Press release

CNC Onsite to present its yaw ring repair at HUSUM WIND 2023

Using patented, portable and compact precision machine onsite and uptower, the offshore or onshore yaw ring is repaired, not replaced, resulting in cost reduction, while eliminating the CO2 emissions from crane and transport needed for replacement – Explained on stand 3C34, HUSUM WIND, Husum, Germany, 12-15 September, 2023

VEJLE, Denmark, 8 September, 2023 – At its stand 3C34 at HUSUM WIND 2023, 12-15 September in Husum, Germany, CNC Onsite, a Danish mobile machining expert, will be demonstrating its yaw ring repair method that eliminates the costly, time-consuming and potentially risky disassembly of the rotor and nacelle. When applying the patented custom-built tool and method, the yaw ring does not need to be replaced. The patent, which covers both the machine and method, was successfully extended to the US last month.

An important component in securing maximum power production from a wind turbine, the yaw ring, also referred to as “yaw gear rim”, is complex to replace and the costs are so high operators of older wind turbines often choose to scrap the whole unit.

CNC Onsite offers its repair service for wind turbines at a fraction of the cost of replacing the entire yaw ring, and that makes it viable to keep perfectly good turbines operating for longer. Launched in Denmark four years ago, the machine has repaired yaw rings in several countries across Europe on both onshore and offshore wind farms and the range of wind turbine types that can be repaired has steadily increased.

Carried out inside the turbine uptower, the repairs have a wide weather window, which is ideal for both work schedules and costings. CNC Onsite designed the machine to be disassembled into several manageable components to allow lifting and handling up-tower. The parts are transported to the tower and then reassembled in the nacelle where the compact machine can be operated in the confined space.

Limited working space around and above yaw ring

The available working space around the yaw ring required for both inspection and repair is generally so small it can only house one technician and not much else. The machine doing the precision work must therefore be small and compact, still leaving enough space for the technician not only to set up the machine but also to monitor the repair.

The machine was designed to works sideways - part of the patent - on either inward or outward-facing yaw teeth. The machine therefore mills out damaged and broken yaw ring segments radially, not axially, which is the traditional yaw ring repair, but most often the nacelle does not offer sufficient working space above the yaw ring.

The machine incises the damaged yaw teeth, leaving a pocket with precise dimensions that fits the exact size of the new segment to be inserted. The shape of the pocket is designed to hold the replacement part in place through grooves and ridges as well as threaded holes for subsequent fixing.

Several raised ridges in the pocket allows the new segment, which is equipped with corresponding indents, to be inserted like a jigsaw puzzle. This mechanical design improves the mechanical strength and will help prevent displacement of the replacement teeth, both axially and tangentially.

At Husum Wind, CNC Onsite will be using explanatory video recordings and live commentary to demonstrate how its portable precision machine repairs the yaw ring, removing damaged areas and reinserting prefabricated teeth.

Some wind farms experience unpredictable wind events

The toothed yaw ring is a gear that engages with motors mounted on the nacelle to align the rotor blades with the wind. Typical damage causes include unpredictable wind events or uneven loads sustained over time. Often several turbines within the same wind park are affected.

Replacing the yaw ring requires the entire nacelle to be detached using a crane and specialist resources – a process that is expensive, labor intensive and time consuming and, whenever a nacelle is taken down, there is a potential risk of damage, especially to the blades. CNC Onsite repairs are completed within days - minimizing downtime - and contributing to significantly reduced CO2 emissions as no cranes and trucks are needed.

About CNC Onsite

Headquartered in Vejle, Denmark, CNC Onsite operates in the onshore and offshore wind sector, designing and delivering high-precision mobile machining solutions for large diameter steel flanges and blade roots. CNC Onsite also offers specialized repairs of yaw ring, blade root inserts, rotor lock, generator shaft, bearing housing and fixings.

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