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**DWEA** Danish  
Wind Export  
Association

*Owned by Danish Export Association and Danish Wind Industry Association*

# Wind Farms Retrofit & Life Extension in Spain

**Spanish-Danish Summit**

**20<sup>th</sup> September 2017**



# Spanish-Danish Companies Summit on **Life Extension**

## Blades

- **Bladena** - Structural repair & retrofit technologies for blades. Damage prevention or repair
- **Global Lightning Protection Services** - How to mitigate risks and limit down time by improving lightning protection of new and existing wind turbines
- **PP Techniq** - Blade access - taken to another level
- **PolyTech** - Life extension and performance optimization through improving leading edge protection, lightning protection and aerodynamic upgrades

## Control and Power

- **Spica Technology** - The control system is essential
- **DEIF Wind Power Technology** - Turbine upgrades, retrofit of control and pitch systems
- **Mita Teknik** - Extended lifetime and boost performance on existing assets

## Service & Logistics

- **Liftra** - Exchange of major components without mobile crane by
- **Connected Wind Services** - How can an individual service provider assist Spanish wind turbine owners and operators?
- **MAN PrimeServ On-site Recovery** - Up-tower machining
- **Eltronic** - 'How can wind turbine operators optimize their processes with multifunctional equipment'
- **Safewind Service** - Blade inspection and repair service

## Data Conditioning & Monitoring

- **Gram & Juhl** - How to make wind energy more profitable and reliable using TCM® (Turbine Condition Monitoring)
- **Brüel & Kjør** - Bringing condition monitoring to the next level; successful expertise gained from detecting thousands of wind turbine faults
- **FT Technologies** - Retrofit with FT sensors at El Toranzo Wind Farm
- **SCADA International** - OEM independent SCADA solution for multibrand/-tech purpose

## Hydraulics and Cooling

- **Fritz Schur Energy** - Optimizing power output by improved pitch hydraulics solutions
- **Hydratech Industries** - High reliability, upgrade, pitch cylinders, tomorrows pitch system
- **LJM Hydraulic** - Up-tower repair of hydraulic pitch cylinders

## Light Solutions

- **IED Greenpower** - Optimization of indoor lighting systems and their functionalities from the O&M and life extension perspective
- **Dialight** - How retrofit of obstruction light solutions brings advantages such as lower service- and maintenance costs

# Workshop: **Bladena**

# Bladena

BLADE ENABLER

## Bladena

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### **Bladena - Structural repair & retrofit technologies for blades: Damage prevention or repair**

Bladena possesses expert knowledge of blade failures and how to avoid them. The Bladena services support owners and manufacturers in bringing down the cost of O&M of blades. The technologies all enhance blade structures and can be installed as retrofit/repair for blades in operation or in new design solutions.

All technologies limit the blade deformations and stress levels in e.g. trailing edge bond lines and panels; hence significantly reduces the failure rates on blades with a positive impact on the O&M costs and blade life time.



# Workshop: **Blades**



## **Global Lightning Protection Services A/S**

Contact:  
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### **GLPS - A strikingly powerful partner**

Hope is a powerful resource but will not prevent the potential damage of lightning strikes - one of nature's most destructive hazards. But lightning is predictable, controllable and the risk is preventable. What you need is smart thinking and effective solutions to plan and protect your investments. It's your responsibility to look after your business; we've made it ours to make sure you can.

Based on more than 20 years of industry experience, numerous design projects utilizing advanced numerical modeling of direct and indirect lightning effects, and a world class, full-featured lightning testing laboratory, you are guaranteed a dedicated

and skilled partner for your lightning protection challenges.

We interact actively in the lightning community by partaking in technical conferences, pre-standardization groups, international standardization committees (UL, IEC, CIGRÉ) etc. By working with GLPS, you will always follow relevant standards and codes.

Whether you are looking for lightning consultancy, testing or installation services or specially adapted world-class lightning products, you can team up with us and we will be successful together.

GLPS is empowering you to take charge.



