

# Latest tugboat technology provides world-class service

**Captain Max Newman**, Manager, Tugboats Division, Panama Canal Authority, Panama

When the United States transferred the Canal to Panama in 1999, the Panama Canal Authority (ACP) shifted its focus and strategy from a profit-neutral utility to a market-oriented business model. With this in mind, it started a modernisation programme to maximise capacity and enhance customer service. As demand increases and ships become wider, larger and heavier, the Canal is upgrading its machinery and equipment, and streamlining and bolstering overall services to accommodate these larger ships and provide a more reliable service.

## Tug upgrades

The Canal's recent upgrades include eight new state-of-the-art tugboats. They are called Z-Tech 6000 and will be delivered between 2007 and 2008. These new tugs support the Canal's goal of making transits safer, faster, and more efficient. The existing tugs will remain in operation, mainly supporting dredging activities related to the expansion project.

The tugboats' primary function at the Canal is to assist vessels in and out of the locks. For safety reasons, ships approaching the locks cannot accelerate because acceleration increases the risk of an accident. As a result, vessels need to be manoeuvred with the assistance of tugboats. Vessels coming from the Pacific or Atlantic first enter Miraflores or Gatun locks respectively.

Depending on the size of the ship, one or more tugboats assist in steering the ship toward the lock to position the vessel. These new tugs help to ensure that vessels are aligned with the entrance of each lock, where they are then harnessed to locomotives.

A secondary function of tugs is to escort ships along the Gaillard Cut, the narrowest stretch of the waterway, and aid them in case of emergencies.

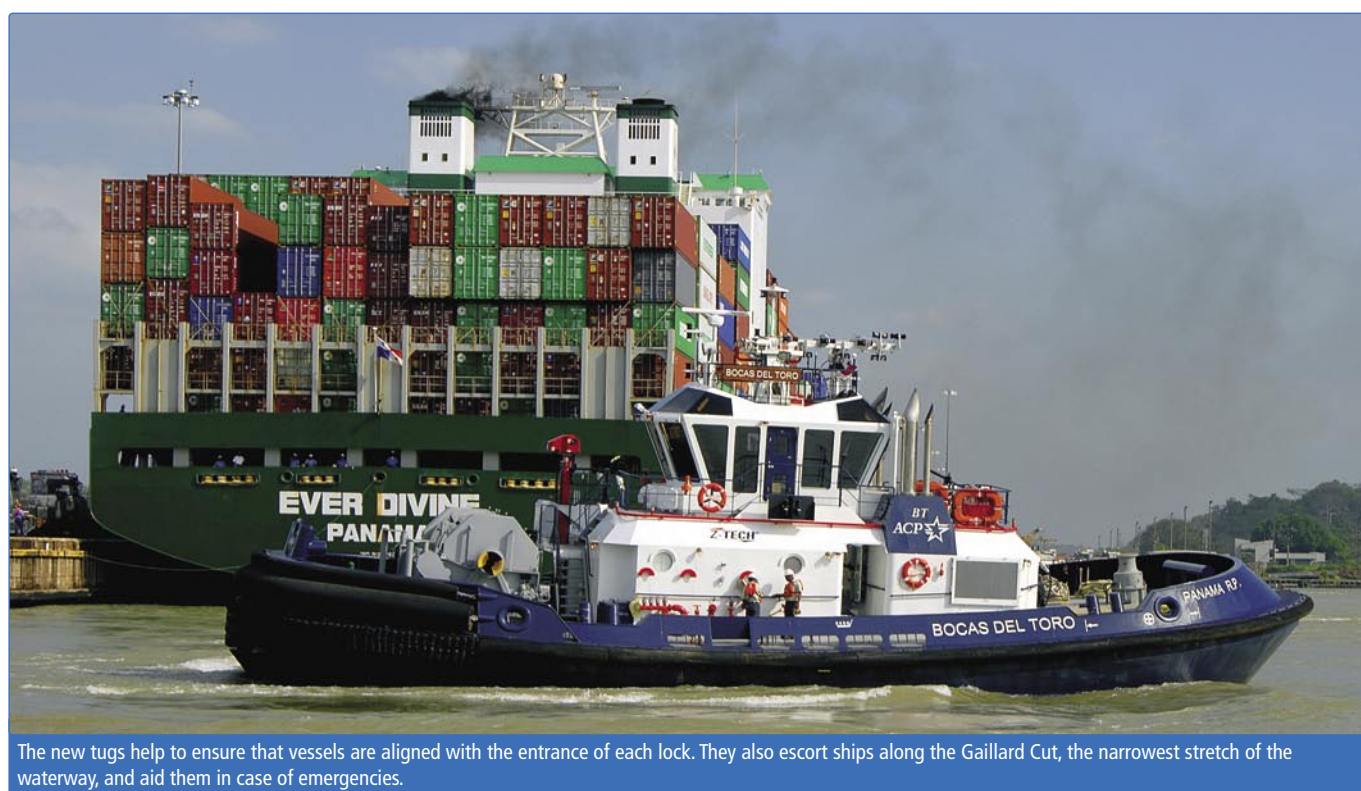
Each tug usually has a crew of two seamen, one captain and one marine engineer. Seamen support ongoing operations while the engineer is responsible for monitoring daily activities, routine maintenance and repairs. The captain coordinates with the Canal pilot onboard the transiting vessel.

