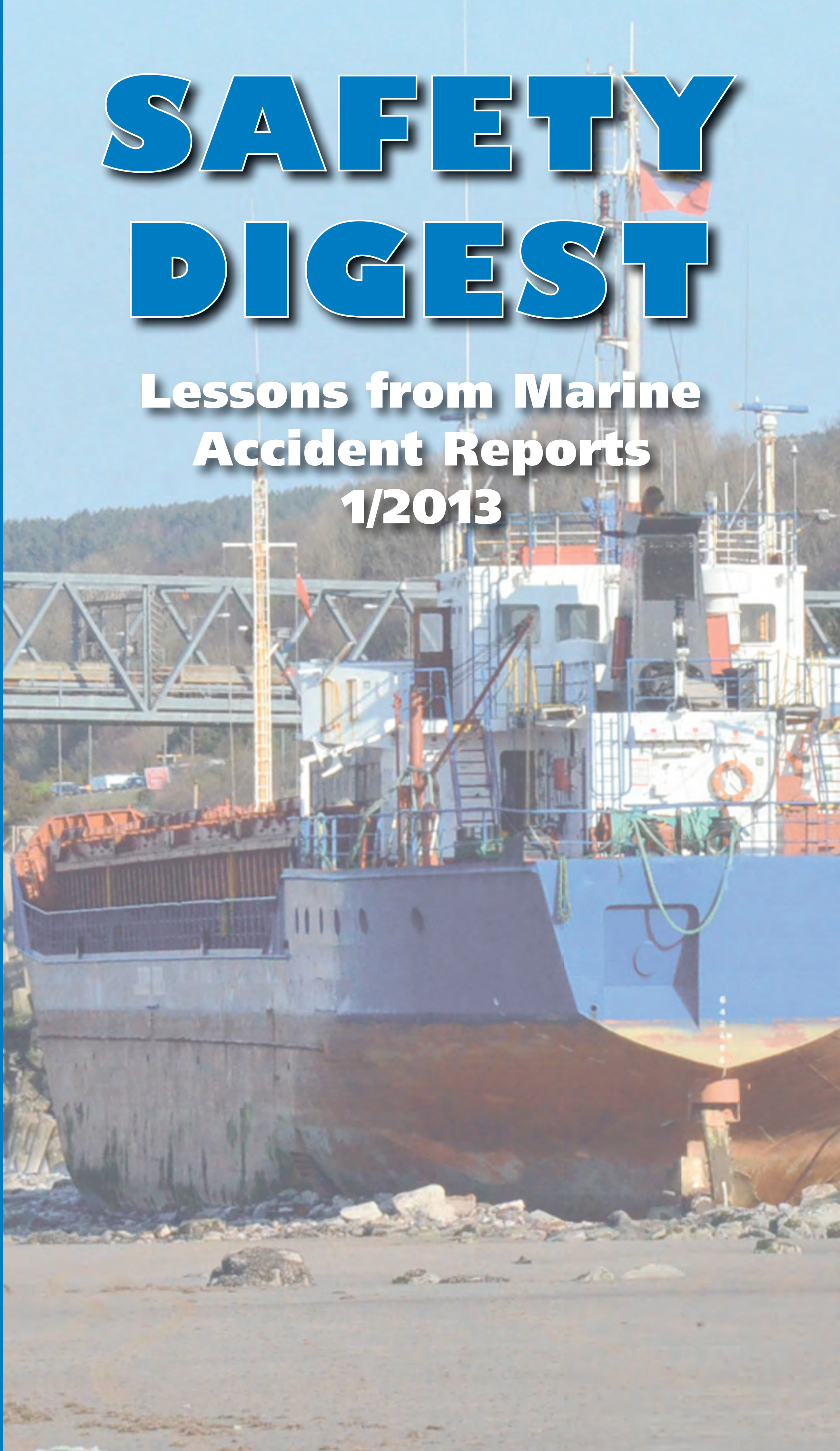
MARINE ACCIDENT
INVESTIGATION BRANCH

MAIB

SAFETY DIGEST

Lessons from Marine Accident Reports 1/2013



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Lessons from Marine Accidents

No 1/2013

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is an
INVESTOR IN PEOPLE

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April 2013

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 a separate, 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 which has been determined up to the time of issue.

This information is published to inform the shipping and fishing industries, the pleasure 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.

Extracts can be published without specific permission providing the source is duly acknowledged.

The Editor, Jan Hawes, welcomes any comments or suggestions regarding this issue.

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MARINE ACCIDENT INVESTIGATION BRANCH

The role of the MAIB is to contribute to safety at sea by determining the causes and circumstances of marine accidents and, working with others, to reduce the likelihood of such causes and circumstances recurring in the future.

Extract from
The 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."

INDEX

Glossary of Terms and Abbreviations

AB	-	Able Seaman
AIS	-	Automatic Identification Syste
BNWAS	-	Bridge Navigational Watch Alarm System
bp	-	Bollard Pull
C	-	Celsius
CO_2	-	Carbon Dioxide
COLREGS	-	International Regulations for the Prevention of Collisions at Sea 1972 (as amended)
CPA	-	Closest Point of Approach
CPP	-	Controllable Pitch Propellers
CPR	-	Cardio-Pulmonary Resuscitation
DSC	-	Digital Selective Calling
EPIRB	-	Emergency Position Indicating Radio Beacon
GPS	-	Global Positioning System
gt	-	gross tons
IMO	-	International Maritime Organization
ISM	-	International Safety Management (Code)
kg	-	kilogram
m	-	metre
MCA	-	Maritime and Coastguard Agency
MGN	-	Marine Guidance Note
MHz	-	megahertz
OOW	-	Officer of the atch
OS	-	Ordinary Seaman
OSB	-	Orientated Strand Board
PLB	-	Personal Locator Beacon
RIB	-	Rigid Inflatable Boa
RNLI	-	Royal National Lifeboat Institution
Ro-Ro	-	Roll on, Roll off
rpm	-	revolutions per minute
SAR	-	Search and Rescue
SOLAS	-	International Convention for the Safety of Life at Sea
TSS	-	Traffic Separation Schem
VDR	-	Voyage Data Recorder
VHF	-	Very High Frequency
VTS	-	Vessel Traffic Service
WBV	-	Whole Body Vibration
XTE	-	Cross Track Error

Introduction

Case 3 of this Safety Digest reminds me of a recent visit I made to Dover, where I was able to spend a day on board a large cross channel ferry. During my visit I was impressed by not only the professionalism of the ship's staff, both on the bridge and in the engine room, but also how the company's procedures were being carried out in a natural but completely comprehensive fashion. I was left in no doubt that a robust, effective safety culture had been completely imbedded into the psyche of everyone on board. There was a real sense of shared purpose between shore and sea staff.

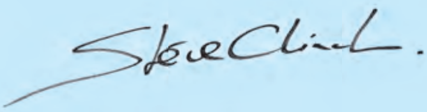
Of course, cynics will point out that it is a lot easier to imbed a safety culture into a business, such as a ferry operation, where managers and seafarers are able to meet and discuss issues much more regularly than, say a bulk carrier on world-wide trading. However my experience over the years, whether at sea, in shore management or through establishing the causes of accidents, is that managers tend to get the crews they deserve. Unfortunately, an STCW qualification does not guarantee that a seafarer will always be competent. The MAIB is currently investigating three serious accidents involving collisions where qualified, seasoned senior officers have ignored the most basic of watchkeeping principles. Complacency, often exacerbated by fatigue will usually lead to accidents but a culture of short-cuts (see Case 13) is difficult to avoid unless managers demonstrate their commitment to best practice by engaging with their sea staff at every level. In particular, masters and chief engineers must feel they are part of the wider management team, rather than simply the hired help if robust, effective safety cultures are to flourish in all sectors of our industry.

