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Unique Engine Concept to Power Cadeler's Hybrid Foundation/Wind Turbine Installation Vessels

Mixed medium- and high-speed MAN engines to deliver greatest lifting capacity ever seen in segment

MAN Energy Solutions has won a fourth order to supply engines to Chinese shipbuilder, COSCO Heavy Industries, in Qidong for the construction of a second F-Class installation vessel used for the installation of offshore wind turbines and foundations. The previous three orders were for engines for two X-class and another F-class vessel. All four vessels are bound for Danish service provider, Cadeler, which specialises in offshore wind transportation, installation, operation and maintenance as well as decommissioning. The four vessels are scheduled for delivery from 2024 through 2026.

X-class vessels are designed to operate at some of the most difficult sites around the globe with a deck space of 5,600 m², a payload of over 17,600 tons and main crane capacity >2,000 tons at 53 metres. The F-class has similar specifications but is uniquely flexible and can be quickly converted from a foundation-installation unit to a wind-turbine-generator installation vessel.

Cadeler's CEO, Mikkel Gleerup, said: "We are currently building four unique, pure-play, offshore vessels that aim at installing the foundations and wind turbines of the future. In order for our vessels to optimally operate, we need engines that meet our requirements by delivering the needed lifting capacity. Our cooperation with MAN has been a good and steady one throughout the years. We chose them as supplier as they have demonstrated the ability to deliver a product that is innovative and of high standard, which will be a good fit with the rest of the vessels' capabilities."

Each vessel will feature an engine configuration based on a mixed MAN medium- and high-speed engine concept with 2 × 6L32/44CR + 2 × 9L32/44CR + 2 × 12V175D engines. As a result, the newbuildings will have the greatest lifting capacity of any vessel ever seen in the field in line with the growing size of modern wind turbines. Each engine will also feature SCR (Selective Catalytic Reduction) and meet IMO Tier III emission standards.

Elvis Ettenhofer, Head of Marine Four-Stroke APAC, MAN Energy Solutions, said: "This is a unique application that will set a new standard for offshore turbine installation and sustainable marine operations, as well as being a great showcase for our mixed-engine concept. With its reliability and long times between overhauls, the 175D has the DNA of a medium-speed engine, which is why it matches so well with our 32/44 units. Only MAN can provide this unique engine-configuration with the highest efficiency, lower weight and a greater payload; this represents real value for our customer, Cadeler."

The F-class jack-ups will be able to transport and install seven complete 15MW turbine sets per load or six sets of 2XL monopile foundations per round-trip – a substantial improvement in efficiency over existing vessels. The vessels will also feature a unique design that enables their conversion from foundation-installation to wind-turbine-installation vessels (WTIVs).

MAN medium and high-speed engine concept

This concept involves frameless 2 × MAN 6L32/44CR + 2 × MAN 9L32/44CR + 2 × MAN 12V175D engines and offers a number of advantages:

- space savings – including small total genset footprint and compact SCR sizes – minimises engine room and funnel space, leading to larger deck area;
- optimised power/weight ratio with the mixed engine concept including the frameless design for the medium-speed 32/44CR engines. In this instance, the total engine weight of the Cadeler project is around 200 tonnes. This is a new benchmark that saves fuel, CO₂ emissions and increases the payload
- optimised OPEX through low SFOC during low-load operation and off-engine when not required. This delivers an efficient fuel consumption and reduced engine-operating hours
- increased redundancy – the 32/44CR and 175D lead in engine dynamics and load ramp-up. Hence, it is possible to have a minimum number of gensets online
- The engines are equipped with the latest generation of common-rail systems and can be adapted to operate on low or neutral CO₂ fuels.

MAN Energy Solutions enables its customers to achieve sustainable value creation in the transition towards a carbon neutral future. Addressing tomorrow's challenges within the marine, energy and industrial sectors, we improve efficiency and performance at a systemic level. Leading the way in advanced engineering for more than 250 years, we provide a unique portfolio of technologies. Headquartered in Germany, MAN Energy Solutions employs some 14,000 people at over 120 sites globally. Our after-sales brand, MAN PrimeServ, offers a vast network of service centres to our customers all over the world.