

Problem-free mooring: the dock master's checklist

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The issue of safe mooring can be approached from a number of different angles, such as:

- **The port** – accidents & consequences, facilities, PSC, etc.
- **Ship** – equipment, maintenance, operation, planning
- **Company** – providing resources, training, compliance with industry requirements
- **Crew** – safety, on-board training, maintenance, resting hours
- **Insurance** – accidents, claims, investigations, the way forward, loss prevention, etc.
- **Training** – best way to raise awareness and training methods, supervision, etc.
- **Mooring equipment manufacturers** – user friendliness, suitability, tailor-made to needs of ship and crew, rules and requirements, etc.
- **Flagstate** – inspections, requirements (Minimum Safe Manning Certificate) etc.

For this article, I decided to look at mooring issues from the port's point of view. Before making my point as to why I decided to do so, let us first look to the chief reasons for bad practice and accidents.

Any accident or problem situation is the result from an unfortunate mix of different parameters at a given time. Also mooring accidents are the result of a combination of failure mechanisms such as abrasion damage in combination with improper mooring line leads, shockloads, and so on. If one of the failure mechanisms necessary to create a mooring accident is missing, a worn mooring rope may still safely hold a laden ship

alongside under clement weather conditions, but will fail with catastrophic consequences, for example when a slight breeze impacts on the bigger windage area that developed during the discharge operations (or during loading of containers on deck).

Moreover, mooring operations disrupt the normal shipboard operations as they are frequently carried out during nighttime or outside the crew's normal working hours and with limited crews on board. With uncomfortable weather conditions and time pressure, all these factors increase the accident potential of mooring operations. Especially when the conditions on the mooring stations are difficult, the mooring crew/squads should be aware that a small omission or error can have serious consequences.

The writing of the mooring book took roughly about five years and during this period, especially during surveys on board, I took the opportunity to investigate more into the reason why crews arrange and belay the lines wrongly, leave ropes on drum ends, fail to observe lead angles, and so on. In many cases I found out that they were not aware of the risks involved as a result from their actions and did not know why certain mooring arrangements constituted bad practice. Frequent answers were that "it is always done like that", "there was no time to do otherwise" etc. Many of the answers received in combination with the poor arrangements, bad practice and maintenance reflect lack of awareness, improper training, insufficient experience and understanding of mooring operations, loads, arrangements and techniques.

The above makes it clear that the different parameters that may have an effect on mooring safety should be identified and that awareness needs to be raised. As lack of awareness is



With a trained eye, a port's dock or harbormaster can play a significant role in ensuring the safety of all those involved in the mooring process.

definitely one of the major contributing factors in improper and unsafe mooring operations, raising awareness seems to be the logical answer to this problem. However, who is in a position to raise awareness?

This brings me to the reason of my decision to approach mooring problems and dangers from a port's point of view.

When mooring incidents happen in a port, port operations may be seriously disrupted. Accidents like fatalities, injuries, breakway incidents, damage to quay/wharf, other ships, cranes, pollution and so on will result in time consuming investigations, inquiries (P&I, H&M, PSC, Flagstate, Class, industry vettings, and so on) and will cause delays that might affect access to the port, stevedores' activities and berthing schedules. It is therefore clear that it is also in the port's interest that the ships are properly and safely moored alongside the port terminals.

Whilst ships are inspected frequently, it should be appreciated that the inspectors may either have a mission to carry out an over and above or general inspection, which does not necessarily warrant a focus on the mooring equipment. Also, depending on the background of the inspector, he or she may not be familiar with good and bad mooring-related practices. A typical example here is the regular technical superintendent's visit on board. In view of their background, technical superintendents are highly experienced and qualified when it comes down to technical matters, but in view of their previous area and scope of work (engine room), they have never been working on the mooring stations and will therefore not be as familiar with mooring operations, arrangements and practices. Unless there is a chance that improper mooring arrangements would lead to failure or damage of the ship's mooring equipment, most mooring issues will pass unnoticed. The same would also be the case for class surveyors (most of them also have a background in engineering); even during PSC inspections mooring procedures, arrangements and practices might not always receive the attention they deserve. In many cases the scope of inspection, time windows, knowledge and experience do not allow identification of mooring problems and their potential as vehicles for accidents and disasters. Therefore, the chance that improper mooring arrangements or early warning signs are picked up and reported is remote. Only surveyors attending on board on behalf of P&I clubs for condition surveys, or surveyors carrying out vetting inspections on behalf of oil majors vetting might be in a better position to carry out more detailed inspections of mooring equipment and identify the fatality potential of bad practice and poor mooring arrangements.

