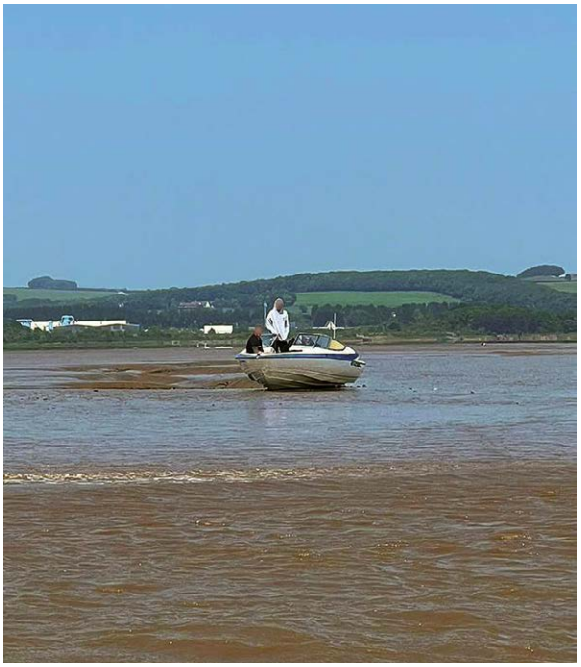
MAIB
MARINE ACCIDENT INVESTIGATION BRANCH

SAFETY DIGEST

Lessons from Marine Accident Reports

1/2025



Featuring introductions by Gary Doyle | Anne Hornigold MBE | Mark Bleecker

MARINE ACCIDENT INVESTIGATION BRANCH

The Marine Accident Investigation Branch (MAIB) examines and investigates all types of marine accidents to or on board UK vessels worldwide, and other vessels in UK territorial waters.

Located in offices in Southampton, the MAIB is an independent branch within the Department for Transport (DfT). The head of the MAIB, the Chief Inspector of Marine Accidents, reports directly to the Secretary of State for Transport.

This safety digest draws the attention of the marine community to some of the lessons arising from investigations into recent accidents and incidents. It contains information that has been determined up to the time of issue.

This information is published to inform the merchant and fishing industries, the recreational craft community and the public of the general circumstances of marine accidents and to draw out the lessons to be learned. The sole purpose of the safety digest is to prevent similar accidents happening again. The content must necessarily be regarded as tentative and subject to alteration or correction if additional evidence becomes available. The articles do not assign fault or blame nor do they determine liability. The lessons often extend beyond the events of the incidents themselves to ensure the maximum value can be achieved.

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The editor, Clare Hughes, welcomes any comments or suggestions regarding this issue.

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GLOSSARY OF TERMS AND ABBREVIATIONS

°	degrees
°C	degrees Celsius
2/E	second engineer
AGM	absorbent glass mat
C/E	chief engineer
cm	centimetre
CO_2	carbon dioxide
COLREGs	Convention on the International Regulations for Preventing Collisions at Sea, 1972
CPR	cardiopulmonary resuscitation
DfT	Department for Transport
DSC	digital selective calling
ECDIS	Electronic Chart Display and Information System
kts	knots
m	metre
“Mayday”	the international distress signal
MCA	Maritime and Coastguard Agency
MOB	man overboard
OOW	officer of the watch
PFD	personal flotation device
PPE	personal protective equipment
PTX	pilot/tug exchange
STCW Convention	International Convention on Standards of Training, Certification and Watchkeeping for Seafarers 1978, as amended
TSS	traffic separation scheme
UKC	under keel clearance
VHF	very high frequency
VRLA	valve-regulated lead acid

CHIEF INSPECTOR’S INTRODUCTION

Welcome to the MAIB Safety Digest. As usual, I will start by thanking Gary Doyle, Anne Hornigold MBE and Mark Bleecker for their respective introductions to the merchant, fishing and recreational sections of this edition. Each is an expert in their own field, and their respective industry insights help bring contemporary context to the cautionary tales and safety messages in the following pages. I hope you will find time to read the whole edition as there is something here for everyone, but please do read the section introductions.

In my opening remarks, I would normally highlight some themes that stand out from the cases on the following pages. However, following the very recent collision between the container vessel *Solong* and the tanker *Stena Immaculate* I am going to break from tradition. This is not to offer privileged insights – it is way too early in the investigation for that – but because it appears to be yet another collision that simply should not have happened.

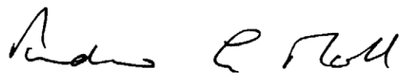
Over the last few years, the MAIB has investigated more than its fair share of collisions. Anyone who says that merchant vessel collisions just result in some bent metal needs to think again. Recently published are the reports into the collision between the cargo vessel *Scot Carrier* and the split hopper dredger *Karin Høj*, resulting in the loss of two lives, and the collision between the general cargo vessel *Scot Explorer* and the gas carrier *Happy Falcon*; very fortunately a glancing blow that resulted in only minor damage. Still to publish are: the collision between the oil tanker *Apache* and the fishing vessel *Serinah*, which sank following the collision; the collision between the bulk carrier *Polesie* and the general cargo vessel *Verity*, resulting in the loss of five lives; and, of course, the collision between *Solong* and *Stena Immaculate* that resulted in the loss of one life, significant pollution, and the likelihood that one if not both vessels will be a constructive total loss.

Keeping a good lookout by all available means is, of course, key to identifying the risk of collision (COLREGs[1] Rule 5). If you do not see it, it is unlikely that you will take action to avoid it. However, I have also seen a tendency by stand-on vessels (COLREGs Rule 17) to maintain their course and speed in the firm belief that the other vessel must give way, despite clear evidence that the other vessel is doing no such thing. Rule 17 requires the stand-on vessel to take avoiding action when the action by the give way vessel alone will be insufficient to avoid a collision. But why wait that long? Rule 17 also allows the stand-on vessel to take action as soon as it becomes evident that the other vessel is not taking sufficient action, and it seems to me that is the sensible thing to do. Waiting until collision is imminent can leave few options for effective avoiding action, and no time to correct if the other vessel then does something unexpected.

I remember as a young cyclist trying to understand the complexities of ‘right of way’ on the roads, and a Dale Carnegie quote that my father used when he thought I was pushing my luck:

> *Here lies the body of William Jay, who died maintaining his right of way— He was right, dead right, as he sped along, But he’s just as dead as if he were wrong.*

Dale Carnegie’s words might be considered insensitive today, but the sentiment still rings true. Whatever the size of your vessel, please keep a good lookout and navigate with caution.



Andrew Moll OBE
Chief Inspector of Marine Accidents

1 Convention on the International Regulations for Preventing Collisions at Sea, 1972.

MERCHANT VESSELS

As you approach the twilight zone before retirement you look back over your career and can sometimes be guilty of reminiscing through rose-tinted glasses; remembering the good times, skimming over the bad but above all remembering the people you worked and served with. The one constant is safety, and how the individual and team approaches it, though it would be fair to say I have witnessed a considerable change for the better in the 45 years since I walked through the gates to join the Royal Navy.

The work of the MAIB and the safety digest, certainly in my last 8 years at Peel Ports, has been in sharp focus with the principle of a no blame culture and the desire to find out what happened to stop reoccurrence is one we as an industry should be thankful for. Besides my surface career, I was also fortunate to serve in the Fleet Air Arm and there are many common and transferable approaches to safety management within the aviation and maritime sectors. One that we used to good effect was the 'Cockpit Article'. Following a transgression or emergency event the 'perpetrators' were encouraged to write an article entitled 'I learnt about flying from that'. This was part of a no blame culture that allowed the rest of us to understand how it happened but, more importantly, what was going through their minds, how they got themselves into that situation, and how they got out of it! It also helped those involved to exorcise their demons. A rhetorical question for us all: How good are we as an industry at sharing best practice and learning from incidents that do not make it into the digest? I am pleased to say that safety is the number one priority at Peel, as it is in all port authorities, and it has been encouraging to see how the marine departments have recently collaborated on safety initiatives, regardless of the commercial aspects.

Living and working in the marine industry is an experience unlike any other, demanding respect, discipline and adaptability as situations can switch from calm to unpredictable danger in a moment. Our focus as harbourmasters is to ensure we have the correct procedures and safety culture, with appropriately trained teams to manage day-to-day marine operations safely and respond effectively to an unexpected event or crisis. I have tried to stick to the following principles that have developed over the years: respect for the procedures; awareness and teamwork; preparation and training; and mental resilience. Also, remembering that just because a good plan did not work out did not make it a bad plan – stuff happens, it is how we react that matters! While I admit that my application of these standards was not always successful, the intent was there.

Adherence to safety guidelines is non-negotiable and there needs to be effective communication to ensure the workforce are aware of these golden rules and empowered to enforce them, halting operations or stopping a sailing or indeed an arrival, often in the face of considerable commercial pressure. We must respect the procedures and do what is written down. Yes, we need dynamic risk assessments when things change, but these again are a measured operation.

Awareness and teamwork is important because safety depends on group as well as individual actions. There are a number of incidents were better communication or better use of resource would have avoided tragedy. The ability of someone to stand back and take a holistic view is vital, especially during pilotage when bridge resource management to support the pilot is a crucial collective responsibility. The consequences of an incident on the dockside during berthing and unberthing can be similarly catastrophic: Who is watching the team to ensure they do not get caught in that bight or walk off the quay edge? Who has noticed the ship's crew trying to embark/disembark inappropriately? Our ports have experienced all three during my tenure, one with a fatal outcome that, although not directly one of our operations, happened in our Statutory Harbour Authority and prompted a lot of soul-searching and an in-depth review of our group policies, training and PPE provision. From a marine perspective it was interesting to see how many people had not experienced what it was like to 'fall in the water' and know how their PPE would work, and perhaps understand how there was a degree of complacency. It is now compulsory for the marine department and anyone from the wider company wishing to embark a vessel to have completed that course.

Which brings me on to preparation and training. Invest in marine staff, train them appropriately and conduct regular drills to reinforce readiness for emergencies and give them the confidence to act. Analysis of our incident statistics over the last 8 years reveals that the number one issue has been mechanical breakdown on board vessels. The recent *Dali* incident, and to a differing degree that of *Evergiven*, are stark reminders of the evolving challenges in maritime safety and the impact these have when it all goes wrong. They are forcing us to reflect on key safety considerations: What is our infrastructure resilience to an impact from today's larger vessels? Do our procedures, risk assessments and control measures consider this? As an operator of lock entry to dock systems we are as concerned by the power supply and control resilience as the potential physical impact of vessels or the pressure of the high tides. What redundancy do we have and what are our cyber protection protocols? More broadly, have today's vessel maintenance and regulatory enforcement requirements also moved with the times? Have we the transparency of reporting required to enable authorities to 'accommodate' and manage any declared issues with additional control measures?

Lastly, safety is both a physical and psychological quality and therefore requires mental resilience. Managing stress, fatigue and isolation are critical to ensure sound decision-making in difficult moments. How well do we know our teams and can we spot an issue?

In summary, I would describe this approach to safety as more than just adhering to a set of thought-out safety practices; it is about complementing them with a mindset where caution and awareness are part of daily life.

GARY DOYLE | Group Harbour Master, Peel Ports Group

Gary joined Peel Ports in 2017 as Group Harbour Master and Statute Harbour Master for its seven harbour authorities. He is responsible for leading and developing the Group Marine Operations Strategy, the evolution of marine operations through the embracing of technological advancements to ensure safety standards are maintained. He is the current chair of the British Ports Association/UK Major Ports Group Marine Pilot Working Group.

Gary first went to sea in 1980 as a Royal Navy officer cadet, serving in various positions from officer of the watch to captain throughout his 38-year career as a seaman/warfare officer on vessels ranging from patrol boats to aircraft carriers. He also qualified as a helicopter observer, serving on a number of frigates as a member of the embarked flight and latterly as the Fleet Air Arm senior operator to the duty holder responsible for operation safety. Gary's introduction to harbourmastering was a brief spell as a Queen's Harbour Master watchkeeper in Port Stanley in 1982.

Dangerously weighted heaving lines

The MAIB has been recording incidents involving dangerously weighted heaving lines used in British ports for the last 2 years. While there have fortunately been few cases of injury or damage the risk remains, and is a continuing concern.

A member of the public was recently injured by a heaving line sent from a sail training vessel. The weight used on the heaving line was of rubber construction and bounced when sent ashore, striking the person as they walked past. The marina was accessible to the public and busy with foot traffic at the time of the accident. A single member of harbour staff was assisting with mooring operations and was not in the area where the line was thrown ashore. The member of the public sustained head and eye injuries that continued to affect their health and functioning for a long time afterwards. In another incident, the weight on the end of a heaving line was enough to result in the window of a pilot boat being broken.

Types of weighted heaving line

Heaving line weights come in various shapes and sizes and present different risks to people. Mass produced heaving line weights from outside the UK can be made of rubber, or rubber with a metal core. This presents a risk to the public due to the likelihood of the weight bouncing and striking people under the chin, on the face, or on other areas not protected by a safety helmet. Additionally, rubber weights with a metal core might be far heavier than the 500g maximum weight limit for a heaving line weight.

Other heaving line weights are homemade and come in an even wider variety of 'innovative' designs, from the classic monkey's fist, filled with metal scrap and occasionally painted to give it a hard exterior, to unusual constructions such as paint and metal scrap poured into a plastic bottle and left to harden to form a weight. Metal scrap is both heavy and sharp and can cause serious injury if it strikes someone.

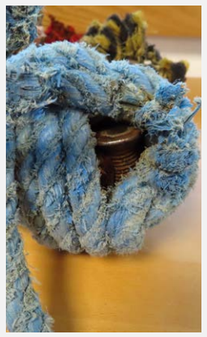
▲ Metal scrap poured into a plastic bottle

Although such weights might seem like a practical solution to sending heaving lines ashore easily, their dangerous design and composition poses a significant risk of harm and they are illegal in the UK. The penalties for a vessel include fines and confiscation of the offending item.

Many ports in the UK are willing to provide safe alternatives such as sandbags to replace dangerously weighted heaving lines.

Photographs courtesy of Peel Ports and the MCA

▲ ▼ Dangerous monkey's fists filled with metal scrap



▲ Rubber weight (metal core)

▲ Iron weight

Safe, highly visible sandbag ►

Please continue to report the use of dangerously weighted heaving lines, and include photos and weights of the items when doing so. These documented incidents highlight the risks posed by such practices, and provide the means to educate those involved in mooring operations to identify common mistakes when weighting a heaving line and implement safe alternatives.

Thank you for supporting us to spread this important safety message.

Every day is a school day

bulk carrier | grounding

A bulk carrier under pilotage had one last bend in the river to negotiate before making its final approach to the dock entrance. With the remnants of the flood tide behind them, the pilot had timed the arrival perfectly to achieve a maximal under keel clearance (UKC) for passage over the dock sill. Suddenly, and without warning, the bulk carrier lost speed and started juddering. To the pilot and the master it felt like the ship had gone aground; however, with the Electronic Chart Display and Information System (ECDIS) still showing the ship as being only about 35m to starboard of track in a 220m wide channel, and with at least 5m height of tide giving them a large UKC, they were confused as to what could possibly have happened.

Source: Made Smart Group BV 2024

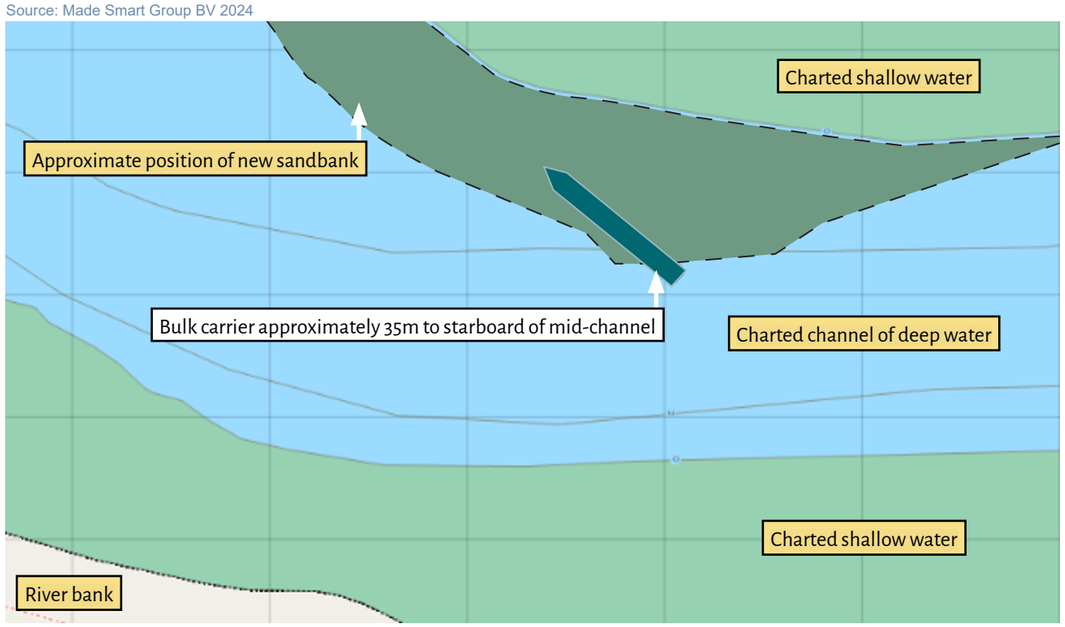


Figure 1: The bulk carrier's position near mid-channel shortly after going aground

The pilot tried to extricate the ship from the apparent grounding by using maximum power astern but, aside from making the ship's stern pivot around more to port, this had little impact other than to point the bows further towards the new sandbank (Figure 1). The ship's team sounded their tanks and found no water ingress. With the tide now ebbing, it became clear that the bulk carrier was firmly aground. Having informed all the relevant local authorities and examined towing options it was inevitable that the pilot and ship's crew would have to wait until the next high tide to free themselves. The pilot stayed on board as a contingency measure during the long wait. At low water it was seen that the sandbank on the inside of the river bend had extended almost 200m further out into the river than it had previously, and that it was this that had caught the bulk carrier unawares (Figure 2).

The harbourmaster sent a team to visually inspect the river at low water and check for other changes that might impact other shipping using the port and dock. No significant changes were noted compared to the last visual river channel inspection 4 days earlier. Unfortunately, the bulk carrier did not manage to free itself at the next high water and had to wait a further 3 days for a high enough tide to lift it clear of the new sandbank. Once afloat the bulk carrier made its entry to harbour for cargo operations and a damage assessment. Despite the length of time aground the ship was undamaged and was cleared to continue operations.

Figure 2: The bulk carrier firmly aground and waiting for high water

The Lessons

1. **Action →** The pilot and master both took appropriate actions once the grounding became apparent. Raising the alarm early, making attempts to pull free of the sandbank and checking tanks quickly all served to warn other ships, assure the cargo and ship's structural integrity, and reassure all that the situation was under control. Although the bulk carrier was undamaged, the pollution plan was discussed and contingency plans were refreshed. These immediate actions ensured that the right people knew what was happening, what the risks were, and what options were available.

2. **Risk →** At school, many would have been taught about river systems and how they meander through time. Sediment is deposited on the inside of bends and the outside of bends suffer from erosion due to the scouring effect of stronger currents; it is also where the deeper water lies. Charts and sailing directions of river systems regularly give cautions about shifting sands. Hydrographic surveys are only truly correct at the time the data was collected and much can change post-survey. If considering navigating on the inside of river bends then watch out for water disturbances on the surface, follow echo sounder depths closely, and be sensitive to surface water discolorations; all might warn of the risk of shallow patches.

3. **Monitor →** As a result of this incident the harbour authorities plan to install a fixed closed-circuit television camera system to provide a more accurate assessment of the position of the channel and any movement of the bank on the stretch of the river involved. This simple use of technology could prove to be an excellent way of monitoring risks and keeping river users safe.

Is your battery safe?

barge | explosion

A barge crew member escaped injury when a bank of four lead acid batteries exploded on starting a generator engine after completing the start-up checks. The four batteries simultaneously exploded as the start solenoid closed to power up the starter motor. Fortunately, the bank of batteries was housed in a secure steel battery locker that contained the explosion and limited the damage (Figure 1).

An investigation found that the batteries, which had been in service on the vessel for more than 5 years, were of a low maintenance, valve-regulated lead acid (VRLA) type that was incorrect for their intended purpose due to the battery circuit being maintained by a continuous float charge. The battery charging system was found to be working correctly, maintaining the required rate of trickle charge.

Given the wet cell nature of the batteries and the length of time they had been in service, it is most likely that the electrolyte level had gradually dropped because of continuous float charging. This exposed the top of the cell plates, which probably started to corrode. The cells shorted out when the batteries were subjected to a high discharge load, causing the explosion (Figure 2).

Figure 1: Battery locker after the explosion

Figure 2: Destroyed batteries

The Lessons

1. **Equipment →** It is important to select the right type of lead acid battery for the intended purpose:

   Flooded or wet cell batteries contain an electrolyte of sulphuric acid/distilled water and require regular maintenance to retain the correct electrolyte level in the cells. These batteries must be stored upright to prevent leakage. This type of battery is most suitable for installations that utilise float charging in the battery circuit to maintain the charge. The service lifespan is 5 years to 7 years;

   Low maintenance wet cell VRLA batteries have sealed cells with a valve arrangement to release the gases created by charging the battery. The electrolyte level cannot be maintained by topping up. These batteries are most suitable for intermittent use where the battery circuit is not maintained by a float charge. The service lifespan is 5 years to 7 years, although batteries installed in a system using a continuous float charge should be replaced after 2 years of use due to the increased risk of explosion under high discharge loads;

   Maintenance free gel type VRLA batteries have similar properties to wet cell VRLA batteries and are most suitable for intermittent use. Batteries installed in a system using a continuous float charge should be replaced after 2 years of use;

   Absorbent glass mat (AGM) batteries are a type of VRLA battery. The electrolyte is absorbed and suspended between AGM plates to provide extended life and durability. These batteries are designed for intermittent charging use and should be replaced after 2 years if installed in a system using a continuous float charge.