# Workshop: **Blades**

**PP TECHNOIQ**  
BLADEGUIDED ACCESS



## **PP Techniq A/S**

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### **PRODUCT ADVANTAGES**

#### **Integrated hoist system**

- No cranes needed
- Hoisted into operation via anchor points in nacelle of WT
- Driving up the tower like an external elevator

#### **Maximum output and minimum downtime**

- High movable payload (450 kg)
- Designed for in-service wind speeds up to 14 m/s
- Designed for onshore and offshore use.
- Safest and most stable blade access platform in the industry
- Habitat, light and heat system allows for a 24/7 operation (improved business case)
- Easy transport on road and vessel
- Highest payload in the industry (450 kg)
- Fits on a specially developed trailer
- Safe and low cost transport
- Onshore installation directly from trailer
- Total max weight 2.800 kg incl. trailer
- The platform is independent of the tower when in operation



**25 full time employees**

**Located in Southern Denmark**

**Est. 2003**

# Workshop: **Blades**



PolyTech is a fast-growing global company highly specialized in the wind industry. PolyTech's focus is the design and manufacture of OEM and aftermarket products for turbine blades. Company expertise majors in:

- Leading edge protection
- Lightning protection
- Blade Balancing
- Blade Covers
- Transport and Storage solutions
- Blade Add-ons (serrations, vortex generators, spoilers)

PolyTech is your partner throughout the entire value chain. From design to production, from off-the-shelf to custom-made. The company shares your ambitions and understands your goals. PolyTech encourages your aspirations and helps find you solutions.

PolyTech is headquartered in Denmark where production, research & development and senior management are located.

With offices and production facilities in Denmark, USA and China, the company combines the skills of scientists and engineers, chemists and fitters, designers and programmers, construction experts, machinists, skilled laborers and many others.

## **PolyTech A/S**

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PolyTech is engineer-driven - from design and evaluation, through prototyping and production, to continuous improvement of the finished article. The outlook is global, with strong emphasis on customer service, wherever it is needed.

### **To find out more**

- visit our website at  
[www.poly-tech.dk](http://www.poly-tech.dk)

and our LinkedIn company page  
<https://www.linkedin.com/company-beta/2505197/>



# Workshop: Data, Measurements & Monitoring



## Gram & Juhl

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### **Gram & Juhl are the leading supplier of CMS in the wind industry**

Gram & Juhl develops and sells certified innovative solutions for retrofitting and monitoring wind turbines.

Gram & Juhl is the leading supplier of CMS in the wind industry, having installed over 20.000 TCM® (Turbine Condition Monitoring) systems worldwide. The application empowers our customers to protect their assets and plan for optimal maintenance.

### **Extend your turbines lifetime**

TCM® Wind Turbine Retrofit is a cost-effective turnkey solution for your next retrofit project. The TCM® Wind Turbine Retrofit solution can effectively increase the turbine's annual energy production, and extend the turbine's lifetime. Gram & Juhl's extensive experience and know-how covers a massive number of retrofit solutions around the world.

The TCM® Wind Turbine Retrofit solution will optimize maintenance, and minimize downtime. Using the latest state-of-the-art software and hardware innovations, the TCM® Wind Turbine Retrofit solution is designed, to detect and predict impending failure. This will ensure you low operational costs, maximum performance and avoidance of catastrophic, dangerous and costly failures.

### **Customized kits with simple installation**

Gram & Juhl delivers the TCM® Retrofit solution as a lightweight customized Retrofit Kit® containing everything you need to retrofit your turbines, including a simple plug and play installation for your convenience.