The ImarEST is an organisation which has been at the forefront of efforts to raise professional standards within our industry and I am grateful to Malcolm Vincent, the Institute's current President, for his introduction to the Merchant Vessel section of this Safety Digest. Malcolm's comments about the importance of the regular practice of drills are too often demonstrated when the absence of such training leads to vessels being lost and seafarers unnecessarily becoming injured or worse.

Liz Forsyth, who has graciously given her time to introduce the Fishing Vessel section, is someone who regularly risks her life to rescue seafarers in distress. Liz provides an alternative perspective for fishermen on the reasons why survival and location aids are so important to the successful outcome of SAR operations. In support of the points that Liz makes in her introduction, Case 16 provides yet another example of why it is so important that fishermen should routinely wear lifejackets on the open deck and, ideally, should also carry PLBs to maximize the chances of survival if they fall or are taken over the side.

In his introduction to the Small Craft section, Howard Pridding explains the nature of the important work that the British Marine Federation has been involved with over the last 100 years. The Federation has a proud history of working with national and international bodies to ensure that the codes and standards are fit for purpose. Howard makes the point that, although the pages of this Safety Digest are testament to the fact that accidents do happen, generally the leisure and small commercial boat industries have good safety records. However, you should always think about how you might react to an emergency. For example, if you are the owner of a small boat (or fishing vessel) please consider stowing in a handy place on your vessel a go bag containing flares, a torch, sharp knife and other useful items that you might need in case you are unlucky enough to need to abandon - the kit supplied with many small liferafts can be quite limited.

Until next time, keep safe.



Steve Clinch
Chief Inspector of Marine Accidents
April 2013

Part 1 - Merchant Vessels

Improving professionalism by working together

The safety cases within this section of the Safety Digest reflect the reality of life at sea in merchant ships and highlight the importance of the regular practice of drills as the best means of being prepared to cope with emergency situations. They include bridge team management, fire drills, and coping with failure modes of critical equipment.

The training experts at Warsash Maritime Academy, who have studied the Crew Resource Management (CRM) of team training in simulators, tell us that productive learning is about influencing attitude, behaviour and cognitive change. The maritime training community often finds that the application of Simulator-based learning is limited to a retro-active 'dose' of remedial training after an incident has happened. A collision or a grounding is likely to result in bridge teams being prescribed a course of 'treatment' in passage planning; or an engine room fire or catastrophic failure is likely to result in engineering officers being prescribed a course of treatment in engine room management.

An Engine Room Simulator, like any other tool, is only as good as the operator. Simulation scenarios which are well thought out and managed can provide excellent opportunities to practise both normal and abnormal operations, although nothing can fully substitute real experience picked up on the job in the real world, through well-constructed training and backed by structured Continuing Professional Development or CPD.

The research team at Warsash has developed a novel approach to the evaluation of shore-training which they hope will provide evidence of the effectiveness of the training, and enable students to assess for themselves their own strengths and weaknesses and where they need to improve. This approach is based on the application of reflective practice, a methodology being used to evaluate the effectiveness of such training and at the same time promoting reflection on practice by the students concerned. Their view is that reflection on professional practice during a training course, and afterwards in the operational environment, adds value to the student's learning experience and benefits their professional development.

For simulator training to be effective therefore, the lessons learnt need to be taken to sea. So, for example, do employers encourage continuous learning through personal development plans, appraisal and 360 degree feedback; and do seafarers themselves take the time to reflect on their practice and take responsibility for seeking out opportunities for learning?

One of the key roles of the Professional Engineering Institutions, such as IMarEST, is to provide opportunities for structured Continuing Professional Development (CPD) such as lectures, conferences, journals, online discussion forums and branch networking. They also provide online tools to plan and record development plans. However taking time to think about what one did right and why, and indeed what went wrong and why is where the learning and professional development is effective. Effective CPD involves critical self-reflection and analysis and working out "what did I learn and how I would do it differently next time"? This applies to all individuals whether part of the bridge or engine room teams.

It is incumbent on leaders at all levels in the maritime community to promote an active dialogue to achieve safer professional practice and to develop a holistic approach to the management of ships' officers' learning. The MAIB Safety Digest provides an excellent, valuable and vital part in telling us where things still go wrong and pointing to the challenges for the whole maritime community to improve. By working together, at sea and ashore our maritime professionalism can rise to this challenge.

Malcolm Vincent

President of the Institute of Marine Engineering Science and Technology (IMarEST)

Malcolm Vincent
110th President of IMarEST

Following Alternative Training Cadetship and seagoing appointments with Shaw Savill and Cunard, Malcolm Vincent joined P&O Technical Services Division. He undertook various engineering and business development appointments leading to Managing Director of Three Quays Marine Services Ltd undertaking new ship design and construction activities in China, Japan, South Korea, India, Europe and UK. He was appointed director of a ship repair company, and subsequently director of a business services consultancy, which led to appointments with BT Global Services where he was responsible for commercial development and negotiation of major service contracts.

Malcolm Vincent was awarded an IMarEST scholarship to study at Surrey University and has a Masters Degree in Automation & Systems Engineering from City University. As a Trustee of the RNLI, Council Member and Chairman of the Technical Committee he is responsible for the design, build and maintenance of all weather and inshore lifeboats and lifeboat stations. He is also a Liveryman and Member of the Court of Assistants of the Worshipful Company of Engineers. Currently a Trustee and Chairman of the IMarEST Retirement Benefit Scheme he recently chaired the Institute's Building Working Group.

About IMarEST

Established in London in 1889, The Institute of Marine Engineering, Science & Technology (IMarEST) is the leading international membership body and learned society for marine professionals, with over 15,000 members worldwide. The Institute has a strong international presence with an extensive marine network of 50 international branches, affiliations with major marine societies around the world, representation on the key marine technical committees and non-governmental status at the International Maritime Organization (IMO). It is the only membership body that can award Chartered Marine Scientist and Technologist, Chartered, Incorporated and Engineering Technician status to their professional engineering counterparts.

CASE 1

Passenger Ferry Leaves Berth - With Shore Embarkation Structure

Narrative

Shortly after leaving dry dock, the crew of a ro-pax ferry discovered that the forward bow thruster was not functional due to a wrongly assembled circuit breaker. The master decided that, given the prevailing and forecast weather conditions, he could manage with one bow thruster for a few days. The workshop staff who carried out the circuit breaker overhaul in dry dock were asked to attend the next day.

Technicians came on board within 24 hours, repaired the fault and asked the ship's engineers to test it. To power up the breaker, the engineers started the starboard main propulsion engine which drove the shaft generator dedicated to the forward bow thruster.

As there was no clutch between the engine and propeller, the CPP was maintained at neutral pitch. The vessel was at its usual berth and passenger embarkation and vehicle loading carried on throughout. The bow thruster was successfully tested, and as the vessel was due to depart in a short while the engineers decided not to stop the engine.

Shortly afterwards, the chief officer came up on the bridge to test the controls before departure. The usual practice was to test the steering and alter the pitch control of the bow thrusters and main engines while these were shut down. The chief officer called the engine room and asked for engine controls to be passed to the bridge. The engineer who attended the phone call was in the final stages of a fuel bunkering operation. He passed control of both engines to the bridge knowing full well that the starboard engine shaft was turning at the normal sea speed of 150rpm. The master was standing at the port wing and could see two tachometers indicating that the starboard engine was running. The chief officer, who was at the central console, could also see two tachometers with the same indication. However, as this routine was repeated twice daily for every day of the year except Christmas and New Year's day, he moved the pitch control of both engines to full ahead.

The mooring ropes, held with winches in the auto-tension mode, payed out as forward thrust was applied and the vessel surged ahead along the quay, causing serious damage to the passenger access structure. The foot-passenger walkway detached at both ends and collapsed onto the quay. The gangway fell from the vessel's side shell door and was left hanging on a single rope. Fortunately, there were no passengers in the walkway or on the gangway as these collapsed. Eight passengers were trapped in a compartment between the walkway and the gangway and were subsequently rescued by the fire service.

