailored to match the wind industry, where the same process' are repeated over and over. Like fabricating or servicing 100 wind turbines for an offshore park. Lautec made a system that matches that workflow, says Anders Greve Pihlkjær.

- The initial version of the DPR system was launched 2 year ago and the system is now being used by 5 of the main developers of offshore wind plus a number of large stand-alone projects, contractors and operators.

Hexagon PPM Supporting Success for Offshore Project Execution, Commissioning, Operations and Maintenance

Why do so many projects in the offshore industry experience significant cost overruns and delays especially when it comes to commissioning, operations and maintenance? In this article, Amr Eltablawi, Business Development Manager at Hexagon PPM discusses how full life cycle project management helps to streamline the project life cycle; yielding to cost optimization, workforce effectiveness, process efficiency and prompt time to market.

It comes as no surprise that poor handover processes play a significant role in this struggle to deliver projects on time and on schedule. Handover, or the lack of it, continues to generate unexpected costs and delays, resulting in inefficient operations and safety risks. According to a report by the National Institute of Standards and Technology[1], old school processes, outdated technology and inadequate interoperability result in $15.8 billion losses annually. Let's face it - for most contractors and owner operators, completions and commissioning are an afterthought.

Improving commissioning and operations and maintenance

Improving commissioning, operations and maintenance are often easier said than done. However, support from an experienced technology partner can help. Hexagon PPM has a proven track record in serving the offshore industry and is uniquely positioned to support the marine, offshore wind turbine and oil & gas platforms. With the help of Hexagon PPM's state-of the-art mobility solutions, combined with Intergraph Smart® Construction and Intergraph Smart Completion, offshore operators have an opportunity to increase productivity, improve worker effectiveness and safety, as well as daily workflow and operations reliability. With Hexagon's Connected Worker solution, Smart Completions, Smart Construction, field personnel and project managers can access instructions, manuals and drawings through tablets, phones and an ergonomic virtual helmet; take pictures, and find information fast through a voice command recognition. Furthermore, this information is linked to a database for construction, commissioning and turnaround projects, and a handover package can be created by just one click in the system. This provides a single data source of truth that is leveraged throughout the process and delivers both unique transparency and productivity, enhancing operations operability and reliability.

Enhanced end-to-end solutions

From a solutions perspective, Hexagon PPM offers different data-centric solutions for the offshore industry. Intergraph Smart® Completions and Smart Construction combined are a very powerful solution for the offshore segments, providing a parallel approach that enables concurrent work processes, unlocking communication barriers and automated project building capabilities for economies of scale, leveraging data throughout the life cycle of the project.

We provide an enhanced end-to-end solution for project delivery, from design, through fabrication, construction, and commissioning, to maintenance and operation. With our solutions, offshore operators can go through all the steps through planning, execution, information control, project compliance and turnover. Overall, our information management solutions streamline the process and provide progress viability, project governance, and control to our customers enabling them to reach their goals as planned.

Offshore challenges

Weather and sea conditions make the window for commissioning, maintaining and constructing an offshore project very challenging and expensive. Time is even more of an essence for an offshore project than an onshore one, as any delay in schedule might be multiplied by the bad weather conditions.

To maximize efficiency during this limited time, offshore operators would benefit from using highly configurable and mobile completions and construction solutions that make data easily accessible. This type of solution meets the offshore personnel ergonomics, unlocks all hands-on communication barriers and manages changes. This helps the user to improve productivity, as no time is lost finding, validating or retrieving information.

Hexagon PPM has a long history and years of experience supporting key companies in the offshore industry, and the company have been chosen as a digital transformation partner by leading offshore companies across the globe. Hexagon PPM has a technological edge that is unique in many aspects, covering the complete life cycle of an asset, with solutions focused on streamlining execution and handover. Hexagon PPM's customers are seeing tangible improvements in both operational and capital expenditures.