### **KEY SENTENCES:**

- Leading supplier of CMS
- 20.000 CMS systems installed worldwide
- More than 20.000 TCM® systems installed worldwide
- More than 20.000 turbines across the world are equipped with TCM® (Turbine Condition Monitoring)
- Optimize maintenance and minimize downtime with TCM® Retrofit and Monitoring
- CMS, TCM® Monitoring, TCM® Retrofit solution, TCM® Retrofit Kits, Plug & Play installation
- The TCM® Wind Turbine Retrofit solution will optimize maintenance, and minimize downtime
- TCM® Retrofit kit with plug and play installation
- Optimize maintenance, and minimize downtime with a Plug and play TCM® Retrofit installation

# Workshop: **Data, Measurements & Monitoring**



**Brüel & Kjær Vibro**

Brüel & Kjær Vibro is an international company with headquarters in Darmstadt (D) and Nærum (DK). We have **60 years of experience in Condition Monitoring** in all industrial sectors. Over the last **10 years** we have been established as the leader in **monitoring drive trains of wind turbines**.

More than **15,000 online condition monitoring systems sold to the wind power market** reflect the high degree of confidence manufacturers and service companies have in our ability to provide reliable analysis, diagnostics and maintenance advice.

Not only has Brüel & Kjær Vibro developed a field-tested monitoring system dedicated to wind power plants. We have also introduced a unique service programme in which a **diagnostics team certified according to ISO18436-2 Cat. II and III** carries out the monitoring, diagnostics and reporting tasks.

Thanks to its ability to assess the severity of **every** identified fault, our **efficient alarm management system** helps optimise the planning of on-shore and off-shore service calls. The timing of a developing fault is predicted based on

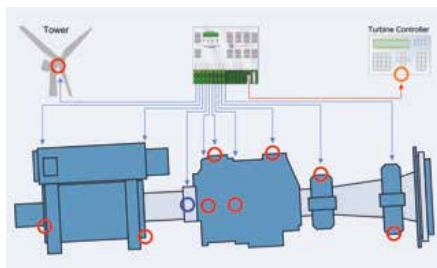
## **Brüel & Kjær Vibro**

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years of built-in experience and sent to the customer together with a brief but detailed report.

We **optimise uptime**, determine the **lead time to maintenance** for operators and enable an **effective service strategy**. The entire system can be adapted to each operator, individual wind turbines as well as large and complex wind farms. Thanks to the flexible configuration possibilities, each customer is provided with a customised CMS solution. A close cooperation with OEMs, owner/operators, service companies, research organisations and universities allows us to continually improve our high-precision measuring instruments and products.



*Measurement points for vibration monitoring of wind turbine drivetrains*



# Workshop: Data, Measurements & Monitoring



FT Technologies specialises in the design and manufacture of high performance Acoustic Resonance wind sensors - also known as anemometers or air-flow sensors. All our sensors deliver reliable wind speed and direction data from compact, lightweight sensors. Users typically experience over 99.99% data availability even in harsh climates and in the toughest weather conditions.

FT Technologies was founded in 1981 and has been in business for over 30 years. We began selling wind sensors to the wind turbine industry in 2002. We are now the industry's largest supplier, with 11 of the world's top 15 turbine manufacturers amongst our customers. We are the market leader in the offshore wind energy sector as more than 70% of all offshore turbines in the world are fitted with an FT sensor.

Our latest products, the FT742 and FT722, offer enhanced accuracy. The FT742 also offers a wind speed reading range of up to 75m/s. The FT742-DM direct mount variant will also fit directly to pipe making it ideal for customers in the wind resource assessment, meteorological, marine and environmental industries. FT sensors have been installed all over the world in a range of applications from weather stations, marine buoys, on top

## FT Technologies

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of some of the world's tallest buildings and along railways.

The wind energy industry is growing significantly, and FT is growing with it. We now have around 80 employees and are always looking for more high quality engineers.

The future for wind energy, and for FT Technologies, is bright. We will continue to invest in new products and new manufacturing technology. This will enable us to better serve our existing customers in wind energy.



# Workshop: **Data, Measurements & Monitoring**



## **SCADA International**

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### **SCADA-WIDE and WORLD-WIDE**

SCADA International enables the renewable energy sector to optimize production and reduce cost, through intelligent software and hardware that captures live production data from various sources and turn them into decision supporting information.

SCADA international provides consulting, system engineering, hardware solutions and application software related to real-time Supervisory Control and Data Acquisition (SCADA) systems.

