Press release

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MITSUI Performs World-First Hydrogen Test

Adapted ME-GI gas engine runs on hydrogen up to 100% load

MAN Energy Solutions' licensee, MITSUI E&S Co. Ltd., has announced that it has successfully tested a 50-bore MAN B&W two-stroke engine up to 100% load at its Tamano facility while running on hydrogen, a world-first for the maritime industry.

In collaboration with MAN Energy Solutions, MITSUI converted one of the four cylinders of an MAN B&W ME-GI (-Gas Injection) engine to hydrogen operation. The hydrogen was supplied from a hydrogen gas-supply system that MITSUI developed in 2023.

Stable operation was achieved at various loads and operating conditions, including successful hydrogen combustion up to 100% load. MITSUI also confirmed greenhouse-gas emission reductions of up to 95%, with the remaining fraction originating from the pilot-fuel employed during testing.

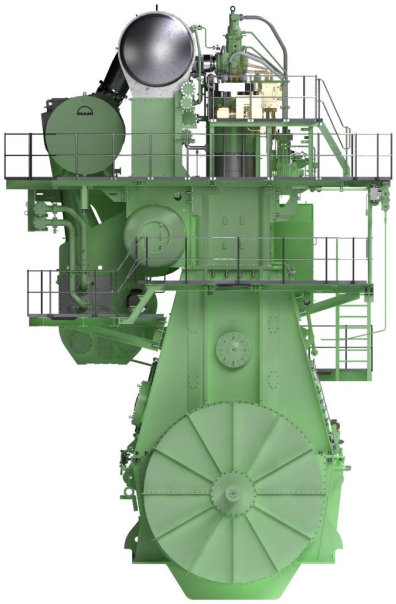
In its own press release, MITSUI stated: "This is the world's first successful hydrogen combustion test on a large, marine two-stroke engine. In achieving operation along with providing the hydrogen gas-supply system, we are now one step closer to developing a zero-emission ship that uses hydrogen as fuel."

Gunnar Stiesch, Chief Technical Officer, MAN Energy Solutions, said: "This is a very interesting project and one of several activities related to hydrogen that MAN Energy Solutions is currently pursuing within both two- and four-stroke segments. My congratulations to MITSUI for achieving this world-first and pushing the envelope on decarbonisation."

Brian Østergaard Sørensen, Vice President and Head of Research & Development, Two-Stroke Business at MAN Energy Solutions, said: "This exploratory work is illuminating and gives us much food for thought. MAN Energy Solutions continuously looks to support the decarbonisation journey within the maritime industry, and as often as possible with esteemed industry partners such as MITSUI."

Bjarne Foldager – Country Manager, Denmark – MAN Energy Solutions, said: "We have worked closely with MITSUI on this research project and are very happy with the results achieved. This proves the advantages and the flexibility of two-stroke engine technology, and means that we are now also prepared for the future, not only for hydrogen derivatives but also for hydrogen as a fuel. MAN Energy Solutions closely follows the market to keep track of any significant developments and this test is a noteworthy progression."

Thomas S. Hansen – Head of Sales and Promotion – MAN Energy Solutions, said: "MAN B&W-branded engines are flexible by nature and designed for an easy retrofit at a later stage to different fuel types. This is an encouraging milestone for hydrogen as a fuel. We will now take some time to evaluate the results and ensure that we are ready to take action if and when the market for hydrogen matures."



Mitsui combusted hydrogen in a single cylinder of a 50-bore MAN B&W ME-GI engine

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.