Hexagon PPM

Hexagon's PPM division empowers its clients to transform unstructured information into a smart digital asset to visualize, build and manage structures and facilities of all complexities, ensuring safe and efficient operation throughout the entire lifecycle.

www.hexagonppm.com

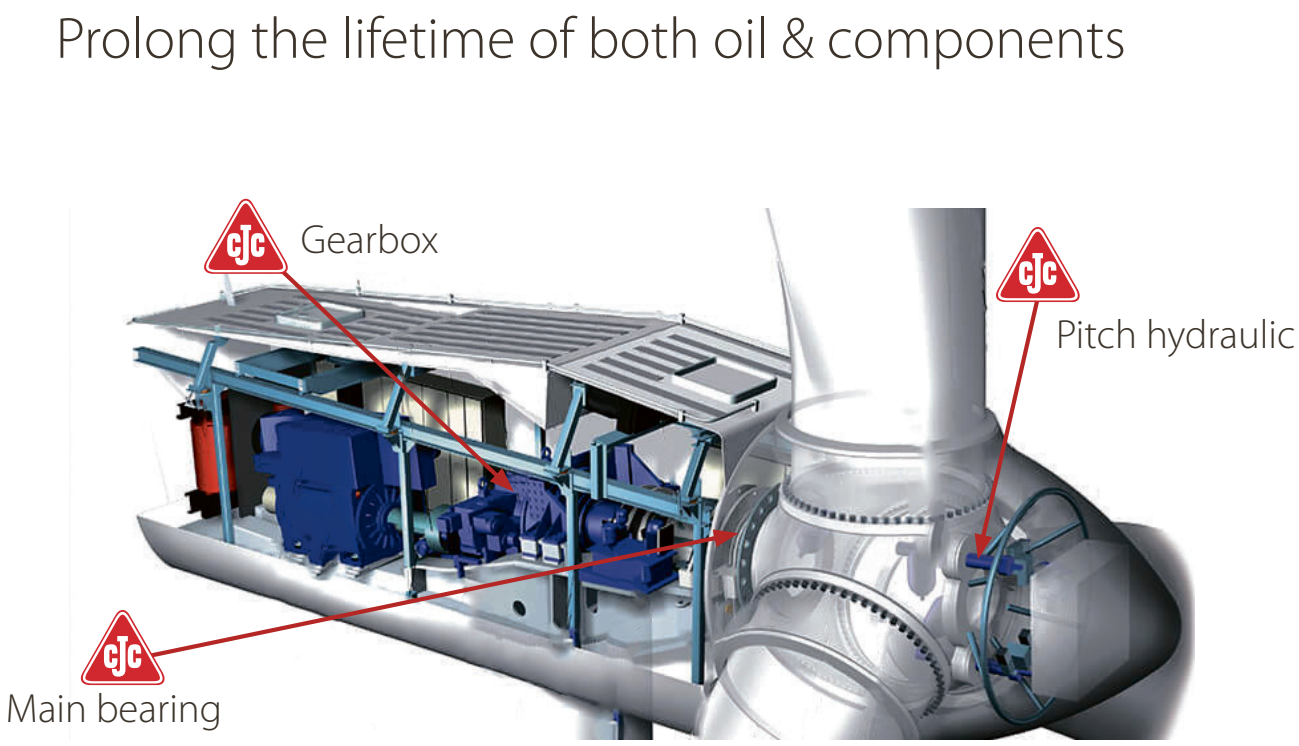
Sources

[1]Cost Analysis of Inadequate Interoperability in the U.S Capital Facilities Industry, NIST GCR 04-867, August 2004. (C) National Institute of Standards and Technology

Catching the smallest particles

Oil maintenance is essential for keeping components like the Gearbox or the Pitch hydraulics in a wind turbine operational as long as possible. An offline depth filter is the way to remove more contaminants and prolong the life of both oil and components.

