# MOORING LINE, TOWING HAWSER AND FISHING GEAR 'SNAP-BACK' HAZARDS: STAY ALERT AND STAY ALIVE!

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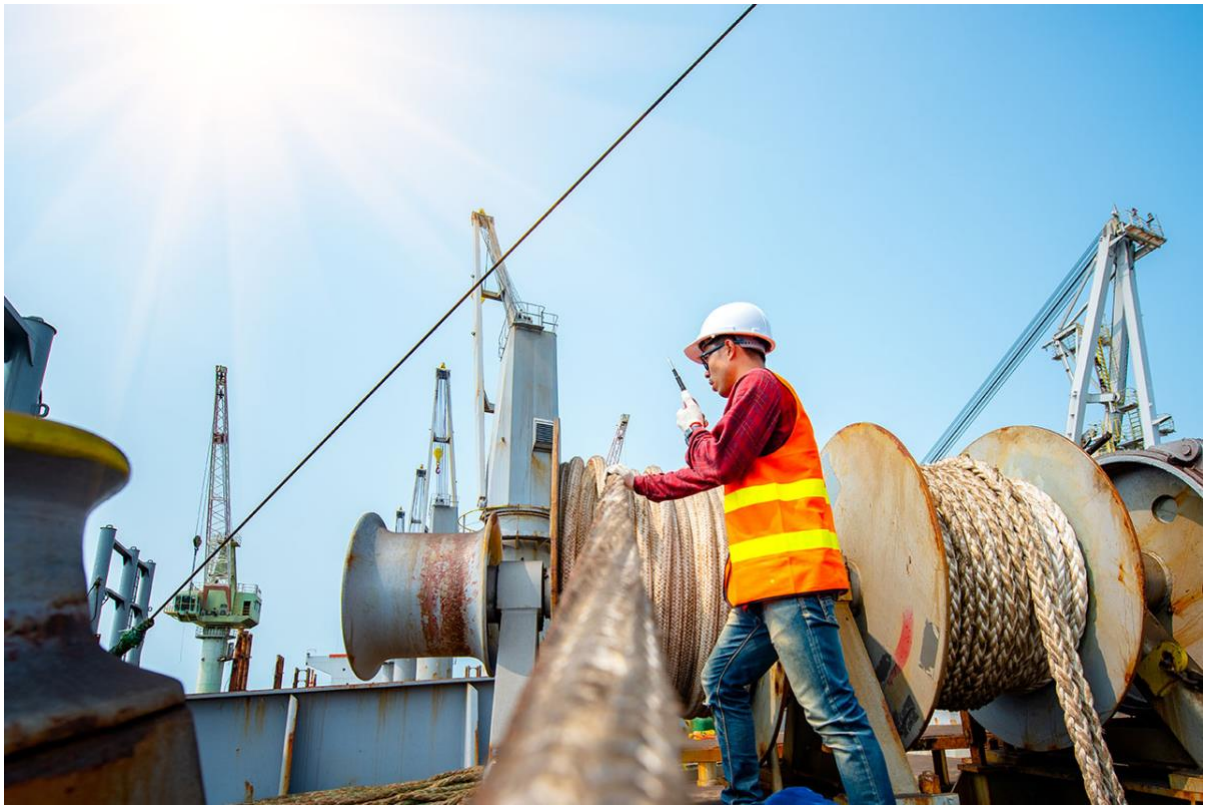

*Not a 'Snap-Back' safe place to be standing and using your radio!*

## INTRODUCTION

'Snap-Back' is the marine industry term used to describe the potentially deadly recoil of a mooring line, towing hawser or fishing gear which breaks – suddenly and without warning – due to overload and/or pre-existing fibre or wire rope damage. The danger to crew when a natural fibre or wire line breaks and recoils is severe. Much worse is a broken and recoiling synthetic rope which can lash back onto a mooring deck area and ship's crew at speeds up to 800 km/h. This Risk Bulletin is intended to highlight Snap-Back dangers and provide recommendations to minimise this ever-present and potentially deadly risk to crew.

# BACKGROUND

Snap-Back dangers exist in relation to mooring and unmooring operations, towing operations (inclusive of both harbour assistance and barge towing tugs) and fishing vessel operations. These distinct, but sometimes overlapping, operations and their associated Snap-Back danger risks are discussed under separate headings below. However, they are all connected by the underlying cause of Snap-Back which is the sudden parting and uncontrolled release of the stored energy in an overloaded mooring, towing or fishing gear rope or wire line.

