

LESSONS LEARNED FROM MARINE CASUALTIES

1 FATALITY

Very serious marine casualty: tug master struck by a falling stores container

What happened?

While discharging a routine parcel of crude oil alongside an oil terminal, a 58,000 GT tanker was simultaneously using its crane to receive stores from a barge (with an assist tug), which was secured on the tanker's seaside. The barge had two deckhands and the tug master in attendance. The storing operation was being conducted by six members of the tanker's crew, who were being supervised by the off-duty third mate. An additional officer had also been called to assist. The Bosun was operating the crane while the remaining crew/officer were engaged in unloading the stores and transferring them to the galley.

The procedure for the operation was as follows:

- The vessel's crane hook was lowered to the barge.
- The crane hook was fitted with a four-legged chain sling.
- Two web slings (left in place under the container when it had been loaded onto the barge) were attached to the chain sling arrangement.
- A deckhand on the barge signalled to the Bosun by hand that the lift was ready, and the Bosun then operated the crane.
- As the weight came on the chain slings, the barge deckhands held the slings as far out toward the sides of the container as possible.
- The container was then lifted from the deck of the barge.
- When the container was above shoulder height, the two deckhands moved aft along the barge to positions clear of the area under the lift.

After transferring the first container to the tanker, the barge deckhands arranged for a second container to be transferred. They then moved away, leaving the tug master on the main deck of the barge to look out for the returning first container. On board the tanker, the second container was being emptied while the nearly empty first container was prepared to be transferred back to the barge with some frozen fish to be returned.

The assisting officer placed the web slings under the container's open forklift tyne slots, hooked up the ship's crane and, after some adjustment to make the container and slings stable, directed the lift towards the barge. Once the container cleared the ship's rail, the officer moved his attention away from the site. As the container was being lowered, it rotated out of the slings and fell onto the barge below, striking the tug master who was standing under it.

Why did it happen?

- The stores container was incorrectly rigged on board the tanker. While the barge crew knew where and how to place the slings, they assumed that the ship's crew would likewise return the container. However, the web slings were passed

through the open forklift tyne slots rather than the closed tyne holes. As a result, the container was easily unbalanced and toppled free from its slings as it was being lowered to the barge.

- The tanker's crew did not warn the crew of the barge of the returning container and thus, the barge crew did not pay attention to the operation. As a result, they were not aware that the container was being returned.
- There was lack of supervision during the storing operation despite two officers being present. As a result, the crane operator was, in the absence of any other clear direction, the person in charge.
- The ship's and the barge's crews viewed the storing operation as a routine task and had developed a false sense of security about the dangers associated with loading and unloading stores.

What can we learn?

- Relevant and appropriate job hazard analysis, risk assessment and tool box talks, even for tasks that seem routine, can increase awareness of the risks involved.
- Effective communication between the involved parties can help to ensure that everyone has the same mental model of a hazardous situation.
- When in doubt, ship's officers and crew should seek clarification from senior officers and/or shore contractors, especially when handling non-ship's equipment.
- Personnel involved in cargo operations should always stand clear of suspended loads.

Who may benefit?

Seafarers, shipowners, ship managers.

2 FATALITY

Very serious marine casualty: able seaman struck by debris from exploding windlass motor

What happened?

While waiting for its berth to load a cargo of coal, a 39,000 GT bulk carrier anchored in a designated anchoring position as provided by the port authority. The next day the port authority instructed the vessel to shift its anchor position further south, and the vessel then re-anchored and brought up to seven shackles on deck on its port anchor. The nature of the sea-bed at a depth of 53 metres was a mixture of fine sand and shells.

Two days later, while still at anchor the wind speed increased to Force 6. Sea swell was about 2-3 metres. The chief mate was sent to check on the anchor cable. The officer reported dust coming out of the windlass, there was excessive weight on the anchor cable and the bow securing pin was bent.

The bow securing pin from the starboard anchor was used to replace the one on the port anchor cable, which also got bent shortly afterwards. A stainless steel rod was then fabricated on board to replace the newly bent pin.

At night time the duty officer, who was asked to check on the condition of the cable, reported that the distance from the nearest ship was reducing and confirmed that own vessel was dragging anchor. Stations were called and main engines were prepared. The hydraulic power pack for the windlass was switched on. The chief officer, along with six crew at the forecandle, prepared to heave the anchor. As the cable was up and down, the master used the engines (half ahead) to keep the vessel away from dragging onto the nearby ship. The anchor cable lay astern as the vessel moved ahead and dredged on its anchor. Subsequently, moderate weight came on the cable and the cable came back to up and down. Heaving of the anchor resumed. The master then notified the port authority of his intention to shift the anchor position.

Subsequently, the lay of the anchor cable changed from up and down to ahead medium stay to abeam short stay to astern. At some point when the cable was leading astern the anchor could not be heaved up any further. As the attempt to heave the anchor continued, the crew saw sparks flying out of the port windlass. The windlass operator, an able seaman, applied the brake on the anchor cable. Soon after, the windlass motor exploded and flying debris from the explosion hit the windlass operator on his neck and jaw.

The power to the windlass was stopped by the other crew and the brake was re-applied. On-site first aid and pressure to the wound of the injured operator were applied by the crew. The master requested medical assistance. An hour later the injured operator stopped responding and was declared deceased by paramedics an hour thereafter.

The port anchor was subsequently heaved up using the motor from the starboard windlass. The anchor was noted to be fouled with an abandoned anchor chain on the sea-bed.

Why did it happen?

