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First Wärtsilä X62DF engine ready for large LNG carrier

Demonstration shows stable, NOx-compliant running in gas and diesel modes

On 5th April 2016 Winterthur Gas & Diesel (WinGD), together with Doosan Engine Co., Ltd demonstrated the first low-speed low-pressure Wärtsilä 6-cylinder X62DF (W6X62DF) engine for a commercial application.

The event took place at Doosan's works in Changwon, Korea and the W6X62DF engine is also the first sold X-DF engine for the new generation of very large LNG carriers. It is currently under test by Doosan before delivery and is one of a pair that will power the first of two 180,000 cbm LNG carriers being built by Samsung Heavy Industries Co., Ltd (SHI) in Korea for SK Shipping Co., Ltd and Marubeni Corporation. The vessels are due to operate on long-term charter to Total S.A. of France.

Operating modes and data

In addition to witnessing the W6X62DF running under a number of load and fuelling conditions, visitors to the *X-DF powering the future* event also saw validation of its engine control features, tuning, economy and emissions. Key aspects confirmed included the engine's design fuel consumption, its Tier III NOx emissions compliance in gas mode without any additional exhaust treatment – and its capability to run stably in a wide operating window.

CAPEX and OPEX benefits

At a technical seminar following the W6X62DF demonstration at Changwon, WinGD and Doosan also stressed the cost benefits of X-DF technology with low-pressure gas admission. Reductions in capital expenditure (CAPEX) of 15 to 20 % are possible compared to other low-speed dual-fuel engine technology, as validated on the new 180,000 cbm LNG carriers. This results from the substantially simpler and lower cost LNG fuel gas handling system needed for gas admission at pressure below 16 bar. On the operating expenditure (OPEX) side, gains are expected, especially for LNG carriers, since no high-pressure gas compression system external to the engine is needed to enable the use of NBOG (Natural Boil-off Gas).

A further advantage, as underlined during the W6X62DF demonstration run, is that WinGD X-DF technology allows stable operation on gas across the entire load range from 5% to 100%, so that there is no need to increase liquid fuel injection under any situation where sufficient gaseous fuel is available. Moreover, at around only 1% of the total heat released during combustion, pilot fuel consumption is lower than with other low-speed dual-fuel engine technology.

Fuel-sharing

During the technical seminar WinGD also announced that a “Fuel-sharing” feature will be available on X-DF engines later in 2016. This feature aims to give vessel operators broad flexibility to use liquid and gaseous fuel at the same time if economically viable at a given time.

Type-approved technology

The first engine employing WinGD’s X-DF technology with low-pressure gas admission, an RT-flex50DF, has already successfully completed Classification Society type approval testing (TAT).

Photo



Caption: The Wärtsilä 6X62DF engine’s launching celebration at Doosan’s works in Changwon, Korea.

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WinGD in brief:

Winterthur Gas & Diesel Ltd. (WinGD) is a leading developer of two-stroke low-speed gas and diesel engines used for propulsion power in merchant shipping. WinGD's target is to set the industry standard for reliability, efficiency and environmental friendliness. WinGD provides designs, licences and technical support to manufacturers, shipbuilders and ship operators worldwide. The engines are sold under the Wärtsilä brand name and are manufactured under licence in four shipbuilding countries. WinGD has its headquarters in Winterthur, Switzerland where, as one of the earliest exponents of diesel technology, it started the development of large internal combustion engines in 1898 under the "Sulzer" name.