As awareness can best be raised when evidence of improper mooring is found, I am of the opinion that dock and harbor masters can play an important role in bringing evidence of poor arrangements and bad practices to the attention of the ship's staff. From my personal experience as a ship inspector for more than 20 years, I have seen many "early warning" signs when I was approaching the ship and, at a later stage, poor mooring management and bad practices were generally confirmed during my further inspection onboard the ship and mooring stations. By being vigilant and picking up early warning signs that indicate flaws in the ship's mooring management and procedures, dock and harbor masters might actively contribute to reducing the likelihood of mooring accidents happening and raising awareness.

If there is evidence of poor mooring techniques and equipment, a friendly talk with the ship's staff may highlight further and underlying problems and, as such, attention can be focused on what can be done to avoid recurrence. Suitable actions might consist of addressing mooring issues during safety committee meetings, mooring plan discussions, on-board training, review of mooring procedures and SMS, and so on. Furthermore, when the ship's staff is open to the idea, a further visit to the mooring stations will generally reveal some further anomalies and bad practices.

It should also be remembered that mooring operations are not completed when the ship is moored alongside upon arrival. Phenomena such as passing ships, changing currents, tidal differences and their effect on number and lead angles of mooring lines or changing weather/wind conditions should be considered in order to apply correct and timely preventive measures. Dock and harbor masters could actually assess quickly if the ship is safely moored and play an active role in improving the port-ship interface from a mooring point of view by simply looking for evidence of poor mooring management and bad practices.

I have therefore included a small checklist with addresses items that I frequently noticed during my inspections. I hope they might be used to help dock and harbor masters in raising awareness and improve mooring standards, which will benefit ships and crews calling at their ports and terminals. In some cases, such an exercise may also reveal anomalies or flaws in the port's mooring policy and arrangements, and eventually lead to improvement of the port's facilities as well.

The dock master's checklist

Item to be checked

Are mooring lines in good condition and free of damage?

- Check for wear, cut strands, improper splices.



Yes No

Are mooring wires correctly connected to nylon tails?

- Check for faulty and improper connections.



Yes No

Are mooring lines properly tended?

- Check slack in mooring lines, same lines used for same service?



Yes No

Are mooring line lead angles appropriate for the stay of the vessel in port?

- Will mooring line lead angles remain appropriate throughout the port stay (loading/ discharging operations, number of lines sufficient)?
- Situational awareness (weather, current, tide, passing ships, etc.) to be considered.



Yes No

Are the mooring lines properly belayed on the bollards ashore?

- Lines properly belayed without the risk of causing damage to the ship's or other ships' mooring lines.



Yes No

Are overboard fairleads, chocks, rollers free from visible damage?

- Check for any visible signs of wear, deformation, damage.



Yes No

Are rat guards properly fitted?

- Are rat guards properly fitted and will they remain in place during the port stay?



Yes No

Is gangway free from contact with mooring lines?

- No contact or chafing between mooring lines and gangway.



Yes No

Are mooring lines free from obstacles and contrivances?

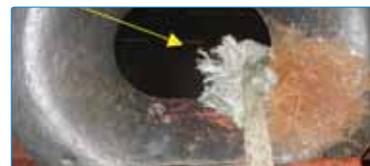
- Check for lines that are caught by/under fenders, ladders, etc.



Yes No

Are there any inappropriate arrangements that may cause chafing or damage to mooring lines?

- Check mooring line leads and possibility for contact with sharp edges, ship's structure (rough edges of chocks, protruding hawse pipes, anchors, etc.), other mooring lines/wires.



Yes No

ABOUT THE AUTHOR AND ORGANISATION

Walter Vervloesem (FNI) is the Chairman of the IMCS Group of Companies, Chairman of the Nautical Institute's Belgian Branch and author of the Nautical Institute's major reference work *The Nautical Institute on Moorings Vol. 2*, which was published in 2009. In this publication, he highlights good and bad mooring practices as well as mooring equipment related maintenance issues, damages and frequently seen problems through a wealth of photographs.

The Nautical Institute is the international professional body for qualified seafarers and others with an interest in nautical matters. It provides a wide range

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