



Four-Stroke Fuel Sharing Feature Launched

19 June 2009

MAN Diesel introduces new feature to dual fuel engines

Already offering one of the most fuel flexible medium speed power plant arrangements in the liquefied natural gas (LNG) transport sector, MAN Diesel has now added Fuel Sharing capability to its type 51/60DF marine engine for LNG carriers.

The new feature offers operators of LNG carriers the possibility to run the engine, not only in gas or diesel mode, but also on mixtures of gas and liquid fuel – hence the designation “Fuel Sharing mode”. In other words, shortfalls or fluctuations in the availability of natural boil-off gas (NBOG) from the LNG cargo of a carrier powered by the 1000 kW per cylinder MAN Diesel 51/60DF dual-fuel engine can be compensated by increasing liquid fuel injection beyond the quantity used by the dedicated pilot fuel injection system. Either heavy fuel oil (HFO) or distillate fuel can be used for this purpose, injected via the main fuel pumps.

MAN Diesel head of sales for LNG and cruise ship applications, Sokrates Tolgos, explains the concept. “The new Fuel Sharing capability of our 51/60DF engine adds an exciting new dimension to the fuel flexibility of our dual fuel diesel electric (DFDE) propulsion concept for LNG carriers,” he states. “Indeed, it gives the same level of fuel flexibility as in concepts based on steam turbine generators, but of course with the advantages of the much higher efficiency of dual-fuel diesel engines at both design point and part-load, much greater redundancy, much greater power flexibility, and lower installation space requirements, which translate into the potential for increased cargo capacity for given vessel dimensions.

By adding our Fuel Sharing capability to the 51/60DF, the operator can now, within wide limits, determine the proportions of gaseous and/or liquid fuel used in each single engine. In this way, the crew of an LNG carrier can run all engines in operation at a given time at similar load points, regardless of required vessel power and the available amount of gaseous fuel. This innovative 51/60DF engine feature fits in perfectly with the requirements of LNG carrier charterers who allow only the use of NBOG throughout the vessel’s round trip. It opens a new era for future LNG carrier designs based on energy efficient dual-fuel diesel engines with unmatched fuel flexibility and low emissions.”

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51/60DF and the MAN Diesel LNG Carrier DFDE Concept

The vast majority of today's LNG projects require ships with cargo capacities in the range of 145,000 m³ – 215,000 m³ with a combined 35 – 45 MW of installed propulsion and onboard electrical power. MAN recommends four or five inline type 51/60DF dual-fuel engines of identical or similar cylinder count instead of an inhomogeneous mix of inline and vee engines to provide the required cylinder count and total power output. As a consequence, the MAN Diesel alternative minimises the drop in the vessel's available power when an engine is out of service thus enabling the crew to carry out maintenance work on any engine at any time during the voyage.

Fuel sharing adds a further important dimension to this basic flexibility. Furthermore, with the 51/60DF being capable of operating below 15% MCR not only in diesel mode but with its upgraded design version in gas mode as well, the MAN Diesel alternative gives LNG operators the required fuel and power flexibility throughout the vessel's complete operating profile – also during port and LNG terminal operations.

At 1.5 g/kWh (IMO cycle E2) in gaseous fuel operating mode, the 51/60DF already complies with IMO Tier III limits for NO_x by a considerable margin without the need for exhaust gas treatment or any other countermeasures.



The first production 51/60DF dual-fuel engines recently completed their Factory Acceptance Testing at the MAN Diesel works in Augsburg, Germany

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 450 to 97,300 kW. MAN Diesel employs approx. 8,000 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.

Ref no 6510-0137