

Risk Alert



Work safety - Container cargo operations



Written by
Nahush Paranjpye
Loss Prevention

Introduction

Incidents involving serious injuries and fatalities during cargo operations on container vessels are not uncommon.

This Risk Alert is intended to briefly highlight potential safety scenarios in order to raise levels of awareness for personnel and the need to exercise extreme care and caution during container cargo operations.

Considerations

At times, cargo operations with gantry cranes working overhead can be very fast paced, with the commercial demands (time and costs) and pressure being transmitted, often subconsciously, to the operations personnel such as the shore stevedores, crane operators and ship's crew.



A typical container cargo terminal

Common container operation issues:—

- large number of cargo units moved at a fast pace
- large / heavy loads (cargo / pontoons) being moved,
- blind spots for the crane/forklift operators,
- tight access between containers,
- cargo stacked over multiple tiers,
- hazardous material (dangerous goods),
- manual handling heavy lashing / securing equipment and
- large numbers of shore workers on board,

Examples of contributory causes for incidents:

Human element

- Rest hours / Fatigue
- Incorrect/inadequate PPE
- Unauthorised (enclosed space) entry
- Incorrect handling/lifting of heavy or large objects (twistlocks, lashing gear etc) when working in close proximity to others
- lashing gangs boarding vessels before a safe access is in place (properly rigged with safety nets etc)
- lashing gear being thrown about (sometimes overside)

Design, layout, or other aspects of the work area

- Available space (any restriction on movement)
- Load bearing capability (platforms, ladders)
- Illumination
- Ventilation

Equipment failure

- Lashing and securing gear
- Staging and ladders

Unsafe condition

- Openings without safety rails or similar (hatch openings, accessway hatches, removable railings etc)
- Loose gear on hatch covers (requires removal before lifting),
- Unsecured cargo - cargo shifts/moves/spills,
- Housekeeping
 - Slippery surfaces – spills, leaks, or ice
 - Trip hazards – loose gear, cables left unsecured

Risk Alert



- Electrocution hazard – exposed/damaged reefer cables

Other factors

- Lift path (during loading/discharging/restow),
- Weather conditions,
- Vessel's motion (during heavy lifts by vessels own lifting gear)
- Overhead hazards (possible unsecured/loose/falling objects, lashing equipment, melting ice, others)

Cases

The following case extracts are intended only to draw attention to the need for extreme caution to be exercised when on container vessels. It is not the Club's intent to make any comment or judgement on the causation as may have been determined by the investigators or as to the presumption of any liability.

Case 1

Fatality – AB Crushed by container

A general cargo ship (Multipurpose carrier) at Sao Tome and Principe Anchorage – 25 Jun 2018 (discharging containers onto a lighter barge using the ship's cargo crane)

While the Bosun was performing a gas-cutting task trying to free a twistlock that was stuck between a 20' and 40' container. The 20' container swung out and hit an Able Seafarer Deck (ASD) who was in the vicinity, causing fatal injuries.



Ref: Top view of accident site and location where ASD was crushed. [TSIB report - MIB/MAI/CAS.046](#)

The investigation revealed that the lifting force acting on the containers had compromised the integrity of the corroded locking edges permitting the 20' container to break away.

[TSIB report - MIB/MAI/CAS.046](#)

Case 2

Fatality - Crushed under container (blind spot)

A container ship at Jakarta, Indonesia – 19 July 2016

While trying to release a twist lock from a deck socket at the loading position **without notifying the quay crane operator**, the operator assistant was trapped a 40-foot container when it was loaded by the quay crane. He was discovered only later in a curled position (his head bent forward touching a deck socket) after a stevedore noticed the container had not been positioned properly on the loading location.



Ref: Scene of the accident [MAISSPB Report Dated 13 Sep 2018](#)

The investigation noted the **crane operator had a restricted view** for container handling but was not provided with a signalman. Both the crane operator and the operator assistant had functional walkie talkies but there appeared to be a **lack of communication** of the intent to release the twistlock from the loading position. Further, the operator assistant was **wearing neither a reflective vest nor safety helmet**.

[MAISSPB Report Dated 13 Sep 2018](#)

Risk Alert



Case 3

Fatality - Crushed under falling containers

A container ship at North West Lamma Anchorage, Hong Kong - 23 Mar 2014 (Discharging containers to a dumb steel lighter barge alongside on the starboard side)

Containers were being transferred (using the barge derrick) from the vessel to the port side of the barge (causing the barge to list to port). Later, when lifting a 20' container, the barge **listed further to port** causing all of the top tier 40' containers stacked aft of the barge to **topple and fall on to the cargo hold area** of the container vessel.