Synthetic fibre ropes, constructed of polyester, polyethylene or a combination of these materials, are now in standard use throughout all marine industries. The upside benefit is that they are lighter, stronger and more durable than older natural fibre ropes. They are now also used as a replacement for, or in combination with, wire ropes. The critical downside is that synthetic fibre ropes have a much higher high level of elasticity and elongation, with a resulting and dangerously high level of energy storage capacity.

NOTE: A one minute video, Mooring Line Snap Back: the Hidden Danger (created by industrial loss prevention specialists, Holmes Solutions), illustrates the destructive power and danger to crew of the recoil experienced when a synthetic rope parts.

# MOORING OPERATIONS

Mooring operations include mooring and unmooring situations. Both operations generate crew exposure to Snap-Back events which are potentially deadly. As such, it is critically important for Members, their masters and crews to fully understand and consistently implement all applicable regulatory and industry mooring/unmooring best practice standards as an integral part of a company safe work culture.

As a starting point, Members are referred to Risk Bulletin No. 43, Code of Safe Working Practices for Merchant Seafarers (COSWP) 2015, as amended to 2020, and the UK MCA's COSWP full text web page. COSWP provides basic advice at Chap. 26 on safe 'Anchoring, Mooring and Towing Operations'. The COSWP publication should be accessible on board all Member vessels and should already be incorporated into each vessel's ISM Code or equivalent NCVS SMS Procedures.

Turning now to the regulatory aspects of safe mooring/unmooring, are provided by SOLAS Regulation Chap. II, 1/38, with important amendments scheduled to come into force on 1 Jan 2024. Full details and supporting links are available on the IMO Safe Mooring web page.

Members should also note the impact of the associated and supporting IMO/SOLAS Circulars as follows:

- MSC.1/Circ. 1175 (issued 24 May 2005) Guidance on Shipboard Towing and Mooring Equipment, in its original and unrevised form, will remain as being applicable to all vessels built after 2007 and before 1 Jan 2024.
- MSC.1/Circ. 1175/Rev 1 (Issued 9 Dec 2020) Revised Guidance on Shipboard Towing and Mooring Equipment, will only apply to vessels over 3,000 GT built after 1 Jan 2024.
- MSC.1/Circ.1619 (Issued 11 Dec 2020), Guidelines on the Design of Mooring Arrangements and Selection of Mooring Equipment and Fittings, will only apply to vessels over 3,000 GT built after 1 Jan 2024.
- MSC.1/Circ.1620 (Issued 24 Dec 2020), Guidelines for Inspection and Maintenance of Mooring Equipment, including Mooring Lines, applies retrospectively to all existing vessels by way of the provision of IMO "guidance and recommendations".

NOTE: With respect to mooring operations safety on board existing vessels, Members should pay particular attention to the prior requirements of MSC.1/Circ. 1175 and the new requirements of MSC.1/Circ.1620.

NOTE: Of special interest is the advice provided by MSC.1/Circ. 1620 that the concept of 'Snap-Back Zones' being marked on mooring deck areas has been made redundant in favour of stressing that the entire mooring deck should be considered as a Snap-Back danger area.

In relation to mooring operations Snap-Back risk awareness and avoidance, Members should ensure that MSC.1/Circ. 1620 required Mooring Plans are prepared prior to arrival and that all participating crew are briefed – preferably during a pre-berthing/un-berthing 'tool-box meeting' – on their mooring operation duties and the necessity for heightened situational awareness, inclusive of Snap-Back dangers.

Additionally, the IMO Safe Mooring web page referred to above contains links to a series of 'best industry practice' mooring safety videos prepared by the European Harbour Masters' Association. They include advice on the preparation of Mooring Plans and the Inspection and Maintenance of Mooring Equipment and Lines.

Members who operate tankers should also obtain and refer to the OCIMF publication, Mooring Efficiency Guidelines 4th Ed. (MEG 4). This provides a comprehensive guide to safe mooring at oil

terminals and offshore installations, inclusive of detailed advice on mooring line inspection, maintenance, record keeping and replacement.

NOTE: OCIMF also publish a companion booklet, Effective Mooring 4th Ed. which, although designed for use as a safe mooring training aid for tanker seafarers, can be used to enhance mooring safety on board any type of vessel.