By Lene Steinbeck



Illustartions by C.C.JENSEN

Wind turbines are designed to run for 20+ years. But it can be a challenge to make the components like a gearbox last that long.

C.C.JENSEN offers fine filters for depth oil filtration in gearboxes or pitch systems that can catch even the tiniest particles.

- The cleaner the oil, the longer both oil and gear will last, says Thomas Herdahl-Thorsing, Global Key Account Manager in C.C.JENSEN.

- An inline filter can remove particles sized 10-20 microns. But in a Gearbox or Pitch System, most of the particles are smaller than 10 microns. We deliver offline depth filters, that removes and retains particles down to 1 micron.

Retaining the particles can be a problem for the inline filters, as an outage or pressure peak will cause it to release particles. But the CJC® Fine Filter works offline in a kidney loop system, which makes the filter resistant to pressure peaks and therefor retain the particles.

Monitoring the oil condition

C.C.JENSEN has developed a system that allows the operator to continuously monitor the oil condition online.

- Sensors will monitor the oil by counting particles, detecting moisture, oil degradation etc. That guarantees you a condition-based maintenance and an online overview to see if everything is running according to the plan or if something needs attention, says Thomas Herdahl-Thorsing.

And, says Herdahl-Thorsing, save you downtime:

- Normally, you do oil sampling and analysis manually once, twice or more per year, but by the constant monitoring, you can plan an oil sampling during an already planned downtime.

The monitor is based on a Cloud-technology and can be set up to give the earliest possible warnings of wear generation in order to prevent breakdown.
The raw data is treated, and the software learns what is normal for this specific gearbox/turbine. This ensures the output is relevant for the individual turbine, not just based on the general average.

Maintaining hydraulic pitch systems

But it is not just gear oil, that need service and maintenance.

- There is an increased pressure on the pitch systems and the oil as the turbines get bigger and more complicated, says Thomas Herdahl-Thorsing.

- If the hydraulic oil is not kept clean and free from particles, varnish and water, you may experience malfunction.
But right now, the hydraulic pitch systems are not considered as critical as they perhaps ought to be, according to Thomas Herdahl-Thorsing.

As more turbines move offshore, there might be a new set of rules to comply to. This includes the use of EAL, Environmentally Acceptable Lubricants. The predominant EAL type used is ester-based and they require the extra attention and care.

- Since most pitch hydraulic oils are mineral based, it is more exposed to oil degradation. As the industry is always looking to reduce cost and optimize production, I think this is a place to draw attention as it could optimize the production of the turbine.

Safety, Service, and Maintenance

Avanti is a leader and pioneer in vertical access solutions for wind turbine towers and is dedicated to increasing safety whilst lowering the cost of energy production.

By Avanti / Photo by Avanti

Avanti is a leader and pioneer in vertical access solutions for wind turbine towers and is dedicated to increasing safety whilst lowering the cost of energy production.

Avanti service lifts, tower internals and climb assists products can be found in every corner of the globe, with an increasing proportion of installations being off-shore as Avanti equipment is selected by major OEMs and wind farm operators due to the quality and reliability of its products, service support and total cost of ownership over the total lifecycle of the equipment.

In 2016, Avanti became part of the Alimak Group, a global leader in vertical access solutions. Service support for Avanti products is provided by Alimak Service, the global service organisation of the Alimak Group of companies. Alimak Service was launched to the global wind industry at WindEnergy Hamburg in September this year to great applause. The coming together of two industry leading brands, Avanti and Alimak Service provides an unparalleled support package for the off-shore wind sector.

Alimak Service is uniquely positioned to support its customers to manage their installed base of off-shore wind turbine tower internals, no matter where in the world they are located. Alimak Service has service centres in over 60 countries with dedicated off-shore trained and certified technicians able to mobilise to some of the hardest to reach locations in the off-shore industry.

Through Alimak Service, customers can access a full range of products and services, designed to offer a 'one stop shop' solution that makes it easy for customers to manage their off-shore assets in a cost-effective manner.

