

Addressing mooring forces and snap-back hazards

Sam Mazaheri¹

¹ Dalrymple Bay Coal Terminal, Hay Point, QLD, Australia; sam.mazaheri@dbct.com.au

Summary

There are still incidents being reported regarding mooring forces and snap-back issues from various ports and maritime terminals worldwide despite the development of new technologies and enforcement of extensive safety measures by marine terminals, shipping lines and regulatory organisations. Implementing a proper risk management and addressing the snap-back issue during operation on busy terminals is still a challenging task to maintain safety of personnel while the vessel is berthing, berthed and sailing. This paper tries to highlight the snap-back hazards on wharf access areas to raise a flag to relevant regulatory organisations for additional works needed to be put in place to minimise / eliminate the risk of snap-back forces across all ports and maritime terminals across Australia and worldwide.

Keywords: port terminals, wharves, mooring forces, snapback hazards, quaylines

Introduction

Snap-back happens once a mooring line ruptures and the parted line snapback like a rubber band. Snap-back can present a significant risk to the safety of the personnel working around the mooring areas on wharves and quaylines. Although some control measures during the design and operation have been developed and addressed by various organisations and through several guidelines and manuals such as OCIMF, PIANC, MCA [1] and MAIB [2], there are still incidents being reported regarding the parting of mooring lines causing snap-back hazards to personnel working on ship decks and wharves mooring areas. In addition, some of the terminals have attempted to identify and mark the snap-back danger zones and in some cases, they have also implemented a hard barricade / cage type structure around the mooring bollard / quick release hook to eliminate the hazards or to reduce the impact intensity of the snap-back forces. Recent real test practices and footages of incidents have showed that the parted lines can release a significant amount of stored energy causing their tips to reach a speed of a sound and even beyond – Figure 1. This means that the current control measures are not effective for some circumstances and not good enough to eliminate the risk of snapbacks to provide adequate safety to the wharf side personnel.



Figure 1: Footage of an incident occurred in 2021 in one of the BHP port terminals showing the location of departed mooring lines and the snap-back area [1]

Incidents

A report published by UK Protection and Indemnity Club (P&I Club) showed that mooring equipment related incidents over the last 20 years have injured many seafarers and have cost the Club over US\$34 million – [2]. It is also understood 14% of the incidents have led to fatalities – Figure 2.

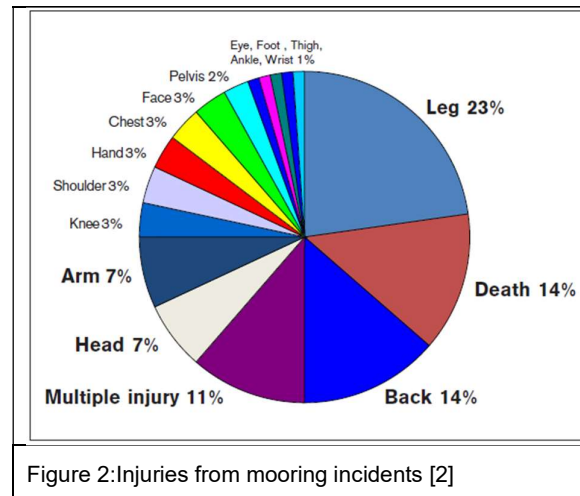


Figure 2: Injuries from mooring incidents [2]

Standards and Guidelines

Reviewing current standards and guidelines showed that only a few of them such as guidelines/reports from PIANC and OCIMF ([5], [6], [7]) are addressing the design and safety of mooring equipment. However, less details in respect to safety control measures of mooring equipment can be seen in these guidelines and reports. Given that more details and clarifications would be inevitable to address this issue thoroughly.

Approach

It is important to increase the awareness of hazards related to mooring equipment including the snapback issues to a wider community to. This may best be achieved through a range of actions:

1. Review the issue thoroughly and identify the hazards with more details

- II. Gather and integrate lessons learned from various incidents
- III. Review and reconcile control measures implemented by port authorities and terminal owners
- IV. Develop a more detailed guidelines for the designers and asset owners to minimise the risk of interacting with mooring forces
- V. Develop a risk-based management framework for port authorities to control the risk of mooring equipment during all stages of operation
- VI. Develop a live monitoring system in accordance with the developed risk management framework

Concluding Remarks

There are still uncertainties with understanding hazards associated with mooring equipment and snapback forces and therefore the risk to personnel working in wharf areas and in the line of fire of mooring equipment is still significant. On the other hand, valuable information regarding to snapback incidents has been gathered over the last few decades and several terminals and port operators have implemented risk-based control measures to control the risk and minimise the impact of the snapback forces for potential incidents. There has been sufficient industry evidence collected to review the issue and develop more details for designers and operators in terms of developing new guidelines or updating the existing guidelines / manuals.

References

- [1] Maritime and Coastguard Agency, "Code of safe working practices for merchant seafarers," Maritime and Coastguard Agency, Norwich, 2015.
- [2] Marine Accident Investigation Branch, "Report on the investigation of the failure of a mooring line on board the LNG carrier," Marine Accident Investigation Branch, UK, 2017 .
- [3] Holmes Solutions, "Understanding marine snapback events," 4 Feb 2022. [Online]. Available: <https://www.youtube.com/watch?v=eXaDSO-a3lc>. [Accessed 3 June 2022].
- [4] UK P&I Club, "Understanding mooring incidents," Thomas Miller, London, 2009.
- [5] PIANC, "Design principles for dry bulk marine terminals," PIANC, Brussel, 2019.
- [6] OCIMF, "Mooring Equipment Guidelines," OCIMF, London, 2018.
- [7] PIANC, "Recommendations for the Design and Assessment of Marine Oil and Petrochemical Terminals," PIANC, Brussel, 2106.
- [8] Oil Companies Marine Forum (OCIMF), "The Hazards of Snap-back; Initial learning from a serious incident of mooring line failure," OCIMF, London, 2015.