An able-bodied seaman (AB), working on the starboard side of the cargo hatch cover was hit and fatally crushed by the toppling/falling containers. The victim was crushed under two fully loaded containers, it was not possible to assist him, a shore rescue team being required.



Ref: AB was crushed under collapsed containers (red arrow) [MAISSPB Report Dated 29 Apr 2015](#)

Four containers fell onto the vessel deck; 10 containers fell into the water and others remained inside the cargo hold.

[MAISSPB Report Dated 29 Apr 2015](#)

Case 4

Fatality - Fall into cargo hold (Slipping)

A container vessel at Felixstowe – 17 Dec 2011

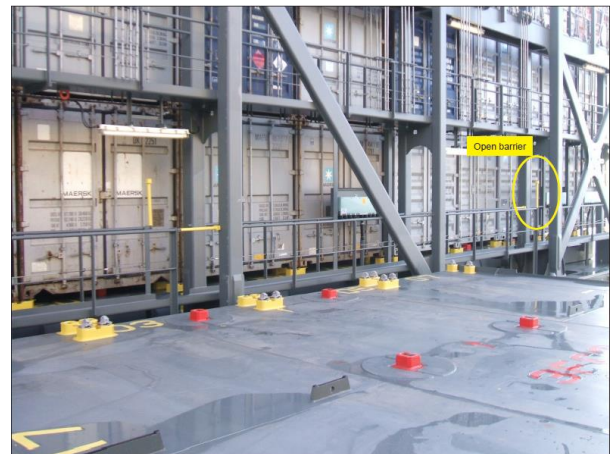
No witnesses

The AB probably **slipped on a patch of ice** while walking across a hatch cover of a **partially open hold** and fell approximately 25m - he died of multiple injuries.



Ref: View of the open cargo hold [MAIB Accident Report No 20/2012](#)

It is possible that the AB fell through an open barrier in railings adjacent to a walkway although this was thought unlikely on the basis of the site where the AB was found.



Ref: Open barrier at the railing of adjacent walkway [MAIB Accident Report No 20/2012](#)

[MAIB Accident Report No 20/2012](#)

Risk Alert



Case 5

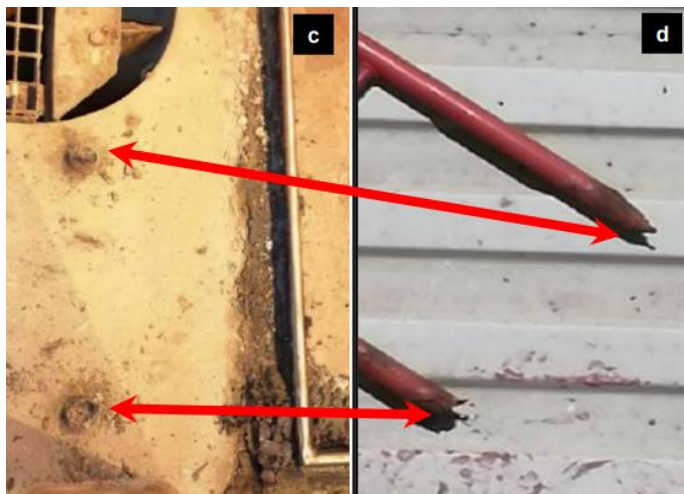
Fatality - Fall into cargo hold (Railing)

A container vessel at Buenaventura, Colombia – 16 Jul 2019

A container being discharged using the gantry crane fell into the cargo hold. The deceased stevedore had **likely leaned on a corroded safety railing** on the cross deck to check the condition of the container when the safety railing gave way.



Ref: (a) Location of recovered clipboard and broken railing, with fallen container in no. 3 cargo hold. (b) Original position of broken railing along cross deck. [TSIB report - MIB/MAI/CAS.069](#)



Ref: (c) and (d) remaining parts of broken railing on cross deck [TSIB report - MIB/MAI/CAS.069](#)