The fastest way to get back in business

VMS Group is well known for their worldwide maintenance and repair of diesel engines, but they also excel in tasks like cold straightening of propeller shafts and repair of damaged propeller blades. **By Lene Steinbeck / Photo by VMS** Group

When misfortune strikes and a ship hits ground and damages the propulsion line, some vessel owners choose to invest in a new instead of fixing the damaged.

However, the delivery time for a new propeller shaft is usually several months and waiting for the spare parts will keep the vessel out of operation for a long time.

Repairing instead of ordering new saves the vessel owner a lot of time and with that money.

- We can repair the damaged propeller or shaft and get the ship back in business in just a few days, says Dan Seidelin, Senior Project Manager at VMS Group.

VMS Group performs cold straightening of the damaged propeller shaft and if the shaft is beyond repair, they can manufacture a new shaft using all classified materials.

Minor damages of the propeller blades can be repaired onsite. In case of bigger damages, VMS Group will repair the blades in their well-equipped propeller workshop.

> ***We can cold straighten the damaged propeller shaft in just a few days and get the ship back in business quickly.***
>
> - Dan Seidelin, Senior Project Manager

- Our onsite services also include line boring of stern tubes linings and milling, says Dan Seidelin.

Fully approved by classification societies

As one of a few, VMS Group is certified to carry out special welding procedures and all repairs are done according to the requirements of the classification societies.

The company's strength comes from their wide experience within the marine and offshore service industry. Being a full-service supplier for many years, VMS Group has reached a scale with a broad set of competences. This allows them to prioritize and move assignments and competences around.

- Our set up allows us to react fast and prioritize. From the inspection and demounting on-site to the repair of the equipment and the final delivery, we take full responsibility until the vessel is back in operation, says Kim Rasmussen, CCO at VMS Group.

One point of contact for 50 subcontractors

Serving as a junction between contractors and subcontractors, Kriegers Flak Service Group helps both sides of the table.

By Lene Steinbeck

When Vattenfall or Siemens Gamesa is looking for suppliers, the solution is often just one phone call away.

- We provide them with a very easy access to subcontractors. One point of contact for 50 companies, says Michael Noer-Hvarre.

He is Vice Chairman of Kriegers Flak Service Group, a professional network for contractors in the offshore industry. The network has a good and productive cooperation with Siemens Gamesa and Vattenfall.

- We are sort of a gatekeeper. If they are looking for a supplier, a lot of big and small companies will be interested. We can't prevent them from get hundreds of requests, but when they call us, we can provide them with a direct contact to a verified subcontractor, says Michael Noer-Hvarre.

- We manage all the rules, regulations and verifications of the companies in the network, and that saves Vattenfall and Siemens Gamesa a lot of time in administration.
For the subcontractors it is a chance to be one step ahead in getting the contracts.

- Siemens Gamesa and Vattenfall are very positive towards us, and we have a very productive cooperation. We work together on inviting new subcontractors to workshops once they are appointed, to develop their skills.

Keeping jobs local

A big motivation for the network is to strengthen the local business.

With the offshore wind industry moving east – the offshore wind farm Kriegers Flak in the Baltic Sea is under commissioning – the network with the identic name will be an obvious choice for Vattenfall to hire local subcontractors.

- We want to keep the local jobs on local hands in the eastern part of Denmark. We offer local labor close to the construction site, says Michael Noer-Hvarre.

And that is definitely a factor:

- The big contractors wish to stay on good terms with local authorities, who often is a financial support in these projects. So, they have to think locally.

-We profit from quick adaption

Years of experience from the fishing industry that requires immediate action in case of downtime has given Kynde & Toft an advantage in adapting to the offshore wind industry.

