

A view from the top



André Moura

André Moura, Founder and CEO of Pro-Drone, Integrated Solutions for the Inspection of Energy Infrastructure, sat down with PES to tell us his perspective on drone inspections and how his company differs from other players in the market. Their experience and strategy means this company is here to stay and remain one step ahead of the game.

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

André Moura: Pro-Drone was born out of our desire to contribute to the efficiency of the wind energy sector by modernising the blade inspection procedures and empowering asset owners by providing them with high quality data. Our team has a very diverse background including robotics,

aeronautical engineering, computer science and data management systems.

Founded in 2015, we have carried out inspections in Europe and South America totalling over 1500 blades over the last 8 months. Our aim is to be established globally by the end of 2018.

PES: We were wondering why Pro-Drone decided to focus on wind turbine inspection with the UAVs?

AM: I was involved with offshore



encompasses the surveying logistics, data management, report generation and full data access with an accurate ruler, distance to hub and all the important metadata for a thorough analysis.

Our data scientists have implemented several automatic damage statistics and we are looking towards offering automatic damage identification tools over the second semester of 2018.

PES: We know that the use of drones is growing rapidly and the technology used is advancing all the time. How do you ensure your equipment remains at peak performance and up to date?

AM: That is a very important question and something that has been present in our minds since the very start of the company. Over the past 5 years drones have been coming of age and seen an incredible evolution in availability and reliability, which means that we are only scratching the surface of what they will do for us.

However the design and manufacturing of drones is very hard and expensive and it is hard to predict which way the industry will go, which is why our whole philosophy has been to be drone agnostic. Our system comprises several sensors and a computing unit that can be attached to virtually any drone on the market.

This means we are able to use the best drone available for the task at hand and to place our system in more modern and competent drones, as they come out.

Lastly it also means that we can source the drones locally or even rent out our system to be used in drones locally, which makes operating logistics much easier.

PES: How do you see future wind turbine inspections developing or has it gone as far as it can?

maintenance operations of wind energy assets, which is where I became familiar with the costly and cumbersome logistics of accessing wind blades for inspection. It was also clear to me that the industry was turning towards focusing its efforts on optimising O&M costs and I saw an opportunity to improve the status quo of blade inspections.

Traditional inspection methods have clear setbacks regarding safety, downtime and data quality. UAV's had the potential of disrupting this industry by offering high quality, repeatable and safe inspections in a short amount of time. However to deliver this automating inspection was the first and crucial step, as no pilot expertise is needed for this operation and this is what we achieved.

PES: We see your core values are robustness, safety and data accessibility could you explain what you mean by each of these?

AM: Robustness relates to the ability to trust that the inspection will be carried out in an efficient and consistent way every time. In the case of UAV inspections this means the data collected is of a high quality in resolution, that the entire surface of the wind blade is covered and that the system delivers the same inspection day in day out.

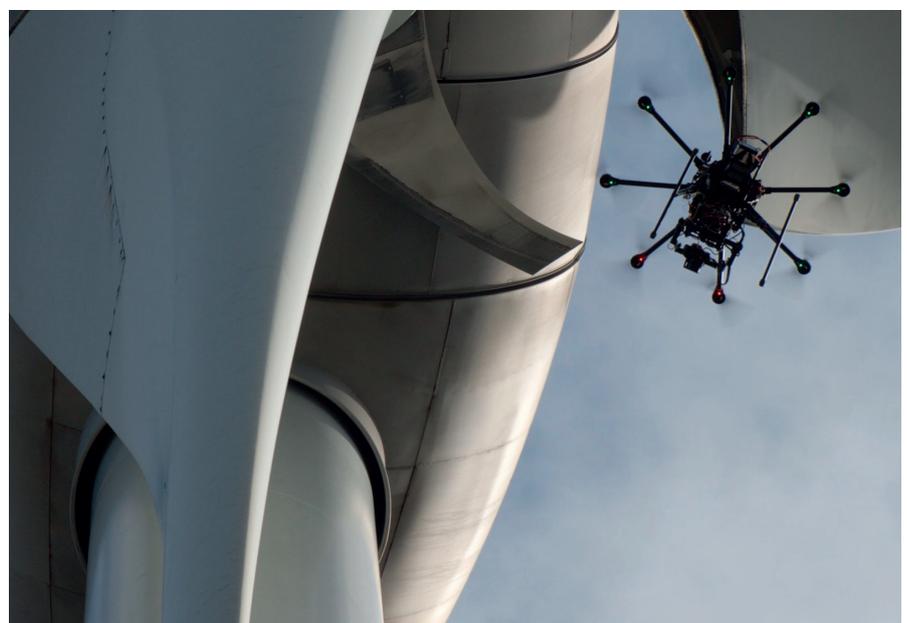
This is what enables the data to be comparable between blades, turbines, sites, manufacturers and so on and also allows the client to count on the same quality wherever he hires our services. The high quality is also key factor in identifying damage accurately, as well as the precise location on the blade, which has a critical impact on the severity and repair strategy that we set off.

Safety standards are paramount for any large asset owner and we have incorporated this throughout our development. Firstly, by complementing or reducing the need for rope access work we can limit the physical hazards workers are exposed to.

