

June 10, 2024

### **Test operation of a Marine Engine Fueled by Carbon Neutral LNG ～ Initiatives to Reduce CO<sub>2</sub> Emissions in the Manufacturing Process of Marine Engines ～**

Hitachi Zosen Marine Engine Co., Ltd. (Kumamoto Prefecture, President: Tatsuji Kamaya; hereafter HZME), a consolidated subsidiary of Hitachi Zosen Corporation, has conducted a demonstration test run using carbon neutral LNG\* in a four-cylinder test engine for technical development (Hitachi Zosen-MAN B&W 4S 50ME-T9.5-GI (rated output 7,120 kW)), which is permanently installed at its head office/factory.



[Test-engine: Hitachi Zosen-MAN B&W 4S50ME-T9.5-GI]

Although methanol, ammonia, and hydrogen is considered as fuels for ships in the future, currently LNG is increasingly getting popular as a low-carbon fuel. In preparation for the future production of LNG-fueled marine engines, HZME converted its test engine to the newest high-pressure LNG-fueled dual-fuel engine, ME-GI Mk.2, and conducted test operations using a carbon-neutral LNG to reduce CO<sub>2</sub> emissions from the marine engine manufacturing process.

If this test operation had been carried out using heavy oil, the CO<sub>2</sub> emissions would have been approximately 70 tons, whereas the LNG operation would have reduced them to approximately 53 tons. Furthermore, by using carbon-neutral LNG, the CO<sub>2</sub> emissions from the LNG are carbon-offset, which means that the CO<sub>2</sub> emissions have been

reduced to approximately 1.4 tons. This corresponds to a reduction of approximately 98% compared to the use of heavy oil. The final stage of marine engine manufacturing typically involves test operation in the factory - HZME's head office/factory manufactures around 40 marine engines a year, and around 60% of the CO<sub>2</sub> emissions come from the fuel used during commissioning.

HZME has also received an order for a land-based test engine fueled by methanol at the end of March 2023. As well as developing engines compatible with these new fuels, HZME is also actively working to reduce CO<sub>2</sub> emissions during manufacturing, thereby helping clients (shippers, shipowners, shipyards, etc.) to reduce CO<sub>2</sub> emissions that fall under Scope 3.

※Carbon neutral LNG is considered to generate no CO<sub>2</sub> emissions on a global scale by offsetting the greenhouse gases generated during the mining, transport and consumption of the raw gas through CO<sub>2</sub> credits and other means (carbon offsetting).

The outline of the operation:

- 1.Engine type : Hitachi Zosen-MAN B&W 4S50ME-T9.5-GI (rated power 7,120kW)
- 2.Testing period : Conducted in 9 days from May 13, 2024 to May 28, 2024
3. CO<sub>2</sub> reduction by carbon neutral LNG : vs. heavy oil 68.6 tons, vs. normal LNG 51.6 tons