2. **Maintain →** Batteries are a piece of machinery and require a documented service and maintenance log. The record should individually list the type of battery; where it is located on board; when it entered service; dates and details of any inspections or maintenance and, if applicable, what corrective action was taken; and when it is due for replacement.

3. **Hazard →** Safe stowage of battery installations is crucial to contain and minimise impact in the event of a fire or explosion. To prevent a build-up of gases from the charging process batteries should be kept in a purpose-built, well-ventilated locker in a cool, dry location away from the elements. Light fittings in a battery compartment should be corrosion-resistant and flame/explosion-proof.

A rope has two ends

cruise ship | accident to person

A cruise ship was arriving into port on a windy day and was starting to run the mooring lines to the waiting line handlers. On the jetty next to the aft end of the ship there were two vertical posts used to guide chains from offshore vessels as they were offloaded. The horns stood about 1m tall and were spaced about 3m apart.

The cruise ship ran two stern lines ashore. The waiting line handlers hauled the first mooring line ashore, leading it between the two vertical posts and placing its eye on a bollard set back from the edge of the jetty (Figure 1).

The line handlers then hauled in the second mooring line and were pulling the eye towards the bollard as the ship started to tension the first mooring line. One of the two line handlers pulling the second mooring line stepped backwards over the first mooring line as it came tight on the post. Two of their colleagues spotted the hazard and moved away from the rope under tension. However, the line handler who had stepped back over the first mooring line was focused on the task in hand, had their back to the vertical post and the ship, and so did not see the danger.

The first mooring line slipped up the vertical post and held briefly at the top before releasing, striking and lifting the line handler into the air and causing serious injury. It had taken 5 seconds for the mooring line to snag on the vertical post and then release (Figure 2).

For illustrative purposes only: not to scale

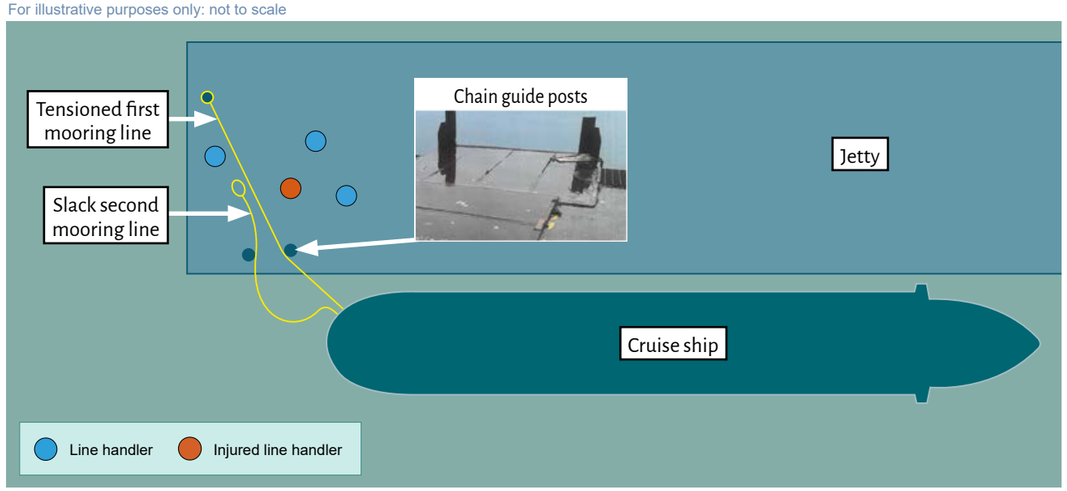


Figure 1: The jetty layout

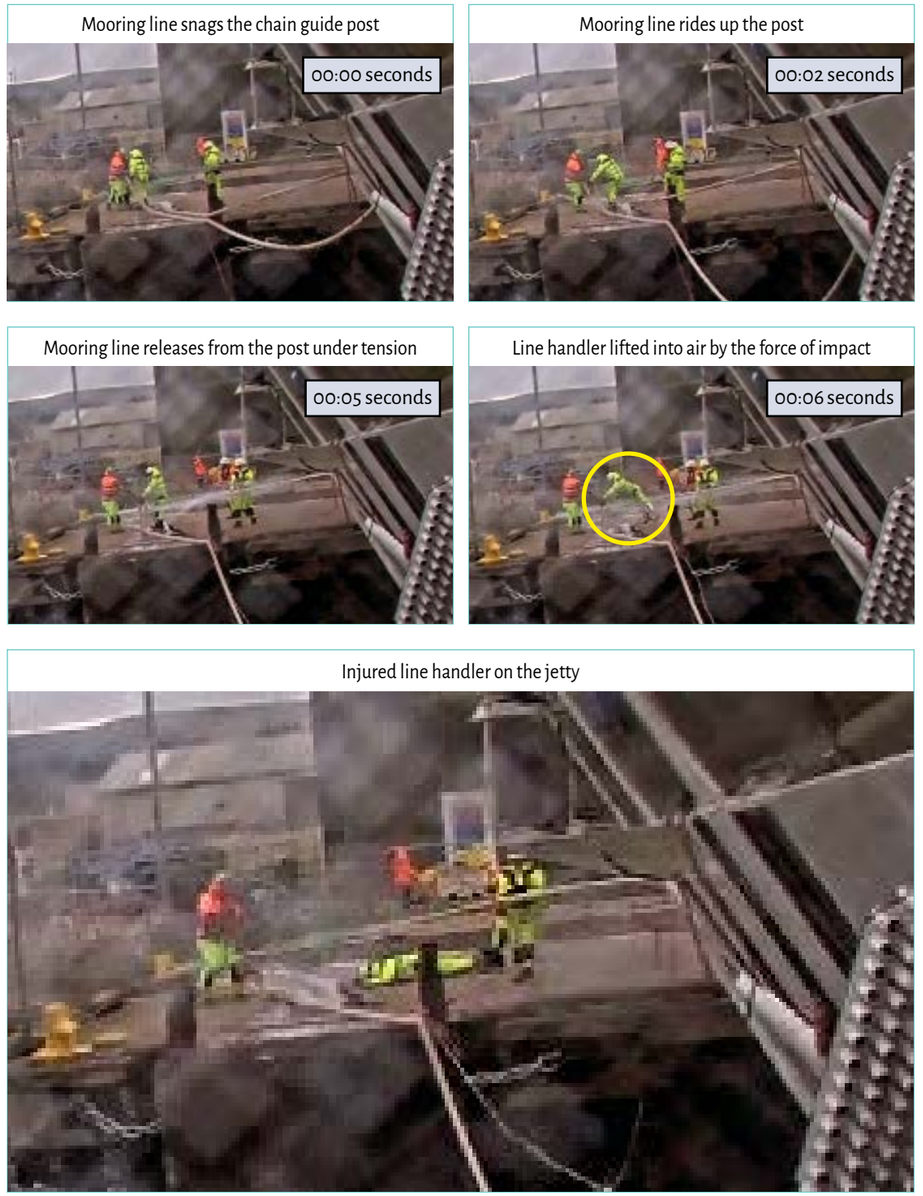


Figure 2: The sequence of events

The Lessons

1. **Aware →** Everyone involved in the dynamic environment of mooring operations should recognise the hazards posed by heavy lines that are moving and coming under tension. Be alert to the ever-present danger of snap-back on mooring decks and ashore and take appropriate steps to avoid being in a snap-back zone when mooring lines are under tension.

2. **Monitor →** Although this accident happened ashore, the mooring line was tensioned by the ship. It is vital that the movement of the mooring lines is monitored so that action can be taken if a snag occurs or if someone is spotted in a dangerous position. In this case there were 5 seconds between the line snagging and releasing, during which the accident could have been averted by stopping the winch.

3. **Plan →** The mooring line became snagged because it was led between the vertical posts. To mitigate the risk of snagging during hauling it is essential to have a plan for running the slack mooring lines ashore that considers how they will move under tension.

I can only count to eight

workboat | accident to person

A port tender was transferring two workers to a barge moored on a busy river. Two boats were already tied up to the barge so the skipper placed the tender alongside one of these. A crew member ran a mooring rope between a cleat on the port shoulder of the tender to one on the boat secured to the barge, holding the tender in place while the two workers boarded the barge. The tender had a much lower freeboard than the boat it was tied to, and the mooring rope was at a steep angle.

The river's current moved the tender against the barge and the mooring rope slipped off the cleat. As the crew member went to resecure it, the wash from a passing boat caused the tender to rise and fall. The crew member placed the eye of the mooring rope onto the cleat just as the tender descended, causing their fingers to be caught in the bight and crushed against the cleat.

The skipper heard a yelp and saw the crew member holding their hand in pain. Unaware of the severity of the injury the skipper asked what first aid was needed, to which the crew member replied, "*New fingers*". The accident had severed the tip of the crew member's little finger on their right hand and badly crushed their right ring finger (see figure).

The skipper raised the alarm and used the tender to transport the injured crew member ashore, where they were transferred by ambulance to hospital.

Figure: The crew member's injured fingers

The Lessons

1. **Hazard →** Relative movement between a vessel and its mooring point creates a dynamic environment that requires crew members to be alert to entrapment risks when handling mooring ropes. Unexpected boat movements due to strengthening or receding waves, wind and currents can cause ropes to switch from slack to taut without warning: keep your fingers clear.

2. **Equipment →** Manage the risk. The difference in height between the two boats in this case increased the likelihood that the mooring rope would slip off the cleat and need to be resecured. Where this is a routine operation, and ropes cannot be run horizontally, conduct a risk assessment of the design and fitting of the cleats to prevent slippage.

Stop splashing around

sailing yacht | capsize

Appearances can be deceptive, especially when on the water. On a clear, warm, autumnal day, a sailing training yacht had just departed its berth. Gentle breeze permitting, the plan was to head to another harbour and get under sail for the trainees to gain more experience.

The yacht had cleared the berth and was waiting to recover the yacht's tender and its two crew, who had assisted in the unmooring operation. The tender's coxswain positioned the boat beneath the yacht's stern and attached the tender to slings rigged to the yacht's davits (see figure). The yacht was beam on to the tide and passing waves.

A ladder had been rigged to allow the tender crew to embark the yacht. As the two crew moved towards the ladder a combination of the weight shift and the action of the waves inverted the tender, throwing the crew into the water. Unharmed, they were able to hold on and safely climbed the ladder. The tender was righted using the slings it was attached to, and was recovered to the yacht without damage.

Figure: The tender in its stowed position

The Lessons

1. **Revise →** Be prepared for changes to planned circumstances. The crew were following a procedure to bring the tender to the yacht after completing unmooring operations, but no assessment was made of the effect that the vessel stemming the tide had on the waves at the stern. Take the time to reassess, and implement an alternative plan that considers all the variables that a new plan introduces.

2. **Communicate →** Both crew members made for the ladder at the same time, creating the momentum needed for the tender to capsize. A small boat secured to its slings is not a stable platform when afloat and it was fortunate that the crew in this case were able to reach and climb the ladder to avoid their full immersion in the cold water.

3. **Observe →** Someone should always have oversight of what is happening on board and over the side. A mooring or unmooring operation on most vessels brings about a flurry of activity and it is easy to forget the competence levels of those involved. Watching operations from a position with a bird's eye view presents an opportunity to shout "STOP!" and gives those involved the chance to reassess their actions.

Not dolphin friendly

oil tanker | contact

An oil tanker had unloaded a cargo of vegetable oil and was preparing to leave harbour on the ebb tide, under pilotage and with the assistance of a tug. The master had requested a departure time of 0400, but 0500 was the earliest that the tug could be available. The pilot was concerned about the reducing height of tide and decided to maintain the 0400 sailing time, but without using a tug. The master was worried about sailing without a tug, but was eventually persuaded by the pilot to depart at the earlier time.

A high-density electronic navigational chart was available for the area, but safety contours in the ECDIS had not been selected with care. The contours used marked the entire area off the berth as being within the safety contour and nominally unsafe.

On departure, the strong ebb tide and constrained area for manoeuvre meant that the oil tanker was quickly taken by the tidal stream and swept down towards an adjacent jetty. In the darkness, and with no one supporting the pilot, the hazardous nature of the situation went unnoticed until it was too late. Despite the master and the pilot shouting a series of engine, helm and anchor orders, the starboard aft quarter of the oil tanker struck the nearest mooring platform (or dolphin) on the adjacent jetty with a great deal of force, dislodging a walkway and cutting all but emergency electrical supplies to the jetty (Figure 1). The oil tanker came to rest on the landward side of the jetty with its bows held by the vessel's anchor and the mud of the riverbank.

The oil tanker returned alongside assisted by two tugs and some careful pilotage, where it was assessed for damage to its starboard aft quarter.

Source: Port of London Authority (inset images)

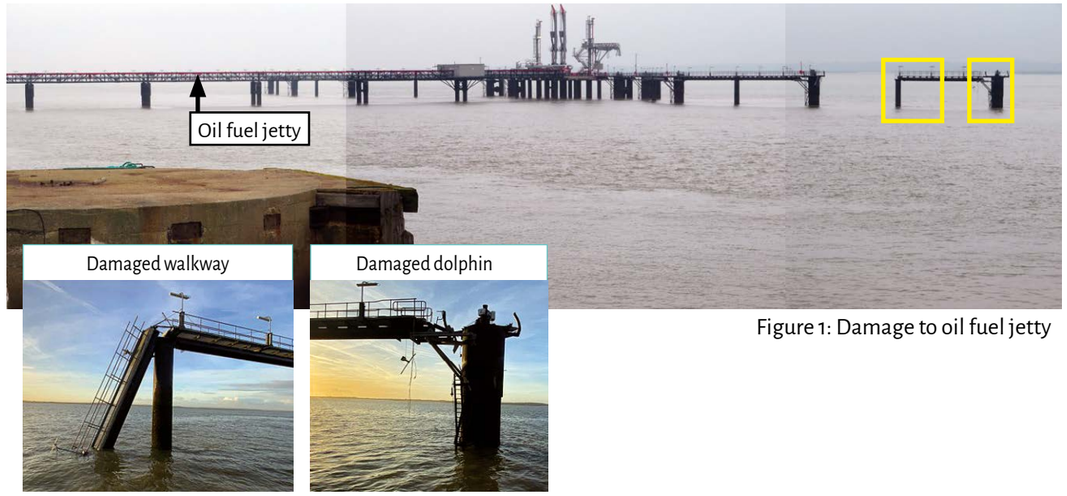


Figure 1: Damage to oil fuel jetty

Source: Made Smart Group BV 2024

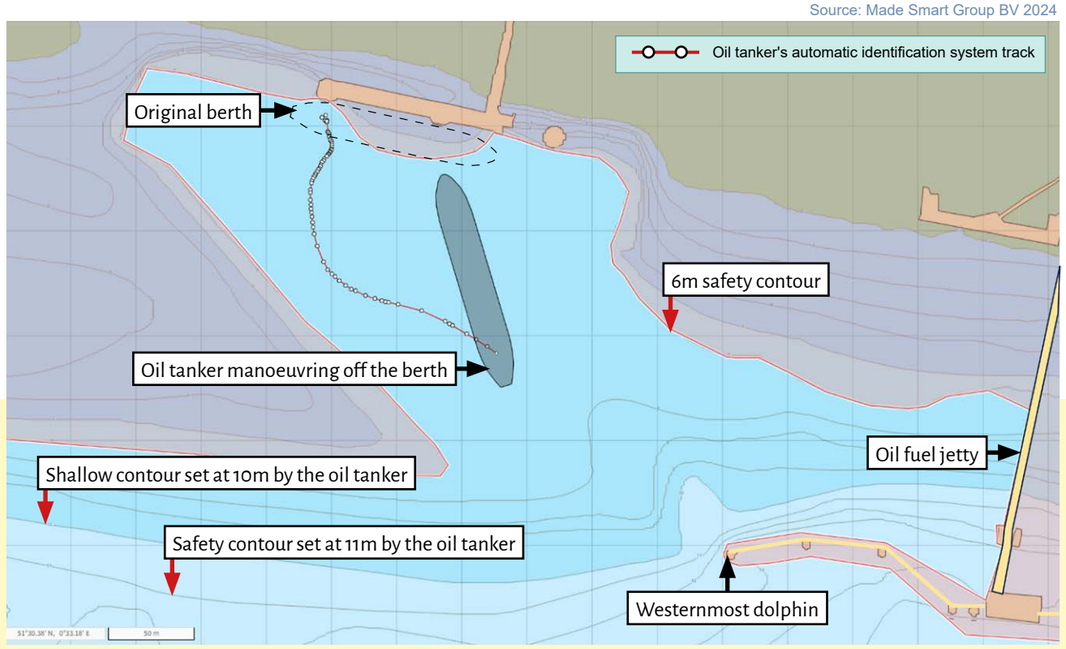


Figure 2: Safety contour used for the move

The Lessons

1. **Teamwork →** Integrating a pilot into the bridge team is a vital activity to ensure that everyone knows what everyone else is doing to keep the vessel safe. While a pilot might assume that the bridge team are monitoring radio channels, maintaining a careful navigational watch and reporting distances to hazards, this does need to be clarified before any manoeuvre is undertaken. The International Chamber of Shipping's Bridge Procedures Guide reflects best navigational practice.

2. **Margin of safety →** The oil tanker's ECDIS safety contour was set to 11m but the vessel's proximity to shallow water and other hazards was not effectively monitored. A safety contour is used to mark the division between safe and unsafe waters and should, at a minimum, account for height of tide, vessel draught, squat, charting accuracies and the impact of weather. A safety contour setting of 6m would have complied with the company safety management system and allowed the dangerous waters to be readily identified and avoided (Figure 2). High-density ENCs are becoming increasingly available, allowing the selection of intermediate contours to give the best possible picture of safe water. The benefits afforded by these products can make all the difference when used to their full advantage.

3. **Risk →** The port had issued temporary guidance to pilots about the mandatory use of tugs from this berth during an ebb stream. Unfortunately, this guidance was not reflected in the port's detailed towage code and led to ambiguity over how to deal with a previously identified risk. Organisational documentation must communicate clear, accurate and consistent guidance to maintain a safe working environment for all involved.

Out of sight, out of mind

freight ferry | fatal accident

A freight ferry was in port loading a cargo of semi-trailers onto its vehicle decks. Shoreside drivers used tractor units to pull the semi-trailers on board under the direction of the vessel's deck crew. The bosun was responsible for loading the upper vehicle deck and was assisted by two deckhands. The three crew members were loading the front row, where there was space to park five semi-trailers side by side.

The bosun directed the first four semi-trailers into their designated parking spaces, leaving a gap in the corner for the final trailer to be parked next to the bulkhead (Figure 1). The fifth semi-trailer arrived on deck shortly after, and the driver waited for instructions from the bosun. While waiting, the driver rotated their tractor unit seat assembly by 180° so they were facing the direction of travel. This adjustment allowed the driver to lean out of the window to observe the side of the semi-trailer while pushing it into position rather than relying solely on mirrors.

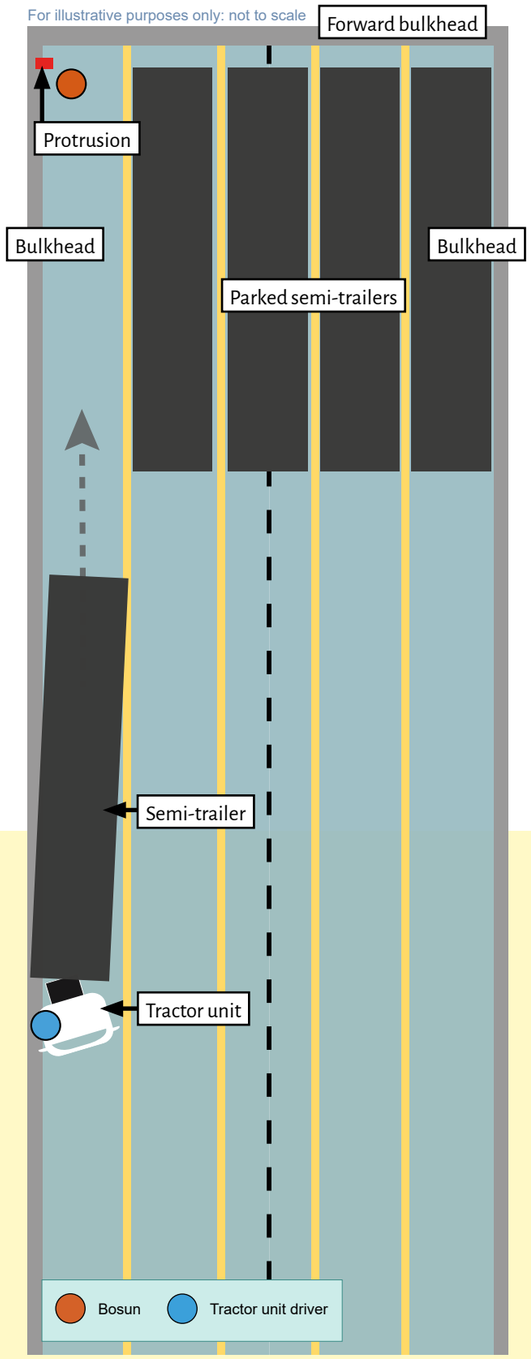


Figure 1: The fifth semi-trailer being pushed into the corner parking space

A few moments later, the bosun waved to the driver, indicating it was time to move the semi-trailer forward. The driver guided the semi-trailer into the last available space, using the tractor unit to pivot it into position. Once parked, the driver disconnected the tractor unit and drove off the vessel, believing everything had gone to plan.

