3DX™ AutoPilot Pro: cutting-edge blade inspections by an in-house team or trusted partner

Have you considered the benefits of self-performed rotor blade inspections?

As owner-operators in the wind sector look to gain greater control of the operational challenges and costs associated with maintaining wind turbine asset health, there is a growing trend toward empowering in-house teams to self-perform rotor blade inspections. Using the latest high-quality technology that couples advanced UAVs with software solutions that support long term management and data analysis, many leading global organisations are already seeing the successful deployment of the latest solutions.

By empowering wind OEMs, owners, and operators to take direct control of their inspection processes, this innovative strategy enhances efficiency, optimises scheduling, and reduces costs associated with traditional outsourcing to third party service partners. However, the key to successful blade operation and maintenance lies in capturing the highest quality inspection data and leveraging a powerful platform to analyse this data, turning it into actionable insights.

We've been exploring this topic with Patrik Huber, Head of Business Management at the inspection technology expert, Sulzer Schmid, along with a customer who uses in-house teams for blade inspections.

PES: Can you tell us about the challenges of outsourcing rotor blade inspections?

Patrik Huber: Firstly, there are issues with inconsistent image quality from different service providers, making it difficult to maintain a reliable standard across inspections. Secondly, varying data formats complicate the integration of inspection data into existing organisational data ecosystems.

There are also operational hurdles like planning inspection campaigns months in advance, which can cause long standby times during bad weather, or downtime during high winds, directly impacting energy production that causes financial losses and operational inefficiencies. Outsourcing inspections is also typically higher cost.

PES: What motivated Sulzer Schmid to develop a solution for self-performed inspections?

PH: Our journey began in response to the logistical challenges we faced with a rapid global expansion. We needed a portable solution that relied on off-the-shelf technology available worldwide, eliminating the need for shipping large equipment, which was time consuming and could cause delays. The 3DX™ SmartPilot was developed as a software solution that enabled pilots to take compact off-the-shelf DJI drones and inspect turbines autonomously, relying on the software to bring the drone along predefined flight paths ensuring consistent high image quality and very little pilot intervention.

When we launched the 3DX™ SmartPilot, we quickly realised its potential. With its low starting costs and easy handling, it filled a significant gap in the market. It offered our customers more control and flexibility by enabling them to perform blade inspections with in-house teams instead of outsourcing. It answered the desire to optimise costs and operational efficiency.

PES: How has technology advanced to support self-performed inspections?

PH: Advancements in image capturing systems and drone technology have been pivotal in enabling self-performed inspections at different levels. For instance, low-cost, off-the-shelf solutions provide an accessible entry point for many of our customers, with higher quality upgrades available for more detailed inspections.

We also have customers like BKW and Arowya who have opted for our flagship solution, the 3DX™ AutoPilot Pro. Equipped with a proprietary payload and brand-new image capturing system, it delivers top notch image quality, probably the best on the market.

All our solutions are easy to use, require very little pilot intervention and are designed to enable OEMs, owners and operators to use in house, providing our customers with flexibility and control.

PES: What about those who prefer to inspect with third party providers?

PH: Self-performed inspections come with many benefits but it's not for everyone. Some of our customers have a long standing relationship with their third-party inspection teams and in these cases, we have simply trained their partners. The benefit is that the technology ensures consistent quality throughout inspections during the long term, even if they were to change inspection partners or decide to move to self-performed inspections, the technology and platform remain the same.

PES: Can you elaborate on the challenges with different inspection sources?

PH: When you work with different inspection partners, or perhaps a mix of in-house and external teams, it's vital to be able to access the data in one platform to enable fleet wide analytics and a holistic view of the turbine's health, facilitating a more efficient and effective operation and maintenance (O&M) strategy.

Only an advanced platform will allow you to turn inspection data into actionable insights and prepare you for an increasingly AI driven approach to blade O&M in the future. With the development of our products, we have focused on a user-friendly interface, useful dashboards and high-quality inspection reports bundled with powerful data analytics modules.

We were keen to explore the topic from the customer perspective and also spoke with Giampasquale Gambacorta, Support & Remote Operations Manager at Arowya, the independent service provider part of BKW Energy with a large network along the entire energy value chain.

Using Sulzer Schmid's 3DX™ technology and platform, Giampasquale and his team cover all the Italian and Swiss rotor blade inspection programmes for BKW and will soon start to inspect rotor blades in Germany, France and Norway.

