
Automating Mooring for Increased Safety and Security

Many aspects of port operations, have been improved by automation in recent years. These improvements have increased the throughput of port and visibility of operations. However, in most ports mooring continues to be a manual time consuming and dangerous task. Indeed mooring and the required line handling is one of the few tasks left in modern industry that regularly exposes staff to life threatening risks on a daily basis. Furthermore, conventional mooring provides no feedback to the port or vessel regarding mooring performance or integrity.

Automated mooring system that do not employ ropes are able to eradicate the risks associated with line handling for all staff on board and land side. There are no handling injuries and snap back risks making mooring significantly safer for personnel and reducing lost time due to injuries to nothing.

Furthermore these systems are able to monitor environmental conditions and mooring performance with a high level of precision and provide real time detailed feedback on mooring performance and integrity. Data stored over time can be used to compare to current conditions to predict potential upcoming events and provide advance warning to the port and vessel. Also stored data can be examined and stored in much the same way as Voyage Data Recording (VDR).

This paper will examine the pros and cons of automated mooring implementation and provide real world examples of three ports and one canal system:

- Port Hedland Port Authority, Utah Point, Port Hedland, Western Australia, multiuser bulk loading facility
- Port of Salalah, Salalah, Oman, container terminal.
- Port of Ngqura, Port Elizabeth, South Africa, container terminal.
- St Lawrence Seaway, Canada

Port Hedland has been able to secure cape size bulk carriers on a berth originally only intended, and long enough, for panama vessels. This has enabled the port to realise a large increase in potential through put due to increased vessel size and speed of mooring while reducing risk to personnel. Additionally as the berth is very close to the busy port entrance the system has removed the effects of passing vessels at the berth and thus the removal of the risk to the moored vessel and personnel of parted lines.

The port of Salalah experiences a long wave during the Khareef (monsoon) season that can cause the vessels to surge back and forth in the berth. The surge often times resulted in ceasing of cargo operations and parted lines and the associated risks to port staff. The automated mooring system has reduced vessel surge to insignificant amounts removing all the risks associated with it. Furthermore the port can be kept fully informed of the longwave condition and how the mooring system is coping with it.

Similarly to the Port of Salalah the Port of Ngqura experiences vessel surge as a result of long wave. This combined with significant and steady winds resulted in significant risks to both staff and vessels while in the port. Again these effects have been completely removed through the implementation of automated mooring resulting is safe and secure vessels while along side and a safer work environment for the staff.

Finally we look at the St Lawrence Seaway, the river and lock system connecting the Atlantic Ocean with the Great Lakes of North America. Mooring vessels in these locks exposed staff to significant risks from falling and parting ropes as a result of gear failure. Additionally at low water level the mooring lines were extremely ineffective at preventing surge in the vessel and thus the risk to vessel or lock at this point of the lockage was very hazardous. Managing these risks was a major part of the operation of the locks. After the implementation of automated mooring not only are the risks to the vessel and staff reduced to almost nothing the locks can now be transited faster and the operation implemented remotely.

Bio:
Mike Howie
Global System Specialist - MoorMaster
Cavotec

Mike Howie was appointed Global System Specialist for the MoorMaster™ automated mooring products at Cavotec in 2017. Prior to that he had held the position of group Product Manager, Technology Manager and Engineering manager at Cavotec MoorMaster.

Mr Howie began work with the automated mooring products in 2003 as a design and development role spending most of his time in ports developing early prototypes of the product. This included development of concepts for ship to ship and military systems. This role evolved to encompass product development, front line sales and market entry strategy development.

Prior to Cavotec Mr Howie worked extensively in the wood processing industry focusing mostly on the automation of previously manual and dangerous tasks.

Mr Howie has completed an executive MBA and holds a bachelor's degree in mechanical engineering.