As one of the deckhands started to secure the front of the semi-trailer to the deck, they noticed the bosun trapped between the rear of the semi-trailer and a protrusion from the vessel's structure (Figure 2). The deckhand attempted to reach the bosun from both sides of the semi-trailer, but the gaps were too narrow. Finding an alternative route along the forward bulkhead, the deckhand discovered the bosun motionless but was unable to free them. The deckhand raised the alarm and asked another driver to use their tractor unit to pull the semi-trailer forward and free the bosun. As the semi-trailer was moved the bosun fell to the deck and the crew quickly began cardiopulmonary resuscitation (CPR). Unfortunately, their efforts were unsuccessful due to the bosun's significant crush injuries.

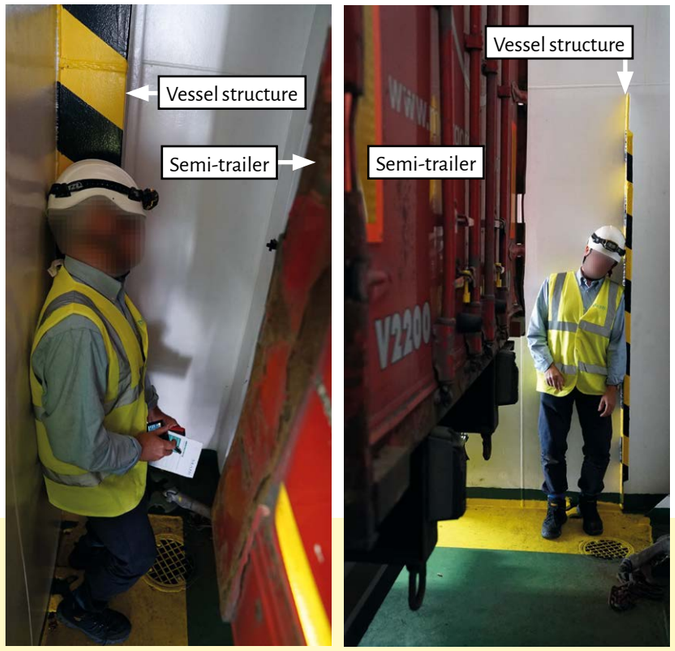


Figure 2: Reconstruction of the bosun's trapped position

The Lessons

1. **Hazard →** Standing in the path of a moving vehicle poses a significant risk of being struck. Although it has become commonplace for deck crews to work close to moving vehicles on ferry decks, the danger is no less real. A crew member performing marshalling duties must avoid the driver's blind spots and the path of any moving vehicle. Instead, marshallers stand in a safe location that presents no risk of being crushed.

2. **Check →** The driver lost sight of the bosun during the manoeuvre and failed to check whether the bosun was in a safe location. Never assume that crew members will remain out of the way, especially when they are in a blind spot position. Terminal operators must ensure that these unsafe practices do not happen and should reconsider their operating practices, including the role and position of marshallers to ensure they are kept out of harm's way.

3. **Teamwork →** Safety comes first. The two deckhands did not monitor the bosun as the semi-trailer approached the corner parking space, focusing instead on other tasks to load the cargo quickly and efficiently. This practice was contrary to the procedures that required them to work together and in sight of each other. In this case, a critical safety barrier that could have warned them of the impending accident was overlooked.

4. **Procedure →** The safety procedures that were in place for the vehicle deck looked good on paper but were frequently ignored in practice. There was no proper procedure for loading high-risk corner spaces, leading frontline staff to create their own methods that were neither formally risk assessed nor developed into a safe system of work. Routine deviation from written working practices often indicates that existing procedures do not align with how people actually perform their jobs. Involving workers in the development of procedures can be an effective means of bridging the gap between the intended process and how a task is completed in reality.

Gap analysis

passenger ferry | risk of collision

A passenger ferry was preparing to depart harbour for its second trip of the day on its scheduled service. The plan was for the ferry to come astern and make a turn off the end of the berth before heading off to its next port. The weather was fine, with light winds and good visibility.

The harbour was busy with a host of small boats and people who were either watching or taking part in a major rowing competition. The finishing line for each race was adjacent to the end of the ferry's berth. The gaps between the races were fairly short, meaning that every few minutes 15 to 20 rowing boats would sprint past the ferry as they raced to the line. The ferry had to carefully choose its moment to depart.

The ferry's passengers had boarded well before the scheduled departure time so the master decided to take advantage of an apparent gap in the races to get underway. The line handlers were ready on the jetty and the master signalled to them to let go all the mooring lines.

Just as the ferry started backing away from the berth, another group of rowing boats hove into view, racing quickly and headed straight for the finishing line. It quickly became obvious that the ferry would only just make it away from the berth before the rowing boats crossed the finish line, so the master increased the speed astern. Some of the rowing boats were concerned about the proximity of the ferry and altered course towards the end of the berth. Despite a few of the rowing boats getting very close indeed to the ferry (see figure) all passed clear, and the ferry made its turn and then departed on its way, leaving some relieved but irate rowers in its wake.

Figure: Rowing boats passing down the starboard side of the ferry

The Lessons

1. **Check →** The rowing boat race managers had published a timetable of events for the races that accounted for the scheduled arrival and departure times for the ferry. Unaware of this, the ferry master had tried to make good use of an apparent gap between races, inadvertently entering a near miss situation that could have been avoided by checking the race timetable.

2. **Communicate →** Race officials and harbour personnel were on the jetty and could see that the ferry was preparing to depart and that the line handlers were attending to the ferry's lines. There was a missed opportunity for those on the jetty to check the master's intentions; and for the master to check with those on the jetty. Clear and open two-way communication can make all the difference.

3. **Plan →** The ferry master had not been involved with the risk assessments for the rowing races and was unaware that the races had been planned to avoid the ferry's scheduled arrival and departure times. When considering risks it is always a good idea to consult widely and communicate clearly; actions the organisers have already taken to prevent a reoccurrence at next year's event.

A concrete result

passenger ferry | loss of control

Passengers and vehicles boarded a small inter-island ferry for a routine 1-mile crossing. The sea state was calm with a moderate breeze, and it was daylight. A strong flood tide was running, opposing the southerly breeze.

The vehicles were parked side by side in two lanes. At the front a ready-mix cement lorry was parked alongside a pickup truck. The cement lorry was carrying a full load, and its drum was slowly rotating. Recognising that the cement lorry had a high centre of gravity and that the centre of gravity changed as the cement moved in the drum, the ferry's crew asked the driver to stop the drum for the short crossing. However, the driver did not comply with the request and the drum continued to rotate when the ferry departed.

Halfway into the passage, the ferry sailed into a patch of turbulent water caused by the action of the strong tidal flow.

The ferry rolled heavily and the ready-mix cement lorry toppled over onto the adjacent pickup truck, crushing it (see figure). The two occupants of the pickup truck escaped unharmed but were understandably shaken by their experience.

Figure: The cement lorry and crushed pickup truck

The Lessons

1. **Hazard →** It is probable that the ferry's movement combined with the cement load's shift in centre of gravity caused the lorry to tip over. Drivers of these lorries often undertake awareness and prevention training that focuses on rollover hazards on sites and when on the road but does not include situations where the lorry is being transported on a ship's vehicle deck. In this case the rollover risk appeared to be minimal as the lorry was stationary on a level deck and the driver of the lorry might not have expected the ferry's motion in the seemingly benign sea conditions. The crew of the ferry understood that the ready-mix lorry had a high centre of gravity that would alter as the cement moved around in the rotating drum. The driver was asked to stop the drum to mitigate the risk, but this was not done; however, while the crew had considered the effect of sudden tidal turbulence on the lorry, they did not take further prevention measures such as lashing the lorry to the ferry's deck.

2. **Revise →** Following the accident the ferry's operator changed its procedure to require that ready-mix cement lorries are routinely secured to the deck using chain lashings. Additionally, the operator's loading plan now includes an instruction that cement lorries are not to be parked next to cars. The ferry's cargo securing manual has also been updated to reflect these revised practices.

No stronger than a nutshell

rescue craft | grounding

The crew of a rescue craft assembled in response to an alert and set out to sea in company with a smaller, inflatable rescue boat. Their task was to rescue a pleasure yacht that had grounded on a well-known rocky outcrop. The weather was fair, though the sea became choppier as the vessels approached the stricken yacht.

The pleasure vessel was solidly aground and being battered on the rocks by the restless seas. The skipper of the yacht did not want to abandon to the rescue craft so the coxswain decided to attempt to tow the yacht clear of the rocky reef on the rising tide.

The coxswain realised that the reef presented a hazard to the main rescue craft so instructed the inflatable rescue boat to pass a towline over to the yacht. Despite significant tension coming onto the towline, the main rescue craft was unable to pull the yacht clear of the rocks so the towline was dropped and a different plan began to take shape.

As the new plan was being discussed, the coxswain of the main rescue craft became distracted and the vessel was caught by the rocks, going hard aground right next to the yacht.

The rescue craft was lodged on the reef for over 20 minutes, receiving much the same treatment as the yacht it had come to rescue. The coxswain tried to manoeuvre off the rocks but it was only when the tide rose that both vessels floated free and were able to make their way back to port.

Source: RNLI

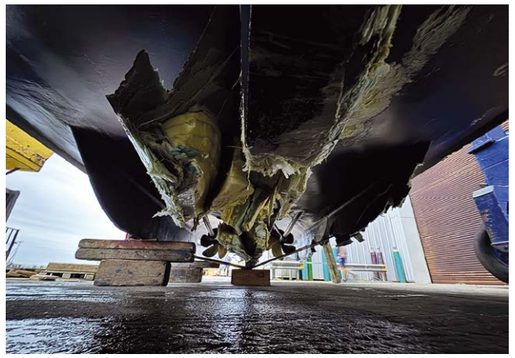


Figure: Hull damage to the rescue craft

On arrival back at base the rescue craft was lifted clear of the water and examined. Approximately 75% of the keel had suffered impact damage, the hull was cracked in several places, and there was significant surface delamination (see figure). After much deliberation, the rescue craft was eventually scheduled for repair.

The Lessons

1. **Margin of safety →** When attending a rescue situation with a casualty vessel aground it is highly likely that rescue craft will be manoeuvred close to hazards. It is vital to ensure that someone constantly monitors the vessel's proximity to danger and that they do not become distracted by other tasks.

2. **Teamwork →** The yacht skipper's decision to stay on board increased the hazard for the rescue vessels and their crews. Rescues require effective coordination between the people and assets involved, including the crew of the stricken vessel, who should consider what actions might be best for everyone. It is sometimes better to leave your vessel to its fate rather than risk the safety of others.

3. **Revise →** Situations can change quickly and pre-planned contingencies for various scenarios can prove invaluable to decision-making. When the original towing plan failed to work it might have been easier to press for saving the skipper's life and then wait for the tide to free the yacht from the rocks. The lengthy discussion about how to revise the original plan exposed the rescue craft to additional risk; it is safer to retreat from the danger while decisions are being made.

Look up, look out

cargo vessel | fatal collision

A general cargo ship was on passage at night with the officer of the watch (OOW) as the sole lookout. The vessel was overtaking a powered dredge spoil barge in a traffic separation scheme (TSS) and was passing clear on its port side. The dredge spoil barge also had a single watchkeeper on the bridge.

The cargo ship's OOW was sitting in a chair, focused on using a tablet computer rather than navigation and keeping a lookout. As the cargo ship approached a waypoint the OOW changed course onto the new track without checking visually or using the radar, putting the ship on a collision course with the dredge spoil barge (Figure 1).

Neither of the watchkeepers saw or recognised the new danger and the cargo ship and dredge spoil barge subsequently collided. The force of the collision overturned the dredge spoil barge (Figure 2) and its two crew did not survive.

Source: Made Smart Group BV 2025

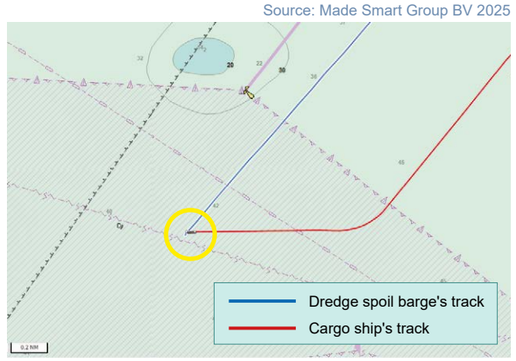


Figure 1: Point of collision

Figure 2: Upturned hull of the dredge spoil barge

The Lessons

1. **Margin of safety →** The presence of a second person to act as a dedicated lookout during hours of darkness is a requirement, not an option. While the OOW is attending to other navigational duties the role of lookout is invaluable to look for hazards and, in line with the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers 1978, as amended (STCW Convention), *no other duties shall be undertaken or assigned which could interfere with the task*. In this case, a dedicated lookout posted on either vessel might have spotted the developing situation and taken action to prevent the collision.

2. **Risk →** Several activities that take place on the bridge are likely to divert attention and it is important to prioritise these in line with the level of risk. For example, replacing a printer cartridge when the ship is approaching a waypoint close to shore should be avoided. It is therefore certain that watching a tablet computer while in a TSS and altering course onto a new track is asking for trouble.

12

A crunchy exit

cargo vessel | collision

It was another routine late-night departure from port for the master of a cargo ship as they embarked the pilot, let go the last of the lines and manoeuvred off the berth. It was a tight turn around into the main channel, which took the cargo ship towards the narrow exit point between two breakwaters. The pilot was engaged in a radio conversation with the port controller and was focused on transport arrangements to their next act of pilotage. The master could hear all the radio chatter but, as it was all in the local language, they had no idea what was being discussed.

Once the cargo ship was on a steady heading out towards the breakwaters, the pilot advised the master to increase speed to 12 knots (kts). Only the pilot vessel was ahead of them, making slow progress out of harbour ready to take the pilot to their next act once this one had finished. The radio conversation turned to gossip and chit-chat.

Twenty minutes into the departure, and just as they were approaching the narrowest point of the channel (Figure 1), the master realised that the pilot vessel was now very close on the port bow.

The pilot was checking the intentions of the pilot vessel at the master's request when it made a sudden turn to starboard across the bows of the cargo ship. The pilot shot into action, shouting into their radio and ordering the master to slow in speed. Nothing could stop the inevitable collision, and the bows of the cargo ship crunched into the starboard quarter of the pilot vessel (Figure 2). The pilot vessel quickly succumbed to flooding and sank to the bottom of the channel. Fortunately, all four crew were uninjured and managed to swim clear to be rescued by two local tugs.

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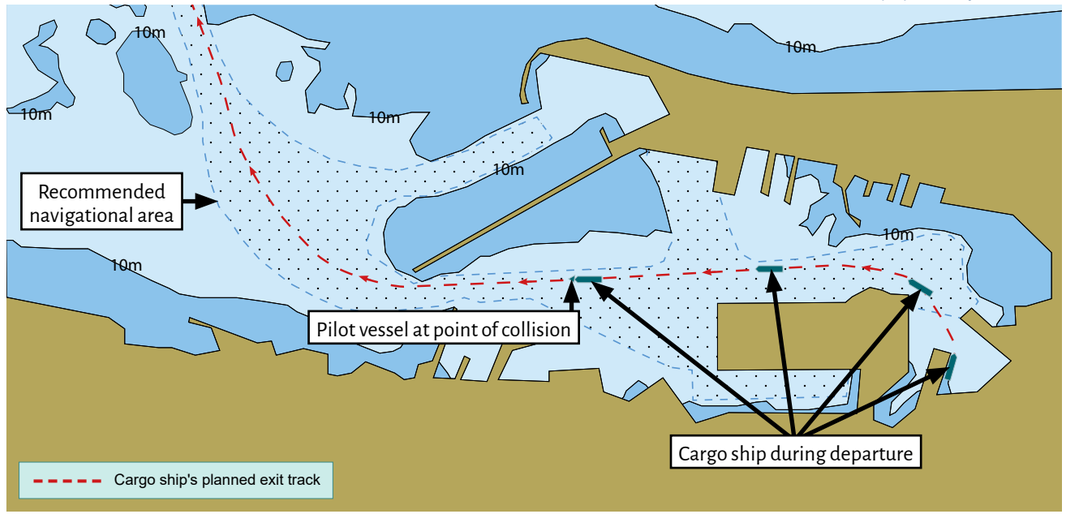

Figure 1: Schematic showing the departure plan

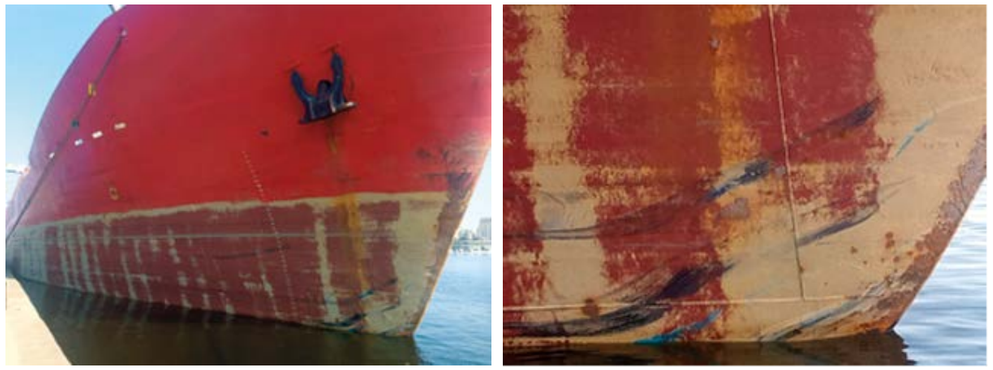

Figure 2: Damage to the bows of the cargo ship

The Lessons

1. **Teamwork →** Effective coordination between the master, other members of the bridge team and the pilot is a prerequisite for safe pilotage. The pilot's focus did not appear to be on the task in hand and the master and bridge team made little evident effort to draw them in. It is possible that the bridge team believed the routine nature of this regular port visit to be well within their capacity. However, the lack of individual or team action taken from the first sighting of the pilot vessel to the eventual collision meant there were several missed opportunities to prevent the outcome.

2. **Action →** In the final few minutes before the collision there was no attempt to alert the pilot vessel by radio or whistle signal. The crew of the pilot vessel were distracted by gossip and chit-chat and had lost focus on the proximity of the cargo vessel. Five or more short blasts on the cargo ship's whistle could have been used to direct the pilot vessel coxswain's attention back to the risk of collision and might have averted the final, calamitous turn to starboard.

3. **Risk →** The pilot vessel began sinking fast after the collision. The deck crew deployed lifebuoys and indicated the position of the pilot vessel to the crew of two tugs that were making their way to the scene. Despite calls to the contrary from the pilot, the master made a sound decision to continue with their exit due to the navigational constraints of the narrow waters. In doing so, the master maintained the safety of their vessel and its crew and was able to return to harbour as soon as it was all clear.

4. **Observe →** The crew of the pilot vessel were not alert to the outbound vessel they were planning to service, nor did they check the safety of their final manoeuvre. Rule 5 of the COLREGs requires that a proper lookout is maintained at all times *by sight and hearing as well as by all available means appropriate…so as to make a full appraisal of the situation and of the risk of collision.*

13

That was not supposed to happen

chemical tanker | explosion

A chemical tanker was moored alongside waiting for another vessel on its offshore side to finish purging its cargo tanks with nitrogen. Without warning one of the cargo tanks exploded, sending a large fireball skywards towards a major road bridge (Figure 1). Remarkably, just one crew member on each ship was injured.

The tanker had loaded a multiple parcel cargo some weeks before. Some of the cargoes required heating, inert atmospheres and/or inhibiting chemicals for stabilisation. One of the cargoes, styrene monomer (an aromatic hydrocarbon used to manufacture plastic, rubber and polystyrene products), was inhibited for the voyage. However, the inhibitor was only effective for a time-limited period within a specific temperature range.

Under normal circumstances, styrene monomer was a benign cargo that did not create any issues when stowed in ambient temperatures away from heated cargoes. Consequently, the chemical was not monitored by the crew, and alarm systems were not enabled.

The styrene monomer was in three of the chemical tanker's 39 cargo tanks. The other tanks contained various chemicals, some of which were heated (Figure 2).

Unfortunately, the heated cargoes in this case were adjacent to cargoes that readily absorbed heat and transferred it to the styrene monomer cargo. The raised temperatures affected the polymerisation inhibitor, reducing its time-limited efficacy. The ineffective inhibitor had triggered a thermal runaway incident that caused high pressure to breach the tank and ignite, likely due to static electricity.