WE COVER THE COMPLETE SCADA VALUE CHAIN

WE SHARE YOUR PASSION FOR GREEN ENERGY

WE KNOW THE CHALLENGES OF THE RENEWABLE ENERGY INDUSTRY

WE CARE ABOUT YOUR BUSINESS



# Workshop: Control and Power



## We are your entrance for better wind performance

Spica Controls is an international trade and technical support company dedicated to the wind power industry. We are part of the international engineering company Spica Technology ApS in Denmark who have designed, tested and built control systems for companies in and around the wind power industry since 1997.

Spica Controls has local sales and technical support offices around Europe and Spica Controls S.L. is located in Barcelona, Spain. We offer a great product range for wind turbine equipment, counselling for customized solutions and technical support.

Our products and solutions are not just adjustments of existing standards - they are born and dedicated to the wind power industry through high-end engineering and technologies. That makes our products the strongest and most reliable wind turbine control systems on the market.

## Our specialities

- Spica Retrofit Controller - a plug-and-play controller to extend the lifetime of your older wind turbine.
- Spica Smart Park - an online SCADA wind turbine monitoring system that gives you remote access to increase performance and reduce breakdowns and production losses.

## Spica Controls S.L. - part of Spica Technology ApS

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## OEM supplier of Bachmann

Besides our own brand products for wind turbine equipment, we are also a OEM spare part supplier of Bachmann electronic GmbH. This means we can offer you sales and support of Bachmann PLC modules.

## We rely on strong partnerships

Spica is a piece in a big industry puzzle, and therefore we rely on strong and mutually beneficial partnerships with a range of actors within the wind power industry. In relation to our own brand products such as the Spica Retrofit Controller, we are open to broadening our international network of skilled service providers and turbine sellers to offer current and coming wind turbine owners an affordable alternative to obsolete controllers.

Read more about Spica Controls at [www.spicacontrols.es](http://www.spicacontrols.es).



# Workshop: **Control and Power**



## **DEIF Wind Power Technology**

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### **Wind Power Technology**

DEIF Wind Power Technology is an independent business area of DEIF A/S, which was established in Denmark in 1933. DEIF Wind Power Technology is a global solution supplier of modern control technology for new and existing turbines and wind parks.

Building on strong partnerships we are a trusted partner in providing the best solution based on our extensive know-how and a decade of experience in the wind industry. We provide solutions based on robust control technology, hardware components and software to unleash the full potential of wind turbines.

### **Solutions for wind turbine retrofit, pitch and turbine control**

We guarantee maximum safety of turbine operation with our components that comply with the newest safety regulations. Our wind power technology is reliable and is developed and tested to secure optimal turbine performance and availability in all environmental conditions, to maximize

wind turbine availability and secure optimal power production, DEIF develops retrofit solutions for pitch and turbine control.

DEIF's retrofit solutions gives turbine owners the opportunity to take full control and get complete access to turbine data and performance with DEIF park control technology and SCADA system. Advanced pitch control solutions, technology and design are provided for new and existing wind turbines ranging from 150 kW up to 7 MW.



# Workshop: **Control and Power**



## **Mita-Teknik**

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### **Retrofitting older turbines with new control technology can effectively improve the availability and secure your turbine for the future.**

Mita-Teknik was founded in 1969 and have since the beginning of the 1980's, delivered control systems for more than 350 wind turbine prototypes. Today we have more than 48,000 control systems in operation worldwide.

We offer a comprehensive and cost-effective solution for retrofitting older wind turbines. The Retrofit solution helps you upgrade the control and electrical systems in your wind turbine to new and improved systems.

#### **The Value of Retrofit**

With our experience and proven solutions, you can safely and easily upgrade and regain maximum performance from your wind turbines. Retrofitting older turbines with new

and field-proven control technology, including advanced new control algorithms and intelligent SCADA solutions, can effectively increase the turbine's annual energy production, heighten the availability and provide modern remote access. In combination with renewed access to spare parts, the turbine's lifetime can be extended with better profitability.

