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LINE INSTALLATION

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Traditional manufacturer since 1949

CONTENT

FIGURES

LINE INSTALLATION MANUAL

WARNING: Potential risk of destruction or damage to the rope or line during its use is a consequence of many factors that the line is exposed to during its use. However, when selecting a line, it is necessary to consider possible risks that exist in the particular application. If doubts arise, please contact the manufacturer or a duly trained and responsible person.

Possible hazardous situations:

- The line is constantly used over a pulley or with a bend having a small diameter
- The line is used at an elevated temperature which can cause weakness or melting of the line material
- The line is used in the presence of dangerous chemicals
- The line is not new, with unknown parameters and unknown previous usage
- The line is not inspected periodically and adequately (inspection frequency and methodology – see Inspection Guideline)

Occupational safety when working with and handling mooring lines and mooring equipment

A successful mooring operation depends on the technical condition of the mooring equipment, the condition of the mooring lines, and experience/skills of the ship's crew.
Before commencing the mooring operation, it is necessary to check in time in what condition the mooring equipment and the mooring lines are. Any undesirable object that could be a hindrance to the mooring operation must be removed.
When the ship is anchored at berth, the condition of tensioning of the mooring lines shall be checked continuously.
The mooring equipment shall be always in a good technical condition. Before every use (arrival at and departure from berth), its mechanism shall be inspected, lubricated, and tested in advance.
Inspection of condition of the mooring lines shall be performed in accordance with recommendations specified in the Inspection and Retirement Criteria.
When working with mooring equipment, occupational safety rules shall be observed and followed.
As the work with mooring lines is an extremely dangerous activity, it is always necessary to know where to stand during mooring operations and how to avoid injuries when the line breaks.
Basic rules:

- it is forbidden to work with the mooring equipment which shows obvious defects
- the basic principle is to avoid the most critical zones known as "whip-back" or "snap-back" zone areas (see Figure no. 1)
- it is forbidden to stand inside the mooring line eyes

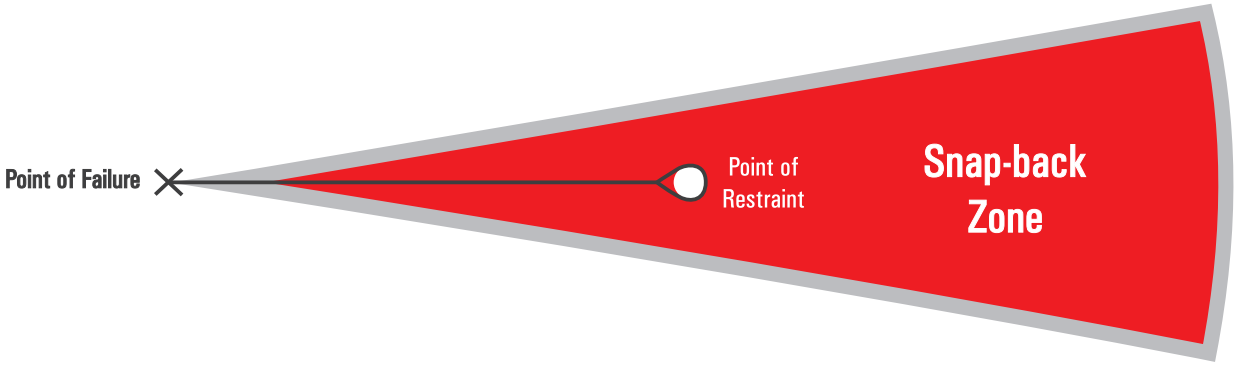

Figure no. 1: **A Simple Mooring System Illustrating the Potential "Snap-Back" Zone Area**