Source: @803_Gorani (X.com)

Figure 1: The major road bridge

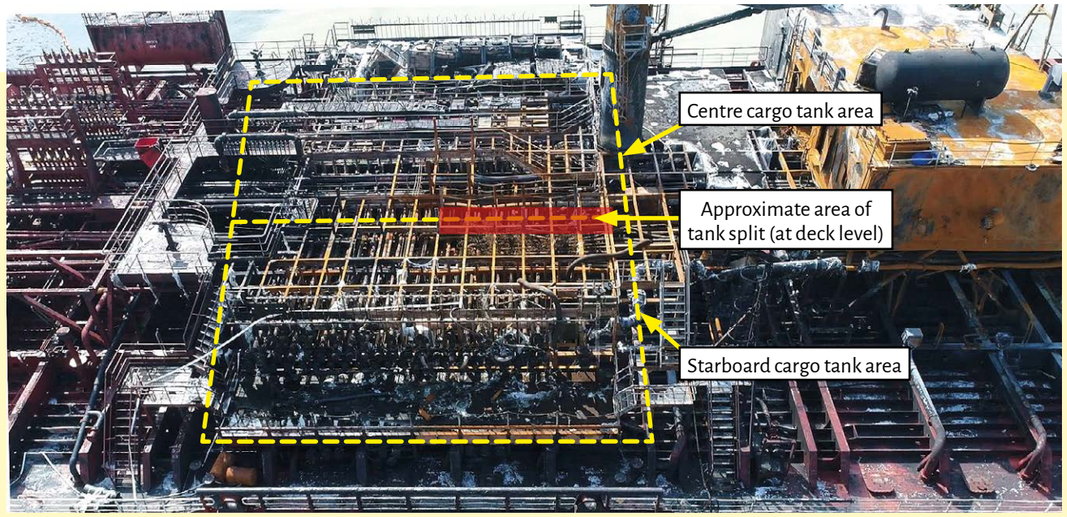

Figure 2: The chemical tanker's main deck

The Lessons

1. **Check →** There are strict rules and regulations for the safe carriage of chemicals. However, while the cargo might be correctly stowed to meet both these and the requirements of the charterer there is a risk that less apparent issues could be missed. Check loaded cargoes frequently to determine whether they are behaving as expected and, if they are not, contact the ship's operating company or the chemical's supplier for advice.

2. **Equipment →** Liquid cargo monitoring equipment usually has a temperature alarm function. Check the safety data sheet and carriage instructions for crucial temperatures and set the alarms in line with these.

3. **Plan →** A phone call ashore could offer solutions, but might prove ineffective mid-voyage when the ship is several days from port. The preparation of a robust shipboard response procedure will ensure that you are well-equipped to deal with unexpected events during the carriage of sensitive cargoes.

4. **Risk →** Inhibited cargoes are stable for a limited amount of time. The inhibitor could lose its effectiveness if the voyage is extended, causing the cargo to become unstable and change to a hazardous state. Make sure risk assessments account for this possibility and that appropriate mitigations are in place.

Tipping point

tug | loss of control

On a dark winter's evening a small conventional tug, conducting its third job of the day, was tasked to attach to the stern of a small cargo vessel to assist it to berth. Once the cargo vessel had entered the port approaches the tug skipper was instructed by the cargo vessel's pilot to approach the starboard quarter and pass its towline. The cargo vessel's speed over the ground was about 6kts.

The tug's towline was quickly passed and secured to the cargo vessel's starboard quarter (Figure 1a). The tug was fitted with a gob wire and winch, but the tug master decided not to use it on this occasion. Once the towline was connected the tug master conned their vessel alongside the cargo vessel, taking care to keep the towline slack.

A few minutes later, the tug master lost concentration and inadvertently dropped back, causing the towline to come under tension (Figure 1b). The tug was towed sideways, girted and heeled over to 50° (Figures 1c and 2). The tug master was unable to control the tug and tried unsuccessfully to operate the tow release from within the wheelhouse, simultaneously calling the cargo vessel's pilot on very high frequency (VHF) radio.

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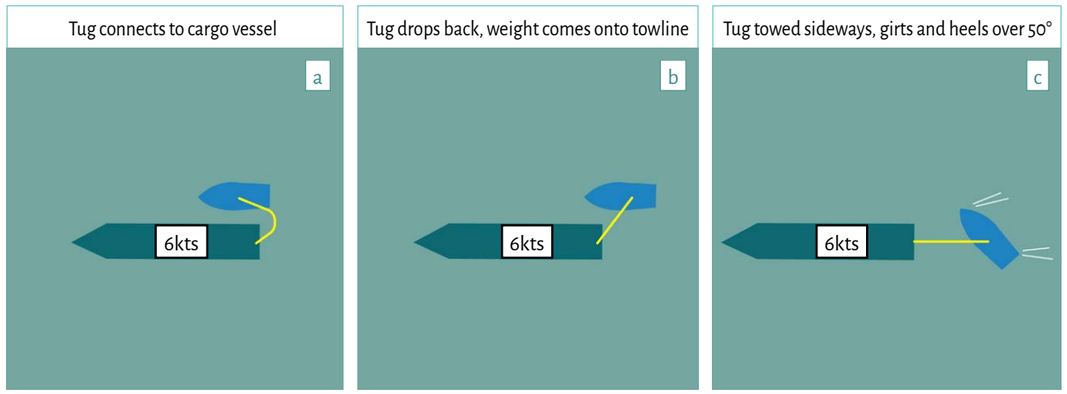

Figure 1: Sequence of events that led to the tug girting

The tug's quick-thinking deckhand went aft and released the towline at the hook, after which the tug swiftly came upright. The cargo vessel later berthed without further incident.

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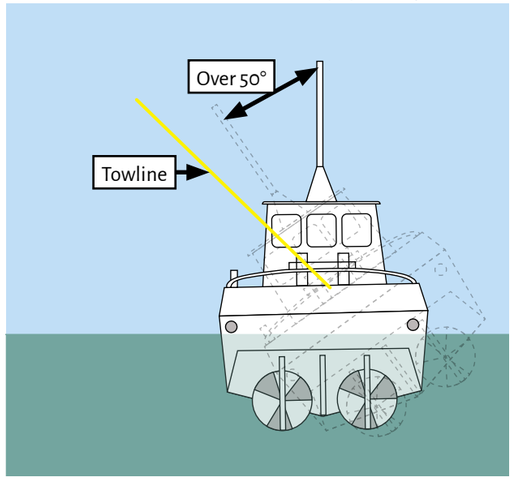

Figure 2: Tug girted and heeling to over 50°

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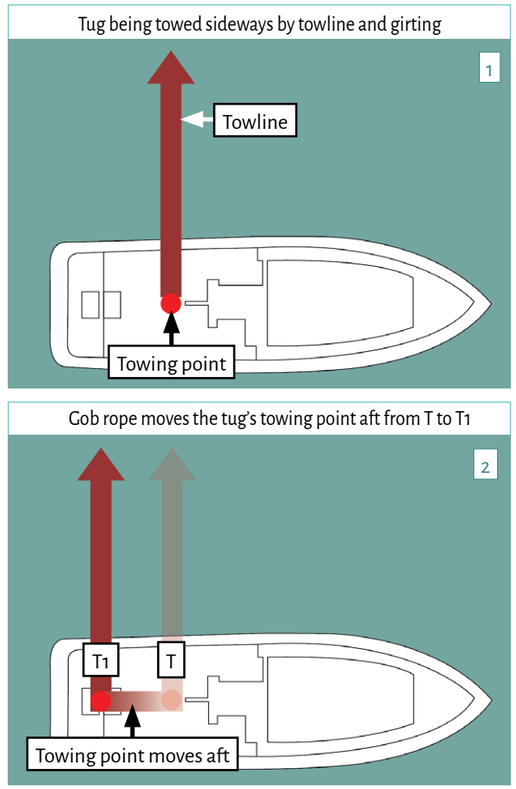


The movement of the towing point towards the tug's stern causes the bow to swing to starboard and prevents the tug being towed sideways and girting

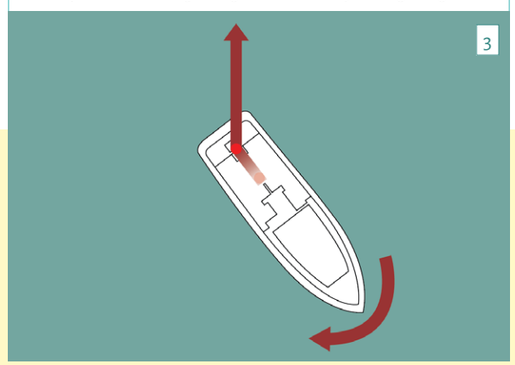


Figure 3: The effect of a gob rope or wire in preventing a tug being towed sideways and girted

The Lessons

1. **Hazard →** The sequence of events that led to the tug girting and its near capsize took only a few seconds and it was only the swift action of the deckhand that on this occasion saved the crew and the vessel.

2. **Communication →** Good communication between the pilot and tug master is at the heart of safe ship assist towage and a pilot/tug exchange (PTX) must be conducted before tugs connect. The PTX should include the planned positioning of the tug(s), the safe working loads of the lines and bollards, and the maximum safe speed. The PTX will also be heard by harbour control/vessel traffic services and the assisted vessel's master, further ensuring that all involved in the harbour movement share a common understanding of the plan.

3. **Speed →** It is important to remember that a small increase in speed will exponentially increase the forces acting on the towline and increase the risk of something going wrong. In this case 6kts was too fast and the speed should probably have been kept below 2kts to 3kts while the tug was connected.

4. **Procedure →** Conventional tugs should almost always use a gob rope or wire. The purpose of the gob rope is to move the tug's towing point aft. Had the gob rope been correctly used on this occasion, it is likely that the tug would have been safely towed backwards by the cargo vessel when the weight came onto the towline. This in turn would have prevented the tug's girting and near-capsize and minimised the risk to its crew (Figure 3).

15

A little too much flexibility

oil tanker | fire

On a chilly but calm autumnal morning, an oil tanker was approaching its destination berth where it was to discharge a cargo of naphtha, a flammable hydrocarbon mixture used to manufacture fuels and solvents.

The bridge team worked together to bring the vessel into position alongside the berth on schedule. The crew on the mooring boats had just collected the first forward and aft lines and were running them to shore when the tanker's local fire suppressant system in the engine room activated, triggering the fire alarm.

From the engine control room, the chief engineer (C/E) and second engineer (2/E) could see smoke in the vicinity of the combined exhaust/oil-fired boiler. The C/E grabbed a fire extinguisher and started to make their way to the boiler. As they approached, they could see fuel oil running down the side of the boiler and realised that something was amiss with the fuel system. The C/E hurried down two ladder flights and stopped the fuel pumps while the crew closed the quick closing valves on the fuel oil system, causing the ship to lose power. The 2/E started to gather and prepare the engine room fire team.

The master led the coordination of the on board response to the fire and the pilot informed the shore authorities. Mooring operations were suspended, tugs were called to stand by the vessel in case the situation worsened and the local fire and rescue service was notified.

The oil tanker's crew set up boundary cooling and a fire team made an entry into the engine room, targeting the combined boiler and the lagging below it. Twenty minutes after the initial alarm, the fire was declared extinguished. The oil tanker was later secured to the berth without further incident, where the fire and rescue service confirmed that the fire was out.

The fire had started when a connection on the flexible fuel return hose failed where it was joined to the burner unit on the boiler (Figure 1). Fuel from the detached connection had sprayed onto adjacent hot surfaces, causing a fire of such intensity that it caused serious damage to the equipment in that area (Figure 2).

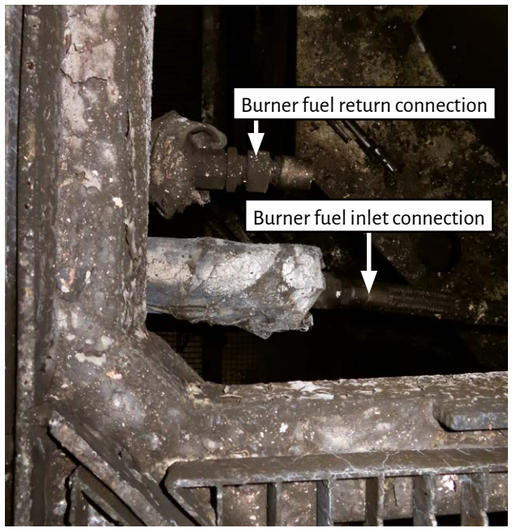


Figure 1: Return line connection

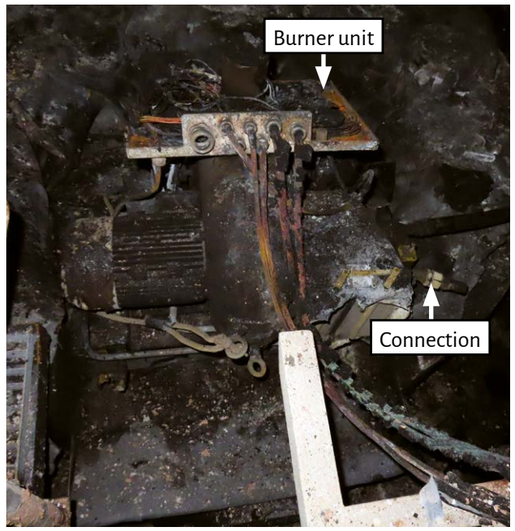


Figure 2: Damage to the boiler

The Lessons

1. **Equipment →** The fire was caused by the failure of a flexible hose connection containing fuel under pressure. The history of the hose assembly could not be traced, and it is possible that it had not been changed since the tanker was built. In 2023, the MAIB issued a safety bulletin[1] to emphasise the hazards of such flexible hose installations and highlight that flexible hoses had a higher risk of failure than properly fitted metal pipes. It is vital that flexible hoses are inspected and changed out at regular intervals, and that detailed records are kept.

2. **Action →** Early reaction to an alarm can prevent escalation. Once alerted to the fire both the bridge and engine room teams acted quickly to ensure the safety of the oil tanker, crew, and the terminal. The master's efficient coordination of the individual teams facilitated a quick and early response to the emergency from the very first alarm and the well-prepared actions taken by the crew prevented a serious situation becoming catastrophic.

3. **Teamwork →** The crew had completed regular drills, including a simulated engine room fire exercise only the day before the accident. Practising various scenarios is an opportunity to develop crew skills, test emergency procedures and ensure that equipment and systems are in place and working. There is no guarantee that every situation can be brought under control. However, the chances increase substantially when the crew are well-drilled in their individual and collective responsibilities.

1 MAIB Safety Bulletin 1/2023 https://www.gov.uk/maib-reports/safety-warning-issued-about-the-hazards-of-flexible-hose-installations

FISHING VESSELS

My entry into the fishing industry and safety training was a mixture of chance and fate rather than something I had planned. Born in a Northumberland mining village and brought up on Teesside, I moved to Whitby to join my partner and get married and soon settled into local life. My husband Tony was well-known in the town, having been a volunteer lifeboat crewman and a coastguard as well as a familiar face in and around the marina where we moored our ketch.

"You're a nautical type so you deal with it"

My work experience on Teesside had been based on business development and I was flattered to be head-hunted by the Whitby and District Business Development Agency. While I was working there, a local fishing company and the Whitby Mission and Seafarers Centre approached us with concerns about the lack of youths coming into the industry and to ask if we could assist them to set up a training centre. My boss said to me, "You're a nautical type so you deal with it", and so began the process of business planning and sourcing funds. Supported by the Whitby Mission and Seafarers Centre and the local borough council, the Whitby & District Fishing Industry Training School (WDFITS) opened in April 2002. I set up the legal side of the company and became a director and company secretary and Tony applied his experience as head of an engineering college to set up the teaching side.

...younger trainees had very little idea about life in the fishing industry...

We had a slow start, advertising the Seafish Industry Authority basic safety courses to fill the gap between Northumberland and the Humber and make safety training more accessible. It became apparent that younger trainees had very little idea about life in the fishing industry, so we arranged mentoring with working fishermen to help them develop a better understanding. We were also approached to improve on the introduction to fishing industry training delivered to youngsters by a local training company. I worked with Seafish to develop a fishing diploma qualification, which in time became accredited and proved very successful.

We hoped to create an apprenticeship, but this could not be validated because fishing crews were classed as self-employed share fishermen so did not hold contracts of employment. Together with the chief executive officers of Seafish and the Maritime Skills Alliance, I lobbied for 2 years in the House of Commons and the House of Lords for parliament to accept our training under the apprenticeship system. This was ratified in May 2012, producing The Apprenticeships (Alternative English Completion Conditions) Regulations 2012, a 'non-employed' qualification that specified an apprentice was working in an occupation 'otherwise than for reward' for the duration of the course. This allowed WDFITS to access improved funding and advertise the apprenticeship nationally.

Successful apprenticeship applicants received a hardship allowance and WDFITS covered the cost and provision of their safety kit, travel, accommodation, training and certification via government funding. For those applicants who were not local to the area, we followed the famous example of Captain Cook and advertised for 'homely lodgings'. Unfortunately, the Alternative English Completion Conditions apprenticeship was subsequently rejected due to government changes, resulting in less national coverage and fewer applicants. The diploma in sea fishing course continues to offer the same content with the same funding.

Looking to the future, I hope funding for maritime training becomes more widely available...

The training school was successful and gained an excellent reputation. Having seen our achievements, The Workboat Association seconded me as a consultant to a training committee to help launch the original workboat training apprenticeship. We began to trade under two distinct names, WDFITS (our legal entity), and 54 North Maritime Training, which caters for and attracts workboat companies requiring apprenticeship and STCW training. As all workboat crew are paid under a contract of employment, a regularly updated apprenticeship continues to be offered for this sector.

I worked part-time before retiring and was flattered to be voted chair of the North East Fishermen's Safety Forum, a role I have held for the past few years. Seafarer safety is paramount at WDFITS and so support of this forum is essential. A skipper once told me he and his crew did not bother with lifejackets, never had. Encouragement to start fell on deaf ears, so I asked if I could borrow £350 from him. He assured me I could, but was it for something urgent? I replied it was to purchase lifejackets for him and his crew. The skipper was suitably contrite; I had shamed him into doing the right thing, and to this day those crew wear lifejackets to keep them safe.

Looking to the future, I hope funding for maritime training becomes more widely available, and that funding schemes run for longer than a year so that training companies can plan ahead with confidence. I would also like to see a 'joined up' regional and nationwide approach to advertising and marketing the training centres that accept Royal Navy, merchant, workboat and fishing course applicants from anywhere in the UK.

A. Hornigold

ANNE HORNIGOLD MBE BA (Hons) FCMI | Director, Whitby & District Fishing Industry Training School/CEO (retired)

Anne is well-known nationally for her determination to ensure an outstanding level of high-quality mandatory and higher level maritime qualifications. Alongside the creation and operation of the Whitby & District Fishing Industry Training School, Anne's experience encompasses the workboat industry, safety forums, and strategic work at all levels from routine to ministerial. Through her work with, among others, the MCA, Maritime Skills Alliance, The Workboat Association, and Trinity House, Anne is recognised as having established maritime safety training excellence in the fishing and workboat sectors.

Under Anne's guidance, 54 North Maritime Training has received many quality and excellence awards and has an outstanding safety record. The introduction by Anne of a robust safety training programme has, to date, resulted in no serious accidents or death to anyone trained by the company.

In 2012, Anne graduated with a leadership and management degree. In 2013, she became a Fellow of the Chartered Management Institute. In 2014, Anne was thrilled to be awarded an MBE for services to Education in the Sea Fishing Industry in Her Majesty The Queen's Birthday Honours. In 2015, Anne received the Maritime Professional of the Year Award at the annual Seawork event in Southampton, England.

16

Hitting all the stops

trawler | grounding

A 2-year-old trawler returned from a lengthy fishing trip and, having finished loading new nets at one pier, was due to move to the fish market quay to offload their catch. Shifting between berths was quite commonplace at this harbour and the fishing vessel's crew were used to short-notice moves. The trawler's skipper started the engines, ordered the lines to be let go and manoeuvred away from the berth using the controls at the centreline console in the wheelhouse.

Once clear of the pier, the skipper turned the trawler sharply to port before making a longer turn to starboard to line up with the fish market quay. The skipper settled up on the approach at about 4kts and then walked to the port side bridge console to control the engine revolutions and pitch for berthing. The approach seemed good and the skipper pulled the pitch lever back to apply power astern as the trawler closed on the berth. Nothing happened.

The skipper looked at the pitch indicator and saw that 40% of ahead pitch was still applied. Pulling the pitch lever further astern, the skipper noted no response. The trawler was inches away from hitting the fish market quay so the skipper pulled the engine revolution control back to idle. Still no response.

The fishing vessel made a hard glancing blow on the fish market quay before continuing past the end of the quay (Figure 1). The skipper ran around the bridge hitting all the emergency stops for the engines. This slowed the trawler a little but it went aground in the mud and shingle 120m off the end of the quay, narrowly missing a buoy and a submerged pipe (Figure 2). The trawler listed hard over to starboard but there was no water ingress. Tugs managed to pull the trawler off the mud and berth it back on the quay after 90 minutes. Fortunately, no one was injured and the damage was slight.

