
Press release

Copenhagen, 24.06.2024

MAN Energy Solutions SE
Tegholmegade 41,
2450 Copenhagen SV,
Denmark
www.man-es.com

Group Communications
Nils Søholt
P +45 33 85 26 69
Nils.Soholt@man-es.com

MAN Cryo Supplies Fuel System for World's First Hydrogen-Powered Superyacht

Newbuilding features below-deck liquid-hydrogen tanks and vaporization system in other industry first

MAN Cryo has supplied a liquid-hydrogen gas-fuel supply system to a 118.8 m superyacht constructed by Feadship, the Dutch designer and builder. Known as 'Project 821', the newbuilding is the world's first hydrogen fuel-cell superyacht.

MAN Cryo's fuel-gas system will store the hydrogen in liquid form, evaporate and heat it, and supply gaseous hydrogen to the fuel cell enabling the zero-emission propulsion of the vessel. The company is a division of MAN Energy Solutions and a leading expert within engineering solutions for cryogenic equipment for the storage, distribution, and handling of gasses.

Henrik Malm, Managing Director – MAN Energy Solutions Sweden, said: "This notable project showcases MAN Energy Solutions' leadership within the development of future-fuel systems for the maritime sector. In particular, MAN Cryo is setting new standards in sustainability and engineering with its system design and the innovative positioning of the vessel's fuel-tanks below deck. Congratulations to Feadship on its dedication to decarbonisation and pushing the green envelope within the superyacht segment."

Although hydrogen fuel-cells have existed commercially for over six decades, no solution had previously been available within the maritime sector. Project 821's fuel-cell technology can provide an entire week's worth of silent operation at anchor, or emission-free navigation at 10 knots when departing harbours or cruising in protected marine zones with pure water being the only emission.

Challenges

MAN Cryo faced a number of challenges during the project, in great part owing to the lack of existing design codes and standards to follow in order to get approval for its tank design. Normally, type C LNG tanks are designed according to IGF code, but this is not fully applicable to hydrogen.

Instead, MAN Cryo approached Lloyds Register with a risk-assessment-based design that is considered safe and approved for placement below deck, a first of its kind in the world and just the second ever for a marine liquid-hydrogen project.

MAN Cryo's scope of supply for the project includes:

- a 92 m³ vacuum-insulated type C tank, storing liquid hydrogen at -253 degrees Celsius;
- a tank connection space (TCS) including necessary process equipment such as vaporizers, control valves, safety valves, etc;

- a bunker station, enabling shore-to-ship bunkering of liquid hydrogen;
- control and automation systems, including the groundbreaking 'tank prediction tool', a feature that simulates tank pressure and tank-filling levels and helps crew to predict and plan bunkering operations;
- a vent mast;
- interconnecting hydrogen piping.

Sofia Liedholm, Project Manager – MAN Cryo, said: “The alternative design-approval process proved challenging from time to time but – thanks to good cooperation between MAN Cryo, Lloyd’s Register and Feadship – we managed to successfully resolve all issues. MAN Cryo is a frontrunner when it comes to marine fuel systems and, from this project, we now have further knowledge to bring with us into whatever the next opportunity will be to develop a more sustainable marine sector.”

About MAN Cryo

Based in Gothenburg, Sweden, MAN Cryo offers system design and engineering solutions for the storage, distribution and handling of liquefied gases and has a pioneering reputation within the marine sector. It supplied the world’s first LNG fuel-gas system for the ‘Glutra’ ferry in Norway in 1999, while in 2013 it supplied the world’s first LNG bunker vessel – the ‘SeaGas’ – with operations in Stockholm, Sweden. More recently, MAN Cryo has signed its first design contracts for methanol-supply systems, and obtained an approval in principle from several classing societies for its ammonia fuel-supply system.

Contact: Reinert Magnusson – Head of Cryo

reinert.magnusson@man-es.com



Project 821, the world's first hydrogen fuel-cell superyacht (picture courtesy Feadship)

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.