By Lene Steinbeck / Photo by Kynde & Toft

Kynde & Toft in the small town of Thyborøn has 60 years of experience in maintaining fishing vessels. That is very valuable experience in a process of entering the offshore industry. Kynde & Toft offers service and maintenance on everything concerning vessels and machinery. And even though the fishing vessels may be smaller than the service vessels for offshore wind industry, the principals are the same. And so are the demands for service:

> ***"We are aware of the substantially costs of downtime from the fishing industry. We are on call 24/7 and work night shifts as well.***
>
> - Bjarke Toelberg Vinther, Project Manager at Kynde & Toft

- We are aware of the substantially costs of downtime from the fishing industry. We are on call 24/7 and work night shifts as well. And we are ready to move assignments around to get to the important ones done first, says Bjarke Toelberg Vinther, Project Manager at Kynde & Toft.

- Call me at 2 o'clock and I'll be there with my crew at ten past two.

The ability to adapt very fast pays off:

- Our customers are happy with that. When they need anything – even extraordinary things – we will help them and go that extra mile. They like that, and we surely profit from it, says Bjarke Toelberg Vinther.

The largest floating dock on the West Coast

Thyborøn Harbor is traditionally known to the fishing industry. But for the harbor and the city, including Kynde & Toft, adapting to the offshore wind industry is a natural step, and investments has been made.

- We have purchased the largest floating dock on the West Coast of Denmark, and we have the capacity to use it. That save the offshore service vessels a trip around Jutland. So, I would say it is very naturally for the offshore companies stationed in the North Sea to use us for service, says Bjarke Toelberg Vinther.

The dock was purchased around three years ago before any contracts were signed.

- But I like the signal. In Thyborøn, we are really interested in entering the offshore wind industry. So, we made an investment. We are very serious, and I'm sure the contracts will follow, says Bjarke Toelberg Vinther.

A time saving catalogue

By creating a catalogue of approx. 800+ product codes for the wind industry, Megatrade has made a one entry point to purchase everything their customers need.

By Lene Steinbeck

A large catalogue of information about product codes has been of great importance to Megatrade, a distributor of industrial hardware components.

- We are collecting all the information we handle on each product number. That way, we can easily help others getting access to that same information, says Anders Melgaard, Sales & Marketing Manager at Megatrade.

The company has been in the offshore wind industry for many years, working with the Danish giants Siemens Gamesa and Vestas.

- Originally the idea was to help engineers at Siemens, so they wouldn't create a product that already existed. They have many developers working on many different projects, which poses a high risk of duplicates, says Anders Melgaard.

A unique customer

Now, the catalogue serves both existing and future subcontractors to e.g. Siemens Gamesa and Vestas.

Once they enter the catalogue, which Megatrade can send to them digitally, they get an overview over the components that Megatrade has sold to the industry, as the catalogue is generated directly in Megatrades ERP system.

- We have quite a unique customer in New Zealand. I'm sure they could purchase all of our products closer to home, but because of the overview and because they are certain to get the right part, they are willing to pay a bit more, says Anders Melgaard.

Megatrade has a long track record working with Siemens and Vestas, Danish wind industry, and the products in the catalogue is the result of this co-operation.

The tables have turned

Having a large number of especially Siemens Gamesa item numbers has had an unintentionally implication on Megatrade's relation to Megatrade Shanghai. The fellow enterprise in China was established to source products for Megatrade to sell in Europe.

- But the tables have turned. Today, we deliver more products to China than the other way around, says Anders Melgaard.

Megatrade Shanghai's customers who mainly are suppliers to Siemens Gamesa, have had significant help from this product catalogue.

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Off-shore wind turbines

When establishing of off-shore wind turbines and wind farms, the off-shore wind turbines foundations are anchored by means of jackets, which are driven into the seabed. For corrosion protection of these jackets BAC CC and Impalloy LTD. UK produce specialised sacrificial anodes with weights from 150-500 kg.

Designwise, these sacrificial anodes are cast around tubes with dimensions which are adapted for each jackets lattice or tubular construction.