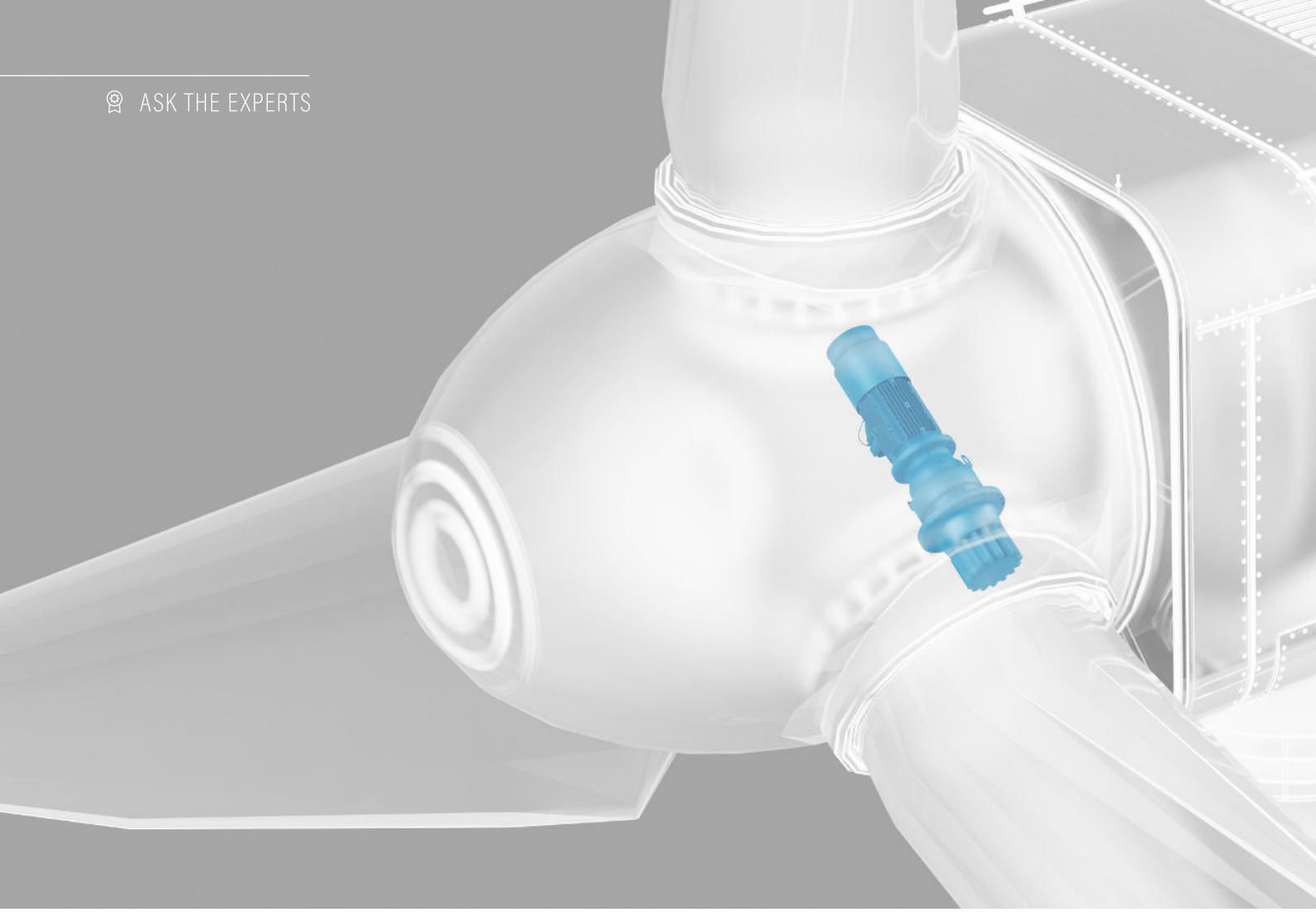

Exploring wind solutions

In an insightful conversation with Roberto Pasqualini, Wind Business Development Senior Manager at Bonfiglioli, we explore the company's innovative solutions showcased at WindEnergy 2024, including advanced pitch and yaw drives, synchronous servo motors, and its commitment to sustainability in the wind sector.