# TOWING OPERATIONS

Towing operations can be divided into two principal categories: 1) Ocean and Coastal Towing of Ships, Barges and Rigs and 2) Harbour Towing/Ship Berthing Assistance. Towing operation in both these categories will likely include the use of synthetic fibre tow lines whether alone or in combination with sections of wire tow line. Synthetic fibre lines will also be used as messengers to assist connection to and disconnection from the tow. As such, there are a variety of situations in which Snap Back can occur during towing operations with resulting crew injury or death.

## REFERENCE CATEGORY 1) OCEAN AND COASTAL TOWING:

There are currently no IMO/SOLAS based international towing operations regulations. There is guidance, however, from the 10 page IMO MSC/Circ.884, Guidelines for Safe Ocean Towing (issued 21 Dec 1998). These Guidelines remain in draft form and have never been formally adopted by the IMO's MSC. Despite this, MSC/Circ.884 is referred to by flag states (e.g., the Australian Maritime Safety Agency) and industry organisations as providing the minimum recommendations for the organisation, planning and execution of safe ocean towage and the design of associated equipment.

The IMO Guidelines for Safe Ocean Towing make no specific reference to towline Snap-Back dangers, but they do refer to the necessity to ensure crew safety during towing operations as follows:

> *"The towing arrangements and procedures should be such as to reduce to a minimum any danger to personnel during the towing operations."*

In relation to Ocean and Coastal Towing operations and Snap-Back risk awareness and avoidance, Members should ensure that, like the MSC.1/Circ.1620 required Mooring Plans described above, MSC/Circ.884 recommended Towing Plans are prepared prior to towline connection. Further, that these Plans include the requirement for a pre-connection and pre-disconnection 'tool-box

meeting' with all participating crew to clarify their towing operation duties and reinforce the necessity for full situational awareness, inclusive of Snap-Back dangers.

## REFERENCE CATEGORY 2) HARBOUR TOWING/SHIP BERTHING ASSISTANCE:

All such operations are subject to flag state regulation and industry best practice guidelines and their incorporation into NCVS shipboard SMS Procedures.

Harbour Towing operations require tug crew to work close to towing lines placed under high levels of stress with a resulting high level of Snap Back injury risk. It is therefore essential that tug crew are kept under close observation by a tug's master while they secure and let go towing lines and that crew on deck stand well clear when tow lines are under strain.

Useful advice on Harbour Towing operations safety is available from the OCIMF publication referred to above, Effective Mooring 4th Ed. Further advice and guidance is provided by the Nautical Institute publication, Tug Use in Port: A Practical Guide, 4th Ed, 2021. Written and regularly updated by Capt Henk Hensen, an towing industry acknowledged tug expert, this book has been endorsed by the IMO.

NOTE: Members who operate tugs are also referred to an International Tugmasters Association (ITA) web page article by Cap Hensen, titled Towlines. It provides a wide range of helpful information about Harbour Towing, including safe handling of towing lines and Snap Back avoidance through regular inspection and care of lines, fairleads and warping winch drums.

# FISHING OPERATIONS

## COMMERCIAL FISHING VESSEL FLEET SIZE AND CREW INJURY/FATALITY RISKS

A UN Food and Agriculture Organisation (FAO) website report advises that the estimated global fleet of fishing vessels was 4.1 million in 2020. Of this number, about 45,000 were commercial motorised fishing vessels 24 metres in length or over. FAO predicted fleet growth suggest that this number has been static over the past few years.

In terms of the risk of injury and death to fishing vessel crew/fishers, another FAO report begins as follows:

> *"Fishing at sea is the most dangerous occupation in the world. The data gathered from countries that keep accurate records show that occupational fatalities … far exceed the overall national averages. For example, in the United States the fatality rate among fishers is 25 to 30 times the national average; in Italy it is more than 21 times the national average …"*

## COMMERCIAL FISHING VESSEL SAFETY REGULATION

The FAO, ILO, IMO and fishing industry organisations have worked together for several decades to improve fishing vessel and fisher safety. Advice on their fishing vessel regulation and training standards progress is available at the IMO Legal Framework in the Fishing Sector webpage.

In brief, crew training, certification and watchkeeping standards for fishing vessels 24 metres in length and above are subject to the IMO's STCW-Fishing 1995 Convention which came into force internationally in 2012.

