

Cutting edge blades

PES caught up with Ryan Lauridsen, CEO at Bladena to find out about the latest developments in blade technology. An important issue in our industry..



Ryan Lauridsen

PES: Welcome to PES Wind magazine. Thanks for talking with us. Would you like to begin by explaining a little about the background of your organisation and how you currently serve the wind industry?

Ryan Lauridsen: Bladena was founded 5 years ago as a spin off from the Technical University of Denmark and since then has been focusing on further development of the patented technologies and their commercialisation. Our focus is on the structural design of blades and all our work is centred on reducing the failures seen on blades in operation; hence reducing the cost for Operation and Maintenance on blades and so extending their operational life time. We have expert knowledge in blade failures and how to avoid them.

Our main office is in Denmark, but so far also we are represented in France and North America. We are looking to expand this to other areas in the near future. We serve the industry, in all locations, with our blade knowledge, starting from root cause analysis of failures to our products and solutions. These can be installed both in

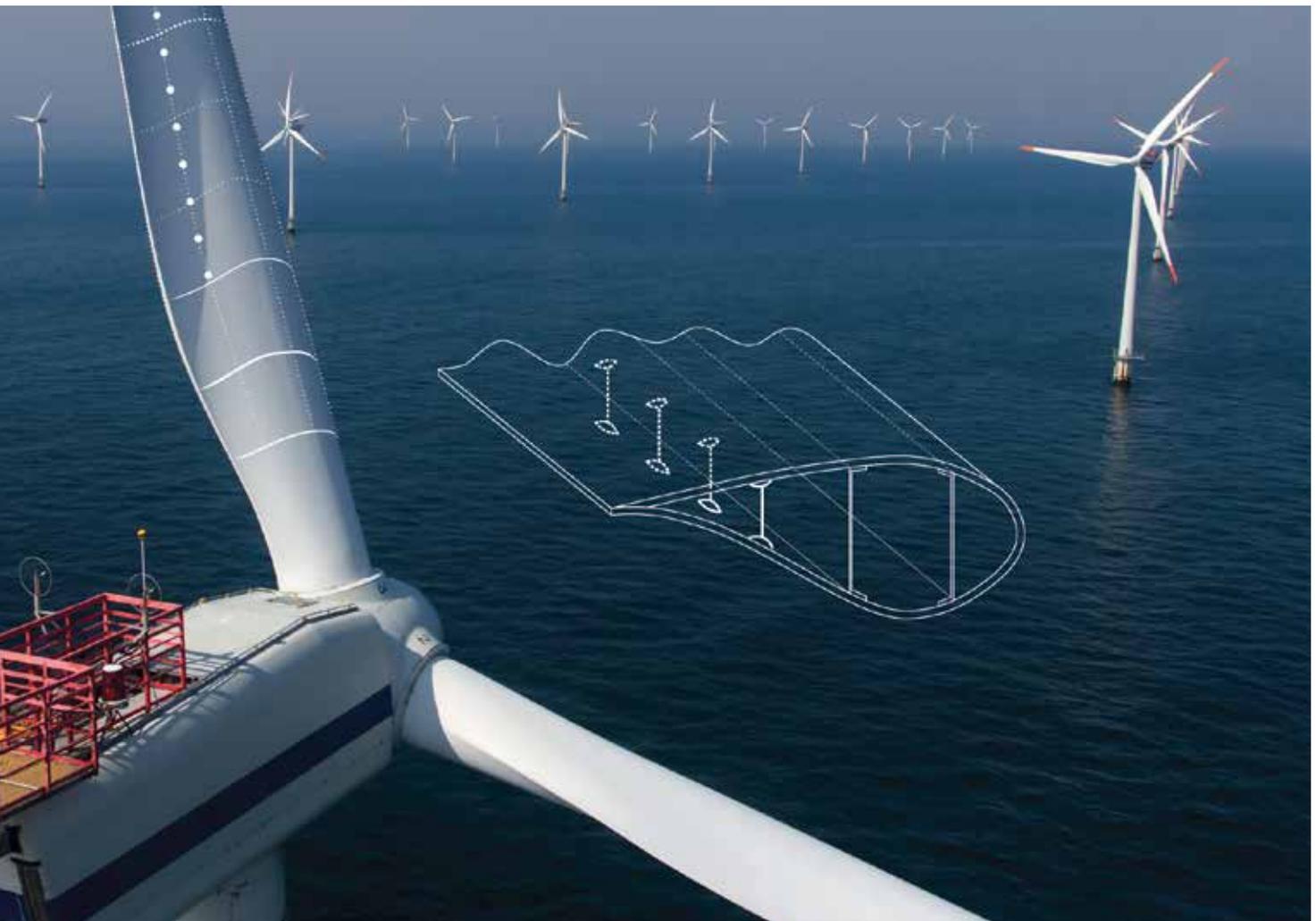
manufacturing and as retrofits up-tower on blades in operation.

PES: Your business focuses on blades, is this a growing business? How are you capitalising on this growth?

RL: The wind turbine industry moves towards ever longer blades and expectations of driving down cost (LCOE). During recent years, as the awareness of challenges increases, the focus within operation and maintenance has to some extent shifted from “only” looking at the drive train. Blade failures/damages on MW turbines are part of the daily concerns for the turbine owners and operators; hence they are spending more and more resources on reducing the O&M cost and long term operation of the blades.