For illustrative purposes only: not to scale

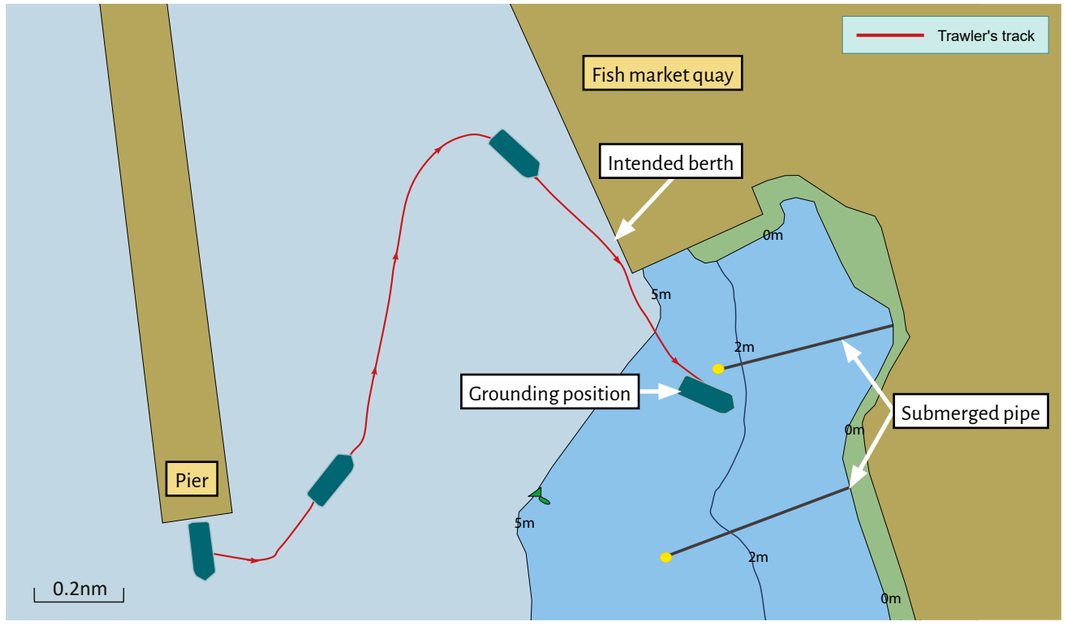


Figure 1: The trawler's path

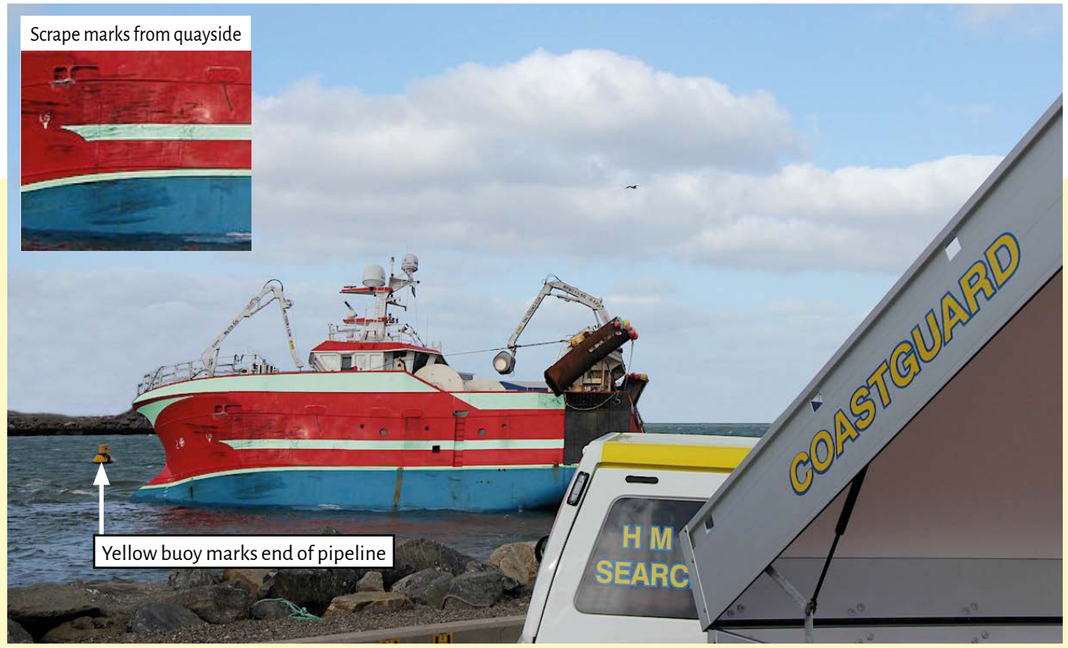


Figure 2: The trawler aground and listing to starboard

The Lessons

1. **Procedure →** Control had not been passed from the centreline console when the skipper moved to the port side console to berth the trawler. This meant that there was no response to lever movements from the port console. A well-documented, practised procedure for passing control of propulsion to different stations increases the likelihood of a smooth changeover in the heat of the moment.

2. **Action →** The skipper took positive action to minimise damage when they realised they did not have control of propulsion. By hitting all the emergency stop buttons the skipper managed to slow the trawler down, achieving a softer grounding than would otherwise have been the case.

3. **Check →** As soon as the trawler grounded the skipper sent a distress message, tasked crew to check for damage and water ingress, and prepared to abandon ship. After establishing that damage was minimal and the vessel was stable, the skipper liaised with the harbour authorities to safely recover the trawler alongside. The skipper's well-prepared, diligent response resulted in a sound plan of action and a successful outcome.

4. **Plan →** Even the shortest trips benefit from a clear plan. Think about when and where to take control of propulsion and allow enough time to be able to check all is well and react if something does go wrong.

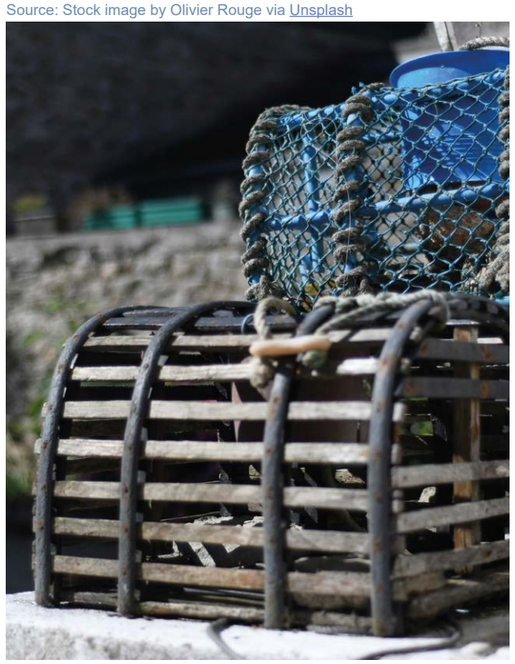
Plucked from danger

potter | capsize

On a November morning, the lone skipper of a small creel fishing vessel was thrown overboard into cold water when their boat capsized in swell near a rocky coast. The skipper was wearing a lifejacket, but had no means of raising the alarm from the water. Fortunately, the incident was witnessed by the crew of a rescue helicopter who were conducting a training exercise in the area and spotted the skipper clinging to their vessel's upturned hull. The rescue helicopter immediately responded and the skipper was recovered from the water and treated for hypothermia by the on board medic during the transfer to the local hospital.

The skipper underwent a thorough examination before being discharged from hospital later the same day with no severe injuries. Despite remaining afloat and visible from ashore for a while after its capsize, the fishing vessel later sank.

Source: Stock image by Olivier Rouge via Unsplash



The Lessons

1. **Cold water shock →** A prompt rescue was critical to avoid the skipper succumbing to the increased risk of drowning or heart failure due to the immediate effects of cold water shock, which is associated with a gasp reflex, hyperventilation and a rapid increase in heart rate and blood pressure. The skipper was wearing a lifejacket and managed to cling to the upturned hull, but lacked a means of raising the alarm from the 12°C water. Given the circumstances, it was remarkably fortunate that the rescue helicopter happened to be in the right place at the right time.

2. **Equipment →** Staying afloat is futile without rescue, particularly when operating alone. Having the means to send a distress alert via an Emergency Position Indicating Radio Beacon registered to your vessel or a personal locator beacon attached to your lifejacket enables search and rescue teams to identify and find you.

3. **Teamwork →** Operating a vessel alone is dangerous and challenging, especially in emergency situations. The presence of other crew could have facilitated a better working arrangement and might have prevented the accident from occurring.

4. **Check →** Adverse conditions such as high winds, sea swells or sudden waves might have contributed to the capsize of the vessel involved in this case. Make sure the prevailing and forecast weather conditions are suitable for your planned activities, particularly when operating alone.

Plan before action

trawler | fatal accident

A prawn trawler was returning to harbour in the late evening after completing its last haul of the day. The skipper was in the wheelhouse and the two deckhands were in the forward fish hold, finishing the boxing and stowing of the cargo of prawns.

The wind picked up and the vessel started to roll and pitch in the choppy seas. One particular heavy roll caused some of the unlashed trawl net stowed aft (see figure) to fall overboard. The skipper noticed this and put the engine in neutral, shouting to the two deckhands to help retrieve the net. None of the crew put on a personal flotation device (PFD) before they rushed to help.

The skipper and senior deckhand tried pulling the net in by hand but the trawler rolled heavily and the senior deckhand fell into the water. The skipper leant over the side to try to pull the senior deckhand back on board, but also fell overboard after another heavy roll. The shocked, cold skipper and senior deckhand struggled without PFDs or any means of buoyancy to keep them afloat in the rolling seas.

The junior deckhand made a distress call on VHF channel 16, which was immediately answered by the coastguard. A lifeboat and search and rescue helicopter were tasked to the scene and three nearby fishing vessels also responded. Meanwhile, the junior deckhand rigged a makeshift recovery line from the winch and managed to pull the unresponsive skipper and exhausted senior deckhand back on board. Despite the efforts of the deckhands, rescue personnel and the crew of the attending fishing vessel the skipper remained unresponsive and was declared deceased.

Figure: Net stowed at stern after the accident

The Lessons

1. **Equipment →** When something goes wrong and quick action is required there is always a risk that procedures and personal protective equipment (PPE) will be forgotten. The habitual wearing of PPE at sea increases the chances of survival for those who enter the water unexpectedly and anyone who might be attempting to recover them back on board. Promote a best practice safety culture on board your vessel by wearing appropriate PPE for the task in hand and look after colleagues by reminding them when they forget to do so.

2. **Risk →** Sea conditions can change rapidly and without notice. The trawl net involved in this case had not been lashed for the relatively short voyage back to port and the unprepared crew put themselves in immediate danger when attempting to retrieve it back on board. Regardless of the forecast or distance, it is always safer to expect bad weather and stow equipment properly .

3. **Plan →** Training and drills are essential to ensure a practised emergency response, familiarise everyone with on board safety equipment and check that it is fit for purpose. Training plans should consider various what-if scenarios to prevent an "*It will never happen to me*" culture and avoid instinctive actions when it does.

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Too low and too heavy

gill netter | fatal accident

On the day of this accident, the sea conditions were choppy and a 2m swell was running. Few local boats from the same port had ventured out.

The 8m gill netter had a bulwark of 60cm, about knee height, around its entire deck. The bulwark had been supplemented by a guardrail around the forward deck area, raising the height of the barrier to 97cm. Aft of the small wheelhouse, the only protection was provided by the low bulwark (Figure 1).

The skipper and deckhand had worked together for many years and had left their home port early to fish. By about 0830, they retrieved their nets and decided to head back to port. Neither crew member was wearing a PFD. After helping the skipper to move some nets on the aft deck, the deckhand went to the wheelhouse to adjust the vessel's course. About 30 minutes after turning for port, the deckhand heard a shout and, looking out of the open wheelhouse door, saw the skipper had fallen over the low bulwark into the water and was struggling to stay afloat off the vessel's starboard quarter. The deckhand quickly threw a lifebuoy into the water and manoeuvred the vessel alongside the skipper. Despite the deckhand's best efforts, the skipper was too heavy to be recovered by one person. About 30 minutes after hearing the initial shout for help, the deckhand managed to tie the now unconscious skipper to the vessel's side to keep their head above the water and went to the wheelhouse to make a "Mayday" call on the VHF radio (Figure 2).

On hearing the call, the coastguard deployed both a rescue helicopter and a lifeboat to assist. The helicopter was the first on scene and lowered a winchman down to the fishing vessel's deck. The deckhand and the winchman worked together to lift the skipper from the water onto the deck and started CPR. The skipper was airlifted to hospital and later declared deceased.

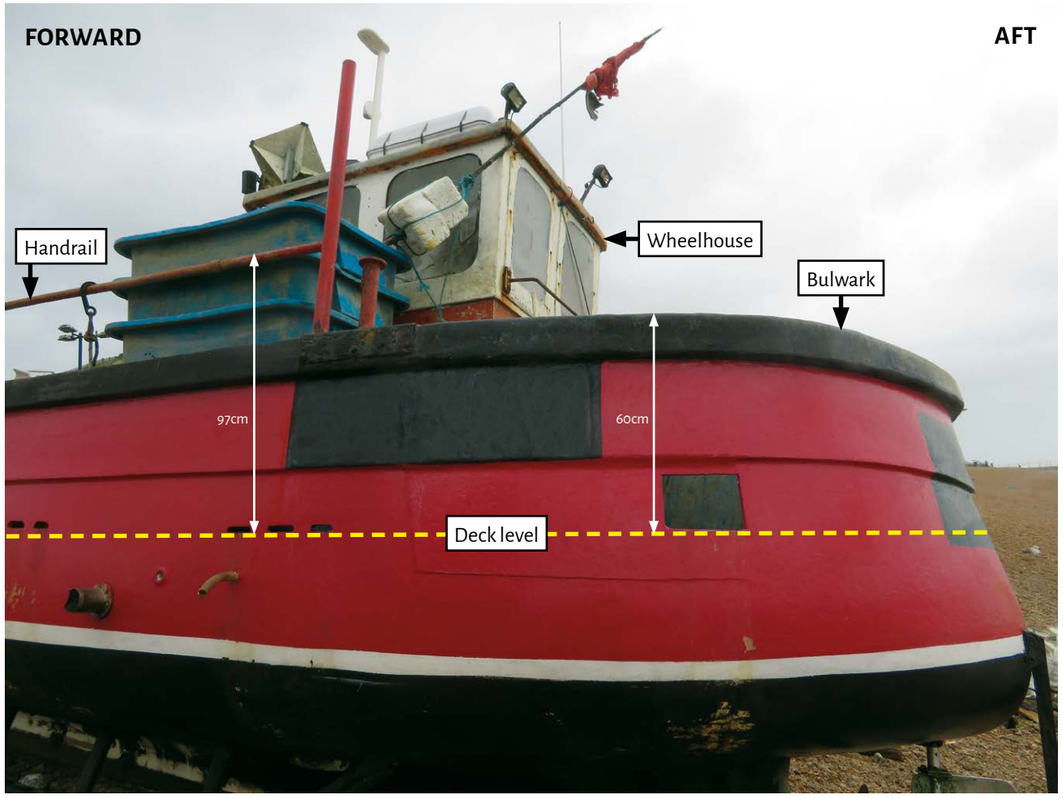

Figure 1: The low bulwark on the fishing boat

Source: Made Smart Group BV 2023

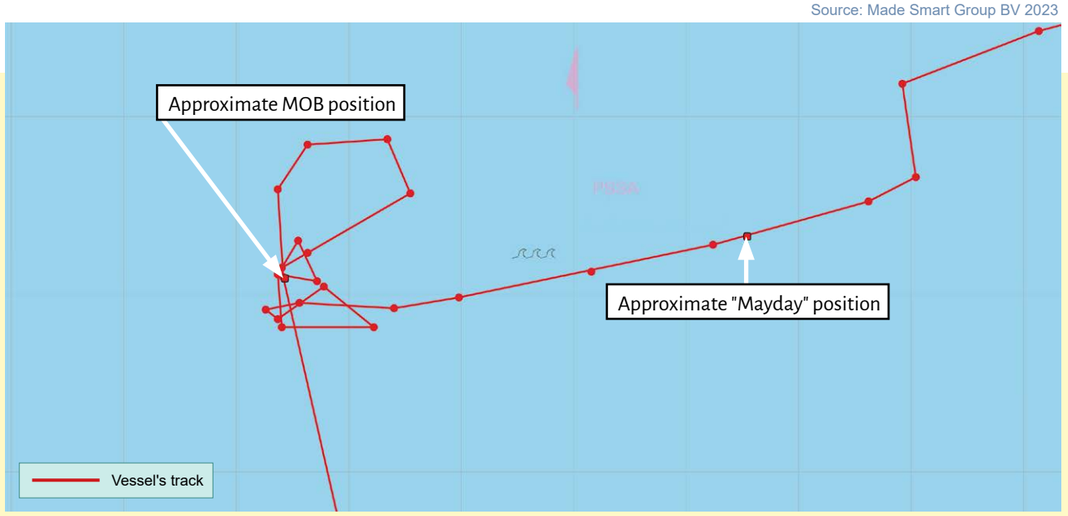

Figure 2: The "Mayday" call via VHF radio

The Lessons

1. **Procedure →** Both the skipper and deckhand had encountered man overboard (MOB) events before, but had not completed emergency drills on board this vessel. This was a missed opportunity to understand the difficulty of recovering a person from the water, especially someone who is unable to assist in their own rescue. Well-prepared and practised vessel-specific emergency procedures can be lifesaving.

2. **Risk →** The skipper and the deckhand had worked together for decades and were familiar with the vessel and each other. The obvious risk presented by a low bulwark on a small boat in rough seas was overlooked simply because they 'always did it that way.' Risk assessment does not need to be complicated: a simple step-by-step walk through of a routine on board task can help highlight hazards that might otherwise go unnoticed.

3. **Action →** Every second counts in an emergency. The deckhand in this case responded quickly to the skipper's situation but did not immediately call for help. It takes seconds to raise the alarm by pressing a digital selective calling (DSC) alert button and just a few minutes to complete a "Mayday" call via VHF radio: whichever method you have to hand, making an early call to the emergency services can save lives.

20

Calm under fire

trawler | fire

The crew of a pair trawler were heading back to their home port after a long week of fishing. As evening approached, and moments after one of the deckhands had popped below to call the skipper, everyone was shocked to hear shouts of "*Fire, Fire!*" from the engineer and the shriek of the engine room fire alarm. Thick, acrid, black clouds of smoke filled the passageway almost immediately. Quickly realising the potential severity of the situation, the skipper leapt up to the wheelhouse and conducted an emergency stop on the main engine, used the remote fuel shut-off valves, mustered the crew and, with the help of the mate, started shutting down the engine room to prepare to activate the fixed firefighting system for a shot of carbon dioxide (CO_2) into the space.

Only once everything was ready and everyone accounted for was the CO_2 activated. The mate confirmed that the CO_2 bottles had fired correctly and then the crew sat on the upper deck, waiting to see what would happen next. The boundaries of the fire were checked once the smoke had cleared from inside the vessel. Aside from a complete loss of power, nothing outside the engine room was damaged. Despite all appearing safe, the skipper knew there was a risk that the fire could reignite and did not re-enter the engine room.

With the engine unavailable and a hold full of fish, the skipper called their partner vessel to arrange a tow and, once connected up, the journey home recommenced. Having checked in with those ashore, the skipper planned to wait 10 hours before looking inside the engine room and eventually entered the space just before the vessel's arrival into harbour. There was a lot of debris and the damage seemed extensive, but the fire was definitely extinguished (Figures 1 and 2). A harbour launch took over the final part of the tow to the fish market berth, where a full damage assessment was arranged.

Source: Vikas Kamble

Figure 1: View from port forward toward the starboard aft corner of the engine room after the fire

Source: Vikas Kamble

Figure 2: Smoke blackened deckhead and the remains of the fire alarms

The Lessons

1. **Action →** The fire was extinguished effectively because the skipper took the time to isolate fuel sources into the space and close the engine room down properly before activating the CO_2 . This fire took hold quickly and produced clouds of toxic smoke. The skipper's actions ensured the safety of the crew and successfully contained the hazard.

2. **Teamwork →** The crew responded well to the skipper's directions, and they all knew what to do. Regular fire drills meant they were well-prepared when faced with a real-life emergency. The pair trawler's partner vessel also responded promptly and arranged a safe tow back to port.

3. **Communicate →** Unfortunately, in the rush of activity to extinguish the fire no one reported this incident to His Majesty's Coastguard using the Global Marine Distress and Safety System DSC alert. Had the fire remained alight, the pair trawler's crew would have been solely reliant on their partner vessel for support. Further, the provision of expert first aid by the rescue services would not have been available had anyone been injured or suffered burns. Any delay in raising the alarm can be critical, particularly when control of the situation is lost.

4. **Procedure →** This accident was not reported until a couple of months after the event, which meant that the cause of the fire was never fully established. The role of the MAIB is to help prevent further avoidable accidents from occurring by carrying out investigations to determine causes of accidents at sea and increase awareness of how marine accidents happen; help your fellow mariners by submitting an accident report form or phoning the MAIB's dedicated 24-hour accident reporting line on **+44 (0) 23 8023 2527** – it could save lives.

   For more information on how to report a marine accident go to:
   https://www.gov.uk/government/publications/report-a-marine-accident

Escape from an inferno

trawler | fire

A UK registered beam trawler was fishing in fine weather when its running starboard generator overheated and stopped, leading to a total loss of electrical power. The mate asked a deckhand to go below to the engine room and start the port generator to restore power. Shortly after starting the port generator the deckhand noticed a fire near the main engine.

The fire alarm sounded and smoke filled the accommodation spaces. Crew there tried to escape through a hatch onto deck but found it obstructed by vegetable boxes stowed on the other side (Figure 1). They were able to make their way out safely by another route. The location of the fire prevented the deckhand from using the usual access ladder out of the engine room, forcing them to exit by climbing on top of the main engine through the flames, and using an open emergency escape hatch onto deck. Once out, the deckhand was doused with water by their fellow crew members. They had sustained serious burns to around 40% of their body (Figure 2).

A "Mayday" call was transmitted and a local angling boat was first on scene. The injured deckhand was transferred across to it and taken ashore at high speed to be placed into the care of the medical services. They required hospitalisation in a specialist burns unit.

Figure 1: The blocked escape hatch

Figure 2: The deckhand's burnt clothing

In the 3 months leading up to the fire, the vessel's main engine fuel system had become difficult to prime due to debris in the fuel tanks causing the fuel lines to clog. In an attempt to resolve the problem, a small additional fuel oil day tank serving the main engine had been fabricated and fitted in the engine room. Its installation had not been completed before the vessel resumed fishing.

The day tank was designed to be replenished automatically using a fuel transfer pump controlled by two float switches, but the work to install the wiring for the pump control was not completed. The lack of automatic control meant that the tank needed to be topped up manually by the crew every 30 minutes. This was done by plugging the fuel transfer pump into a 240-volt extension lead until the tank was showing full on the gauge pipe, after which it was unplugged. The fuel oil day tank had an open vent pipe on top of it, into which a plastic hose had been loosely inserted (Figure 3).