- Operation of the port windlass hydraulic motor in the reverse direction would have resulted in severe rise of hydraulic pressure inside the motor due to the positive displacement pumping action, causing the motor to explode.
- The loading capacity of the windlass was exceeded due to dragging anchor, shock loading due to heavy rolling and pitching of the vessel in severe conditions, frictional force due to chain rubbing against the hull and fouling of the anchor by an abandoned anchor chain.
- The master had not fully assessed the future weather conditions at the anchorage to prepare for heaving the anchor before the weather worsened.
- The windlass manufacturer had not provided any safety guards around the windlass on existing vessels to protect the crew. These however had been provided on new vessels.

What can we learn?

- Appropriate training and familiarization on board is necessary to ensure the correct handling procedure for the anchor windlass and vessel, with special emphasis on circumstances such as anchor dragging, adverse weather conditions, anchor fouling, etc. which may place excessive load on the windlass equipment.
- Severe weather conditions can place excessive loads on the windlass motor and ship's crew should take appropriate precautions in a timely manner to avoid such loads.

- Physical guards may protect crew from potential explosion of a windlass hydraulic motor.

Who may benefit?

Seafarers, shipowners, ship managers.

3 FATALITY

Very serious marine casualty: master and oiler struck by deck cargo in bad weather

What happened?

While on passage in bad weather, the master of a 23,000 GT bulk carrier summoned crew members to the main deck in order to secure some loosened deck cargo lashings. A high wave struck the vessel, causing further shifting of the deck cargo and the breaking up of cargo lashings. It is believed that the shifting cargo hit the master and an oiler, although nobody witnessed the accident happen at the material time.

Nearby ships were called for help. As a result, a naval ship arrived to provide assistance to the vessel. A helicopter was arranged to transfer the injured oiler, who was in a stable condition, to the nearest hospital ashore, but the master was declared deceased.

Why did it happen?

- The rolling and pitching of the vessel causing the cargo to shift.
- The master and crew accepted working in an unsafe environment.
- There was a lack of an effective risk assessment with regard to the hazards involved in securing the loosened deck cargo lashings.
- The master was overconfident in securing the deck cargo lashings without following company safety procedures, and in carrying out the work himself instead of arranging and supervising other crew members to do so.

What can we learn?

- Risk assessment is essential and helpful in order to assess and improve ship operations with respect to the reduction of fatalities and hazards to the crew, the vessel, and the environment.
- The identification, assessment, and management of risk must be dealt with in identifying the elements to be assessed, the reason for the assessment, details of the activities related to them, and to establish adequate controls and procedures. In this accident, nobody, not even the master, was designated for supervision and there was no effective communication between the working crew. A proper risk assessment of working in bad weather conditions must be conducted and discussed before commencing operations on the weather deck, such as securing deck cargo lashings, mooring, or electrical jobs.
- A proper risk assessment must be conducted before any work on deck when bad weather is forecasted. The results of the risk assessment should be discussed with the crew and all controls to mitigate the risks should be in place before work begins.

- Regular safety meetings are important opportunities for all crew members to evaluate and discuss their safety sense and improve their knowledge and approach to any shipboard operation.

Who may benefit?

Seafarers, shipowners, ship managers.

4 FATALITY

Very serious marine casualty: fatality following entry of an enclosed space

What happened?

A 24,000 GT general cargo ship was discharging a bulk coal cargo. When the cargo discharge from one of the cargo holds had been completed, the second deck officer (the 2/O) decided to check the structural integrity of the cargo hold and entered the space without informing others. When an able seaman (the AB) failed to receive feedback to his portable radio call to the 2/O, he decided to look for him. When the AB noticed that the cargo hold access hatch cover was open for no apparent reason, he entered the space through the hatch access. Before the AB could call the chief officer about his finding the 2/O, who had lost consciousness inside the space, he collapsed with the 2/O.

When the missing 2/O and AB came to the mind of the chief officer and they failed to respond to his portable radio call, the chief officer instructed a sailor to look for them. The sailor eventually managed to discover from outside the cargo hold access hatch that the AB was lying inside the space, and he decided to rescue him by entering the space. Once inside the space, he felt dizzy but managed to call the chief officer before fainting. When the chief officer went to the cargo hold access hatch and realized the situation, he returned to the accommodation, triggered the general alarm to summon a rescue team and notified the port authority, requesting help.

The rescue team successfully brought out the three crew members from inside the space. They were then taken to hospital ashore. The 2/O was later certified deceased. The sailor and the AB recovered on the same day.

Why did it happen?

- Safety procedures for entry of an enclosed space (Safety Management Manual, SOLAS regulation III/19 and resolution A.1050(27)) were not followed.
- There was a communication breakdown among working crew on board. The 2/O failed to use a safe alternative access to the cargo hold, which was a ladder used by stevedores for cleaning the cargo hold throughout that day.
- The victims did not use personal protective equipment suitable for enclosed space entry, and they did not have permission to enter the space.

What can we learn?

- Numerous enclosed space accidents are the result of non-compliance with safety procedures for entering an enclosed space.
- Never enter an enclosed space unless safety procedures for entering an enclosed space are in place, including arrangements for dealing with emergencies and rescue.

- No attempt should be made to rescue someone unless safety procedures for entering an enclosed space are followed.
- The atmosphere in an enclosed space can quickly become hazardous.
- Within an enclosed space, if a person perceives changes to their well-being, or suspects an emerging serious and imminent risk, the space should be vacated immediately.
- Enclosed space entry and rescue drills must be conducted and participated in as required by SOLAS regulation III/19.
- Use of "Atmosphere testing instrument for enclosed spaces" in accordance with SOLAS Regulation XI-1/7

Who may benefit?

Seafarers, shipowners, ship managers.