PES: I'm very pleased to be speaking with you today Roberto and am looking forward to learning more about the latest thinking from Bonfiglioli. With WindEnergy 2024 now behind us, perhaps that would be a good place to start. There were many innovations on display. What was a highlight for you?

Roberto Pasqualini: WindEnergy Hamburg was a packed show for us. Complete solutions for pitch and yaw drives for offshore and onshore turbines were displayed, showcasing our commitment to enhancing turbine efficiency and reliability in diverse wind conditions. For the offshore sector, a yaw drive and a pitch synchronous permanent magnet servo motor with increased power, both of which can reach 18 MW, were highlighted.

Another important innovation was the integration of a DGM modular inverter directly in the yaw drive. For the onshore sector, both the yaw and the pitch drive are coupled with a BMD permanent magnet motor, which is an innovative technology in the wind sector, compared with the traditional asynchronous three-phase motor.

Moreover, the pitch and yaw drives are suitable for offshore wind turbines of up to 8+ megawatts and are part of the third generation. They offer nearly double the torque density and have a more advanced structure compared to the first generation.

PES: What sets the BMD synchronous servomotor apart in the wind sector, and how does its design and technology contribute to enhanced performance and flexibility in various applications?

RP: The BMD synchronous servomotor uses cutting-edge permanent magnet technology, which is a significant innovation in the wind sector. Its compact design and low inertia meet the highest standards for precision, dynamics, and speed control, thanks to high-quality neodymium iron boron rare-earth magnets and our advanced engineering. Equipped with the latest encoder technology, these motors are optimised for use with frequency inverters and precision planetary gearboxes, ensuring seamless integration.

Modularity is enhanced through a range of available options, including a flywheel for

Roberto Pasqualini

superior control in high-load inertia applications, as well as brake and forced ventilation options to extend performance in continuous operation and challenging temperature conditions.

PES: What makes the BE Series asynchronous motors suitable for industrial applications, and how do they stand out in terms of efficiency and durability?

RP: Some of the key advantages of the BE Series asynchronous motors over alternatives include their compact design and versatility, making them ideal for a wide range of industrial applications. The aluminum frame of the motor, along with its availability in the IE2 efficiency class, contributes to reduced operating costs and energy savings.

Additionally, these motors offer several customisable options, such as a protection class of up to IP 56, tropicalisation for harsh environments, corrosion-resistant paint, and anti-condensation heaters, all of which enhance durability and reliability in demanding conditions.

PES: How does the fifth yaw drive solution from the 700 TW Series demonstrate Bonfiglioli's commitment to better service, and what role does the torque limiter play in protecting mechanical components?

RP: This fifth yaw drive, part of the 700 TW Series, is equipped with W and Z sensors, and a specially designed torque limiter to manage overload situations that can sometimes lead to mechanical component failure. The torque limiter functions like a fuse, protecting the mechanical components from damage.

PES: What are the key advantages of applying Bonfiglioli's AxiaVert inverters and Z and W sensors to their drive systems, and how do they contribute to improved performance, efficiency, and reliability?

The innovation and advantage of using inverters like AxiaVert and sensors such as the Z and W models in their drives lie in their ability to greatly boost performance, efficiency, and control.

One of the main benefits is energy efficiency. AxiaVert inverters optimise motor control by adjusting the speed and torque of the drive to meet the specific needs of each application. This leads to a reduction in energy consumption compared to traditional fixed-speed drives, which can cause cost savings, particularly in energy-intensive industrial settings. Depending on the application, energy savings can reach up to 30% or more.

