
Press release

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MAN Cryo Takes Further Step towards Cleaner Shipping in World-First

First supplier to develop a marine, liquid-hydrogen fuel-gas system

MAN Cryo, the wholly owned subsidiary of MAN Energy Solutions, has – in close cooperation with Fjord1 and Multi Maritime in Norway – developed a marine fuel-gas system for liquefied hydrogen.

Multi Maritime's hydrogen vessel design for Fjord1, including the fully integrated 'MAN Cryo – Hydrogen Fuel Gas System', has been granted preliminary approval in principle, "AIP", by the DNV-GL Classification society. The award is significant in that the system is the first marine-system design globally to secure such an approval.

Dr Uwe Lauber, CEO of MAN Energy Solutions, said: "Winning this approval is a significant development for a number of reasons. As a solution for vessels employed on relatively short maritime routes, such as ferries, this technology is a world-first and showcases our company's ability to deliver genuinely innovative solutions. Furthermore, Hydrogen is a clean fuel whose profile fits perfectly with the general desire within the industry to move towards cleaner technology. The possibilities for this technology are varied and exciting."

MAN Cryo developed the Liquid Hydrogen Marine Fuel Gas System design in-house at its headquarters in Gothenburg in close cooperation with the shipowner, Fjord1, and ship designer, Multi Maritime, in Norway.

Louise Andersson, Head of MAN Cryo, said: "To secure this approval in principle shows the determination that MAN Energy Solutions has to advance cleaner shipping solutions."

She continued: "Our strategy is to actively work with our customers to design and promote cleaner ways of powering vessels, and the competence and energy within MAN Cryo conveys this strategy excellently."

Fuel-gas system for liquefied hydrogen

The system has a scalable design that allows easy adaptation for different shipping types, sizes and conditions. The design is suited for both above- and below-deck applications, offering ship designers the flexibility to optimise their designs in relation to efficiency, and to cargo or passenger space.

MAN Cryo has long experience with cryogenic gases and solutions for storage and distribution. The company has also made numerous hydrogen installations over the years on land that, in combination with its extensive experience from marine fuel-gas systems for LNG, have been invaluable when designing the new system.

Liquefied hydrogen has a temperature of -253° Celsius and is one of the absolutely coldest cryogenic gases there is, which places system components and materials under extreme stresses. Another design challenge was hydrogen's explosive nature, with the MAN Cryo engineering team accordingly placing top priority on safety.

Once liquefied, hydrogen is reduced to 1/800th of its volume, compared to that of its gas phase, facilitating a more-efficient distribution. As a fuel, hydrogen does not release any CO₂ and can play an important role in the transition to a clean, low-carbon, energy system. Liquefied hydrogen can be used to charge batteries for electrical propulsion via fuel-cell technology. MAN Cryo states that it sees a bright future for hydrogen applications globally as part of its target of achieving zero fossil emissions within the marine sector by 2050. In particular, Norway is currently developing several promising hydrogen applications.

The Maritime Energy Transition

Shipping in particular is facing great challenges with regard to more environmentally-friendly fuel sources, which is why MAN Energy Solutions has argued in favour of what it terms a 'Maritime Energy Transition' for some time as the most promising way to achieve a climate-neutral shipping industry.

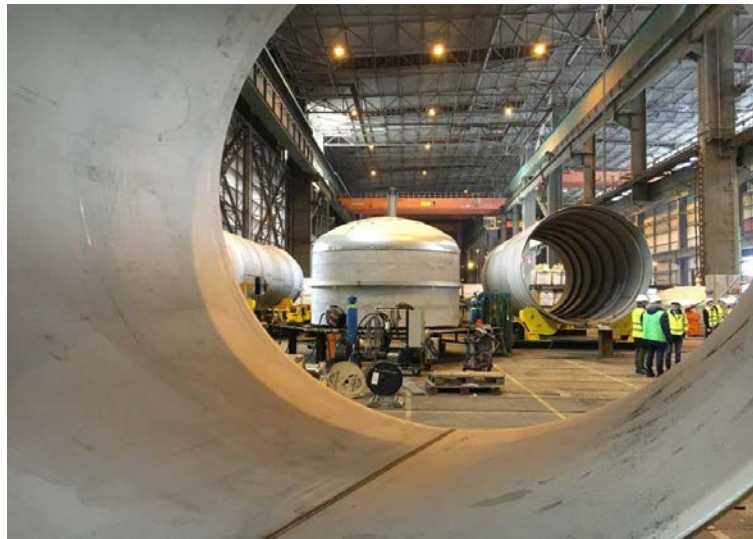
The term 'Maritime Energy Transition' stems from the German expression 'Energiewende' and encapsulates MAN Energy Solutions' call to action to reduce emissions and establish natural gas as the fuel of choice in global shipping. It is also an umbrella covering all MAN Energy Solutions' activities in regard to supporting a climate-neutral shipping industry. Launched in 2016 after COP 21, the initiative has since found broad support within the shipping industry and German politics.

About MAN Cryo

MAN Cryo offers systems for the storage, distribution and handling of liquefied gases and has a pioneering reputation within the marine sector and LNG business development. It supplied the world's first LNG fuel-gas system for the 'Glutra' ferry in Norway in 1999, a vessel that is still operational to this day. More recently, in 2013, MAN Cryo supplied the world's first bunker vessel, the 'SeaGas', with operations in Stockholm, Sweden. The design for the conversion of the SeaGas was also provided by Multi Maritime with whom MAN Cryo has a long-time cooperation.



MAN liquefied hydrogen fuel-gas system for fuel-cell-powered, emission-free shipping



View of the MAN Cryo workshop in Gothenburg, Sweden

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.