Figure 1: Passenger embarkation/disembarkation facility

The Lessons

The investigation identified that the quay on which the passenger access structure was built had suffered considerable settlement over the years. The walkway was secured to the rest of the structure with only two small bolts at either end, and there were no records of inspections or maintenance having been carried out.

1. When you do a repetitive job day in and day out, it is easy to become blind to changed conditions around you. To prevent accidents, think about the implications of what you are about to do, especially when the task is slightly different from the norm. A short discussion between all those involved, reminding everyone about the potential hazards, can be extremely beneficial.

2. Running main propulsion engines while a vessel is alongside is an extremely hazardous activity and must be controlled carefully. Clear warning notices should be displayed at any location where machinery could be inadvertently operated. Crew should be stationed to watch out for unusual tension or slack in ropes.

3. Auto tension winches on ro-ro ferries may significantly reduce the dependence on the crew to maintain the required tension in the mooring lines. However, engine movements, strong wind and interaction from a passing vessel could cause the ropes to pay out if the forces exceed the auto tension settings. Where it is essential that a vessel's position is maintained, e.g. while embarking passengers, consider securing mooring lines on bitts, or switch winches to their manual mode and apply the brake.

4. Passenger loading and vehicle embarkation should be stopped if engine trials are to take place alongside.

You Delegate the Job, Captain - Not the Responsibility

Narrative

A general cargo vessel operating under a time charter agreement was scheduled to load a combined cargo of containers and cement bags under deck and, unusually for the ship, containers on deck.

The ship was not rigged to take containers on deck and securing arrangements had to be welded first. Under the charter agreement the charterer's port captain was responsible for arranging and paying for these extra deck fittings. However, the master and chief officer reviewed the plans first to make sure they complied with the cargo securing manual.

With work underway, the chief officer had the impression that the welding gang were rushing to get the ship out on schedule, and it was observed that the welding on some of the eye pads and I-beams was inadequate on hatch cover number four. It was also noted that gaps of up to 10mm could be seen between the welded beams and the edges of the containers (Figure 1). The chief officer became further concerned when containers were loaded as they arrived at the ship and, in some cases, not in accordance with the load plan. Although only two tiers high, the deck containers were potentially stacked heavy over light.

Figure 1: Poor quality welding

Any concerns that the master and chief officer had were allayed by the port captain, who waxed lyrical that the welding and lashing team on board were the best in the entire port. He further reassured them that he had been loading three ships a month for the last 6 years in this way and had never experienced any problems.

Loading was completed and, reflecting the charter agreement, the mate's receipt was signed with the note, '*Shipped on deck at shipper's/receiver's risk and expense. Vessel not responsible for damage and/or loss how ever caused*.' The ship was unable to sail that night due to bad weather in the port.

Figure 2: The aftermath on hatch cover number four

The following afternoon and with winds still up to force 7 outside the port, the ship sailed. In anticipation of the heavy seas ahead, the ship's crew had made extra checks on the lashings prior to the ship leaving.

The ship made steady progress on an easterly heading into strong north-easterly winds and heavy swells. Shortly after midnight, however, she started to pitch and roll significantly, and was shipping water on deck. At 0230, the second officer checked the lashings from the bridge by switching on the deck lights. All looked well.

Shortly after 0330, the ship rolled violently with one particularly large swell. The master was already on the bridge, and he turned on the deck lights to see that lashings on hatch cover number four had given way and containers were sliding around the deck, with some lost over the side (Figure 2).

The master informed the local VTS operator, who in turn advised shipping in the area. The engines were brought to manoeuvring revs and the vessel's course and speed were altered to minimise the effect of the weather, which was now up to force 9.

When the weather had improved, the ship returned to port for repairs and to re-secure the remaining loose containers. In total, the ship had lost 27 containers, with 28 containers loose but still on board. Damage to the ship was largely superficial with a gangway, pilot reel, guardrails and a grab rail requiring repair or replacement. However, the main structure of the ship was largely unaffected.

Figure 3: Some of the loose containers that remained on deck

The Lessons

The accident happened because deficiencies in the loading and securing of the deck containers were spotted but not rectified before the ship sailed. This might have been because the master was unduly influenced by the port captain's confident approach to the task. It might also have been because the charter agreement and the mate's receipt seemed to absolve the master of all responsibility if things went wrong. What ever the reason, the master chose to accept those sub-standard arrangements.

Relevant guidance is provided in the IMO Code of Safe Practice for Cargo Stowage and Securing 2011 (CSS Code). Particularly relevant to this accident are Chapter 6 - Actions Which May be Taken in Heavy Weather, and Annex 1 - Safe Stowage and Securing of Containers on Deck of Ships Not Specially Designed and Fitted for the Purpose of Carrying Containers.

Of particular note is that, in spite of the charter agreement stating that the ship was not responsible for damage or loss of the cargo, the CSS Code reminds masters that '*it should be borne in mind that the master is responsible for the safe conduct of the voyage and the safety of the ship, its crew and its cargo*'. What ever the paperwork says, the buck stops with you Captain!

Good Bridge Team Management Prevents a Collision; Bad Bridge Team Management Almost Leads to One

Two close quarters situations demonstrated the best and worst practices of bridge team management.

Narrative 1

The first incident involved a ferry and a container ship. The ferry was preparing to sail; she was on a regular route, with her usual bridge team, and sailed in and out of the port several times each day. Despite this familiarity, the master ensured that the pre-sailing checklist had been fully completed and he held a full pre-departure briefing with the bridge team, discussing the manoeuvre, the environmental conditions, and reminding everyone that if they had concerns at any time, they should raise them immediately.

As the ferry sailed out of the port, the bridge team started to plot and discuss the traffic in the TSS that the vessel would soon have to cross. Once the ferry was clear of port limits, the master set a south-easterly course and handed over the con to the second officer. The two men again discussed the traffic in the TSS, including discussing the large container ship that was in the south-west traffic lane. The master then left the bridge.

The container ship had been overtaking several fishing vessels and had altered course to starboard. This left the vessel on a course passing astern of the ferry and with a CPA of more than a mile. However, once clear of the fishing fleet, the OOW on the container ship became concerned that he was too far off track, and began altering course back to port.

The second officer on the ferry quickly recognised that the container ship was altering course to port and that its CPA was decreasing, and he called the master back to the bridge. The master took the con and executed a round turn to starboard. He called the container ship and the coastguard, informing them of his intentions, while the second officer informed the engine room watch of what was happening and continued to monitor other traffic in the scheme. When the container ship was past and clear, the master brought the ferry back on her original course and handed the con back to the second officer.

The Lessons, Narrative 1

1. While electronic charts and GPS feeds to radars are valuable aids to navigation, an unwelcome side effect is that the modern watchkeeper can often seem obsessed with sticking to 'the red line' (his track) - sometimes at the cost of complying with the COLREGS.

2. When establishing the circumstances surrounding this incident, the voyage data recorder on the ferry was reviewed. This revealed many positive points that perhaps lay the foundation for the successful outcome of this incident:

   - The master clearly has a good relationship with his team. During loading he can be heard in general non work-related conversation with one of his men. As loading draws to a close, the focus shifts to getting the ship ready to sail and, although the topic of conversation is now more 'professional', the tone and atmosphere on the bridge remain friendly and open.

- With the ship closing up and getting to the end of pre-departure preparations, the master can be heard reading through the checklist aloud. This is worthy of mention for a couple of reasons:

  Firstly, by reading out loud he is including all of the bridge team - subconsciously they are checking with him.

  Secondly, as a ferry master, it is likely that he has done this hundreds of times before and yet he hasn't allowed himself to become complacent with the familiar but highly important pre-departure checks.

- He holds a comprehensive departure brief. As in the previous observation, the familiarity of the port and route could easily lead to parts of the brief being skipped owing to complacency. Furthermore, he makes a point of making it absolutely clear that if anyone at any time has a concern, they must 'sing out' and let him know.