All turbines ranging from kW to the MW class can benefit from being upgraded with new technologies. No matter if it is stall, active stall, pitch, 2 or 3 bladed turbines. Mita-Teknik's extensive experience and knowhow cover many of the turbines ready for retrofit today, and as we have developed solutions for these in the past - we can easily provide you with a retrofit solution that will increase the performance of your turbine, and increase your earnings.

#### **We Make Wind Competitive**

# Workshop: **Hydraulics & Cooling**



**FRITZ SCHUR ENERGY**

## **Fritz Schur Energy**

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Fritz Schur Energy designs, develops and supplies hydraulic solutions for the wind industry. Our track record totals more than 14.000 pitch systems worldwide.

High reliability and low cost is our constant aim, and we always find the right solutions in cooperation with our strong and loyal partnerships with customers and suppliers.

Besides hydraulic expertise Fritz Schur Energy has vast experience in load calculations, simulation and pitch control

and can partner with you in many different ways depending on your preferred setup.

Our solutions range from R&D, manufacturing and logistics to aftermarket services such as retrofit, spare parts and hydraulic consultancy, training and support.

We pride ourselves on solutions based on many years of experience and deep insight in hydraulics, wind turbines and the wind industry in general as well as flexibility to support you whatever your needs may be.



# Workshop: **Hydraulics & Cooling**

## **Hydratech**Industries Wind Power

Hydratech Industries Wind Power is a supplier of systems and parts for the wind turbine industry. We supply hydraulic pitch systems, cooling systems, braking systems and filtration/lubrication systems.

When it comes to complete systems of hydraulic and cooling, Hydratech Industries Wind Power is the leading developer in the wind turbine industry.

We have 40 years of experience working with hydraulics and long standing relationships with the major wind turbine manufacturers as supplier of hydraulic and cooling systems.

With dedicated R&D resources in both Denmark and India, we are committed

## **Hydratech Industries Wind Power**

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to constantly pushing the hydraulic and cooling technology further.

Our comprehensive experience expressed in thousands of our systems, under our former name AVN Energy, installed in wind turbines all over the world makes us the perfect supplier when it comes to wear and tear parts for older wind turbine models as well as upgrade kits to increase turbine performance.

Hydratech Industries Wind Power is headquartered in Silkeborg in Denmark with local product development and production in Bengaluru in India and Suzhou in China. A leading developer of hydraulic and cooling systems to the wind industry.



# Workshop: **Hydraulics & Cooling**



**LIND JENSEN**  
HYDRAULIC

## **LJM Hydraulic**

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For more than 30 years LJM Hydraulic has delivered hydraulic pitch and lock cylinders to a number of the world's leading windmill manufacturers. The experience, we have built up will benefit our customers both in the production and after sales segments.

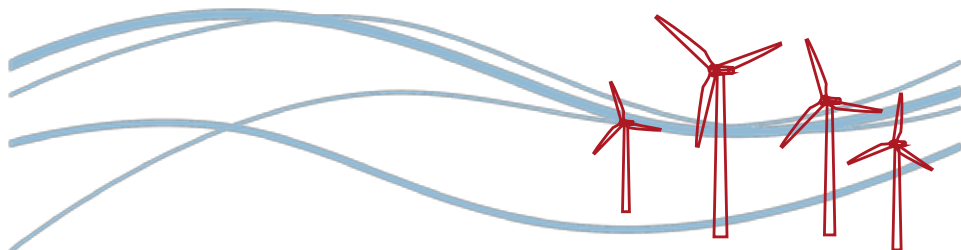
LJM Hydraulic's headquarter is located in Denmark, Western Jutland. This part of Denmark is often very windy, and the entire Danish windmill industry has its origins here. Therefore, wind and the industry linked to it has always been a natural part of our daily lives.

At LJM we have been a part of the wind industry from the start as a preferred supplier of pitch and lock cylinders to

Vestas' wind turbines, we know the industry's requirements inside and out. We have built up an entire production unit that solely produces cylinders for our wind turbine customers.