In terms of control and flexibility, AxiaVert allows precise customisation of drive parameters, making it suitable for a variety of applications, from industrial automation to mobile machinery. It also supports advanced communication protocols for seamless integration with automation systems. Additionally, Z and W sensors provide real-time feedback on critical factors such as temperature, speed, position, and vibration. This real-time monitoring enables more accurate control and enhances system performance and responsiveness.

The use of Z and W sensors also supports predictive maintenance by monitoring the drive's condition in real-time. This allows operators to detect potential issues, such as excessive vibration or overheating before they become critical. As a result, unplanned downtime is reduced, equipment lifespan is extended, and repair costs are minimised, lowering the total cost of ownership.

Safety and reliability are also improved by integrating inverters and sensors. The system

ensures smooth operation and prevents mechanical stress or overload. AxiaVert inverters include features such as Safe Torque Off (STO), which helps create a safer operating environment. Sensors monitor operational limits to ensure the drives remain within safe parameters.

The combination of AxiaVert and sensors also supports sustainability by optimizing energy use and reducing waste, which contributes to lower carbon emissions. This aligns with the goals of industries focused on decarbonising their operations.

Additionally, AxiaVert's modular design allows it to be scaled for use in a wide range of systems, from small to large applications, across industries such as factory automation, logistics, and heavy-duty applications. The ability to integrate various sensors for customised feedback further enhances its adaptability.

Finally, Bonfiglioli's drives equipped with these sensors perform well even in harsh environments, where factors like extreme temperatures, dust, and vibration could affect traditional drives. The sensors help monitor and mitigate environmental impacts, ensuring reliable operation and reducing the risk of system failure.

By integrating AxiaVert inverters and Z and W sensors with Bonfiglioli's drives, businesses can achieve improved energy efficiency, better system control, enhanced reliability, and long-term cost savings, positioning them for a future of smart, sustainable industrial operations.

PES: How is Bonfiglioli contributing to global decarbonisation efforts, and what specific strategies and innovations are being employed to reduce the carbon footprint in industrial sectors?

RP: We are actively pursuing decarbonisation policies through several strategic initiatives aimed at reducing the carbon footprint of industrial sectors.

One focus is sustainable product development. We design energy-efficient motors, gearboxes, and drive systems that help lower energy consumption across various applications, including industrial automation, mobile machinery, and renewable energy sectors like wind and solar power. This supports industries in transitioning toward greener, low-carbon operations.

We are also advancing electrification solutions by replacing traditional combustion-engine-driven systems with electric alternatives in mobile and industrial applications. This shift plays a crucial role in reducing greenhouse gas emissions, particularly in sectors such as construction, agriculture, and material handling.

In line with circular economy practices, we design durable, easy-to-repair, and recyclable products. We offer refurbishment services that extend the life cycle of our equipment, reducing waste and minimizing the need for new resources.

Bonfiglioli is heavily involved in the renewable energy sector, providing critical components for installations such as wind turbine drives and solar tracking systems. This involvement directly supports the growth of clean energy sources, helping to reduce reliance on carbon-intensive energy production.

Energy efficiency is another important area. Through technological innovation, our products enable energy savings in various industries, aligning with global decarbonisation goals by reducing energy waste and improving operational efficiency.

We are also working to reduce the carbon footprint of our own manufacturing processes. This involves optimising energy use in production facilities, incorporating renewable energy sources where possible, and improving waste management practices.

PES: Finally, then, what role does Bonfiglioli play in the APQP4Wind Association, and how does this membership contribute to quality assurance in the wind industry?

RP: APQP4Wind is a non-profit organisation founded by leading global utilities, wind turbine manufacturers, and suppliers to provide a standardised quality assurance methodology tailored for the global wind industry. This approach aims to mitigate risks and reduce costs associated with poor quality.

As a member of APQP4Wind 2024, Bonfiglioli assures its customers of consistent quality standards, enabling them to rely on reduced risks and, consequently, lower costs.

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