Supporting the wind turbine owners and also manufactures in understanding the challenges they face and offering solutions to reduce and avoid failures, is where Bladena comes into the picture.

So in short, the growing installed base, aging fleet, longer blades and focus on reducing LCOE is our opportunity for growth.



PES: You technologies are based on 7 different patents, how long did it take you to develop these?

RL: The main patents were granted during 10 years' research by Dr. Find Mølholt Jensen, our founder, at Risø DTU. After establishing Bladena, the product development and demonstration of the patents was done within the EUDP framework in Denmark, funded by the Danish Energy Agency, in projects with partners from the full supply chain in the industry, from universities and manufactures to wind turbine owners.

During recent years, Bladena has been granted and applied for further patents supporting our existing products or covering new solutions, all with the same target, to enhance the structural design of blades.

PES: Can you tell us something about the technology used by Bladena and what are the benefits in terms of downtime and the cost implications for the client?

RL: In general all our products and solutions will limit the deformation of blades

during operation; which means that the fatigue life of panels and bond lines will increase; less fatigue stresses - longer life time. We always develop our solutions based on defects seen in the field or during full scale testing of blades.

Taking our D-String® as an example, the D-String® reduces the “breathing” of the blades in the max chord area. “Breathing” is out of plane deformation of the trailing edge panels, which results in high peeling stresses in the adhesive bond lines in the trailing edge and in the bond lines at the shears webs. Removing the deformation also removes the risk of bond line cracks and worst case, the splitting of the trailing edge.

For the clients, owners and operators, this means that the risk is significantly reduced, less crack repairs, less operation and maintenance costs and as a result of this less turbine down time. In different case studies made by Bladena, on turbines in operation, the payback time for installing the D-String® will be 1-2 years depending on the failure rates and cost structure for the wind farm in question. Off shore

turbines have the higher cost for O&M and so have a faster return on investment

PES: Can the Bladena solutions be used on both new turbines and during maintenance as retrofits?

RL: Bladena is offering solutions to both “markets”, e.g. D-String® and X-Stiffener™. Several of our solutions can be installed both in new blades during manufacturing and as retrofits on turbines already in operation. From our perspective the ideal solution would be to have them installed in new blades, as preventive measures, or install them as early as possible before damage starts to show on the blades.

The solutions we have for e.g. light weight blade design will not be promoted as a retrofit, as it will require changes to the general design and manufacturing of the blade.

PES: When installed during repairs how difficult a process is it and is it dangerous?

RL: The up-tower installation of the D-String® is simple and within the normal capabilities of all blade technicians. You



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would need to access the blade, as for normal repairs and inspections, e.g. by rope or platform, following the known safety rules and requirements. Installation on a full turbine can be done in approximately 1½ days, allowing for turbine operation at night to reduce downtime during installation.

DEWI-OCC have gone through the background for the D-String®, testing and documentation and states that the installation of the D-String® does not influence the structural safety of trailing edge panels of a general blade design.

PES: Is your work weather dependent, what sort of climates are you able to work in?

RL: We subcontract the installation work to professional service companies or customers’ in house service organisations. Whenever the weather allows them to work on the blades and do normal repairs. This is also a window for installing our retrofit.

Keeping that in mind, especially offshore, where the weather conditions are often more difficult, planning of the retrofit installation should be done together with other maintenance jobs, which will also keep the turbine down time at a minimum.

PES: Geographically speaking, where are the key wind markets for you and do

you have plans to expand in to other areas?

RL: Currently our main targets are Europe and USA, where we already have turbines operating with our D-String® technology. Despite the differences in the way the two markets operate, from our perspective, we see great potential in providing a solution to help lower O&M costs.

In the future the Chinese market will be of interest to us and already initial investigations are underway on how to approach this. We are examining both the vast potential and how to engage, in a somewhat different market.

Geography aside we are involved with both turbine manufactures, owners and operators and independent service providers, as we do see possible value creation by going into the market with more than one approach.

PES: What are your thoughts about prospects for the rest of 2016 with regard to your organisation, and the wind industry in general?

RL: 2016 is where we get our foot hold in the market and expand our activities both commercially, with more references in operation and further developments to our upcoming solutions. We are in the process of moving to a new site in order to improve

facilities for our engineering team, which will continue to grow over the coming years.

Every day we are also getting closer to the customers, gaining important knowledge of how they approach the work with blades; hence allowing us to support them even more.

In general I believe that the continuous focus on cost and life time of the turbines, including blades, will force the industry to look for new solutions, to help them to secure their assets and investments. Also the owners of the turbines continue to increase the focus on blade performance, as they realise that blades do need quite a bit of care, especially on larger turbines.

No doubt that will bring opportunities, not only for Bladena, but also for other companies that bring solutions to the market to support this.

PES: And conversely, what presents you with the biggest challenges?

RL: The knowledge about blades is still, to some extent, limited amongst the turbine owners. Small and mid-size owners often do not have their own blade specialists; hence they rely either on the OEM or their service company. Often this leads to a repair approach instead of looking into the possibilities of damage prevention. Here we have the task of educating the customers to increase their knowledge of blades and to use non-traditional options.

In other words our challenge is to find customers, manufacturers and owner/operators who are willing to think outside the box when it comes to blade structures and solutions. ■

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