



ShoreTension proves itself on the Job

ShoreTension is increasingly gaining recognition the world over as an effective and flexible instrument for safely mooring vessels and increasing productivity. Recent users for example include the PSA terminal in the Portuguese port of Sines which purchased and commissioned six devices and the port of Esperance in Western Australia which decided to lease four ShoreTensions. Furthermore, the three-year ROPES research project has confirmed the added value of the active mooring system in its final conclusion as well.

ShoreTension is now clearly beyond the trial stage. Terminals in Rotterdam (ECT), Sines (Portugal) and Esperance (Australia) are structurally using the stand-alone, active mooring system to ensure that ships remain firmly anchored to the quay. Other ports are also highly interested. And the devices are regularly being used on a project basis as well.

Requests for application come from everywhere – from nearby places like the Netherlands and Germany, but also from Africa and Asia – and for example involve providing assistance to moor offshore installations and floating structures or unload container cranes.

Safety and Productivity

The ShoreTension concept was initially developed to increase safety. Traditional mooring methods using mooring lines on bollards always result in a certain degree of slack. In exceptional circumstances, the vessel movements this generates may result in forces strong enough to snap the mooring lines and unsecure ships, with all the potential, dramatic consequences this entails. The ShoreTension system prevents this by controlling the actual line tensions; paying out to prevent peak loads and reeling in at low loading. This ensures that a vessel remains securely moored at all times. In strong winds – relevant to Rotterdam and neighbouring ports, for example – or in combination with swell from the ocean, a factor especially relevant in more southerly ports.

Besides safety, ShoreTension has meanwhile also explicitly demonstrated its added value in terms of increased productivity. The fact that a ship is moored alongside the quay with greater stability allows for smoother crane operations and prevents damage. The same applies to offshore installations and floating structures, which can spend anywhere from weeks to months in a port for maintenance and rely on stability for continuous and smooth operations.

Confirmed by ROPES Project

The functioning of ShoreTension has also been confirmed in the ROPES Joint Industry Project (JIP) which was completed in November 2013. In this research project, 26 companies worked closely together for three years to investigate the effects of passing ships on moored vessels. Participants included ports, research institutes, consulting firms, pilots, suppliers, vessel operators, terminal operators and boatmen. ECT and the Royal Boatmen's Association Eendracht (KRVE) were also among the participants. The effects of passing vessels were measured both with and without the use of ShoreTensions. Henk van den Boom, Head of the Trials & Monitoring Department of MARIN, one of the world's leading maritime research institutes and co-ordinator of ROPES: "The loads excited by water drawdown due to passing ships on moored vessels is a globally growing issue. Ever larger ships, swift handling in exiting ports and the need for additional berths along waterways mean that moored vessels are more exposed to the effects of passing ships." Here too, safety and productivity are the leading factors. "Passing shipping traffic causes a moored ship to move, resulting in downtime for operations. Eventually, mooring lines can part which clearly jeopardizes the safety of people, ships and the environment."

The Human Factor

"Keeping a ship tightly moored alongside the quay is not as straightforward as one may think," Van den Boom explains. "Quay constructions and traditional mooring equipment are limiting factors. For a long time, mooring methods have not evolved in line with the ongoing scaling-up in shipping. The human factor also plays a role here. Aboard moored vessels, there is often insufficient knowledge and time nowadays to monitor the tension of mooring lines, resulting in slack."

ROPES has thoroughly mapped the effects of passing vessels. Extensive scale-model tests were conducted and actual line

load and ship motion measurements were taken at four locations in Rotterdam, including the ECT Delta Terminal. Furthermore, a computer model was developed which calculates the forces excited by passing ships on moored vessels. "Comparing laboratory tests, field tests and computer data, it became apparent that the software yields the acceptable results for most practical cases. This makes the ROPES software an important future tool for port designers and engineers, for port authorities – for example to determine a maximum sailing speed – and for terminal operators to compute the uptime of their operation at a specific location."

ShoreTension makes World of Difference

"The ROPES project has also evaluated how the effects of passing vessels can be mitigated," continues Van den Boom. "This is where active mooring systems such as ShoreTension enter the picture. At two locations, we compared the measured line loads and motions both with and without the use of ShoreTension and we found that the system significantly reduces the horizontal ship motions." The MARIN spokesman is also enthusiastic about the simplicity of the ShoreTension system. "It can easily be used in existing situations and in theory it could be installed within a few hours through one single phone call."

'We found that the ShoreTension system significantly reduces the horizontal ship motions'

The ShoreTension system is also part of a new, joint industrial project off the coast of West Africa which will commence in September 2014. Van den Boom: "Offshore ship-to-ship transfer is increasingly becoming an attractive option here for both dry bulk and containers as vessel sizes increase and access to ports is restricted. However, West Africa is affected by long swells which travel all the way from South America. The waves may be low, but they do cause resonant horizontal motions of ships in their mooring system. In the so-called Transwell JIP, we will study this swell and the requirements for a high uptime of transshipment offshore. Subsequently, a concept for an offshore transshipment platform will be developed. An active mooring system such as ShoreTension can play an important role in the feasibility of the concept and help to increase the uptime of transshipment by reducing motion and mooring loads."

More about ShoreTension

ShoreTension is an invention of the Royal Boatmen's Association Eendracht (KRVE), the boatmen of the port of Rotterdam. The active mooring system is globally exploited by ShoreTension Holding, a joint venture of All-round Port Services (the pension fund of the boatmen) and ECT. More information: www.shoretension.com. You can also see the ShoreTension in action here.