

# The way ahead for small products tankers

As single-hull tankers in the 600-5,000 dwt bracket will soon be phased out, Rolls-Royce has introduced an NVC-Design family of oil product carriers that meet the new rules

A design for a double-hull 1,600 dwt tanker that combines a high carrying capacity with efficiency, excellent manoeuvrability and safety through system redundancy is the latest NVC-Design by Rolls-Royce. The NVC601 PT is well suited to the needs of the bunkering industry as it can transfer cargo from ship to ship as well as between shore installations.

Oil products can be carried in 10 cargo tanks totalling about 2,000m<sup>3</sup> when 98 per cent full and two deck tanks holding together 40m<sup>3</sup>, served by individual deepwell pumps with a combined discharge rate of 750m<sup>3</sup>/h. Tanks can be heated by a thermal oil system and have permanently installed cleaning units plus additional portable ones.

The NVC601 PT is 64m long overall with a moulded breadth of 12.8m, a summer draught of about 5.0m and a scantling draught of about 5.3m. Fully loaded, the service speed will be about 12.5 knots.

Efficient propulsion and agile manoeuvring have been high on the list of design requirements, and to achieve this the NVC601 PT uses Ulstein Aquamaster Azipull thrusters to

provide both steering and propulsion. They use controllable-pitch pulling propellers and have hydrodynamically optimised underwater units that recover some of the slipstream energy that is normally lost and also, importantly, provide rudder effect. The proven result is that they are very efficient and confer good course stability on vessels of full form that often require excessive steering corrections when equipped with conventional azimuthing thrusters. Units in service also demonstrate very low levels of noise and vibration.

## **The compact propulsion arrangement allows the cargo volume to be increased by 5-7 per cent**

Each AZP085 Azipull thruster is driven by a 750kW high speed diesel engine, in a mechanical transmission which includes in the shaftline a 700kW generator. Generators turn whenever the engines are running, but an engine/generator unit can be declutched from its thruster. This arrangement has a number of advantages. One is redundancy; the vessel retains good manoeuvrability with one engine stopped. In port the thrusters can be declutched and the main engine driven generators are instead used to power the cargo pumps. Because both power and propulsion are available

from either engine, one side can be shut down for maintenance in port without prejudicing safety. The combination of two azimuth thrusters at the stern and a 200kW tunnel thruster at the bow is designed to give accurate manoeuvring of the vessel in confined waters, assisted by the Rolls-Royce control system incorporating an advanced joystick.

The whole propulsion arrangement is very compact, allowing the engineroom bulkhead to be moved further aft and the cargo volume to be increased by 5-7 per cent, compared with conventional vessels of the same length.

A larger products tanker using the same design philosophy is currently under construction at a Turkish yard for Bergen Tankers, which will operate it on the Norwegian coast under long-term contract to Statoil. On an overall length of 90m the double hull NVC604 PT has a deadweight of 4,450 dwt and a 5,200m<sup>3</sup> capacity divided among 10 tanks. The propulsion layout is the same, but on a bigger scale, with two AZP100 thrusters powered by two Bergen C-series engines totalling 3,480kW.

This NVC-Design concept can be applied to oil products or chemical tankers in sizes ranging from the 1,600 dwt NVC601 PT up to about 20,000 dwt, the upper limit depending on the required speed and ice class.



NVC601 PT: efficient, manoeuvrable and safe