## Z-Tech design

Transits of Panamax ships – the widest vessels to cross the Canal – are steadily increasing, and, on average, require the assistance of seven tugs to complete a transit. To meet the growing demand, the Canal has built upon its capabilities updating its technology to better serve the newer and larger vessels that are increasingly transiting the Canal.

In 2003, when the ACP decided to upgrade its tugboat fleet, it studied the needs and focus of the Canal. During this process, the ACP reviewed and thoroughly analysed several proposals. The contract was awarded to Cheoy Lee Shipyards, which included the use of the Z-Tech design in its proposal. These award-winning tugboats combine the best of an Azimuth Stern Drive tug with a tractor-style tug.

The key feature of the new tugs is their bollard pull. For the first time, the Canal specified that the tugs have at least 60 metric tonnes of bollard pull, an 82 per cent increase over older models. Increased bollard pull enhances the tug's ability to transit vessels



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in a safe and expeditious manner. If the tugs are not powerful enough, the Canal pilots will take more time to manoeuvre, which can have an adverse effect on the Canal's throughput.

### Specifications

The new tugs are 27.4 metres in length, five meters in draft and 11.65 metres in beam. Additionally, they have two main WARTSILA engines that enable them to obtain an average bollard pull in less than 20 seconds.

These tugs have a free running speed of 12 knots and 4,800 Brake Horsepower. They are equipped with hydraulic winches, which simplify and facilitate towing. They have two winches at the bow and a capstan on the stern.

The winch specifications are crucial. They must be capable of having a braking force to withstand the dynamic bollard pull, which is higher than the static bollard pull. The dynamic bollard pull can be twice the static bollard pull. These winches have 180 tonnes brake and a pull of six tonnes at 25 m/min.

### Safety

Visibility requirements at the Canal are particularly demanding. Since Panama tugboat operations are performed in very close

quarters, the visibility requirements of the Canal were extremely important to comply with high-safety standards. During the tender process, the ACP received visits from several naval architectural firms that wanted to learn more about the design requirements.

Safety is always a priority at the Canal, so the tugs are equipped with emergency response equipment to handle marine fire fighting operations. Z-Techs have a fire fighting pump, two fire fighting foam tanks and one FFS600 fire fighting monitor. The Z-Tech 6000 tugboats are the most powerful in the Canal's history, replacing older tugs in the fleet and continuing the Canal's investment in the waterway.

### The new fleet

The first three tugs delivered out of the eight ordered were the: Bocas del Toro, Darien, and Veraguas I. The ACP expects to receive the remaining five between November 2007 and May 2008. With these new tugs, the Panama Canal Authority will continue building upon 93 years of commitment to global trade and providing the maritime industry with world-class service, as it expands its capacity and attracts a new generation of post-Panamax vessels.

#### ABOUT THE AUTHOR



**Captain Max Newman** graduated from the Nautical School of Panama in 1984 and started working for the Panama Canal Commission in 1988. He received his Tugboat Captain license in 1991 and, in 1997, was promoted to Tugboats Operations Manager on the Pacific side. Two years later he was named Manager of the Tugboats Division. Captain Newman has a Masters in Human Resources from the Latin American University for Science and Technology (ULACIT) and an Executive MBA from INCAE (MAEX-ACP).

#### ABOUT THE ORGANISATION

The Panama Canal Authority (ACP) is the entity of the Government of Panama established under Title XIV of the National Constitution with exclusive charge of the operation, administration, management, preservation, maintenance, and modernisation of the Canal, as well as its activities and related services, pursuant to legal and constitutional regulations in force, so that the Canal may operate in a safe, continuous, efficient, and profitable manner.

Organic Law of June 11, 1997, furnishes the ACP with legislation for its organisation and operation. Because of its importance and uniqueness, the ACP is financially autonomous, has its own patrimony, and the right to administer it.

An Administrator and a Deputy Administrator head the ACP under the supervision of an 11-member Board of Directors. The Administrator is the highest-ranking executive officer and legal representative of the Authority, and is responsible for its administration and the implementation of the policies and decisions of the Board of Directors. The Administrator is appointed for a seven-year term, and may be re-elected for an additional term.

#### ENQUIRIES

Teresa Arosemena  
International Communications  
Panama Canal Authority  
  
Tel: +507 272 1873  
Email: tarosemena@pancanal.com  
Website: www.pancanal.com