With respect to safety, stability and construction standards for fishing vessels 24 metres in length and above, the most recent update is provided by the IMO's Cape Town Agreement of 2012. It has been ratified by 17 IMO member states but 22 ratifications are required. As such, it is not yet in force internationally.

NOTE: The text of the IMO's Cape Town Agreement (CTA) 2012 is available without charge from the Maritime New Zealand website. Its scope and content could be described as 'SOLAS for Fishing Vessels'.

Additionally, there are two sets of IMO Voluntary Guidance for fishing vessels less than 24 metres in length. The first is the Code of Safety for Fishermen and Fishing Vessels 2005. The second is the Voluntary Guidelines for the Design, Construction and Equipment of Small Fishing Vessels 2005.

NOTE: The IMO Code of Safety for Fishermen and IMO Voluntary Guidelines are available for a fee from the IMO Publications web page or licensed distributors.

With respect to flag state/national regulation, the FAO advise that although many developed nations have incorporated much of the IMO's Cape Town Agreement 2012 and Voluntary Guidance, there are numerous developing nation states that have not done this comprehensively or at all. Members who operate fishing vessels should therefore confer directly with their flag state authority to ensure their full understanding of all fishing vessel safety, design, equipment and construction regulation which applies to their fishing vessels.

## COMMERCIAL FISHING VESSEL SNAP-BACK DANGERS

There are many types of fishing vessels using a wide range of fishing gear and nets ranging from trawling, gill netting, purse seining and many others. Their commonality is that their nets and fish catch – often weighing many tons – must be hauled back on-board using powered deck winches.

It is at the catch retrieval stage that the nets, gear and lines are placed under very high load. The nets and hauling lines will almost invariably be made of synthetic fibres. If they break under load, then – in the same manner as the mooring and towing lines described above – Snap Back recoil will likely occur, and crew may suffer severe injury or death.

Fishing is, as noted above, a high-risk industry. Hours are long with resulting potential for fatigue. Commercial pressures on masters and crews are also very high. In such situations, the supervision of the safe condition of net and lines and operational safety – inclusive of Snap-Back hazard prevention – may not get the critical attention required.

The above circumstances require special loss prevention attention. Members are therefore encouraged to raise crew awareness of all applicable fishing vessel flag state regulation as well the content and purpose of the IMO's Cape Town Agreement 2012 and other IMO Voluntary Guidance publications.

Members are also encouraged to direct their crews to the UK MCA publication, Fisherman's Safety Guide. Its 100 easy to read and well-illustrated pages provide a wealth of practical and potentially life saving fishing vessel safety advice.

# CONCLUSION AND TAKEAWAY

Snap-Back events during line handling operations in all maritime industries present a serious hazard to crew in terms of injuries and fatalities. A review of flag state and other vessel accident reports shows that such incidents are not uncommon. Worse, they continue to occur. The outcomes include crew injury and death, family tragedy, costly vessel downtime and large compensation claims for medical care and permanent disability or fatality.

MM's Snap-Back avoidance and loss prevention recommendations to all Members include but are not limited to the following:

1. Members should ensure that they are fully aware of all IMO Conventions, Codes and Guidance or NCVS equivalent regulations and best industry practice Guidelines which

relate to mooring, towing or fishing gear operations in their own marine industry segment. Members are encouraged to confer directly with both their flag state administration and appropriate industry organisations as an essential part of this process.

2. Members should understand that although the IMO's MSC.1/Circ.1620, Guidelines for Inspection and Maintenance of Mooring Equipment, provides important advice on the inspection, maintenance, replacement and record keeping for mooring equipment, these Guidelines can and should also be applied in relation to towing equipment and fishing gear.

3. Members should encourage their masters and fishing vessel skippers to include rope and line handling safety and awareness of Snap-Back hazards during new joining crew vessel familiarisation. Reminders to all crew should also be provided during essential 'toolbox' meetings which precede mooring, towing or fishing gear shooting and retrieval operations.

4. Members should, when replacing and ordering new mooring, towing and fishing gear lines, consider the availability and purchase of lines which have been specifically designed to reduce elongation, energy build up and associated Snap-Back hazards. These lines will usually cost more that standard synthetic lines. However, the additional investment will almost certainly provide a lower recoil energy and safer line together with a safer ship and crew.

5. Members should ensure that all the relevant regulations and guidance referred to above are formally implemented by specific incorporation into all ISM Code or NCVS equivalent SMS manuals and procedures and by subsequent internal and external audit.