Giampasquale Gambacortaedit

Patrik Huber

PES: Tell us about the key challenges you had with previous blade inspection methods?

Giampasquale Gambacorta: Historically, we used an automatic ground camera with optical zoom, and while the system worked, it was slow, affected by sunlight, and we only documented areas with visible issues, not 100% of the blade. Then we moved to rope inspections but found them time consuming and dangerous.

In seeking a better solution, we transitioned to third-party, drone-based inspections but lacked an efficient platform to review and utilise the inspection data for long term analysis and planning.

PES: What motivated you to switch to Sulzer Schmid's 3DX™ technology?

GG: We were blown away by the inspection quality, and we finally found a platform that would facilitate the development of lifetime records of our blades, monitor how damages progress over time, analyse damage patterns and collect all blade-related documentation in one place.

PES: What are the benefits of self-inspection?

GG: Our policy is to keep everything in-house, as much as possible, so we were looking for a technology that was robust, reliable and easy to use.

The ability to conduct inspections when conditions are optimal, such as during favourable wind conditions, enables us to be in control of minimising downtime, maximising energy production, and therefore providing significant cost saving opportunities.

With our own drone readily available, we are always prepared to initiate inspections at short notice, enhancing our responsiveness and proactive maintenance capabilities.

PES: How has the 3DX™ Blade Platform helped with analysis and decision making?

GG: It has transformed our maintenance approach. Immediate insights into damages allow for prompt action, providing a solid foundation for both short and long term repair planning, and we can make proactive, informed decisions. These capabilities are vital for optimising maintenance strategies and maximising wind asset performance and longevity.

Having the reports created by Sulzer Schmid is a real positive too. Our customers appreciate the independent insight and it builds trust in our services. The reporting accuracy is also vital and by accessing these in the platform, repair partners can provide much more accurate cost estimates.

PES: What is the benefit of building up long term inspection data?

GG: We can easily see how damages occur and evolve, review historical data, and apply various filters to conduct fleet wide analytics. This capability provides us with a comprehensive understanding of our blades' health, how repairs are performing and

Arowya uses its in-house team to inspect BKW turbines with the 3DX™ AutoPilot Pro

3DX™ SmartPilot is an ultra-portable inspection solution perfect for adhoc inspections and turbines in remote areas

ensures we are meeting standards and expectations.

PES: Any initial challenges in adopting this technology?

GG: There is always apprehension about adopting new technology but we quickly proved its value in improving our inspection processes and optimising our resource allocation. Sulzer Schmid supported us throughout the smooth onboarding, holding our hand and ensuring the team was confident.

Patrik Huber concluded: 'We see a clear trend towards self-performed blade inspections with Sulzer Schmid 3DX™ technology. In 2022, only 1% of inspections using our technology were self-performed. This increased to 20% in 2023, and we predict that 30% of all inspections in 2024 will be self-performed. This shift underscores the technological advancements, the growing confidence in the capabilities of in-house teams, and the advantages of having immediate access to high quality inspection data.

'As more customers recognise the benefits of taking control of their inspection processes, we anticipate this trend will continue to grow, driving greater efficiency and cost savings across the industry.'

The wind industry is experiencing a transformative shift towards self-performed rotor blade inspections, driven by advanced UAV technology and robust data analysis platforms.

The insights shared in this interview underscore the transformative potential of empowering in-house teams to perform these critical inspections. High quality inspection data and robust software platforms enable fleet wide insights, facilitating more informed decisions and ultimately improving the performance and longevity of wind turbine fleets.

To book a meeting with Patrik Huber, or a member of the Sulzer Schmid team at Wind Energy Hamburg 2024 email: info@sulzerschmid.com

Damage annotation in 3DX™ Blade Platform

About Sulzer Schmid

Sulzer Schmid is an independent Swiss innovator of next generation rotor blade inspection technology.

www.sulzerschmid.com

About BKW

BKW is an international energy and infrastructure company which currently operates more than 30 wind farms across Switzerland, Germany, France, Italy and Norway.

www.bkw.com

About Arowya

Arowya specialises in the management and operation of wind and solar parks. It is dedicated to maximising the energy efficiency and output of these renewable energy facilities by ensuring optimal performance and profitability for its clients' investments.

www.arowya.com/en