



Upgrade Packages Ordered for Odfjell Tankers

Fuel-saving upgrade package with Kappel technology to optimise propulsion efficiency and lower fuel consumption of 11 vessels

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MAN Diesel & Turbo's Propeller & Aft Ship organisation has won an order to retrofit and upgrade a series of 11 x 37,500 dwt vessels from the Odfjell chemical tanker fleet. The vessels are of the Kværner Class and are due to dock during 2015-17, at which time the upgrades will be implemented. The first vessel, 'M/T Bow Clipper', will dock and be upgraded in August 2015.

Each vessel has an MAN B&W two-stroke engine powering a four-bladed, controllable-pitch propeller and a PTO-driven shaft alternator. The vessels' new service speed at reduced main-engine output – combined with the implementation of MAN's highly-efficient Kappel propeller blades, a fairing cone and a pre-fabricated rudder bulb kit – will all contribute to power savings and reduced exhaust-gas emissions.

The Kappel blades, fairing cone and rudder bulb are designed and customised for the tanker's hull and rudder designs. The calculated power saving has been verified by tank-test analyses at MARINTEK (Norwegian Marine Technology Research Institute) as reported in preliminary results.

"It's a very exciting project and we are proud to be part of it. With our new design possibilities, we are furthermore looking forward to offering this fuel-saving concept to other fleets with similar operational patterns," said Kjartan Ross, Business Development Manager of MAN Diesel & Turbo's Propeller & Aft Ship organisation. He continued: "With the long lifetime expectancy of Odfjell's high value, quality vessels, this upgrade investment is straightforward and very attractive".

Front runner

As technological front-runners, Odfjell embarked on the ambitious Kværner Class newbuilding programme of 37,500 dwt ships with 52 fully-segregated stainless-steel tanks and piping systems in 1991. The first such vessel was delivered in 1994 and the new series was packed with new technology: controllable pitch propellers, shaft alternators on main engines, bow thrusters, fixed tank-cleaning machines and radar positioned in each tank to gauge ullage. Odfjell was also a pioneer within the area of fully computer-controlled

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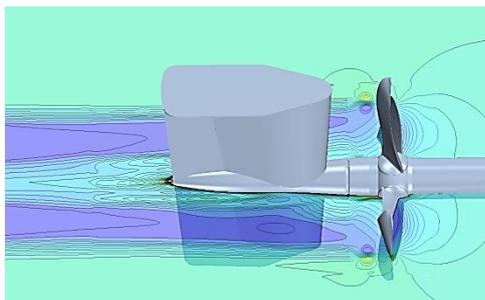


engines. The last ship in the series, 'M/T Bow Firda', was delivered in 2003 and has a main engine – an MAN B&W 7S50ME-C type – with electronically controlled timing and no camshaft – a world first.

The following Kværner Class vessels are currently scheduled for upgrade: Bow Flower, Bow Clipper, Bow Fortune, Bow Cecil, Bow Flora, Bow Cardinal, Bow Faith, Bow Cedar, Bow Fagus, Bow Chain and Bow Firda.

About Odfjell

Odfjell SE is a leading company in the global market for transportation and storage of bulk liquid chemicals, acids, edible oils and other special products. Originally set up in 1914, the company pioneered the development of the chemical tanker trades in the middle/late 1950s and the tank storage business in the late 1960s. Odfjell owns and operates chemical tankers and LPG/Ethylene carriers in global and regional trades as well as a joint venture network of tank terminals. Today's tanker fleet amounts to 80 vessels.



Graphic from MAN Diesel & Turbo's CFD simulation of the new Kappel propeller blades, fairing cone and rudder bulb – customised for the existing aft ship and fishtail rudder



M/T Bow Firda, delivered in 2003, was the last and most advanced chemical tanker in Odfjell's 37,500 dwt Kværner Class. It is powered by an MAN B&W 7S50ME-C main engine (the world's first) driving a MAN Alpha VBS1560 propeller and shaft alternator



Principal particulars	
Vessel type	Chemical tanker – double hull
Dead weight tonnage (mt)	37,500
Length overall (m)	183.10
Breadth (m)	32.20
Draught (m)	10.65
Engine power (kW)	14,160
Max. engine and propeller speed (r/min)	117
Shaft-alternator power (kW)	850
Propeller diameter (mm)	6,300

About MAN Diesel & Turbo

MAN Diesel & Turbo SE, based in Augsburg, Germany, is the world's leading provider of large-bore diesel engines and turbomachinery for marine and stationary applications. It designs two-stroke and four-stroke engines that are manufactured both by the company and by its licensees. The engines have power outputs ranging from 450 kW to 87 MW. MAN Diesel & Turbo also designs and manufactures gas turbines of up to 50 MW, steam turbines of up to 150 MW and compressors with volume flows of up to 1.5 million m³/h and pressures of up to 1,000 bar. The product range is rounded off by turbochargers, propellers, gas engines and chemical reactors. MAN Diesel & Turbo's range of goods includes complete marine propulsion systems, turbomachinery units for the oil & gas as well as the process industries and complete power plant solutions. Customers receive worldwide after-sales services marketed under the MAN PrimeServ brand. The company employs around 14,500 staff at more than 100 international sites, primarily in Germany, Denmark, France, Switzerland, the Czech Republic, India and China. MAN Diesel & Turbo is a company in the Power Engineering business area of MAN SE.

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