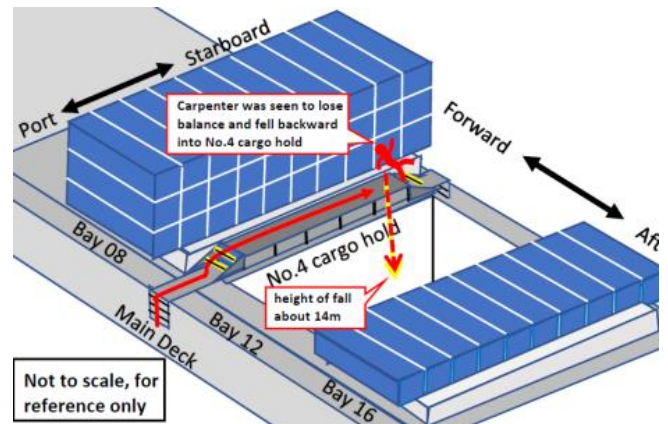
[TSIB report - MIB/MAI/CAS.069](#)

Case 6

Fatality - Fall into cargo hold (Tripping)

Container ship at Taichung – 5 Nov 2017

While walking on a catwalk **cluttered with loose lashing gear**, the crew member slipped, lost his balance, and fell backwards (about 14m) into the open cargo hold which **did not have any safety railings or safeguards**. He was attended to by shore medical personnel and transferred to hospital but succumbed to his injuries.



Ref: Representation of accident location [TSIB report - MIB/MAI/CAS.028](#)

[TSIB report - MIB/MAI/CAS.028](#)

Case 7

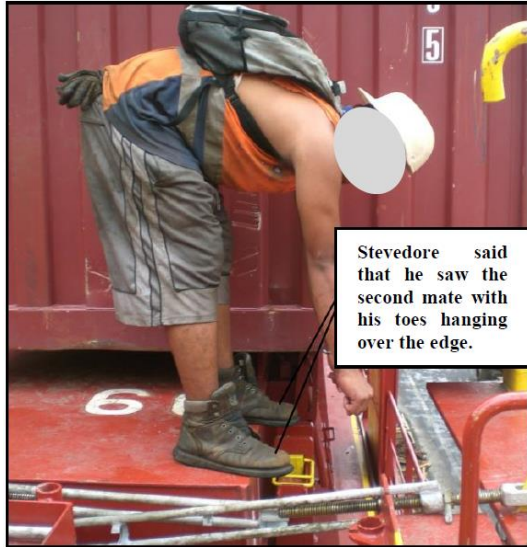
Fatality - Fall overboard

A container vessel at Pago Pago, American Samoa – 2 Apr 2015

The second mate tried to close the ventilation flap of a hatch cover from atop the hatch cover, **bending over to pull the louvre board up** before letting it go to close. He lost his balance, flipped over, and fell on the side railings of the vessel and eventually overboard on the jetty side.

Notwithstanding the medical care received, the second mate succumbed to his injuries

Risk Alert



Ref: Hatch cover vent (close to shipside) [Transport Malta - Safety Investigation Report – 05/2016](#)



Ref: A typical hatch cover vent flap [Transport Malta - Safety Investigation Report – 05/2016](#)

[Transport Malta - Safety Investigation Report – 05/2016](#)

Case 8

Fatality – Fall on deck from hatch cover top

A container vessel at Kwai Chung Container Terminals, Hong Kong – 14 June 2014

A stevedore fell about 2 metres from the top of a hatch cover onto the deck passage. He was spotted lying on the deck passage by a crane operator and was seen to raise his hand but was unable to answer a walkie talkie. He was found unconscious, conveyed to the hospital and subsequently succumbed to his injuries.



Ref: Location of fall [MAISSPB Report Dated 28 July 2015](#)

There were no witnesses to the incident, however an investigation and CCTV footage later revealed that he was working alone and that this probably contributed to the loss of valuable time in receiving immediate medical treatment as his fall was unobserved.

[MAISSPB Report Dated 28 July 2015](#)

Case 9

Fatality - Electrocution / Unsafe act when connecting reefer socket

During routine cargo operations onboard a feeder containership a crew member was subjected to a fatal electric shock. In **attempting to by-pass the safety interlock** of a faulty electrical reefer socket, the crew

Risk Alert



member accidentally inserted a screwdriver into the reefer socket.



