

Dutch tugnology

The Dutch have always been in the forefront of innovation when it comes to towage and the latest development in this sphere could herald a breakthrough

Mampaey Offshore Industries in Dordrecht, Netherlands, a company specialising in the development of mooring, berthing and towing systems, has launched a new towage system called 'dynamic oval towing' (DOT). This is in response to the recent demands to enhance the performance and controllability of tugs by optimising the attachment of the towline by means of a 360° all round towing system.

Optimal match

DOT is a towing system that extends the towing performance by matching the tow line forces with the hull forces and Mampaey claims that the optimal match for all towing directions can only be achieved by an oval shape. By installing the DOT system, not only can the dynamic towline forces be significantly increased, but also, with safe and controlled handling, at higher speeds.

The system consists of a 360° heavy oval deck mounted rail with free running carriages on which the towing hook is fitted and can easily be integrated with existing and new tug designs and deck lay-outs. The oval shape offers a range of flexible parameters to adapt to most tug designs allowing the width, length and specific curvature to be chosen to meet the owner's requirements. This flexibility provides advantages not only for new-buildings but also for retrofitting on existing tugs.

The tug cannot capsize due to towline forces and it enables the tug to tow over the bow as well as the stern with



Left: The DOT system applied to a model of an existing tug to demonstrate the minor implications of a conversion

Right: Schematic drawing showing the integration of the towing points by the DOT system with arrows indicating different towing directions

one integrated system, instead of two. The main advantage of the latter is that the tug operator can be flexible in deciding what mode to assist the ship and maintain the connection to the tow at all times.

Test trials

The system was tested thoroughly, and after detailed engineering, a small scaled steel prototype was produced and the system was mounted on a model tug which successfully passed a series of tests in realistic operational conditions. This was followed by mounting the DOT system on the deck of a pontoon and tested with a double workload of 60 tonnes applied by a large harbour tug. The results from this test demonstrated that the design requirements were easily met.

This initiated the official start of the delivery of the 30 tonne SWL DOT system equipped with a tow hook. Larger sized systems and a towing winch are currently under development. Mampaey has requested the Dutch engineering company IMC, which was involved in the invention of the completely circular 'Carousel' system, to assist in detail work and strength validations.

Clear advantages

The main advantage of a tug fitted with a DOT system lies in the fact that it has a different towing point when towing over the stern and when towing over the bow. Only an oval shape is able to integrate both towing points into one towing system, which cannot be achieved by any other existing tugboat. The towing connection always remains connected when the towing mode is changed.

The tug is flexible to rotate freely and controlled from one direction to the other. Unlike the 'Carousel' system, the oval shape of the DOT system is claimed to offer a clear advantage in the increased size of the area within the towing system offering sufficient space for the accommodation.

The prime objective is to install various small sized harbour tugs with DOT systems since it fits in ideally with the practical operational requirements. The next step would be to upgrade DOT to cater for bollard pulls of 50 tonnes and higher thereby entering the market of medium sized harbour tugs. In the longer term, larger sized tugs will be covered, including escorting tugs where the system would offer superior dynamic performance. ■