On the day of the accident, when the boat first lost power, the deckhand had thought that the problem could be fuel-related so, as they entered the engine room, they plugged the fuel transfer pump in. When they started the port generator, the fuel transfer pump started and began filling the new fuel oil day tank. When the tank was full, it overflowed through the vent and the spilled fuel ignited on the starboard generator's hot exhaust, engulfing the engine room in smoke and flames.

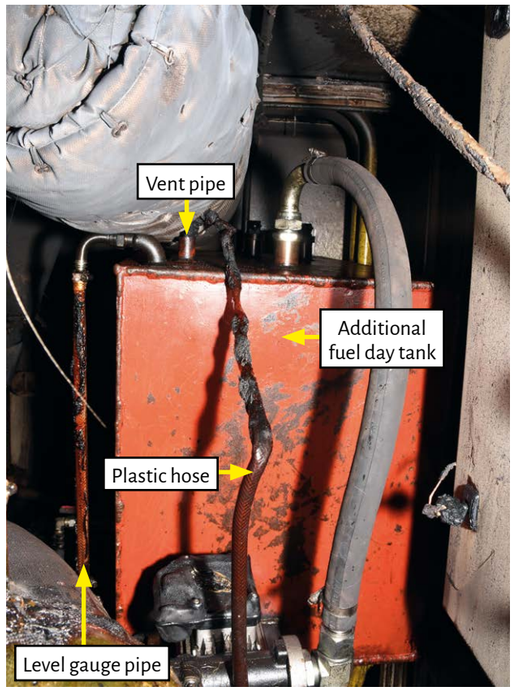

Figure 3: The installed fuel oil day tank

The Lessons

1. **Maintain →** The vessel's fuel system had a build-up of debris in the storage tanks, leading to the blockages in the pipework. Rather than deep cleaning the fuel system, the owner had opted to install the fuel oil day tank. It is always better to fix the underlying issue than devise a way around the problem it creates.

2. **Inform →** The addition of a fuel oil day tank was a major modification that posed a huge fire risk that the owner had not appreciated. The Maritime and Coastguard Agency (MCA) need to approve modifications before they are undertaken to make sure that a vessel's safety is not affected by any proposed changes. Early engagement with the relevant authorities can prevent costly delays and ensures compliance with the standards in place to protect the crew and equipment.

3. **Procedure →** Emergency escape hatches must be able to function as intended. In this case the deckhand knew where the emergency escape from the engine room was, and was able to escape through it. However, the escape hatch from the accommodation was routinely obstructed by the fruit and vegetable boxes. Thankfully the crew were able to escape safely this time, but it could have been worse.

4. **Qualified →** Despite regularly being tasked to carry out jobs in the engine room, the vessel's crew were neither trained in engineering nor had any engineering experience. The injured deckhand did not understand how the retrofitted fuel oil day tank operated, and was unaware that the system was not fully commissioned. Qualified crew who are familiar with the correct operation of a vessel foster a safer working environment for all on board.

RECREATIONAL VESSELS

As the evenings get lighter and the temperature rises many boat owners are preparing their boats for the new season. We are all keen to get afloat again after last year's less than ideal summer, when boats often remained unused due to windy or rainy weather. Some owners will neglect their boat's maintenance, assuming there is no need after only a few uses the previous season, but this oversight could have unfortunate consequences when they finally head out on the water.

...you face the risk of being stranded at sea, possibly in a shipping channel...

The Easter Bank Holiday weekend is often time for the first trip out following 6 months or so of winter, but the excitement of a planned day on the water can quickly turn into frustration if the outboard fails to start or you experience technical issues at sea. Whether it is a dead battery or an engine that cuts out unexpectedly, the consequences of neglecting outboard maintenance are clear. If your outboard breaks down, you face the risk of being stranded at sea, possibly in a shipping channel, and maybe the weather has worsened since you set out; the situation is definitely much more serious than if your car breaks down, when you can simply walk to safety.

Just as it is essential that you always check your kill switch works before heading out the importance of regular preventative maintenance cannot be overstated. Proper maintenance and regular checks by qualified marine technicians not only help to extend the life of the motor but also ensures safety and its reliability on the water. Servicing is far more comprehensive than just changing the oil and applying grease. Outboards work in harsh environments, particularly when used in salt water. Over time, the salty environment can corrode essential components, degrade wiring, seize moving parts, clog cooling systems, and cause fuel systems issues. Even if the outboard has only been used a couple of times last season, it still requires attention before starting the new season to ensure smooth operation. It is also worth noting that fuel systems can develop issues if leftover fuel from the previous season is not replaced.

Software – The more advanced four-stroke outboards, particularly the higher horsepower engines fitted to larger boats, require more sophisticated care. Regular servicing should involve checking the engine's control systems. Just like other modern equipment, outboards benefit from the latest software to ensure they are operating safely and efficiently. Systems including fuel injection, fly-by-wire, joystick control and other electronic components will require software updates and diagnostic checks and adjustments.

A poor battery...can lead to problems including engine failure, engine corrosion and electrical fires

Batteries – As boats get bigger and more powerful, the demands on their systems increase. With electric steering, joystick control, radar, plotters, bow thrusters, fridges and numerous other electrical components on board, the outboard motor has to be capable of charging the boat's multiple battery systems. A poor battery, or one that has corroded connections, can lead to problems including engine failure, engine corrosion and electrical fires. It is crucial to have the charging system checked and batteries tested to prevent such issues.

Fuel systems – One of the most common causes of boat breakdowns is problems with the fuel system. E10 petrol, commonly used in boats, has a shelf life of about 30 days, after which it begins to break down and cause problems. The ethanol in E10 absorbs moisture from the air, leading to water contamination in the fuel. Ethanol can also damage rubber, plastic, and brass etc., all found in a boat and outboard's fuel system. This contamination can clog filters, carburettors and injectors, causing poor performance or complete engine failure. During a routine service fuel filters are replaced and hoses and fuel lines are inspected to ensure that the engine receives clean, contaminant-free fuel. Additives can help to clean the fuel system and where added to fresh E10 petrol can prolong the life of the fuel.

Cooling systems – The cooling system is another critical focus area during an outboard service. The water pump and impeller are responsible for circulating water throughout the engine to regulate temperature. Over time, the impeller can wear down or become damaged, restricting water flow and leading to engine overheating. Blockages in the cooling system, such as salt build-up, seaweed, or other debris, can also impair cooling and cause the engine to overheat, which can result in severe damage. Regular servicing should include inspection and maintenance of the cooling system, including replacing impellers, checking thermostats, and ensuring there are no blockages.

Steering systems – Outboards can regularly face issues related to their steering systems. Smaller motors often use simple cable steering, while larger outboards might have hydraulic or power steering. Like any mechanical system, these require regular checks to ensure they continue functioning smoothly. Even the latest electric steering systems need routine inspection of the wiring and connections to ensure reliability. Worn or damaged seals or hoses can cause leaks or allow sea water into the system, which will lead to failures. Boat owners should keep an eye on these components throughout the season to avoid issues.

Do not wait until the engine fails or you are stranded at sea to realise the importance of proactive maintenance

Corrosion – Sacrificial anodes are fitted in and around the outboard's cooling system and the saddle bracket and gear case, playing a crucial part in minimising corrosion. Anodes and bonding wires should be inspected regularly and replaced if damaged or worn to avoid serious and expensive issues.

Do not wait until the engine fails or you are stranded at sea to realise the importance of proactive maintenance: make sure you get your outboard motor serviced and ready for the season to keep you, your passengers and your vessel safe on the water.

MARK BLEECKER | Director, MB Marine

Mark is a boating enthusiast who has lived and breathed the boat outboard servicing and repairs industry his entire life. He started working on boat engines at six years old, helping alongside his father who founded MB Marine in 1968. Mark took over the successful, family-run dealership in 1992 and moved the operation from Fareham, Hampshire to Ocean Quay Marina, Southampton in 2001. Over the years he has used his knowledge, technical training and industry experience to improve the business and MB Marine is now recognised as one of the top outboard motor servicing companies on the UK's south coast, providing expert guidance and industry-leading servicing, rigging, repairs and approved parts to its customers as an approved Mercury, Yamaha and Suzuki service agent. Mark loves a challenge and competed in the 1991 round Scotland RIB race, completing the 1,730 nautical-mile journey in 10 days.

22

High, dry, hot and stranded

motor cruiser | grounding

One of the great things to do on a hot sunny day is to take your new motorboat for a spin. A group of four friends decided to do just that, but in this case they were inexperienced, had no emergency equipment on board and did not know how to use the VHF radio. They were wearing light clothing and had few supplies, other than some bottles of beer.

The group motored around a wide tidal river during the morning and were far outside the buoyed channel when they grounded on a mud bank shortly after high tide. The water around the boat receded rapidly, and the friends quickly realised that timing is everything. Fortunately, they were in mobile phone range and were able to call for help. By the time a lifeboat arrived the motorboat was high and dry and the crew were unable to get close enough to rescue the group of friends (Figure 1). The lifeboat crew decided that the safest course of action was to leave them be and wait for the tide to come back in to refloat the boat.

As the day went on, the friends were baking in the sun with little protection in the boat's open cockpit. Afternoon rolled into evening and the temperature started falling. The group's lack of appropriate clothing started to become a problem and they became very cold.
The coastguard had been talking to the group routinely throughout the day to monitor their welfare and eventually decided to airlift them from the boat to prevent them coming to harm.

What started as a sunny day out on a boat ended with four sunburned and cold friends dangling below a helicopter as they were hoisted aboard one at a time (Figure 2), leaving their boat to be recovered once it had refloated. A day to remember for all the wrong reasons.

Figure 1: The motorboat viewed from the lifeboat

Figure 2: Lifting the friends aboard the helicopter

The Lessons

1. **Plan →** Preparation enables mariners to identify where it is safe to navigate and the potential hazards they might encounter. Consult charts and guides to gain local knowledge before leaving the marina; a well-made plan provides the best chance for a safe and enjoyable day out on the water.

2. **Equipment →** The boat and the group of friends were ill-equipped for the excursion and on a different day, in a different emergency, things could have been much worse. Supplies such as sun protection, distress flares, waterproof and warm clothing, lifejackets and a first aid kit can make all the difference when the unexpected happens.

3. **Qualified →** There is no requirement for leisure boat skippers to be qualified, but a wide range of guidance material and training courses are available to the leisure user that provide essential information for the safe operation of a small boat. While the motorboat in this case was not lost, it could have been an expensive day out.

An unguarded act

safety boat and dinghy | accident to person

A local sailing club was busy with a day of taster sessions and the experienced sailing instructor prepared a dinghy to take some novice sailors out on the water. There was a decent breeze across the reservoir, though the sailing instructor did note the occasional stronger gust of wind from the south-west so decided to sail up and down the sheltered western shores of the reservoir. The dinghy felt far less stable than normal and during the morning session it was caught by one of these gusts and capsized. The boat was righted and returned to shore without further incident. At lunchtime, the sailing instructor drained water out of the hull via the transom drain and replaced the drain plug.

For illustrative purposes only: not to scale

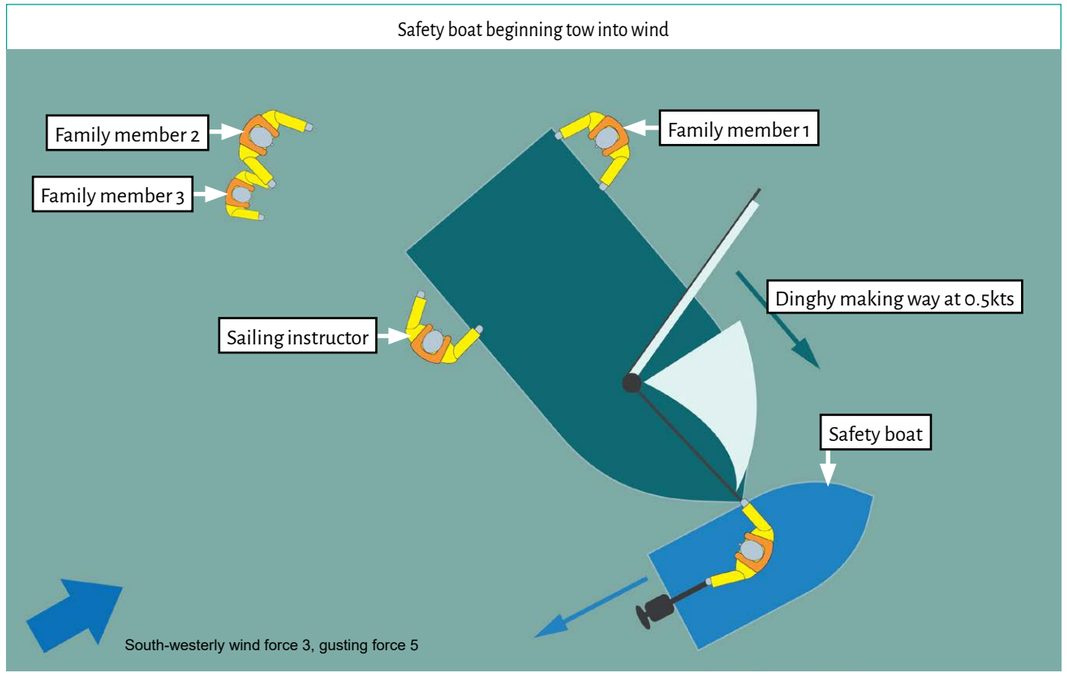

Figure 1: Safety boat starting the tow

The sailing instructor set out for the afternoon with a family of three novices. During this session the dinghy capsized once more. The dinghy was righted, but the jib sheet had been put on a cleat, so as soon as the dinghy came upright it started to sail away from all in the water. The sailing instructor was in the water on the windward side at the aft end of the dinghy and called over to the safety boat for help. When the safety boat arrived, the sailing instructor told its crew to approach the bows of the dinghy stern to the wind. The plan was to tow the dinghy's bows into the wind with the safety boat's lone coxswain holding the forestay in their right hand and controlling the safety boat's outboard engine with their left hand (Figure 1).

The safety boat coxswain slipped as they tried to grab the forestay, twisting the throttle on the outboard engine and pushing it away as they fell (Figure 2). This brought the stern of the safety boat along the windward side of the dinghy. The safety boat's propeller slashed through the sailing instructor's wetsuit, cutting their leg. The safety boat coxswain pulled the kill cord and stopped the outboard engine (Figure 3) before recovering the sailing instructor into the safety boat and administering first aid. The sailing instructor was transferred to hospital by ambulance, where their leg wound was treated and stitched. They made a full recovery but were off work for a while.

For illustrative purposes only: not to scale

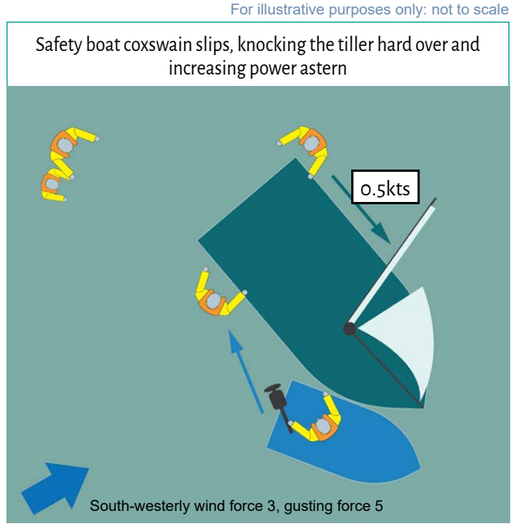

Figure 2: Safety boat coxswain slips

For illustrative purposes only: not to scale

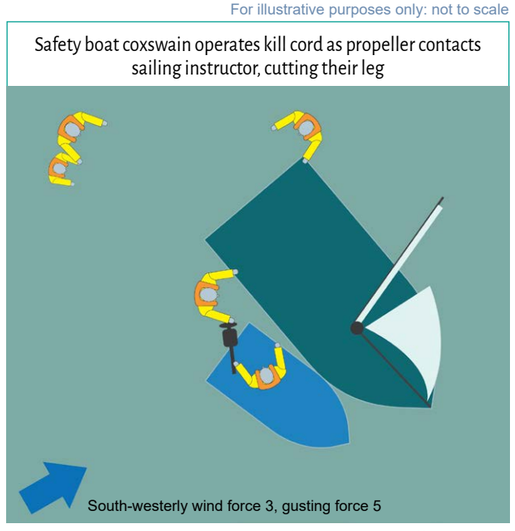

Figure 3: Propeller strike

The Lessons

1. **Plan →** Most of what happened in this case was entirely foreseeable. There was no clear, considered plan for how the safety boat crew should respond in this situation. The coxswain did not question what they were being told to do by the experienced sailing instructor, leading to a significantly reduced margin for error when the unguarded propeller was pushed towards the people in the water. Make sure you have a documented series of risk assessed action plans and practice them regularly.

2. **Check →** The sailing dinghy was prepared in a rush, and no one had checked the transom bung. Water entered the hull during the morning's sailing, creating a free surface effect and resulting in less stability than normal. The hull was drained over lunchtime, but there was no check that the transom bung provided a good seal when it was replaced. Thorough checks of even the simplest fittings are always worthwhile.

3. **Risk →** There is much debate about the benefits of propeller guards. Had one been fitted in this case it is highly likely the sailing instructor's injuries would have been less serious. Procedures and training need to be suitably adapted for the equipment fitted; for example, take great care when near people in the water in a boat without propeller guards and consider reaction times and the need for manoeuvrability at speed when in a boat with propeller guards. Managing risk is a thinking person's game.

Tender by name, sometimes by nature

tenders | fatal accidents

Using a small boat, or tender, to reach a moored vessel or shore is a common element of owning a boat. However, the following cases show that the risks involved in these transfers are easily overlooked.

Case 1

On an overcast but clear autumnal morning, three friends planned to spend the day fishing. One of the three owned a small boat that they often used to visit their favourite fishing grounds on days with little wind. The fishing boat was on a swinging mooring about 100m off the shore and the owner had a small fibreglass tender that could be used to row out to the fishing boat. As the tender could only take two people at any one time, it was decided that one of the party would row the owner out to the boat first before returning to shore for the third friend.

The owner and the friend boarded the tender and set off towards the fishing boat, with the friend rowing. The friend was wearing a PFD but the owner was not. The third friend waiting on the beach watched the small tender make slow progress in the surprisingly fresh breeze. Before they could shout to their friends in the tender to voice concern about the weather, the combination of wind and waves capsized the boat, throwing the occupants into the water (Figure 1).

Source: Made Smart Group BV 2025

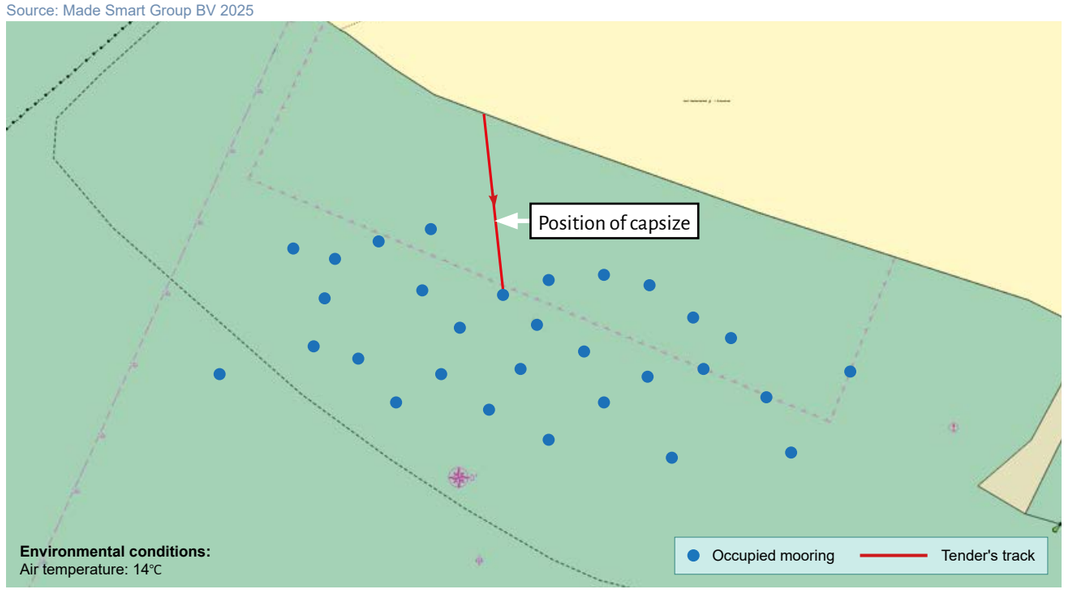

Figure 1: Accident location

The owner and friend attempted to swim to shore but quickly became separated in the cold water, which was between 10°C and 12°C. The friend on the beach immediately called the emergency services and a rescue helicopter, two lifeboats and coastal rescue teams were dispatched to assist. The friend who had been on the boat, although cold and wet, was able to reach the beach without assistance. The owner was eventually recovered from the water by a rescue team and transported to hospital, where they later died.

Case 2

Late in the evening, a passerby walking along a riverside path heard a person's voice from the middle of the river. Looking for the source of the sound, they spotted an upturned small tender with one person holding onto it as it drifted past with the tide (Figure 2). The passerby immediately called the emergency services.

Responders from police, fire, ambulance, and coastguard services arrived on scene very quickly and tracked the stricken person's progress down the river. The river was wide and prevented the would-be rescuers from reaching the casualty, who lost their grip on the upturned tender and were lost from sight. The water temperature was just 14°C. Despite a thorough search, the casualty was not located again.