Ref: Faulty socket and mechanism [MPA SRS e-Bulletin 2015/ISSUE 03](#)

Wet ambient conditions caused the current flowing through the ship's power supply (440V) to the reefer socket into the crew member's body, causing his death due to a heart attack. Autopsy revealed the Blood Alcohol Content (BAC) of the deceased was 90mg/100ml, more than 3 times the limit prescribed in STCW Convention and the company's Drug & Alcohol Policy

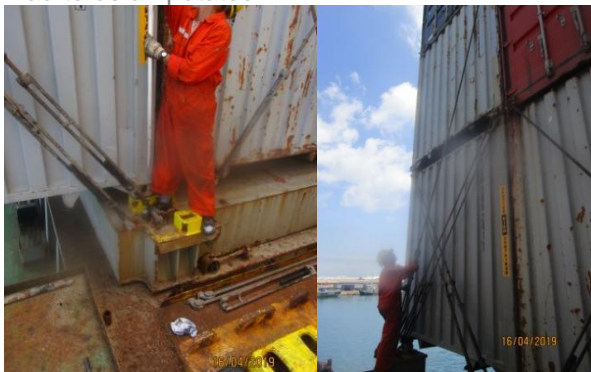
[MPA SRS e-Bulletin 2015/ISSUE 03](#)

Case 10

Serious Injury (while lashing)

A container vessel at Oran, Algeria – 14 Mar 2019

The lower end of a long lashing bar fell onto the seafarer's right foot, cutting through his safety footwear. One toe on the seafarer's right foot was severely injured and had to be amputated.



Ref: Crew member demonstrating hooking and connecting a long bar to a turnbuckle [Transport Malta - Safety Investigation Report – 04/2020](#)

[Transport Malta - Safety Investigation Report – 04/2020](#)

Considerations and Recommendations

The above incidents and their investigations address a wide range of hazards that have resulted in serious, and often tragic consequences, that could have been prevented by following appropriate procedures and exercising due care and attention.

The following are to be considered:

- Risk identification
- Effective barriers and control for risk mitigation
- Effective training
- Understanding of workplace safety
- Effective implementation of workplace safety
- Effective safety culture

Identifying hazards as a part of routine risk assessment is an important exercise. It is equally important to ensure that the identified risk control measures are effectively implemented. Physical control measures such as, lock-out/tag-out, safety signs, barriers, markers, tagging and isolating damaged or condemned gear, etc should be applied as appropriate.

Training needs should be identified, and an appropriate training programme implemented. Vessels, in their equipment and design, constantly evolve, often with new operational characteristics that will need to be considered along with crew training, experience, and familiarity.

PPE should be in good condition, of correct size/fit and when correctly worn can save lives.

Care needs to be exercised when planning and assigning work activities on deck during cargo operations. Aspects such as the experience, fitness and suitability of the task team, location of work, ambient conditions, and other activities in the vicinity of the work area are important considerations.

When working alone or operating in a blind sector clear communication are essential, communicating intent is crucial along with regular status checks with team member(s) at key stages and at frequent intervals.



Risk Alert

Containers are heavy, even an empty standard 20' container can weigh around 2T; and 30T when fully loaded. Similarly lashing gear can be cumbersome for a single person to handle during lashing and securing operations. As an example, a 20kg long bar is hooked at a height far above the natural reach of an average person, then connected to a 20 kg turnbuckle with the possible need for additional connectors. The equipment can be greasy, slippery to hold and in conjunction with the ambient conditions this can represent an onerous task for a single person.

Smaller vessels may find their decks to be at a similar level as the berth. A quick jump across, instead of traversing the ships length to get to a gangway, could be tempting for some. Similarly, a dangerous walk over an unguarded hatch cover/coaming may save time and effort but expose the individual to a serious risk.

Fatigue and mental health are often being identified as contributory causes in incidents. Studies suggest that the effects of fatigue can be slowed thinking and reaction time with delayed / false response. The correlation between quality of sleep and fatigue also cannot be ignored. The consumption of alcohol can further affect reaction times and situational awareness.

Conclusion

Training and reinforcement of safe work practices is of paramount importance not only to ensure an individual's personal safety but also to ensure that the work area remains safe for others. All parties involved in cargo operations should recognise their shared interest in ensuring that cargo operations are carried out in a safe and efficient manner. Tools for supporting a safer working environment should include a near miss reporting system to improve safety awareness and a no blame safety culture that encourages the crew to speak out when they observe or experience unsafe working practices.

The above guidance supplements other widely available industry guidance which is not addressed in this risk alert.

**Carelessness Creates New Risks
Avoid Shortcuts**

Suggested References

- Code of safe working practices
- Maritime Labour Convention, 2006

Citations / Acknowledgements / References

The club would like to acknowledge and thank the investigating bodies and other sources for allowing us to use the information contained in the referenced publications and reports. Below citations refer to the reports used.

Transport Safety Investigation Bureau (TSIB) – Singapore

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