LJM has warehouse, service and repair facilities in America, Asia and Europe and is manufacturing hydraulic cylinders for wind turbines in Denmark and China.

Thanks to our presence on three continents, we live up to our customers' wishes in this field. Our goal is always delivering the right cylinder, in the right quality, at the right price, and at the agreed time. This applies both when the demand is for cylinders to new wind turbines and for the after sales market.





# Workshop: Service & Logistics



## Liftra

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Liftra is recognized by the global wind industry for designing and engineering tailor-made solutions for special lifting and transportation tasks. Products span the full turbine lifecycle from transportation and installation to major component replacement, both on- and offshore.

The Danish engineering company was founded in Aalborg, Denmark, in 2003 by joint CEOs Per Fenger and Jens Mortensen. Since, Liftra has grown rapidly, expanding operations to Spain, China, the USA and Poland.

Liftra's flagship product is the Self-Hoisting Crane, a universal crane system that can change major components without the need for conventional cranes, and at higher wind speeds.

The Self-Hoisting Crane fits in a standard 40-foot container and can be transported by a single truck. On-site, the crane climbs its own lifting wire from the container to the top of the turbine and mounts inside the nacelle on a pre-installed crane base. The entire setup occupies very little space around the turbine,

eliminating necessary civil works, crane pads and other expensive site preparation.

Liftra is getting ready to introduce a second 'craneless' solution, the Blade Way, for replacing single blades and blade bearings without the use of conventional cranes. The Blade Way will be demonstrated at Liftra headquarters in Aalborg in early October and is set to launch shortly thereafter.



# Workshop: **Service & Logistics**



YOUR FLEXIBLE, RELIABLE, AND EXPERIENCED INDEPENDENT SERVICE PROVIDER

For more than 30 years, Connected Wind Services (CWS) have been helping wind farm owners and operators with flexible service and maintenance packages, individual service projects and an extensive components and spare parts supply.

We work closely with you to make sure you get the most out of the full life cycle of your wind turbines.

Our modular offerings mean that we can offer you everything from performance upgrade and 24/7 surveillance to main components replacement and basic scheduled service of your wind turbine. Everything from fast sourcing of components and spare parts to a fully fitted plug n' play solution.

## **Connected Wind Services**

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We operate with these four focus areas:

### **Maintenance:**

We provide maintenance packages from basic scheduled service to full hybrid solutions including major corrected work, with local Spanish personnel.

### **Projects:**

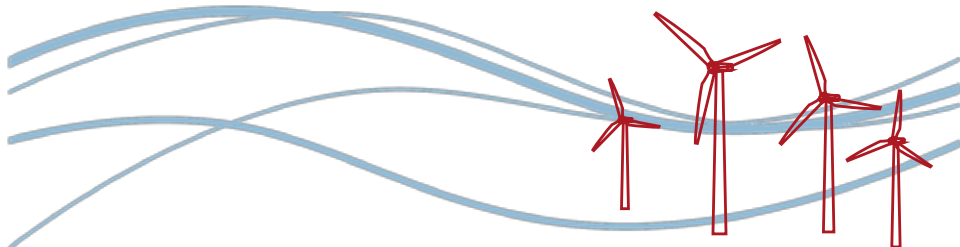
On- and Off-shore repair and/or exchange of any component, including decommissioning of complete WTG's.

### **Components & Spare Parts:**

With +5.000 items in stock plus strong ties to equipment OEM's, we can quickly provide parts needed throughout the world.

### **Gear:**

+ 250 gearboxes in stock and one of the largest in-house refurbishment factories in the world means we can supply plug n' play solutions for a wide range of WTG models.



# Workshop: Service & Logistics



**MAN | PrimeServ**

Whether onshore or offshore, we have extensive experience in up-tower repair for the wind energy sector worldwide. We specialise in up-tower repairs to minimise extensive and expensive downtime for operators. Whether you need an on-site shaft repair, yaw ring repair, accurate line-boring or a customised repair solution, MAN PrimeServ On-site Recovery travel to you to recover your wind turbine and minimise your downtime.