- Before leaving the breakwaters the bridge team are aware, are discussing and, where relevant, plotting the traffic in the TSS.

- The master hands over to the second officer. Following the master's example and with the master now off the bridge, the second officer demonstrates similar good bridge team management by briefing his men on the traffic around him and pointing out those vessels which may give cause for concern. In particular, he is well aware of the container ship's alteration and spots very early the close-quarters situation that develops.

- When the second officer sees the situation developing, he does not hesitate to call the master to the bridge. This is testimony to both the second officer's professionalism and to the working atmosphere created by the master.

- When the master arrives on the bridge and takes the con, the second officer does not sit back and let him get on with it. There is a good brief of the situation, and then the second officer gives the master support by monitoring traffic, informing the engine room of the situation and suggesting to the master that they call the coastguard to let them know of the ferry's intended actions. The master is able to concentrate on dealing with the close-quarters situation without distractions.

3. One might consider that many of these observations are basic good practice, commonplace and are not worthy of mention. Unfortunately, all too often the MAIB deals with cases where some or all of these practices are missing, and have led to accidents that could easily have been avoided. The ferry company had invested a lot of time and resources into bridge team management, including monitoring the effectiveness of training schemes by auditing bridge teams in action and unannounced reviews of VDRs across the fleet. This incident highlights the importance of such a commitment.

Narrative 2

The second incident involved a small survey vessel that was engaged in survey operations. She was on a near southerly heading at 5 knots. Six miles to the north-east of her, on a south-westerly heading, was a large cruise ship.

It was the early hours of the morning and both vessels were operating in restricted visibility. However, on board the cruise ship, the OOW seemed either unaware of his obligations under such conditions or unwilling to comply with them. He had not called the master, was not sounding the correct fog signal, and was listening to dance music while the ship steamed on at 18 knots.

Meanwhile, the survey vessel was following its survey line, and the mate was monitoring the cruise ship on his radar. He acquired the target and assessed that the CPA was less than 1 cable. Not wishing to stop the survey work, the mate identified the cruise ship on the AIS display and called the vessel by name on VHF radio in the hope that she would alter course to allow the survey work to continue uninterrupted. The cruise ship did not respond.

The mate attempted to call the cruise ship a further five times over the next 30 minutes until, with the cruise ship less than a mile away and still not visible, he executed a round turn to starboard, which resulted in the cruise ship passing by at 4 cables.

The Lessons, Narrative 2

1. In restricted visibility there is no give-way vessel, so the survey vessel was as obliged as the cruise ship to take action.

2. The cruise company had clear instructions and the master had clear standing orders regarding actions to be taken by the OOW when encountering restricted visibility, yet the OOW chose to ignore them. When such a blatant disregard for procedures takes place, companies should take steps to establish whether this is down to a rogue individual, or indicative of more widespread poor practice. It is of note that playing music on the bridge and continuing at 18 knots in thick fog without calling the master, seemed to hold no fear for the OOW. Equally noteworthy is that a review of the cruise ship's VDR revealed that the OOW's actions were never questioned by the second watchkeeper on the bridge.

3. Attempting to arrange action to avoid collision, over the VHF radio, is fraught with danger. It is far better to simply comply with the COLREGS.

One Risk Too Many

Narrative

After lunch, the deck crew of a 90m cargo ship led by the chief officer, headed forward to start securing packaged OSB cargo in the hold. After lowering the necessary equipment, the crew climbed down into the hold either via a recessed ladder in the forward portable bulkhead or by using a forecastle access trunk. The second option required the crew to cross a wooden footbridge spanning a void between the access trunk and the forward portable bulkhead, which was in its stowed position (see figure).

The crew secured the cargo as far aft as possible and then started to shift metal clamps from the forward part of the hold to enable them to secure the rest of the cargo. At this time, the AB, who later died, climbed out of the hold via the recessed ladder and re-positioned the hatch covers to allow the remaining cargo to be loaded. He then returned to the hold. As the hatch covers now prevented his use of the recessed ladder, he returned to the hold by climbing down the access trunk and walking across the wooden footbridge. The AB then helped the rest of the crew move the clamps.

A short time later, the AB tried to leave the hold via the wooden footbridge, but he either slipped or lost his balance and fell. The rest of the crew working in the hold heard a thump and realised that the AB was missing. The crew went towards the forward bulkhead and peered down into the dark void below the wooden footbridge. With the aid of a torch, they were able to see the AB lying 5m below; he was unconscious and was bleeding from a head wound.

The crew quickly attended to the AB and raised the alarm. The AB was given oxygen and CPR was started. The emergency services arrived and stabilised the casualty before he was craned out of the hold on a stretcher. Sadly, the AB never regained consciousness and was declared deceased on arrival at a nearby hospital.

Wooden footbridge in its location

The Lessons

1. Any ship spaces that are regularly entered must have a safe means of access - ad hoc measures are likely to be unfit for purpose. This wooden footbridge had no guardrails or toe boards, the openings were not full height and lighting was inadequate. Therefore, it did not meet the requirements of a safe means of access required under UK legislation and was unsafe to use.

2. Have you ever been expected to do something you thought was unsafe, but still did it anyway? Don't take undue risks when often simple solutions or corrective action can rectify the problem. Safety is everyone's responsibility.

Pilot Boat Fire - Disaster Prevented by Swift Actions

Narrative

It was the beginning of another normal night shift for the two-man crew of a pilot boat. The twin engines in the single engine room had been recently maintained by the company's regular contractor and the boat was performing well. The coxswain and his crew man were relaxed. They had just transferred two pilots back onto their pilot boat, and all four were enjoying the fine weather and scenery as they made their way back to the boat's berth.

All was about to change!

The first sign of trouble was when smoke was seen coming from the engine room's port and starboard forced exhaust fan ventilation terminals. Although the fire alarm system had not sounded, the coxswain reduced engine power to idle as the crew man and one of the pilots went to the engine room door. Looking through the door's observation port they saw a fire around the after end of the port main engine. Having reported their findings to the coxswain, the Fire Action Plan was immediately put into effect. The engines were stopped, all fuel supply valves were remotely closed and electrical power isolated. The engine room port and starboard forced exhaust ventilation and natural supply ventilation fire flaps were shut and the engine room's four pyrogen fixed fire-fighting cylinder activation buttons pressed. At the same time, the coastguard was informed of the emergency. It was soon afterwards that smoke was seen still coming from the starboard forced ventilation terminal despite the fire flap being apparently closed.

The coxswain then gave instructions for the anchor to be dropped and for the liferafts to be prepared in case the boat had to be abandoned. Soon afterwards, the RNLI's local inshore and all weather lifeboats arrived and quickly established boundary cooling around the engine room. The boat was then taken under tow. The crew and pilots were evacuated and a lifeboat fire-fighting team transferred to the pilot boat. Once alongside, the local fire and rescue service attended, confirmed the fire had been extinguished and then ventilated the engine room.