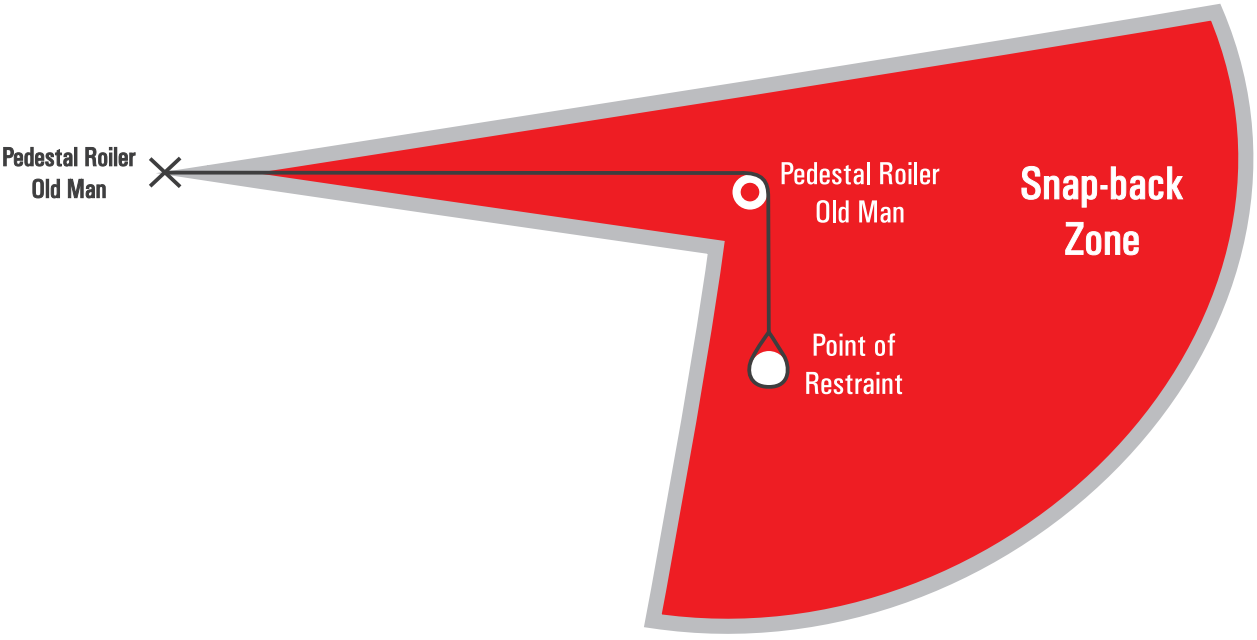

Figure no. 2: **A Complex Mooring System Illustrating the Potential "Snap-Back" Zone Area**