Years of experience coupled with a comprehensive range of tools ensure that we can offer exceptional service to the wind energy sector. No matter what kind of repair is needed, or whether it is required onshore or offshore, we have specialised tools to solve your problem.

The growing importance of wind energy means that the industry is constantly innovating. We understand that you need us to be equally innovative in finding newer and better ways to make up-tower repairs. In this case, we look to you and your expertise and work closely together to develop the best and most rapid recovery processes possible.

## MAN PrimeServ On-site Recovery

Contact:

Rune Damgaard

Sales & Marketing Manager, On-site Recovery

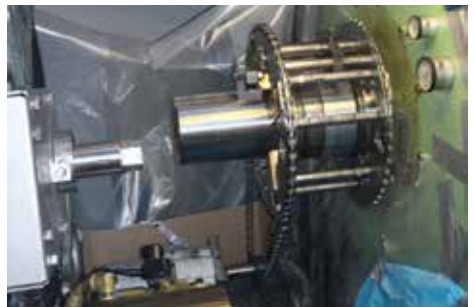
PrimeServ Copenhagen

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[www.primeserv.man.eu](http://www.primeserv.man.eu)

Not all wind turbines are the same, and so the repairs also differ significantly. As a company that thrives most when challenged, we are proud to evolve with the exciting technology in your sector.

We are proud to be known for succeeding in even the most challenging situations. Our extensive engineering knowledge, versatile service range and can-do attitude make us the best possible choice when things seem impossible.



# Workshop: **Service & Logistics**

# Eltronic

WIND SOLUTIONS

Within the wind industry, Eltronic provides innovative equipment solutions for production, transport, installation and service of wind turbine components. Eltronic is a knowledge business run by engineers with deep multidisciplinary skills that cover all aspects of technology development and business understanding.

We employ over 240 technical and mechanical engineers, automation experts and project managers who are highly skilled in concept design, CAD, 3D structural modelling and FEM/FEA calculations. Our on-site experience combined with our in-house engineering allows us to quickly identify potential areas of improvement and provide complete solutions, which are fully tailored to the needs of our customers.

In addition to customized solutions, we design our own products with focus on cost-efficiency, modular design and standardization. At our locations in Denmark, United Kingdom and China, we have facilities for building prototypes, assembling and conducting tests (e.g. FAT) as well as inspections of a wide variety of equipment and systems.

## Eltronic Wind Solutions

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### We are experts in:

- Process Optimization
- Manufacturing equipment
- Transport & Lifting Equipment
- Sea Fastening
- Service & Installation Tools

### Multifunctional equipment solutions for every step of the way



# Workshop: Service & Logistics



## Safe Wind Service

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At Safe Wind Service we know how important it is for our customers to have their wind turbines running efficiently at the lowest possible costs, which is why we have customized our service packages to suit all on- and offshore wind farm demands 24/7. Our wind service team comes with more than 35 years of experience in both the on- and offshore wind industry. Our aim is to secure long-term relationships with our customers and employees in order to perform high quality jobs that meet all deadlines, requirements and with a focus on safety.

Safe Wind Service is certified with ISO 9001:2015, and our crews are highly trained professionals in possession of the proper certificates required to operate all around the world. As our name implies, Safe Wind Service takes pride in the fact that safety is one of our core values - Safety First - Quality Always!

**Safety Track Record as of August 16th, 2017 - 1,950 LTI free days**

**Safe Wind Service operates with the following 3 main areas:**

Blade Repair & Inspection

- Agreements available for labor only or complete service package.

- All turbine services and inspections bundled under one visit.
- Night-time services available to fully utilize all weather windows.
- Innovative RFID tagging used for all inspections with database access for customers.

High Voltage Service

- Installation of cable types from signal cables to 36 KV cables.
- VLF (very low frequency) test of cables and cable diagnostics.
- Installation and maintenance of switchgear.
- Transformer inspection, installation, and replacement.
- Global authorizations & work according to EN 50110 - 1 + 2.