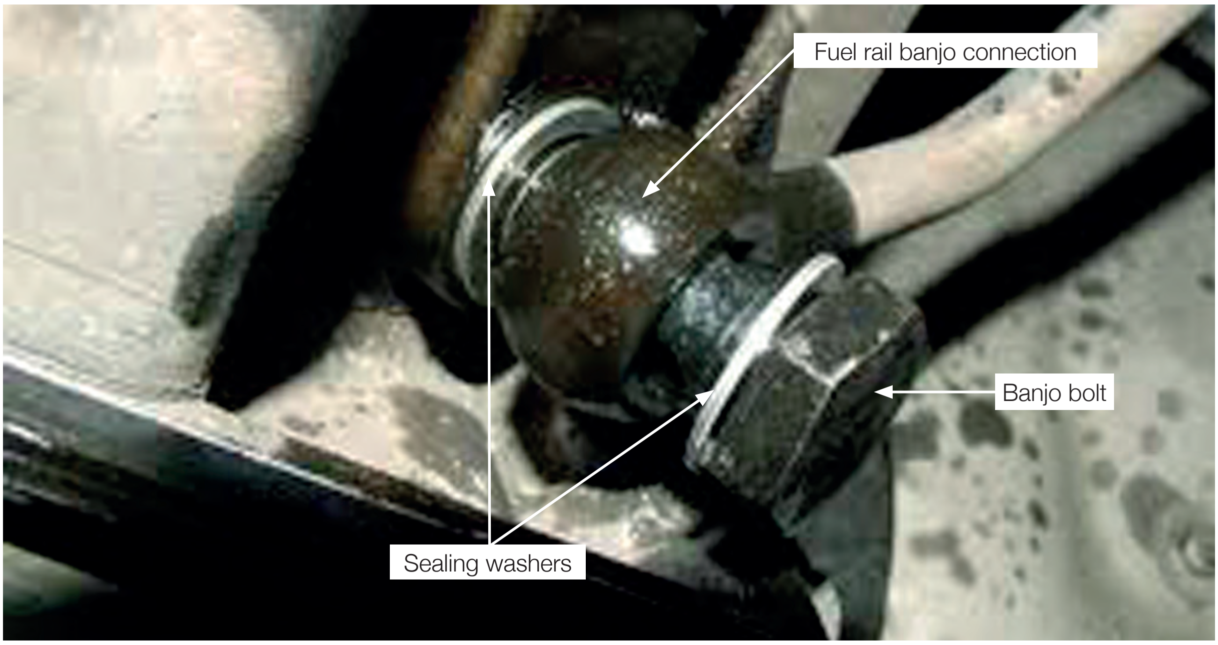


Image courtesy of mbclub.co.uk

Figure 1: Loose fuel rail "banjo" bolt

CASE 5

Figure 2: Port main engine

Investigations quickly identified the cause of the fire to be a loose fuel rail "banjo" bolt fitted to the port main engine (Figure 1) - these bolt connections had been prone to previous leakage. This allowed high pressure, atomised fuel to spray onto the hot port engine and turbo-charger, which then ignited (Figure 2). This caused extensive wiring damage, including that supplying the fire detection and suppression systems, and also damage to many of the plastic fittings and deckhead lining (Figures 3 and 4).

It was also found that only one of the pyrogen fire suppression cylinders had activated because the electrical cables which triggered the system had suffered an open circuit during the early stages of the fire. In addition, all of the fire detectors were of the smoke detection type - there were no flame or heat detectors fitted.

The engine room ventilation terminals had been modified to incorporate sea spray/mist eliminators, which included a fixed fresh water washing system. It was found that the washing system pipework had worked loose, which prevented the starboard forced ventilation terminal fire flap from fully closing.

Figure 3: Electrical cable damage

Figure 4: Damage to plastic fitting

The Lessons

The port authority operating the pilot boat was diligent in insisting that its vessel's equipment, including main engines and fire detection and suppression systems, was properly maintained by competent contractors. Crews were regularly exercised in emergency procedures, including fire drills, and could refer to the vessel's comprehensive Fire Action Drill checklists.

The fire detection and fixed suppression system suffered early damage in the fire, which prevented its operation. It was therefore even more important that those on board reacted in an instinctive and efficient manner. There is no doubt that their swift actions in stopping the engines and isolating the fuel and air supplies to the engine room contributed significantly to extinguishing the fire.

1. "Banjo" bolts should be fitted with a sealing washer on either side of the connection. Where any system, especially one carrying flammable liquids, has shown signs of leakage, it should be regularly checked. Where the leakage is persistent, consideration should be given to changing the type of fitting. It is often helpful to consult with the equipment manufacturer for advice in this event.

2. Equipment overhaul/maintenance routines can sometimes introduce self-induced defects. It is all too easy to forget to fully tighten fastenings during reassembly. During test runs do check the integrity of pipe connections and make a habit of regularly doing so while a vessel is in service. These can loosen over time, especially when fitted to reciprocating machinery.

3. While the current regulations do not specify the type of fire detectors to be fitted in machinery spaces, the MCA's Instructions to Surveyors strongly recommends a mix of heat and smoke detectors. This mix improves the chances of identifying a problem as early as possible.

4. Be very wary when modifying equipment. Modifications are generally intended to improve performance or safety, but can catch you out by introducing other problems. Check that the functionality of the equipment is not impaired by the changes.

5. If fire suppression systems are fitted within the engine room, do check that any associated electrical cabling is afforded the best protection. This may be by considering using a fire-resistant/armoured type cable or routeing it outside the engine room so far as this is reasonable.

6. The importance of realistic fire drills and the operation of all isolation devices during drills cannot be over-emphasised, as this accident clearly demonstrates. It is only by doing so that reactions become instinctive and equipment is proven to function correctly.

PRACTISE REGULARLY - YOUR LIFE AND THOSE OF OTHERS MAY DEPEND ON IT!

Can You Hear Running Water?

Narrative

Four crewmen were sleeping on board a dredger as it was moored alongside overnight. The dredger was old, but its size and capability made it ideal for working in restricted harbours. The owners had invested a lot of money into getting the vessel back to a good standard.

Two of the crew had separately got up during the night to answer the call of nature and each had also checked the mooring lines before going back to bed. Neither saw anything untoward. Shortly after 0500, the vessel rolled violently towards the jetty, throwing three of the men from their bunks. The fourth carried on sleeping and was woken by shouts from his colleagues. The men struggled to climb out of their cabins and along the passageway due to the angle of the decks, but were able to get to the ship's side.

The dredger was berthed at an old quay that was not in regular use. The access ladders were all bent, so the crew had decided to leave their small inflatable line-handling boat in the water and secured on the outboard side ready to use. Thinking that the dredger was in imminent danger of sinking or capsizing, the crew climbed into the boat and headed off to fetch help from the harbour control office. There had been little time to gather clothing, and most of the crew were wearing just their underwear. Only one was wearing footwear, and he climbed the barnacle-encrusted ladder from the water up to the quayside by the harbour control office.

The duty harbour manager was not sure what he could do to help, and called out the harbour's pollution control contractors. Thinking there might be a chance of salvaging the dredger, the crew telephoned the owner - asking him to bring warm clothes as well.

When the owner arrived, he checked that the crew were not injured and gave them the warm clothing. Seeing that the dredger looked stable, with the dredging machine leaning up against the quayside, he took the inflatable boat back across the harbour and boarded the dredger to see if it could be salvaged. The dredger was down by the stern and, before pumps could be brought to the scene, the stern settled on the seabed.

It took several days before salvage arrangements were agreed, and the dredger slowly flooded, rolling away from the quayside as it settled. Concerned that the dredger might capsize, the owner arranged for mooring lines to be secured between the dredger and several excavators that were parked near the quay.

The dredger was eventually salvaged and, after much investigation, water was found to be leaking through the hull plating near to the stern gland in the engine room. The regulations did not require that the vessel had a bilge alarm as the engine room was continuously manned when operating.

Excavators used to stabilise the dredger

The Lessons

1. With all the crew asleep, they were vulnerable to any emergency that might happen on board. If crew are sleeping on board overnight, automatic alarms are needed to warn of flooding, fire and any other dangerous situations that could arise. Such alarms must be capable of waking the crew in sufficient time to enable them to have a chance to react.

2. Even the most well looked after vessels can develop unexpected problems, and it is essential that crew and duty harbour personnel know who to contact and what support is available to prevent emergency situations from escalating.

A Heavy Burden to Bear

Narrative

Before sailing to maintain navigation buoys in a port area, the master of a mooring vessel gave a toolbox talk to his crew. The talk covered the intended day's work: one navigational buoy was to be replaced and a second was to be recovered, inspected and re-laid. The master also reminded the crew, who had completed many similar operations, of the importance of being safety conscious - both for themselves and for each other.