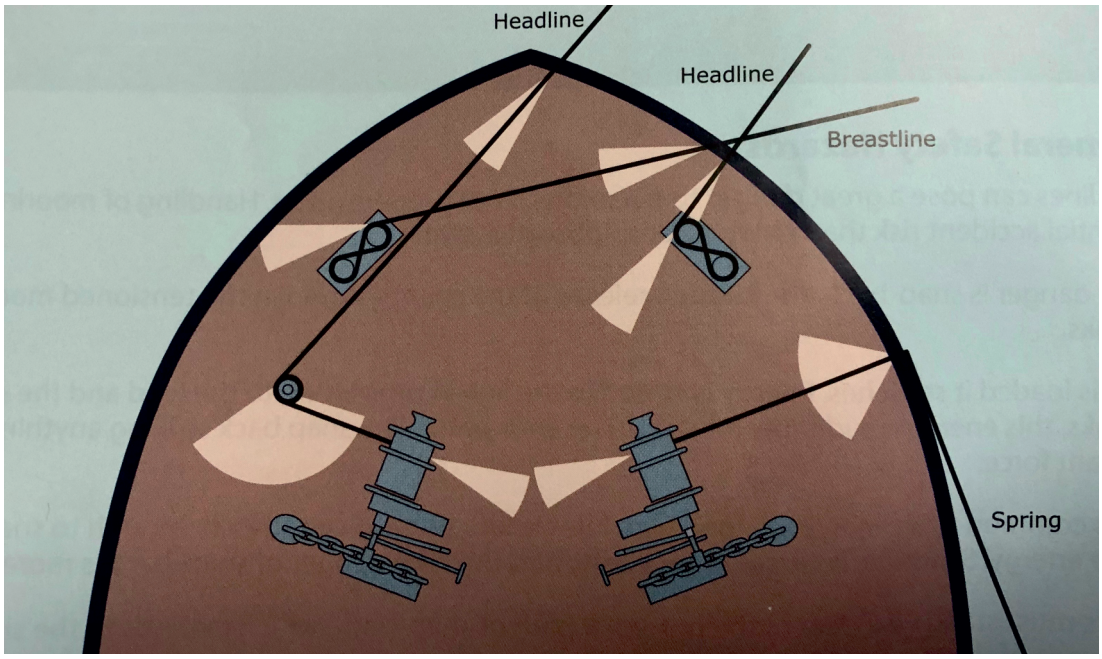

Figure no. 3: **An Actual Mooring Deck Arrangement Illustrating Potential "Snap-Back" Zone Area**

Effectiveness of mooring depends on the correct line routing. An example of incorrect line routing is shown in Figure no. 4.

Figure no. 4: **Incorrect line routing**

Safety of the ship at berth depends on the proper use of the mooring equipment. This requires a correct and good knowledge of the specific mooring equipment and the quality of the ship's ropes and lines. The lines must be routed in such a way that they do not form acute angles and any movement of the crew members is always safe at the mooring point (see "whip-back or snap-back zone areas" above).

Effectiveness of any mooring line is influenced by the following angles:

- vertical angle the line forms with the pier
- horizontal angle the line forms with the ship's deck
- horizontal angle when routing the line through fairleads, drums and winches

The vertical angle cannot be influenced and depends on the pier construction and the ship's type and size. However, a compromise solution shall be found always so as the negative influence and the impact on the line are as small as possible. The responsible employee shall choose such routing of the line that is in conformity with occupational safety principles.

In order to avoid undesirable damage to the ship's crew and destruction of the mooring lines, the lines should not be routed on each other (mutual friction of the lines), over sharp edges (see Figure no. 5) and damaged surfaces (surfaces with burrs, surfaces with notches, ...) of, for instance, winding drums, rollers, thimbles, etc.