Source: UKHO

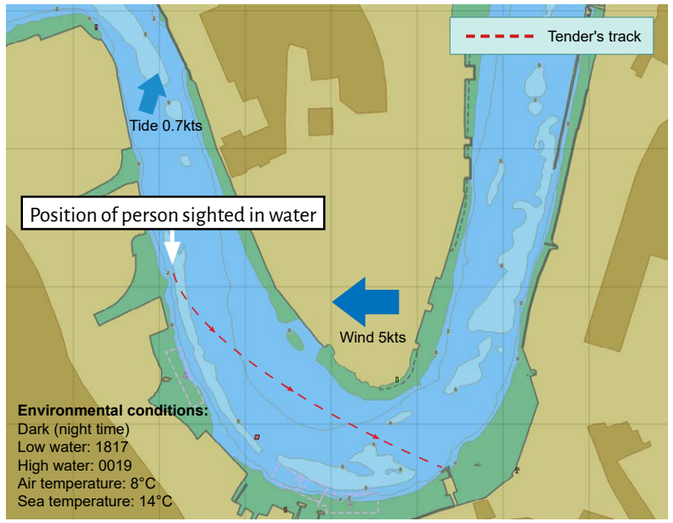

Figure 2: MOB from tender

The Lessons

1. **Margin of safety →** The three friends in case 1 had planned to spend the day fishing but did not change their plan when the weather conditions were worse than they had anticipated. Knowing your boat's operating limits before starting the planned activity might result in a decision to cancel the trip, but you will still be alive to make another attempt.

2. **Cold water shock →** In both cases the water temperature was below 15°C and so met the definition of cold water. Sudden immersion into cold water can cause a gasp reflex, hyperventilation and an increase in heart rate and blood pressure. Even if you survive the initial effects of entering such cold water, your chances of survival are significantly reduced if you do not wear a PFD to maintain buoyancy and conserve energy while waiting to be rescued.

3. **Aware →** When we do something often, or only for a short period of time, it is easy to overlook the accepted hazards and associated risks. Small tenders are convenient and easy to hop in and out of, but they can also be 'tender' by nature and can readily capsize; be aware of the danger they present and have suitable control measures in place.

4. **Plan →** It was pure luck that the casualty in case 2 was spotted by a passerby while in the water. If you intend to use a tender while boating alone, inform someone else where you will be and when you plan to do it. Although the raising of the alarm and emergency response efforts did not change the sad outcome in this case, you cannot be rescued if you are not missed.

INVESTIGATIONS

started during the period 1 September 2024 to 28 February 2025

	Date	Occurrence
	29 October	Foundering of the UK registered 23.1m fishing vessel ***Odyssey*** approximately 130nm east of Fife Ness, Scotland. The crew were rescued uninjured from the vessel's liferaft.
	23 November	Fatal injury to a crew member on board His Majesty's Cutter ***Vigilant*** while the vessel was alongside at Cowes, Isle of Wight, England.
	4 February	Failure of a towline on board the UK registered tug ***Svitzer Avon*** while assisting the Madeira registered car carrier ***Auto Eco*** in the approaches to Royal Portbury Dock, Avonmouth, England, resulting in damage to the tug's wheelhouse and injuries to 2 of its crew.

Correct up to 28 February 2025. Go to www.gov.uk/maib for the very latest MAIB news

Preliminary Assessments

Baltic Arrow
Grounding of a general cargo vessel on the River Nene, England on 25 June 2024.
PA5/2024 Published 24 September

Oceandiva
Loss of propulsion control and contact with moored barges by a passenger vessel on the River Thames, England on 22 June 2023.
PA6/2024 Published 21 October

REPORTS

issued in 2024 and 2025

Eder Sands 1/2024
Person overboard from a UK registered fishing vessel on 7 October 2022, with loss of 1 life. Published 8 February.

Awesome 2/2024
Loss of control of a powerboat on 2 October 2022, with loss of 2 lives. Published 25 April.

Alfred 3/2024
Grounding of a roll-on/roll-off passenger ferry on 5 July 2022. Published 22 May.

Kirkella/Shovette 4/2024
Collision between a fishing vessel and a harbour tug on 24 June 2022. Published 13 June.

Piedras 5/2024
Flooding, capsize and sinking of a fishing vessel on 1 June 2022. Published 20 June.

Ali Ka 6/2024
Contact with Oikos Jetty 2 by a chemical tanker on 25 October 2022. Published 18 July.

Channel Queen 7/2024
Grounding and loss of a motor vessel on 20 July 2023. Published 25 July.

Angelena 8/2024
Capsize and foundering of a fishing vessel on 18 June 2021. Published 1 August.

Inflatable migrant boat 9/2024
Flooding and partial sinking of an inflatable migrant boat on 14 December 2022, resulting in the loss of at least 8 lives. Published 15 August.

Pelican of London 10/2024
Fall overboard from a sail training vessel on 2 October 2023, with loss of 1 life. Published 12 September.

Kommandor Orca 11/2024
Injury to person during deck crane operations on board a survey and supply vessel on 16 August 2022. Published 19 September.

Equinox Seas 12/2024
Fall from height on a bulk carrier on 17 April 2023 with loss of 1 life. Published 27 September.

Guiding Light/Guiding Star 13/2024
Collision between pair trawlers resulting in the flooding and sinking of one on 6 October 2022. Published 3 October.

Wheelyboat 123 14/2024
Capsize of a recreational craft on 8 June 2022, with loss of 2 lives. Published 17 October.

Ocean Maid 15/2024
Grounding an subsequent loss of a stern trawler on 24 October 2022. Published 24 October.

Clipper Pennant 16/2024
Crush incident on board a roll-on/roll-off cargo vessel during cargo operations on 20 July 2021, with loss of 1 life. Published 7 November.

Biter/Hebridean Princess 17/2024
Girting and capsize of a tug while assisting a passenger vessel on 24 February 2023, with loss of 2 lives. Published 13 November.

Mona Manx 18/2024
Mooring deck accident during mooring operations on a bulk carrier on 26 August 2021, with loss of 1 life. Published 21 November.

Pioneer 19/2024
Person overboard from a potting vessel on 29 July 2021, with loss of 1 life. Published 4 December.

Stena Europe 20/2024
Engine room fire on board a roll-on/roll-off passenger ferry on 11 February 2023. Published 12 December.

Baton Rouge 1/2025
Fatal electrocution of the chief engineer on board a motor yacht on 23 February 2024. Published 23 January.

Njord 2/2025
Capsize and foundering of a fishing vessel on 6 March 2022, with loss of 1 life. Published 13 February.

Waverley 3/2025
Contact by a paddle steamer with Brodick pier, Isle of Arran, Scotland on 3 September 2020. Published 26 February.

Lexi Rose 4/2025
Capsize of a fishing vessel on 21 September 2023, with loss of 1 life. Published 27 February.

SAFETY BULLETINS

issued during the period 1 September 2024 to 28 February 2025

MAIB
MARINE ACCIDENT INVESTIGATION BRANCH

SAFETY BULLETIN

SB3/2024 SEPTEMBER 2024

Extracts from The United Kingdom Merchant Shipping (Accident Reporting and Investigation) Regulations 2012 Regulation 5:
"The sole objective of a safety investigation into an accident under these Regulations shall be the prevention of future accidents through the ascertainment of its causes and circumstances. It shall not be the purpose of such an investigation to determine liability nor, except so far as is necessary to achieve its objective, to apportion blame."

Regulation 16(1):
"The Chief Inspector may at any time make recommendations as to how future accidents may be prevented."

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NOTE
This bulletin is not written with litigation in mind and, pursuant to Regulation 14(14) of the Merchant Shipping (Accident Reporting and Investigation) Regulations 2012, shall be inadmissible in any judicial proceedings whose purpose, or one of whose purposes is to attribute or apportion liability or blame.

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Fatal man overboard from the fishing vessel *Kingfisher* (DH110) approximately 30 nautical miles east-north-east of Wick, Scotland on 12 July 2024

Kingfisher

MAIB SAFETY BULLETIN 3/2024

This document, containing safety lessons, has been produced for marine safety purposes only, on the basis of information available to date.

The Merchant Shipping (Accident Reporting and Investigation) Regulations 2012 provide for the Chief Inspector of Marine Accidents to make recommendations at any time during the course of an investigation if, in his opinion, it is necessary or desirable to do so.

The Marine Accident Investigation Branch is carrying out an investigation into the fatal man overboard from the fishing vessel *Kingfisher* (DH110).

The MAIB will publish a full report on completion of the investigation.

Captain Andrew Moll OBE
Chief Inspector of Marine Accidents

NOTE
This bulletin is not written with litigation in mind and, pursuant to Regulation 14(14) of the Merchant Shipping (Accident Reporting and Investigation) Regulations 2012, shall not be admissible in any judicial proceedings whose purpose, or one of whose purposes, is to apportion liability or blame.

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BACKGROUND

At about 1508 on 12 July 2024, a deckhand on board the UK registered fishing vessel *Kingfisher* (DH110) became attached to the backrope and was pulled overboard while manually toggling on creels as part of the shooting process. The deckhand's personal flotation device (PFD) automatically inflated and he initially surfaced, leading the crew to believe that he was clear of the backrope and floating freely.

Kingfisher's crew alerted His Majesty's (HM) Coastguard. They cut the backrope and manoeuvred the vessel to rescue the deckhand, who was still attached to the gear and by then had been pulled underwater by the fleet of creels. The crew recovered the fleet's end float and used the hauler to heave the backrope and recover the deckhand on board. Despite the efforts of the vessel's crew, members of a Royal National Lifeboat Institution lifeboat and a paramedic from a HM Coastguard rescue helicopter the deckhand could not be revived and was declared deceased.

INITIAL FINDINGS

The ongoing investigation has found that the vessel's risk assessment required a PFD to be worn when working on deck. The PFD worn by the deckhand was compliant with EN ISO 12402-2:2020[1] and had a red webbing lifting strop sewn onto the harness **(**see **figure)** that hung freely below the stole.

After the recovery of the deckhand, it was found that the leg rope of the last creel that had been shot away was threaded through the PFD's red webbing lifting strop. This had connected the deckhand to the running backrope and caused him to be pulled overboard. It is probable that the deckhand had inadvertently passed the toggle on the creel's leg rope through the red webbing strop while connecting the creel to the backrope.

Figure: The red webbing lifting strop on the PFD

Marine Guidance Note (MGN) 588 (F) provided guidance to fishermen on the wearing of PFDs on fishing vessels and also stated:

> *MSNs 1871, 1872, and 1873 require that vessel owners ensure a documented and effective risk assessment is in place which sets out the control measures for preventing MOB situations and what to do if a MOB situation occurs for conscious and unconscious persons.* [sic]

SAFETY LESSON

The benefits of wearing PFDs when working in exposed positions on fishing vessels to aid survival if a man overboard (MOB) occurs is clear. *Kingfisher*'s crew had been wearing the supplied PFDs on the working deck for the previous two years, as was required in the onboard risk assessment. However, the red webbing lifting strop hanging on the front of the deckhand's PFD harness presented a risk of entanglement when working creels that had not been identified or mitigated by the risk assessment.

Some crew members had spotted the risk of entanglement and before the accident had cut the strops from their PFDs; however, this had not resulted in a review of their working practices or risk assessments. Had the crew's concerns been raised more robustly, the risks associated with the deckhands' working deck tasks and locations could have been re-evaluated and they might have been provided with personal protective equipment (PPE) more suited to those tasks.

Although some crew cutting the lifting strops from their PFDs removed the risk of entanglement it created another, as their PFDs no longer had the lifting strops necessary to recover them from the water if they fell overboard. Unauthorised modification of a PFD can cause damage, render it inoperable and invalidate its certification; this practice must be avoided.

RISK ASSESSMENT

When managing risk, it is best practice to completely remove the hazard. The fishing method of toggling the creels to the backrope requires the crew to work close to the gear, so the risk assessment needs to consider the possibility of entanglement and MOB.

The use of a PFD as PPE to mitigate the risk of MOB must not increase the risk of entanglement. The type of PFD must be appropriate to the method of fishing, correctly worn and consider factors such as inadvertent entanglement by either loose lifting strops or loose crotch straps.

Other MOB mitigations such as the use of a safety tether and the position of the anchor point must also consider the potential risk of entanglement.

RECOMMENDATIONS

The **Home and Dry Safety Forum** is recommended to:

S2024/129M Immediately communicate through its members the need for owners and crew of creel fishing boats to review their deck working risk assessments to ensure that:

- the hazards associated with shooting and recovering creels, such as the risk of entrapment in a running backrope, are fully mitigated;
- when working deck PFDs are provided, they are of the required standard and are appropriate for the work being undertaken by the deck crew; and
- when new hazards are identified, such as the risk of entanglement from loose lifting strops on PFDs, they share the information among the crew and source alternative PPE as soon as possible.

Safety recommendations shall in no case create a presumption of blame or liability

Issued September 2024

[1] International Organization for Standardization International Standard, *Personal flotation devices Part 2: Lifejackets, performance level 275 – Safety requirements.*

MAIB
MARINE ACCIDENT INVESTIGATION BRANCH

SAFETY BULLETIN

SB4/2024 OCTOBER 2024

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Foundering of the fishing vessel

Argos Georgia

approximately 190 nautical miles east of Port Stanley,

Falkland Islands

with the loss of 13 lives

on 22 July 2024

Image courtesy of Royal Air Force

Argos Georgia foundering

Safety bulletin produced in association with St Helena Government.

MAIB SAFETY BULLETIN 4/2024

This document, containing safety lessons, has been produced for marine safety purposes only, on the basis of information available to date.

The Merchant Shipping (Accident Reporting and Investigation) Regulations 2012 provide for the Chief Inspector of Marine Accidents to make recommendations at any time during the course of an investigation if, in his opinion, it is necessary or desirable to do so.

The Marine Accident Investigation Branch is carrying out an investigation on behalf of St Helena Government into the foundering of the fishing vessel *Argos Georgia* on 22 July 2024, with the loss of 13 lives.

The MAIB will publish a full report on completion of the investigation.

Captain Andrew Moll OBE
Chief Inspector of Marine Accidents

NOTE

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BACKGROUND

On 22 July 2024, the St Helena registered longline fishing vessel *Argos Georgia* capsized and sank while on passage from Port Stanley, Falkland Islands to fishing grounds near the island of South Georgia. Of the 27 people on board, 13 perished and 14 were recovered during the search and rescue (SAR) operation. At the time, wave heights were reported to reach up to 7m accompanied by winds of up to 50 knots.

At about 1230[1], in a position approximately 190 nautical miles east of Port Stanley, *Argos Georgia* suffered an uncontrolled ingress of water through the shell door into the hauling compartment on its starboard side. Water then entered other areas aft of the hauling compartment **(**see **Figure)** and the vessel took on a starboard list. *Argos Georgia* was turned into the weather and the master raised the alarm via a colleague on a fishing vessel operating in the same region. This alarm was relayed to the authorities in the Falkland Islands and a SAR operation initiated using air and sea assets, supported by other fishing vessels.

General arrangement courtesy of Marin Teknikk and insets courtesy of Argos Froyanes and Commission for the Conservation of Antarctic Marine Living Resources

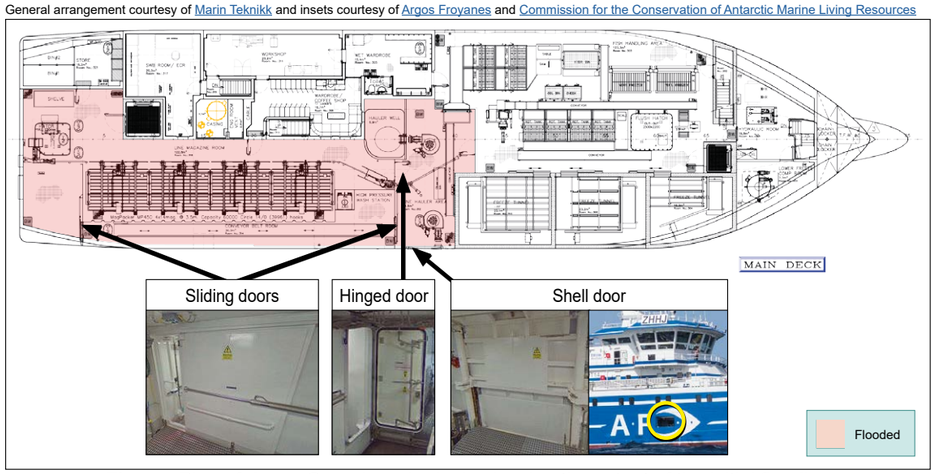

Figure: Plan of *Argos Georgia* main deck, showing the extent of the initial flooding

As the list of the vessel steadily increased, the crew mustered and donned their immersion suits. At about 1445, *Argos Georgia* lost propulsion and the vessel drifted in the heavy seas. At about 1600, with the list continuing to increase and the aft deck becoming immersed, and with darkness approaching, the crew started abandoning ship into two liferafts. By approximately 1130 on 23 July 2024, two of the responding vessels had recovered 14 survivors and 9 deceased crew members. Four crew members remain missing, presumed dead.

INITIAL FINDINGS

The ongoing investigation has found that, before the accident, the shell door in the starboard side of *Argos Georgia* was raised in the closed position. At the time of the accident the door was observed on closed-circuit television to descend slowly into the fully open position. This allowed significant quantities of water to enter the vessel. The crew were unable to close the shell door once it had opened.

Internal doors leading from the hauling compartment were open. This allowed water to flow unhindered into other areas of the vessel, causing a significant list that progressively increased as more water entered. The crew were unable to control the passage of water into other spaces in the vessel, which increased the list still further until the vessel foundered.

SAFETY ISSUES

The initial stages of the investigation have identified that:

- the means of maintaining the shell door in the closed position did not ensure it remained shut at the time of the accident.
- the crew were unable to close the shell door once it had opened.
- some doors in the boundary of the hauling compartment were in the open position, allowing consequential flooding of adjacent spaces.
- the crew were unable to close the boundary doors to the hauling compartment.

RECOMMENDATIONS

All **owners, operators and skippers of fishing vessels** that are fitted with side shell doors are recommended to:

S2024/137M Urgently ensure that a suitable and sufficient assessment of the risk of water entering the vessel through a side shell door has been undertaken and documented, noting the safety issues identified in this safety bulletin, and that:

- mitigations identified are immediately implemented to reduce the risks associated with a failure of a shell door;
- where a risk of consequential flooding between compartments exists, appropriate measures including maintaining internal doors in the closed position are taken; and
- the crew are informed of the findings of the risk assessment and the measures taken for their protection.

Safety recommendations shall in no case create a presumption of blame or liability

Issued October 2024

MAIB
MARINE ACCIDENT INVESTIGATION BRANCH

SAFETY BULLETIN

SB1/2025 FEBRUARY 2025

Extracts from The United Kingdom Merchant Shipping (Accident Reporting and Investigation) Regulations 2012 Regulation 5:
"The sole objective of a safety investigation into an accident under these Regulations shall be the prevention of future accidents through the ascertainment of its causes and circumstances. It shall not be the purpose of such an investigation to determine liability nor, except so far as is necessary to achieve its objective, to apportion blame."

Regulation 16(1):
"The Chief Inspector may at any time make recommendations as to how future accidents may be prevented."

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NOTE
This bulletin is not written with litigation in mind and, pursuant to Regulation 14(14) of the Merchant Shipping (Accident Reporting and Investigation) Regulations 2012, shall be inadmissible in any judicial proceedings whose purpose, or one of whose purposes is to attribute or apportion liability or blame.

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Safety issues on Egyptian liveaboard dive boats operating in the Red Sea

Image courtesy of Ali Aref, President of Dive Pro Liveaboard

Sea Story during modification

MAIB SAFETY BULLETIN 1/2025

This document, containing safety lessons, has been produced for marine safety purposes only, on the basis of information available to date.

The Merchant Shipping (Accident Reporting and Investigation) Regulations 2012 provide for the Chief Inspector of Marine Accidents to make recommendations at any time during the course of an investigation if, in his opinion, it is necessary or desirable to do so.

The Marine Accident Investigation Branch has been made aware of several incidents and accidents involving Egyptian liveaboard dive boats operating in the Red Sea that have resulted in many fatalities, some of which have been UK nationals.

Currently, formal safety investigations into the loss of the vessels involved remains the responsibility of the Egyptian Authority for Maritime Safety.

Captain Andrew Moll OBE
Chief Inspector of Marine Accidents

NOTE

This bulletin is not written with litigation in mind and, pursuant to Regulation 14(14) of the Merchant Shipping (Accident Reporting and Investigation) Regulations 2012, shall not be admissible in any judicial proceedings whose purpose, or one of whose purposes, is to apportion liability or blame.

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BACKGROUND

The MAIB is aware that 16 Red Sea liveaboard dive boats have been lost over the last 5 years. Seven of these losses happened in the last 21 months, and three of these resulted in numerous fatalities including UK nationals. In line with the principles of the International Maritime Organization (IMO) Casualty Investigation Code, the UK has been registered as a substantially interested state in the Egyptian safety investigations into these accidents.

FINDINGS

On 24 April 2023, dive boat *Carlton Queen* capsized and foundered **(Figure 1)** near Hurghada, Egypt with 33 people on board. All passengers and crew were rescued though several were injured, including UK nationals.

On 11 June 2023, dive boat *Hurricane* caught fire **(Figure 1)** and was abandoned near Elphinstone Reef in the Red Sea. Of the 29 people on board, three UK passengers remain unaccounted for and are believed to have perished.

On 25 November 2024, dive boat *Sea Story* capsized and foundered south of Port Ghalib, Egypt with 45 people on board. Four bodies have been recovered and 7 people, including two UK passengers, remain missing and are believed to have perished.