After sailing, the first buoy was replaced without difficulty. On completion, the chief engineer, who was seen as the most experienced of the crew working on the deck, went to the engine room, leaving the remaining crew to recover the vessel's anchor and tidy the deck in readiness for the next buoy operation. This involved moving a 6t navigation buoy from aft of the crane on the vessel's starboard side to an area between a pile of mooring chain and a 'mushroom' air vent on the vessel's port side (Figure 1).

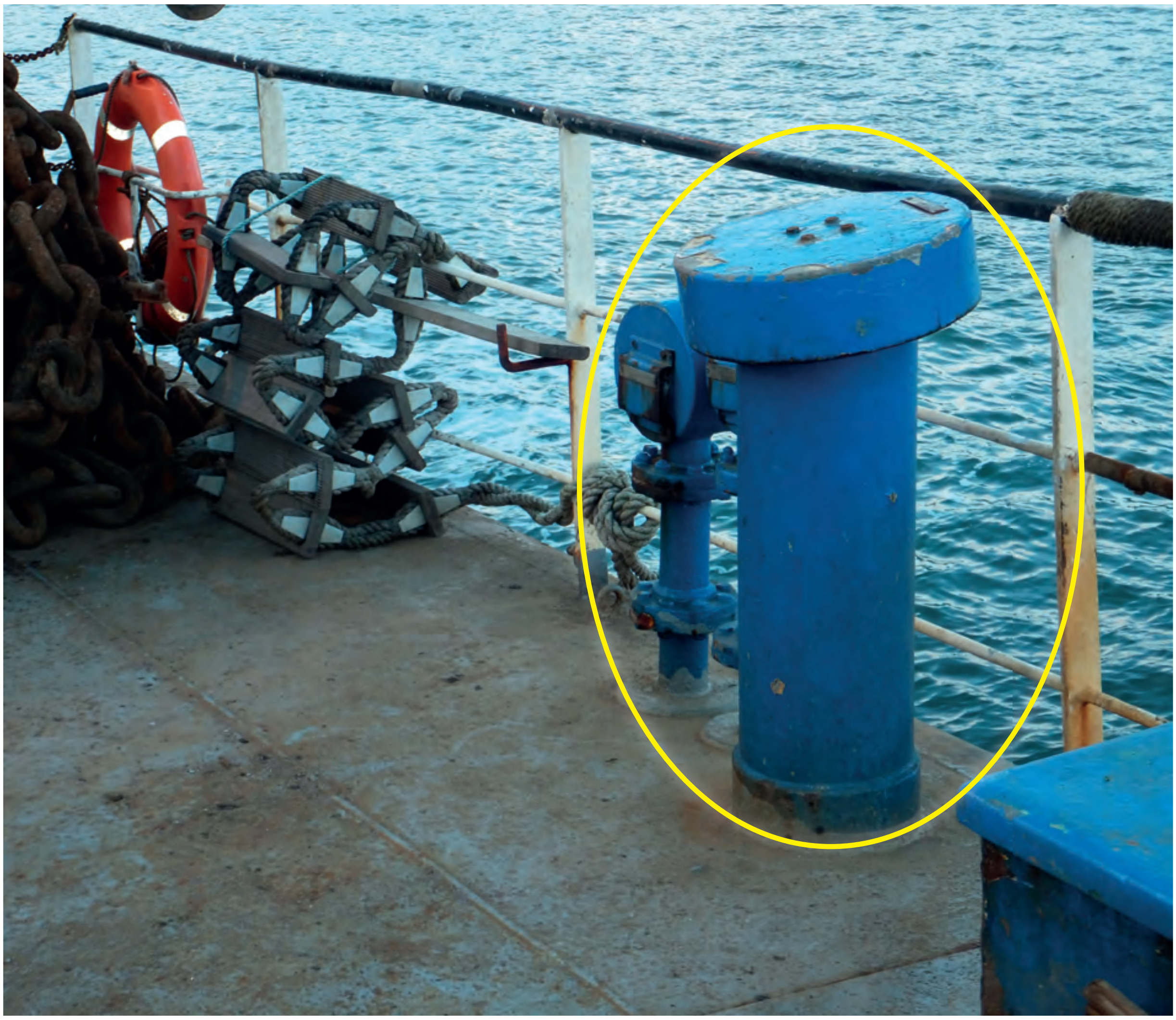


Figure 1: The mushroom vent and mooring chain

With an AB operating the crane, the buoy was moved across the deck. The chief officer followed the buoy at close range while a second AB gave the occasional instruction to the crane operator. As the buoy neared its intended position, the lifting operation was stopped to enable the chief officer and the second AB to place wooden bearers on the deck where the buoy was to be landed.

Soon afterwards, the crane operator shouted "coming right" and started to move the buoy further forward. Almost simultaneously, however, the chief officer moved between the buoy and the air vent to put one of the wooden bearers under the outboard side of the buoy. The chief officer was instantly trapped between the buoy and the air vent (Figure 2), and screamed with pain. As the crane operator moved the buoy inboard, the chief officer collapsed on to the deck.

The master immediately requested assistance from the local VTS and informed the coastguard. A lifeboat with a doctor embarked met the mooring vessel as she returned to harbour. After being examined by the doctor, the chief officer was winched on board a rescue helicopter and taken to hospital. He had suffered crush injuries to his pelvic region and, after surgery, was hospitalised for almost a month.

Figure 2: A demonstration of where the chief officer was trappe

The Lessons

1. Time and time again accidents occur during deck operations because nobody is overseeing or taking charge. Supervising a lifting operation, rather than joining in and lending a hand, is not laziness; it is a prerequisite for the safety of all those involved.

2. Lifting and moving heavy weights not only requires a degree of skill, but it also requires good co-ordination and clear communication. Familiarity with the job is not always enough.

3. It goes without saying that suspended heavy weights are dangerous, particularly when they are being moved in tight areas. Don't stand or work near them if you don't have to.

4. Toolbox talks can either be part of a procedure that we pay lip service to, because we have to, or they can be used to try and enhance safety. Guess which one is a waste of time! If you go to the bother of conducting a toolbox talk, make sure it covers and re-iterates key safety information such as precautions and equipment, roles and responsibilities, and communications.

5. It is sometimes very difficult to assess how serious a person might be injured. If there is any doubt, do not hesitate to call the emergency services to seek advice or to arrange treatment. In this case, the master's quick response helped to get his chief officer properly assessed and transferred to hospital without delay.

Calculate Tug Power Required - Before You Need It

Background

A 300 metre long container vessel was departing from a European port in strong winds. A local pilot had joined the vessel's bridge team and three tugs were in attendance to assist with the manoeuvre.

The tugs had a combined bollard pull (bp) of 45t (1 x 25t and 2 x 10t) and were deployed with the 25t bp tug made fast aft and the two 10t bp tugs pushing on the vessel's starboard side (Figure 1). The vessel was equipped with a bow thrust unit, rated at 20t, to assist with berthing manoeuvres.

The vessel was port side alongside a berth which was perpendicular to the main shipping channel. The wind strength was about 10m/sec at the berth but exceeded 15m/sec in the shipping channel.

Due to the number of containers the vessel was carrying on deck, her cross sectional area at the time of the accident was 6,750 m^2, which in a wind speed of 15m/sec equated to a force of approximately 120t acting on the vessel.

Narrative

Once the vessel's mooring lines were let go she was quickly set off the berth by the wind (Figure 1) as she proceeded astern into the shipping channel. However, as the vessel moved astern into the main shipping channel, the force of the wind acting on her port beam was greater than the power the tugs could produce to hold the vessel against the wind. She was then rapidly set towards a cargo ship on an adjacent berth (Figure 2).
Figure 2 - The bridge team then decided to power the vessel ahead, and attempted a turn to port to avoid the cargo vessel downwind.

