

Mooring Line and Mooring Systems Management

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Mooring line failures / parted mooring line incidents pose a significant risk to personnel, infrastructure, and operations in the port. Over the past few years, a significant number of mooring line incidents were reported in the Port of Port Hedland (the Port). These form approximately 20% of all marine incidents in the Port

1. Contributing factors to failure

- a. Parting of a mooring line occurs when it is placed under extreme loads due to environmental factors (large tidal range, strong winds, etc.), passing vessel interactions, loading conditions (ballast vs fully laden, vessel's trim), insufficient monitoring and tending of mooring lines.
- b. In certain instances, mooring lines have parted at loads well below their rated minimum breaking load (MBL) and in the absence of any vessel interaction. Contributing factors to the early failure of lines can be the age, material, quality and condition of the line, conditions that it has been exposed to during use (abrasion, chafing, sharp angles, shock loads), ambient and deck structure temperatures, as well as, at- sea storage conditions.

2. Mooring line condition/standards

Observation:

It has been noted that, there are some operators who do not have a replacement policy in place and have been observed to change out mooring lines only when the lines part or deteriorate significantly.

Recommendations:

- a. A Line Management Plan (LMP) *or similar*, should be implemented by ship operators on their vessel to check for wear and damage, and to apply a trained and consistent approach in identifying early indications of a potential mooring line failure.
- b. A mooring line management plan (LMP) should define the intervals for end-for-end changes and replacement criteria for mooring lines.

3. Mooring line monitoring standards

- a. A Mooring Safety Management Plan (MSMP) *or similar* should be implemented by ship operators to ensure that all assessed risks are effectively managed through

the design and operation of the mooring system and that the procedures comply with Port Hedland Mooring Line management. The aim is to ensure that during mooring operations, no harm comes to the ship's crew or terminal staff, no damage is caused to the ship or terminal/facility it is interfacing with and that the mooring system meets all applicable regulations, codes and recommended practices.

- b. Whilst the use of chafe guards for protecting mooring lines against chafe damage is recommended by industry guidelines, it has been observed that at times vessel's crew are installing the guards whilst the vessel is berthing with the lines under tension. This has been identified as a unsafe practice and one which increases risk to the crew handling the mooring ropes. Vessel operators are urged to establish procedures and provide clear guidelines to vessel's crew for handling the chafe guards. The guidelines should also include maintenance routine for the chafe protection to make sure it is working properly and can be safely deployed. This information should be included in the vessel's Mooring Safety Management Plan (MSMP) and the Line Management Plan (LMP) *or similar*.

4. Mooring winch and systems management

4.1 Observation:

Incorrect settings for the rendering of winch brakes has often led to vessels drifting off from the berth or mooring line(s) parting.

Recommendations:

- a. An important safety function of the mooring winch brake is its ability to render. This allows the mooring line to release / render in case of excessive loads and avoid parting of the line.
- b. It is recommended that the mooring winch brake rendering test should be carried out at intervals not exceeding 12 months. Preferably also,
 - After completion of any modifications or major maintenance such as but not limited to, brake liner renewal, brake band adjustments etc.
 - Where there is evidence of premature brake slippage or related malfunctions
 - Installation of new mooring lines

Vessel operators should provide procedures and guidelines for testing mooring winch brakes, including risk assessments.

- c. Mooring winch brake rendering loads to be set in accordance with the recommendations given in ISO Standard 3730:2012 and leading Industry publications such as the OCIMF – Mooring Equipment Guidelines.

4.2 Observation:

The deteriorated condition of roller fairleads has led to the failure of fairleads during towage operations.



Recommendations:

- a. Condition of mooring winches, fairleads, bollards must be regularly monitored to identify any early warning signs of failure or damage. Vessels PMS should include regular and detailed condition checks of the roller fairleads (including its mounting arrangement) and other mooring fittings onboard.
- b. All Fairleads, chocks and bollards should have the SWL marked. The SWL being informed to the Pilot / Tugs should be the minimum SWL of the fairleads or bollards of the system.

5. Procurement of mooring lines

- a. New mooring lines should be procured only from suppliers who provide the proper manufacturer's certification. This would mitigate the risk of sub-standard mooring lines being put in service, which may result in mooring line incidents.
- b. Size and strength of mooring lines should correspond to the EN number for the vessel, assigned by the shipyard / Class at the time of new build. Over-size and Over-strength mooring lines provide a risk to the mooring winch operation.

Operators and vessel crews are also reminded of good seamanship practice with regards to mooring lines with appropriate guidance being available from the following reference publications:

- AMSA Maritime Safety Awareness Bulletin.
- OCIMF – Mooring Equipment Guidelines.
- INTERTANKO – Guidance on Line Management Plans (LMP)
- INTERTANKO – Guidance on Mooring System Management Plans (MSMP)
- CI 2001-04 – Fibre rope inspection and retirement criteria

Any questions or feedback regarding this Marine Safety Bulletin should be addressed to the Port Hedland Marine Operations Team.



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