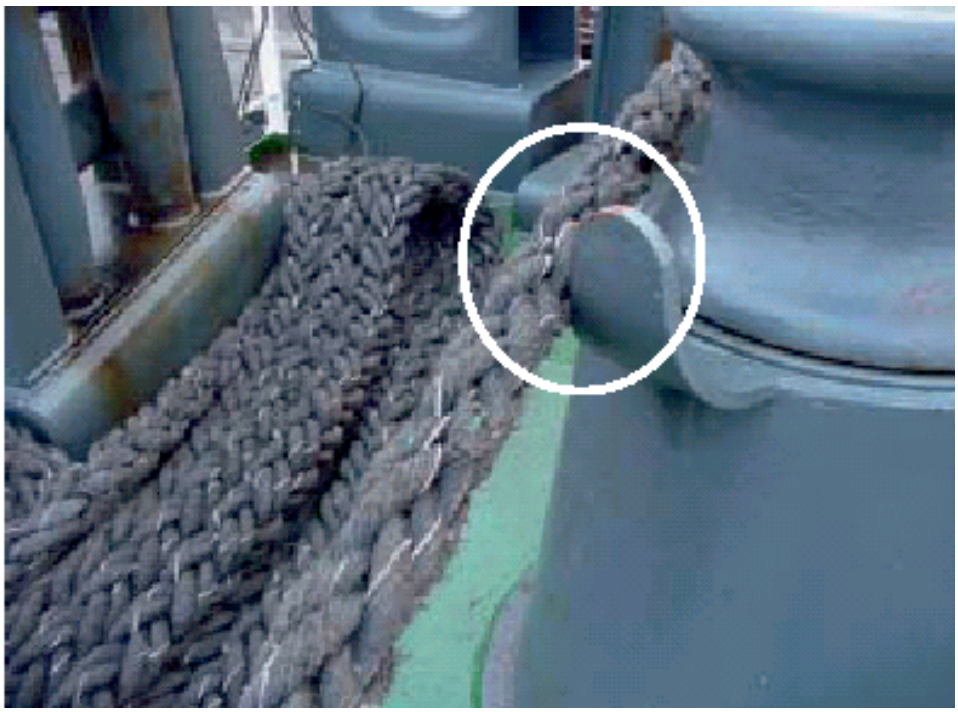

Figure no. 5: **Line routed over a sharp edge**

In case that steel lines on the ship are replaced by synthetic fibre lines, it is essential that all equipment items and parts of the track where the line is to be routed are repaired and inspected.
The operators on the ship must frequently periodically inspect the mooring equipment to minimize or eliminate damages to the ship's mooring equipment.
Undesired abrasion, friction must be avoided. All moving parts of the mooring equipment must be properly lubricated to ensure their functionality and, if the line is to be routed over sharp edges, such places should be protected.

As soon as the ship is at berth in the required position, the lines must be properly secured on bitts.

In case of large diameter bitts, the line should be fastened in conformity with Figure no. 6.

Figure no. 6: **Large Diameter Bitts**

In case of small diameter bitts, the line should be fastened in conformity with Figure no. 7.

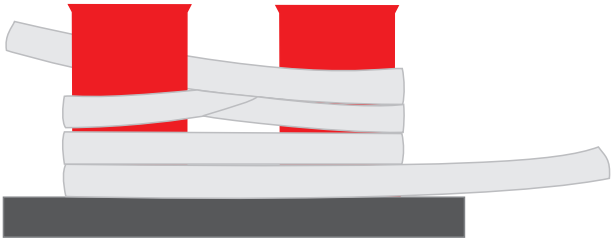

Figure no. 7: **Small Diameter Bitts**

The mooring line should not be left on the tensioning part of the winch drum which is only designed to pull or tighten the mooring line (see Figure no. 8).
The winch drum is not designed to maintain the weight of the entire ship and the winch drum motor can be damaged and the line can slide down.

Figure no. 8: **Mooring line on the tensioning part of the winch drum**

The above mentioned way of leaving the line on the winch drum can be used only in case when the mooring equipment has a split mooring winch (Figure no. 9).

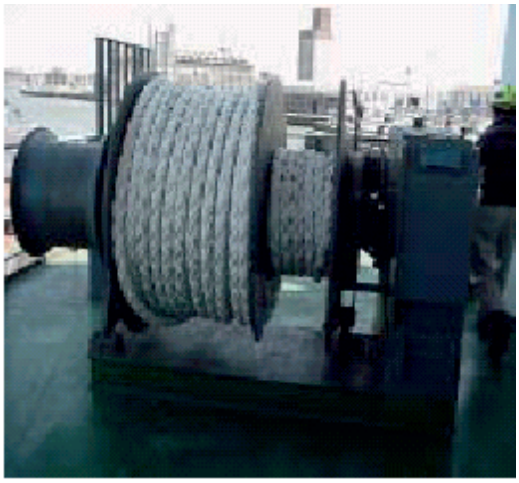

Figure no. 9: **Equipment with split mooring winch**

RESOURCES

1. Guidelines on the Use of High - Modulus Synthetic Fibre Ropes as Mooring Lines on Large Tankers, OCIMF, Code 5457

2. Mooring Equipment Guidelines, 3nd Edition 2008 CI 2001-04, OCIMF

3. Handbook of Fibre Rope Technology, H. A. MCKENNA, JOHN W. S. HEARLE, N. O´HEAR

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