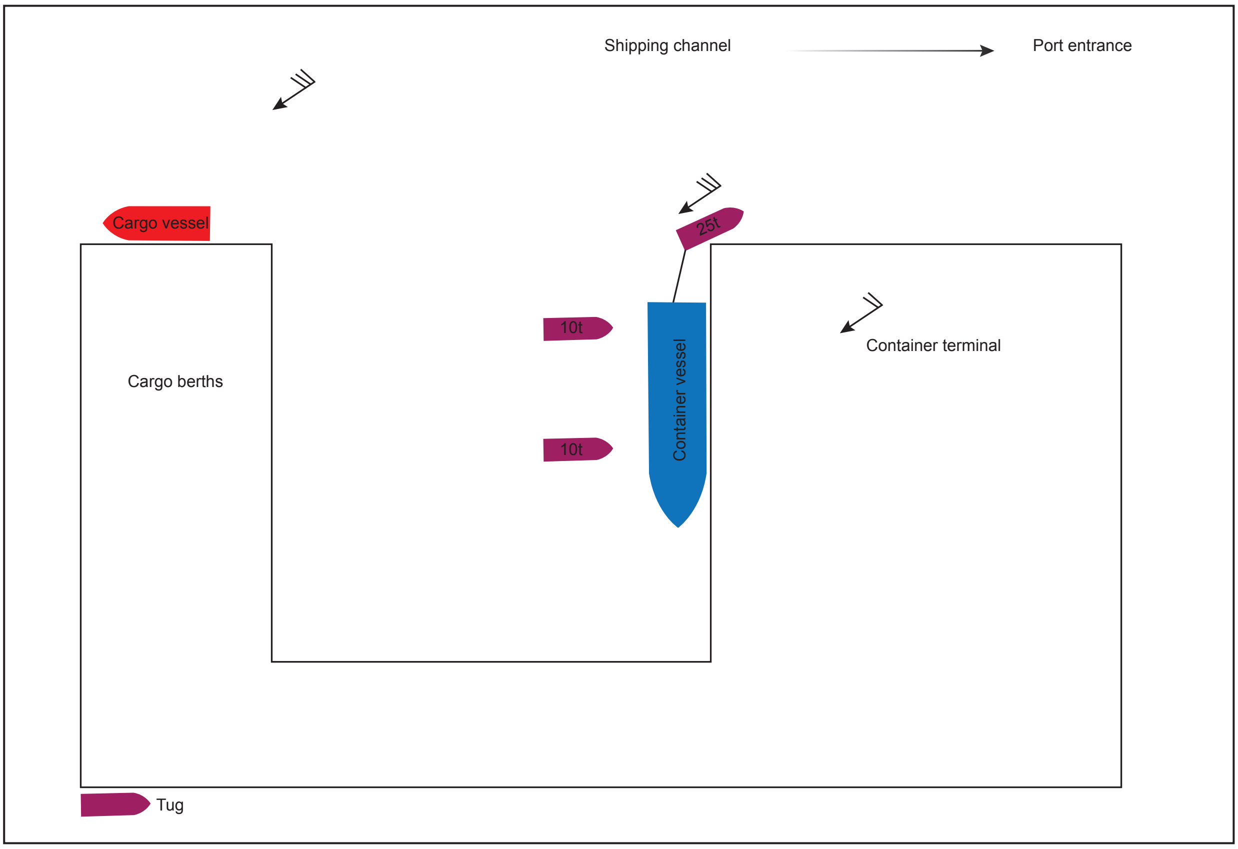


Figure 1: Vessel moves off berth and proceeds astern

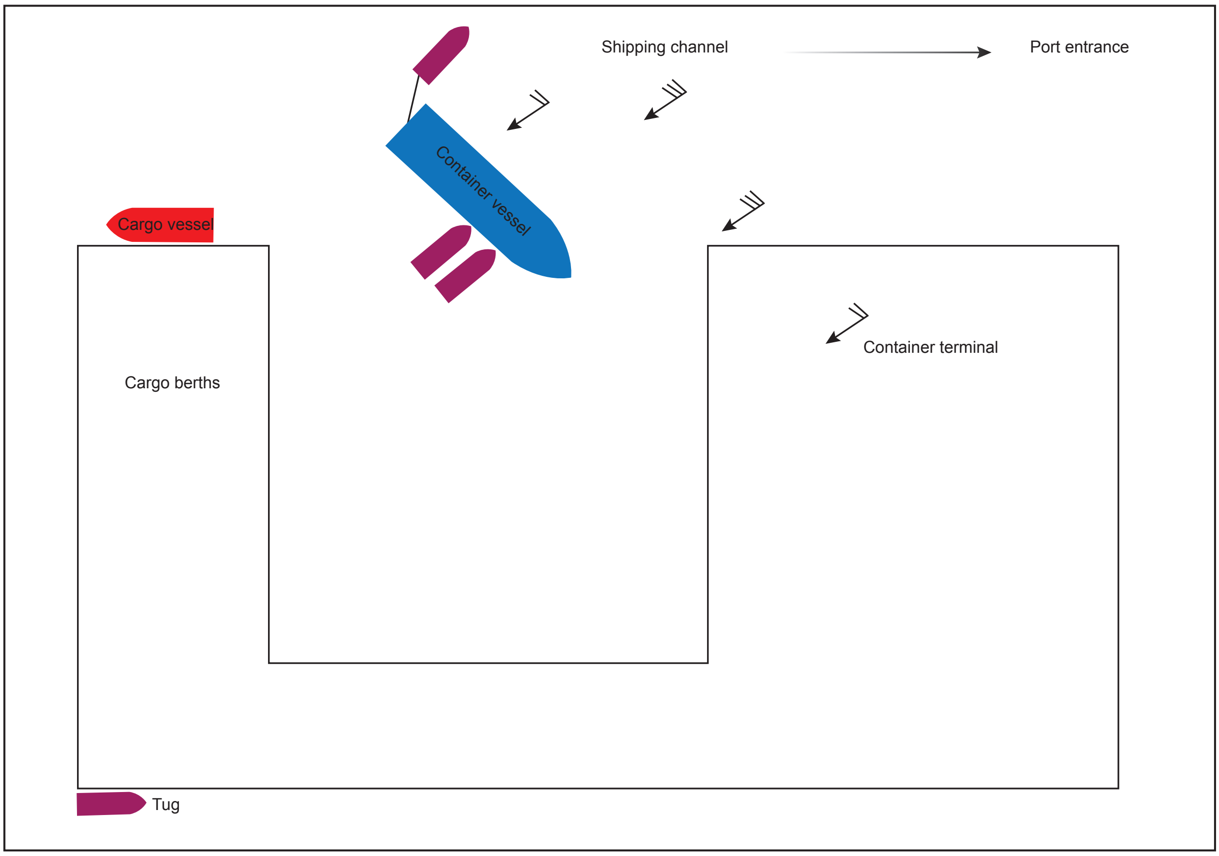


Figure 2: Failed manoeuvre to port

Unfortunately, in the limited room available, this manoeuvre was unsuccessful and the container vessel's stern set rapidly to starboard towards the other vessel (Figure 3).