Secondly, our automated flight system monitors all the structures around the drone and uses them to determine its flight path in real time. This provides an active anti-collision system that prevents the drone from colliding with the blade or tower. With over 350 flight hours and over 1500 blades inspected to date, we are happy to say that our system has been accident free.

The last, and most crucial piece of the puzzle is what is done with the data collected. High quality data implies hundreds of high definition images are collected per turbine inspected, resulting in dozens of GB of data and thousands of files at the end of a day's work. To be able to sieve through them efficiently and extract the significant damage, without missing anything critical, is vital for a manageable and efficient inspection solution.

This is the reason why we developed Bladelnsight.com, our cloud platform that aggregates, processes and manages all of our clients' blade data in an intuitive way. It



AM: We believe that wind turbine inspection methods will continue to evolve and develop with the aim of ever increasing the value delivered to the client. From a still image perspective we don't think there is room for much improvement on quality, but there is still a great untapped potential in methods that would allow us to see what is happening below the first layer of the blade for example.

It is also clear that AI and specifically machine learning will play a big role in this industry, by making analysis more robust and minimising inspector errors. Perhaps further ahead drones might even be able to play a meaningful role in blade repair, but this is still in an exploratory phase.

PES: Does automated inspections have an impact on efficiency and return on investment (ROI)? If so can you explain how?

AM: Having an automated inspection means that you no longer rely on expert pilots to carry out what is a critical and difficult operation. This translates into a much more robust operation enabling more certainty on the production and quality and a decrease in pilot expertise, which has a direct impact on a projects ROI.

PES: Could you tell us about any current or future projects?

AM: We have many interesting things in our pipeline within the wind sector as we look to build upon what we have developed to date. In 2019 we will be launching our 3 blade solution that enables the turbine to be positioned only once as well as some very powerful analytics tools to help clients make more of their data.

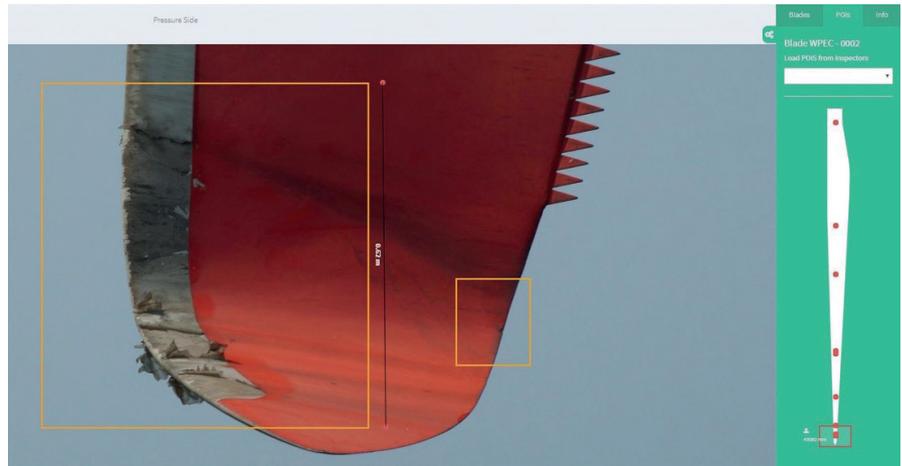
There is also a roadmap and intention to enter other verticals with our tool, but for now our focus will remain in wind energy.

PES: We note that there are more and more UAV operators, how are you finding this and what do you think makes Pro-Drone stand out from the competition?

AM: The number of players in this market is validating what we saw over 3 years ago that UAV's would be playing a significant role in wind blade inspections globally. The market share of this inspection method is growing and it seems quite clear that in time it will become the defacto inspection method and we will end up with several players servicing the industry, our goal is to be one of the leaders, shaping this industry.

Besides the factors previously mentioned, one thing that makes us stand out is our business model. By offering a licensing model we allow any player in the market to carry out high quality, autonomous blade inspections with just 3 days of training.

This means that owners, ISP's, OEMs, insurers and virtually any stakeholder in the



industry can, almost instantly, begin offering top quality inspections.

From what we can see, this is a very unique approach in the market, and we are happy to see it take off.

PES: Where do you operate and where are your key markets and are there are any areas, geographically speaking, that you would like to break in to?

AM: We are operating in Portugal and Brazil currently but expect to be in several more countries by the end of the first semester of 2018. The US and China, as well as the offshore market are key targets for us and we expect to have a presence in each by the end of the year.

PES: What is the single biggest challenge facing the market today?

AM: The drone inspection market is still quite fragmented and there is still some hesitation and distrust in some segments of the industry, regarding the benefits that it can provide. This is the result of several years of over promise and under delivery by several UAV providers, who attempted

to offer industrial solutions using a manual piloting approach. They had very mixed success and none were able to scale, which led to an overall resistance. This challenge is being overcome with several companies, such as ours, achieving thousands of blades inspected and proving the quality and reduced time that UAV's can provide.

PES: Looking to 2018 and beyond, what trends and/or changes are you anticipating in the market and why?

AM: It is clear that the entire industry is moving towards fully autonomous solutions and that a growing focus will be on data analytics. How we, as solution providers, can do more than offer pictures and reports and help the asset owners to better monitor their turbines, identify trends throughout their fleet and optimise their O&M procedures, to ultimately improve the clients ROI.

We are in an era of abundant data and information and so the differentiating factor is, and will increasingly be, how to best extract value from it.

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