Images courtesy of Toby Meadows/Alexander Derhaag (left) and Mohammed Kaddah (right)

Figure 1: *Carlton Queen* capsized and *Hurricane* on fire

SAFETY ISSUES

The following safety issues have been identified:

- The dive boats involved were poorly constructed and often substantially modified/extended **(Figure 2)**, which resulted in some vessels exhibiting inadequate stability.
- Essential lifesaving equipment was defective, out-of-date for service and, in some cases, missing.
- The rapid spread of fire is indicative of poor structural fire protection, and items of essential safety equipment, such as fire detection systems and fire extinguishers, were either missing or defective.
- Emergency escape routes were via lockable doors, had no emergency lighting and were unmarked.
- Safety briefings to passengers were of a poor standard or not conducted at all.
- Crews appeared poorly trained and were unfamiliar with their vessels.

Images courtesy of Ali Aref, President of Dive Pro Liveaboard

Figure 2: *Sea Story* before and after modification, including extension

SAFETY LESSONS

Liveaboard dive boat holidays are often marketed using ratings and reviews posted online that are not necessarily accurate and do not assure safety standards. Further, a number of consumers have found themselves switched to another boat on arrival in Egypt, which has negated their attempts to holiday on a safe vessel.

From the spate of recent fatal accidents and vessel losses, it is clear that the local safety standards of dive boats operating in the Red Sea can fall well below those routinely experienced in the UK and Europe. Prospective customers are advised only to book liveaboard dive holidays through recognised vendors who can provide assurance about the safety standards applicable to the dive boat. On arrival on board, customers should request that the crew provide a thorough safety briefing before departure. This should cover the emergency warning signal, emergency exits, muster stations, the location and use of safety equipment, and abandon ship procedures.

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MAIB

MARINE ACCIDENT INVESTIGATION BRANCH

SAFETY FLYER TO THE SHIPPING INDUSTRY

Fatal man overboard from the sail training vessel *Pelican of London* at Sharpness, England on 2 October 2023

Pelican of London

Narrative

At 2308[1] on 2 October 2023, the volunteer relief cook of *Pelican of London* fell from the top of the vessel's gangway into the water. Their absence was not noted until the next morning when a search was started. In the early afternoon police divers recovered the relief cook's body to the quay where they were declared deceased.

Pelican of London was alongside in Sharpness, England for maintenance and repair ahead of a planned dry dock period starting on 4 October 2023. The gangway to shore was busy with contractors and crew shuttling back and forth with stores and personal effects. On the evening of 2 October 2023, a small group from the vessel met socially at a local bar. The relief cook drank heavily until closing time and then walked alone back to *Pelican of London*. When at the top of the gangway the relief cook lost their balance and fell through a large gap in the guard ropes, towards the safety net, which failed to arrest their fall, and then into the water between the quay and the vessel. Unable to climb out of the dock the relief cook succumbed rapidly to drowning.

[1] All times are British Summer Time – universal time coordinated +1 hour (UTC+1).

Safety lessons

1. With large gaps in the fencing between the inboard end of the gangway and the bulwark ladder the relief cook was not prevented from falling overboard when they lost their balance as they went to step on board. Chapter 22 of the Code of Safe Working Practices for Merchant Seafarers (COSWP) promulgates guidance on how to rig a gangway such that it provides a safe means of access. Specifically, it states that *guard ropes…should be kept taut at all times* and that, when the inboard end of a gangway rests on the top of the bulwark, *Any gap between the bulwark ladder and the gangway should be adequately fenced to a height of at least 1 metre*. Make sure that appropriate fencing covers the entire length of the gangway, through to any bulwark ladder or steps on board.

2. Secured to the edges of the gangway the safety net had been arranged such that its outer edges were lower than the gangway so it sloped downwards away from the gangway and acted like a chute instead of a means of arresting a fall. Chapter 22 of the COSWP is clear that safety nets must: be mounted where there is a risk of falling; act to *minimise the risk of injury arising from falling*; and, that the *whole length of the means of access should be covered*. The Nautical Institute's 2009 publication Mooring and Anchoring Ships Volume 1, Principles and Practice also provides guidance on the use of spreader bars to ensure that the safety net *can be properly stretched out over the gap between the ship and the quay.* A well-rigged gangway safety net can make all the difference.

3. The Efficient Deck Hand syllabus includes instruction on how to rig a gangway. Use crew with these skills to inspect your gangway to make sure it provides the required *safe means of access…between the ship and the quay*[2]. The gangway in this case did not provide a safe means of access; does yours?

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[2] Marine Guidance Note 533 (M) Amendment 2: Means of Access, published in 2022.

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SAFETY FLYER TO THE FISHING INDUSTRY

Collision between the pair trawlers *Guiding Light* (H 90) and *Guiding Star* (H 360) resulting in the flooding and sinking of *Guiding Star* 33 nautical miles south-east of Fair Isle, Scotland on 6 October 2022

Image courtesy of HM Coastguard

HM Coastguard helicopter footage following the collision, showing the overturned liferaft and a member of *Guiding Star*'s crew being recovered from the water using *Guiding Light*'s power block

Narrative

At about 1149 on 6 October 2022, the pair trawlers *Guiding Light* and *Guiding Star* collided 33 nautical miles south-east of Fair Isle, Scotland, resulting in the flooding and sinking of *Guiding Star*. The vessels had completed their last haul of a six-day fishing trip, and the cod end of *Guiding Star*'s net was being transferred to *Guiding Light* when the vessels drifted together and collided in the rough sea conditions. *Guiding Star*'s stern was breached, and water flooded the aft compartment. The crew attempted to pump out the floodwater but were unsuccessful.

Guiding Star started to sink by the stern, and the crew launched the liferaft while its skipper made a distress call and, shortly afterwards, gave the order to abandon ship. The lifejackets and immersion suits were stored inside the flooded area, and the crew could not access them despite attempts to do so. Fortunately, *Guiding Light*'s crew transferred their own survival equipment across to *Guiding Star*'s crew, who donned the gear and abandoned into the liferaft.

Guiding Light's crew used the vessel's power block to lift two of *Guiding Star*'s crew on board before a large wave struck and capsized the liferaft. The six occupants were thrown into the water but were able to swim back to and grab hold of the overturned liferaft. Three of the six crew members were recovered from the water using *Guiding Light*'s power block and the last three crew members were winched to safety by a coastguard rescue helicopter. There were no serious injuries, and *Guiding Star* sank about an hour after the collision.

Safety lessons

1. *Guiding Light*'s wheelhouse was left unattended during the fish transfer. Leaving the wheelhouse unattended, even for short periods, can have catastrophic consequences. MAIB data indicates this remains prevalent in the fishing industry, and the risks of not keeping a safe watch are neither fully appreciated nor controlled. Marine Guidance Note (MGN) 313 (F) requires watchkeepers to stay in the wheelhouse to maintain a safe navigational watch. It instructs them to avoid distractions and consider the impact of fishing operations on their primary responsibilities.

2. *Guiding Star* did not meet any damage stability criteria. It was not constructed to withstand progressive flooding, and the bilge pumps were not designed to manage floodwater. When floodwater entered the hull, it would have caused a rapid reduction in buoyancy and loss of stability. It is therefore crucial to be prepared for such emergencies and to know when to abandon ship. This includes familiarity with the stability information book and understanding the vessel's survivability. The *Fishermen's Safety Guide* provides guidance to help crews develop flood action plans, and MGN 570 (F) offers drill scenarios to practice such plans.

3. The commendable decision to equip both vessels with immersion suits significantly improved the chances of survival of those who entered the water, mitigating the effects of cold water shock and cold incapacitation. Without immersion suits, it is highly likely that the crew would have been unable to help themselves or would have become unconscious. Fishing vessel owners and skippers should assess the need for specific lifesaving appliances by evaluating the risks associated with their vessel's operation, including its location and prevailing weather, which may mean going beyond simple regulatory compliance.

4. The lifejackets and immersion suits on board *Guiding Star* were stored in crew cabins, rendering them inaccessible before abandonment because they were located inside a flooded compartment. MGN 570 (F) advises fishermen to consider suitable storage locations for lifejackets. On board *Guiding Light*, the survival equipment was stored in weathertight boxes next to the liferafts, meaning it was readily accessible in an emergency.

Guiding Light's survival equipment stored in boxes next to the liferafts

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MARINE ACCIDENT INVESTIGATION BRANCH

SAFETY FLYER TO THE FISHING INDUSTRY

Grounding and subsequent loss of the stern trawler *Ocean Maid* (BA 55) on Cairnbulg Point, Aberdeenshire, Scotland on 24 October 2022

Narrative

On 24 October 2022, during the early morning and in poor visibility, the stern trawler *Ocean Maid* grounded on Cairnbulg Point near the port of Fraserburgh, Scotland. The vessel later broke up and sank.

Image courtesy of Alex Young (MarineTraffic.com)

Ocean Maid

Ocean Maid was on passage from Eyemouth to Fraserburgh for pre-arranged maintenance and was being navigated by a lone watchkeeper. The navigation equipment in the wheelhouse included three chart plotter displays, one of which the watchkeeper used to navigate by following the past tracks displayed on it and cross-checking these with external visual indicators to judge the vessel's position. In the final few minutes before the grounding the watchkeeper left the wheelhouse at least twice to make tea for the crew, which was a normal task on the vessel's approach into port. Between these visits to the galley, the watchkeeper made several course adjustments that gradually moved *Ocean Maid* towards Cairnbulg Point **(**see **figure)**. The watchkeeper was absent from the wheelhouse at the time of grounding.

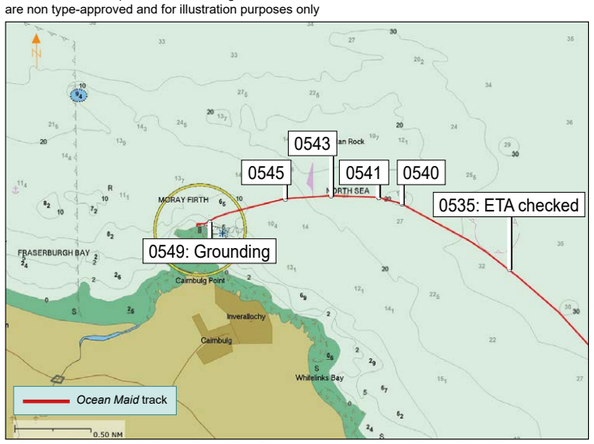

Figure: Chart showing the four course alterations leading up to the grounding

The skipper contacted the coastguard immediately after the vessel ran aground and the crew launched and inflated a liferaft. The movement of *Ocean Maid* was extreme as it rolled violently from side to side and was forced further onto the shoal by the swell so the crew abandoned into the liferaft and pushed it away from the side of the stricken vessel. They were rescued shortly afterwards by an all-weather lifeboat crew and subsequently treated for minor injuries.

Safety lessons

1. The hazard of leaving the wheelhouse unattended was recognised as a hazard in *Ocean Maid*'s on board risk assessment, but this did not stop it happening. The presence of a watchkeeper in the wheelhouse during passages is essential to maintain vessel safety, particularly in coastal waters.

2. *Ocean Maid*'s watchkeeper had been trained to follow past tracks displayed on a chart plotter, resulting in a reactive and unplanned approach to navigating coastal waters in poor visibility. The Maritime and Coastguard Agency (MCA) require fishing vessels to follow the guidance in Maritime Guidance Note 313 (F), Keeping a Safe Navigational Watch on Fishing Vessels, which outlines that a passage plan includes a plotted course on appropriate scaled charts and that areas of danger should be highlighted.

3. The watchkeeper's ability to judge external visual indicators was compromised by poor visibility, and their night vision was compromised by frequent visits to the illuminated galley and the presence of a television in the wheelhouse. Owners and watchkeepers should ensure that the wheelhouse is attended and remove domestic media equipment from the wheelhouse.

4. Lack of sleep in the 2 days before the accident, increased by the watchkeeper not taking opportunities to rest and the early morning low attentiveness danger period, was likely to have affected the watchkeeper's performance.

5. The survivability of the crew was improved by the transmission of an early distress call, the prompt decision to abandon *Ocean Maid* and the skipper and co-owner's attention to emergency preparedness.

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SAFETY FLYER TO THE FISHING INDUSTRY

Fatal man overboard from the potting vessel *Pioneer* (NN200) south of Hastings, England, on 29 July 2021

Pioneer

Narrative

At about 0853 on 29 July 2021, the skipper of the UK registered fishing vessel *Pioneer* fell overboard from the aft deck of the vessel. At the time of the accident, *Pioneer* was returning from its fishing grounds to its beach landing at Hastings in moderate sea conditions with a 2m swell.

Pioneer's sole deckhand was in the wheelhouse when they heard a shout; they immediately went out onto the deck and saw the skipper in the water some distance aft of the vessel. The skipper was not wearing a personal flotation device (PFD). The deckhand threw a life ring towards the skipper and saw him attempt to swim to it before returning to the wheelhouse and manoeuvring the vessel back towards the skipper. By this time the skipper was motionless with his face in the water. The deckhand tried in vain to manually haul the unconscious skipper back on board.

The deckhand raised the alarm by making a "Mayday" call to the coastguard using a VHF radio, then made further unsuccessful attempts to help the skipper. Forty minutes later, with the help of a rescue helicopter winchman who had been lowered onto the vessel, the skipper was recovered on board and then airlifted to hospital, where he was later declared deceased.

The investigation found that the bulwark around *Pioneer*'s aft deck was low and the vessel's wheelhouse windows were semiopaque and cracked, restricting visibility from inside. Some items of mandatory safety equipment were missing, damaged or out of date, the Seafish risk assessment had not been completed, emergency drills had not been conducted and the skipper had not undertaken mandatory safety awareness training.

Safety lessons

1. Make sure your vessel is well maintained and fit to go to sea. Check that your safety equipment is in its correct position on board and in date for service.

2. Risk assessments provide the opportunity to take stock of a fishing vessel's normal working activities, identify hazards and put in place measures to mitigate them. Had *Pioneer* had a guardrail of adequate height, or had the skipper been wearing a tethered safety harness in this case, either would have offered protection against the risk of falling overboard. Make sure you have attended the Seafish Safety Awareness course and refer to the Maritime and Coastguard Agency publication *The Fishermen's Safety Guide* for advice on how to prepare risk assessments for your vessel.

3. The wearing of a PFD while working on deck improves the likelihood of survival should the unexpected happen and you fall overboard. PFDs are designed to keep you afloat with your airway clear of the water.

4. Conduct frequent emergency safety drills, including man overboard recovery, and practice using your safety equipment so you know what is available, how to operate it correctly, and whether it is adequate should a lone crew member be required to effect a recovery; do not wait until an accident happens to find out.

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SAFETY FLYER TO THE FISHING INDUSTRY

The capsize and foundering of the fishing vessel *Njord* (SH 90), resulting in one fatality, 150 miles north-east of Peterhead, Scotland, on 6 March 2022

Image courtesy of SAR helicopter

The crew standing on the upturned hull of *Njord*

Narrative

On 6 March 2022, the 26.56m stern trawler *Njord* (SH 90) capsized and foundered 150 miles north-east of Peterhead, Scotland while processing a very large haul of fish. The MAIB investigation found that the weight of catch, which was secured to the starboard trawl winch and acting on a handrail high up on the vessel's starboard side, caused it to list to starboard to an angle where downflooding occurred. A drain valve had been left open in the starboard weathertight bulkhead on the vessel's working deck, which allowed downflooding into *Njord*'s internal spaces. The starboard list subsequently increased further, resulting in the capsize of the vessel.

Njord's eight crew abandoned to the vessel's upturned hull, but none were wearing either a personal flotation device, an immersion suit or carrying a means to raise an alert. Fortunately, *Njord*'s Emergency Position Indicating Radio Beacon floated free of the wreck and alerted search and rescue (SAR) authorities, which tasked a helicopter and a nearby vessel to assist. The SAR helicopter arrived on scene 45 minutes later but *Njord* sank within minutes of its arrival and all eight crew ended up in the water. Neither of *Njord*'s liferafts surfaced and it is likely that these were trapped on board and then lost their buoyancy. Three of the crew were rescued by the SAR helicopter, but one of them drowned despite the efforts of the helicopter's on board medic. The remaining five crew were rescued by the nearby vessel's fast rescue craft.

The MAIB investigation determined that the modifications made to *Njord* in 2021 reduced the safety margin of the vessel's transverse stability. The Maritime and Coastguard Agency (MCA) was not formally informed of these modifications, nor were any calculations completed by a naval architect to assess the impact of the modifications on the vessel's stability.

The combination of a reduced margin of stability due to the modifications and the vessel's operational conditions during the incident directly contributed to *Njord*'s capsize.

Safety lessons

1. Fishermen are reminded that the MCA must be informed of any significant changes or modifications to a fishing vessel. Early engagement with a naval architect is essential to maintain safe margins of stability.

2. The consequences of operating a vessel outside the assumptions made in its stability book can be unpredictable and devastating. A trim and stability book includes the operating assumptions against which likely stability conditions have been calculated and fishing vessel owners and skippers must work within these to maintain the safe operation of their vessels and prevent accidents.

3. When things go wrong, smooth abandonment and rescue relies on serviceable equipment, knowledge, experience, training, and good communications. Training in the use of liferafts, EPIRBs, digital selective calling and issuing a "Mayday" is vital, as are frequent sea survival and man overboard drills.

4. Essential safety equipment needs to be accessible to save lives. Consider storing abandon ship lifejackets and immersion suits in a box on the working deck of your vessel to make certain they are within reach when there is no time to go below.

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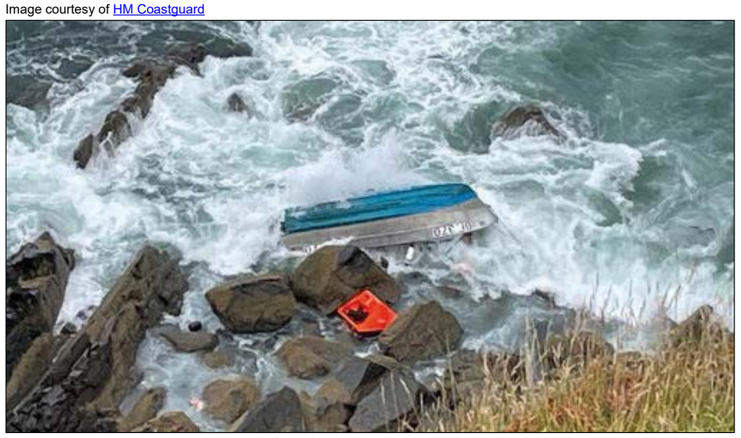
SAFETY FLYER TO THE FISHING INDUSTRY

Grounding and capsize of the single-handed creel fishing vessel *Lexi Rose* (BF 370) resulting in one fatality on Melrose Point, north-east Scotland on 21 September 2023

Image courtesy of HM Coastguard



Lexi Rose and liferaft after the recovery of the skipper

Narrative

During the early morning of 21 September 2023, the skipper of the lone-operated creel fishing vessel *Lexi Rose* departed Banff harbour, Scotland to fish along the coast to the east of Macduff. The winds were from the south-south-west and there was a 1m to 1.5m residual swell from the north. The skipper had discussed working in the swell with another creel fishing vessel skipper who was out fishing at the same time. They agreed that, while the wind direction was favourable for fishing beneath the cliffs, the swell made operating more difficult and so decided to work together should support be needed.

Lexi Rose's skipper began working his individually placed creels in the small coves along the coast before the other fishing vessel had arrived in the area. As *Lexi Rose*'s skipper moved his vessel from one creel to another the outboard engine's lower assembly unit hit a rock promontory at the entrance of a small cove. The engine's lower assembly unit detached from its mounting, causing an immediate loss of propulsion.

Lexi Rose became subject to the waves washing against the shore and was moved onto the rocks within 4 minutes. The skipper made an initial radio call on the local working channel to say he was grounded and in need of immediate aid. Moments later, he made another call on the same channel to say the vessel was going over. The skipper of the other fishing vessel heard the calls and raised the alarm.

Lexi Rose's skipper was found approximately 5m from his vessel in shallow water by emergency services personnel. He was recovered by helicopter but declared deceased on the way to hospital. The skipper could not swim and he was not wearing a personal flotation device (PFD) or carrying a personal locator beacon, although both were normally available on board *Lexi Rose*. A postmortem examination indicated that the skipper had received a significant head wound at the time of the accident and was most likely unconscious before or immediately after he entered the water.

The investigation could not determine what steps the skipper took to mitigate the increased risk of grounding and capsize due to the presence of a significant swell close to shore. The investigation found that the lone skipper had little time to take action to avoid a grounding and might not have realised that the engine's lower assembly unit had been lost. He also had limited time to take all the possible actions that might have improved his chances of survival such as setting an anchor; raising a "Mayday" distress; and donning a PFD.

The accepted method used by fishermen operating near Macduff to prevent grounding and capsize was to drop an anchor to hold the vessel away from the shore. No evidence was found of an anchor being used and it is considered unlikely the skipper had enough time to do so without other crew on board.

Safety lessons

1. When operating close inshore, the presence of a swell or other unusual weather event can increase the risk of exposure to the hazards of grounding and capsizing. If unsure, the safe action is to abort fishing operations.

2. The risks of operating single-handedly are well known, but are compounded when working close inshore when the time to react is reduced. Good preparation is essential to deal with emergencies effectively.

3. Preventing a grounding using an anchor requires sufficient room between the vessel and shore for the anchor and chain to have an effect. This method might prove ineffective when close inshore, particularly when waves are acting on the vessel.

4. Wearing a PFD with crotch straps when there is any risk of entering the water increases the chances of survival as it will keep an unconscious person's airway out of the water.

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