



New development agreement

23/02/2010

MAN Diesel and DSME to Jointly Develop Gas Technology

High-pressure gas system to supply ME-GI engine

At a ceremony in Copenhagen on 11 February, 2010, MAN Diesel signed a development agreement, effective immediately, with Daewoo Shipbuilding & Marine Engineering Co., Ltd. (DSME). The two companies have agreed to jointly develop and exploit the adaptation of DSME's high-pressure cryogenic gas-supply system for installation with MAN B&W ME-GI engines.

The ME-GI engine

The ME-GI engine is a gas-injection, dual-fuel, low-speed diesel engine that, when acting as main propulsion in LNG carriers or any other type of merchant marine vessel, can burn any ratio of fuel-oil and gas, depending on the energy source available on board and dictated by relative cost and owner preference.

While LNG carriers carry a gas cargo, the potential for carrying gas aboard other vessel types is currently subject to a parallel development, for which a cryogenic gas fuel-supply system can be used.

MAN Diesel has decided to make a full-scale demonstration and performance verification test of the GI principle for all kinds of marine applications on its 4T50ME-X R+D test engine, which will be rebuilt as a 4T50ME-GI engine ready to operate on natural gas by end-2010.

The agreement covers the terms for jointly deciding a time schedule for developing and installing DSME's cryogenic, high-pressure gas-supply system on the test engine at MAN Diesel's test facility in Copenhagen. The gas-supply system will subsequently be developed for general use on MAN B&W ME-GI engines, and will ultimately be adopted as an integral part of the engine's gas fuel-supply system for such applications where a cryogenic gas-supply system is applicable.

MAN Diesel Group

Teglholmsgade 41
DK-2450 Copenhagen SV
DENMARK
www.mandiesel.com

Group Marketing

Further information:
Peter Dan Petersen
Tel.: +45 33 85 14 70
peterd.petersen@man.eu

Graphics and images:
Mia Glarborg
Tel.: +45 33 85 15 90
mia.glarborg@man.eu



DSME is a world-renowned shipbuilder and designer and manufacturer of gas-supply systems with extensive experience in their manufacture, application and installation. YoungMan Lee, Senior Executive Vice President & Member of the Board of Directors of DSME, signed the agreement on behalf of DSME at the ceremony while Ole Grøne, Senior Vice President MAN Diesel Low-Speed Promotion and Sales, and Søren H. Jensen, Vice President and Head of Research & Development, Marine Low-Speed, signed for MAN Diesel.

A significant step

At the ceremony, Grøne said: "This is a significant step in the development of the ME-GI engine and pertaining systems, which I expect to have a major impact on the market in the future. Indeed, there is already huge industry interest in this kind of technology as operators look to control costs and emissions. We see many new opportunities for the ME-GI's increased flexibility and greater control within the LNG sector but also, and not least, generally within marine transportation."

YoungMan Lee added: "The ME-GI engine combined with DSME's high-pressure gas system will be a milestone in ship-propulsion systems. In applying the ME-GI engine and our supply system, operators will achieve significant economic benefits while simultaneously benefitting the environment. For instance, applying the ME-GI engine and DSME system to a 14,000-TEU containership could potentially reduce annual operation costs by USD 12 million or greater, based on current gas and oil prices. Moreover, SO_x, NO_x (with EGR or DeNox) and CO₂ emissions would also be reduced at the same time."



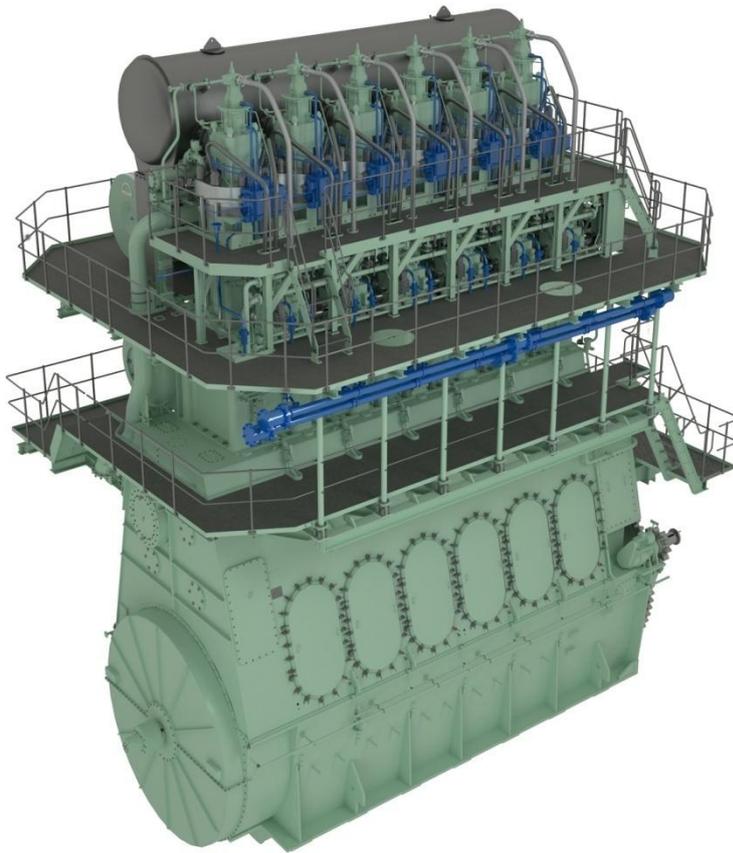
The signatories:

1st row from left: Søren H. Jensen and Ole Grøne (MAN Diesel), and YoungMan Lee and Sung Kak Lyu (DSME)

2nd row from left : Gi Hoon Kim (DSME), Lars Juliussen, Kjeld Aabo and Sang Bae Cha (MAN Diesel), Won Joon Lee (DSME)



The visit of the Korean delegation ended with a tour of MAN Diesel's test facilities



Graphical rendering of the ME-GI engine

About MAN Diesel

MAN Diesel is the world's leading provider of large-bore diesel engines for marine and power plant applications. The company designs two-stroke and four-stroke engines, generating sets, turbochargers, CP propellers and complete propulsion packages that are manufactured both by MAN Diesel and its licensees. The engines have power outputs ranging from 47 to 97,300 kW. MAN Diesel employs over 7,700 staff, primarily in Germany, Denmark, France, the Czech Republic, India and China. The global after-sales organisation, MAN Diesel PrimeServ, comprises a network of the company's own service centres, supported by authorised partners. MAN Diesel is a company of MAN SE, which is listed on the DAX share index of the 30 leading companies in Germany.

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