Operation & Maintenance

- Blade inspection, analysis and repair solutions.
- Hydraulic systems (pitch and brake system).
- Electrical systems and HV transformer and switchgear.
- Maintenance according to manufactures specifications.
- Statutory inspections of safety equipment and lifts.

# Workshop: **Light Solutions**



## **IED Greenpower**

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Head of Marketing and Business  
Development  
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[www.iedgreenpower.com](http://www.iedgreenpower.com)

### **Optimized & innovative cost-efficient indoor lighting solutions for Wind Turbines**

#### **LV Lighting solutions**

IED Greenpower has identified the challenges the wind turbine indoor lighting are facing through its expertise. LV lighting solutions deliver an optimized and cost-efficient solution combining LED technology with electronics, optics, battery technology and advance material, assuring an outstanding lighting performance.

IED Greenpower designs and manufactures LED indoor lighting solutions for the wind turbine. Offering a complete range of waterproof LED luminaires (LV) with built-in emergency kit with the aim to reduce the cost along the wind turbine's lifetime and improve the light conditions.

The presence of lighting in the wind turbine in operation and emergency mode is critical to assure safety working conditions in the interior of wind turbines. The enhanced performance of LV luminaires allows delivering proper and lighted working conditions in any mode.

Present in Europe and Asia, with manufacturing facilities in Spain and India, IED Greenpower delivers its LV Lighting Solutions worldwide. More than 80.000 luminaires have been delivered to the wind industry manufacturers, having LV luminaires installed in wind turbines worldwide, in the five continents.



# Workshop: **Light Solutions**



## **Dialight**

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[www.dialight.com](http://www.dialight.com)

### **Aviation obstruction light solutions**

Dialight is a global market leader in supplying complete data network enabled obstruction light systems comprising aviation obstructions lights and marine aids to navigation solutions for the wind industry.

We develop and manufacture state-of-the-art LED solutions enabling your wind project to comply with local and international authority regulations.

Dialight has a strong track record; offering custom specific retrofit solutions for obstruction light requirements for the Spanish Market.



## Contacts:

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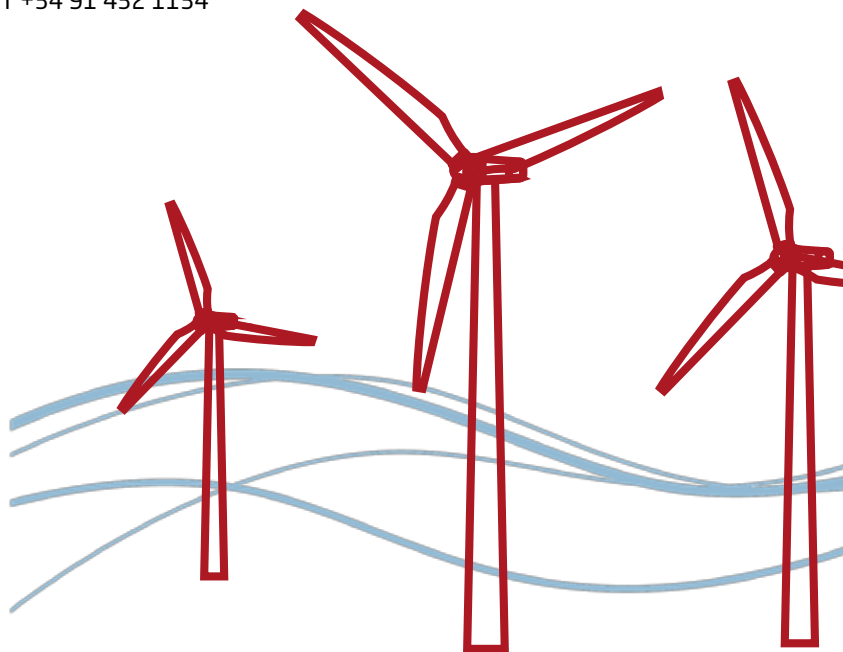
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## Organizers:

**DWEA** Danish Wind Export Association

*Owned by Danish Export Association and Danish Wind Industry Association*



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