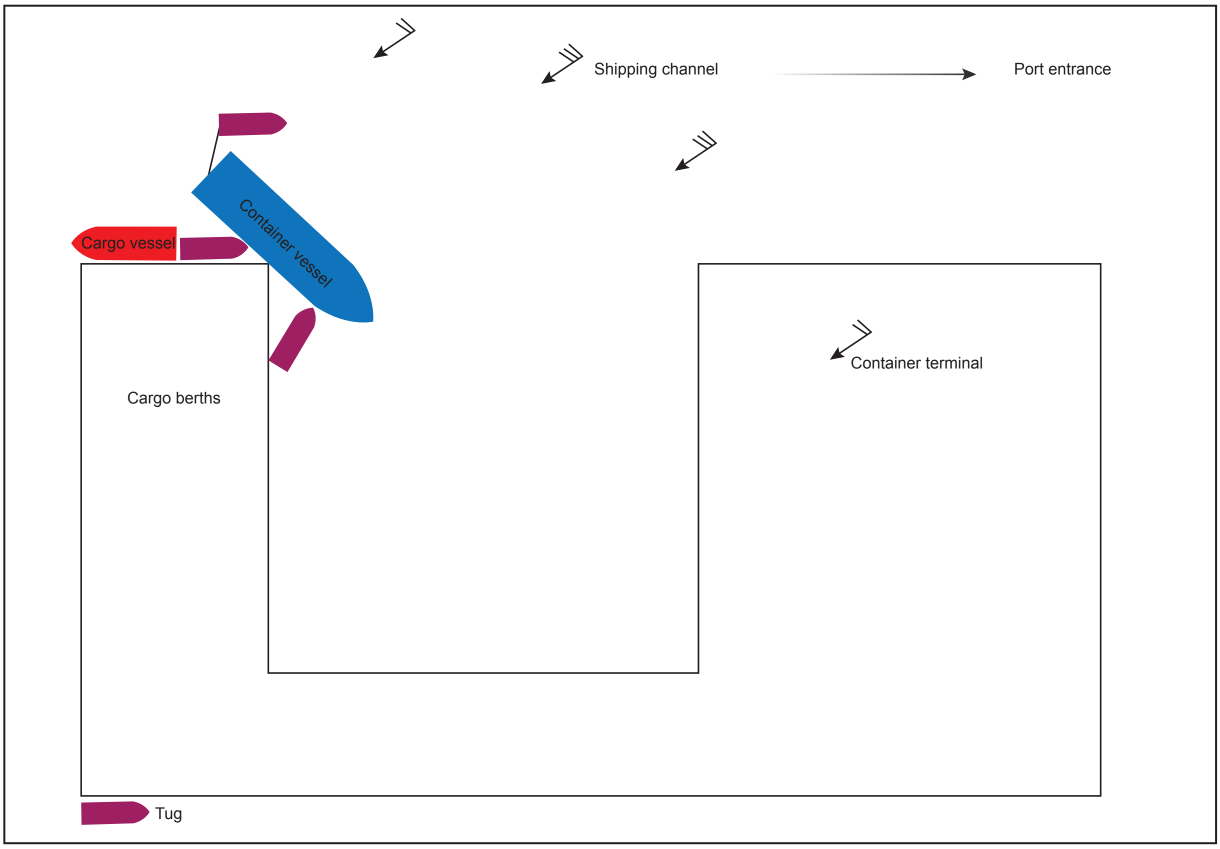


Figure 3: Set towards a cargo ship

Figure 4: Hull damage to container vessel

The container vessel made heavy contact with the aft quarter of the cargo vessel and her hull was split open above the waterline (Figure 4). One of the tugs then became trapped between the vessel and the berth knuckle, causing major damage to the tug and putting her in danger of capsize (Figure 5).

The container vessel eventually manoeuvred clear of the knuckle and was moored at an adjacent berth, where repairs were carried out. She resumed service a week later.

Figure 5: Tug trapped between vessel and quayside

The Lessons

1. The vessel's windage should have been calculated and discussed during the master/pilot exchange prior to departure. This would have enabled the bridge team to recognise that, in the prevailing winds, the bollard pull required to control the vessel (120t) far exceeded the power the tugs and the vessel's bow thrust unit could produce (65t).

2. There were no towage guidelines for vessels manoeuvring within the port. A port authority should, as an essential element of its formal safety assessment of hazards and risks in its area of jurisdiction, develop plans and procedures to control those risks.

   In the event that sufficient tug power is not available within a particular port to move a vessel safely, then wind limits should be applied accordingly.

3. Towage guidelines should also be developed by ship owners to ensure their vessels can be moved safely within the confines of their ports of call, in varying wind conditions.

4. Port authorities and ship owners should be aware of a simple formula for calculating the total power bollard pull required to assist a vessel in varying wind strengths.

   Required bollard pull (Kgs) = $0.08 \times A \times V^2$
   (Where A is the wind area of the vessel in m^2 and V is the wind speed in m/sec)

Fatal Bight

Narrative

A three-man mooring deck team stood by to release a river ferry from her mooring buoy, an operation the team had carried out many times before. Normally the operation was overseen by the mate, but on this occasion he was absent and nobody had been specifically instructed to take over his supervisory role.

The master eased the vessel into the current towards the buoy and gave the crew a hand signal to release the last remaining slip rope. All they had to do was release the tail and pull it out through the mooring ring and onto the deck. One member of the team decided there was no need for three men to carry out this last 10-second task, and nipped off to the toilet.

As the ferry came slowly ahead, the rope became jammed between it and the buoy, hampering its further retrieval. The two men went forward to establish what was causing the problem and, upon recognising the issue, one turned to guide the master in manoeuvring the ferry clear of the buoy, which was no longer visible from the conning position. At this point the tail of the rope fouled the propeller and trapped the remaining deckhand in a bight as it whipped overboard. As the casualty was dragged into and over the bulwark he sustained severe head injuries and was almost certainly unconscious before entering the water.

The casualty's lifejacket inflated and brought him to the surface, but was seen to be riding high and not maintaining his head completely clear of the water. He was recovered, with difficulty, to a high-sided workboat and quickly taken ashore, where paramedics attempted to revive him. Unfortunately, despite their best efforts, they were unable to save the badly injured crewman and he died from drowning.

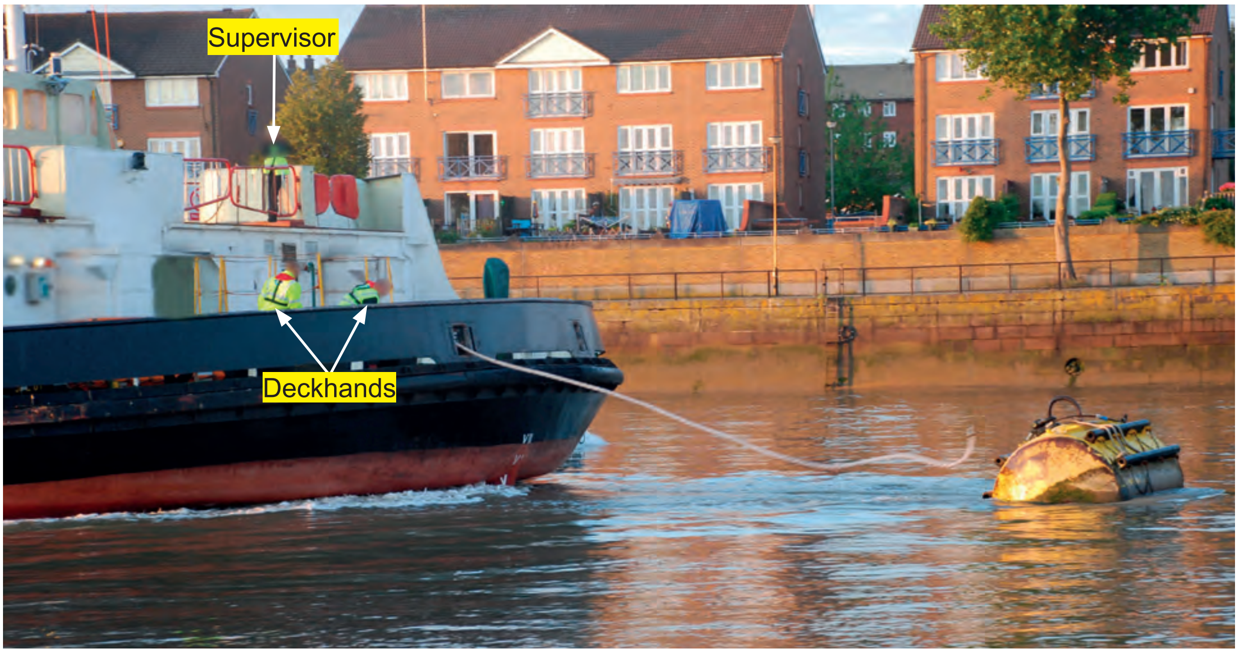


Figure 1: Typical slip rope recovery from the mooring buoy

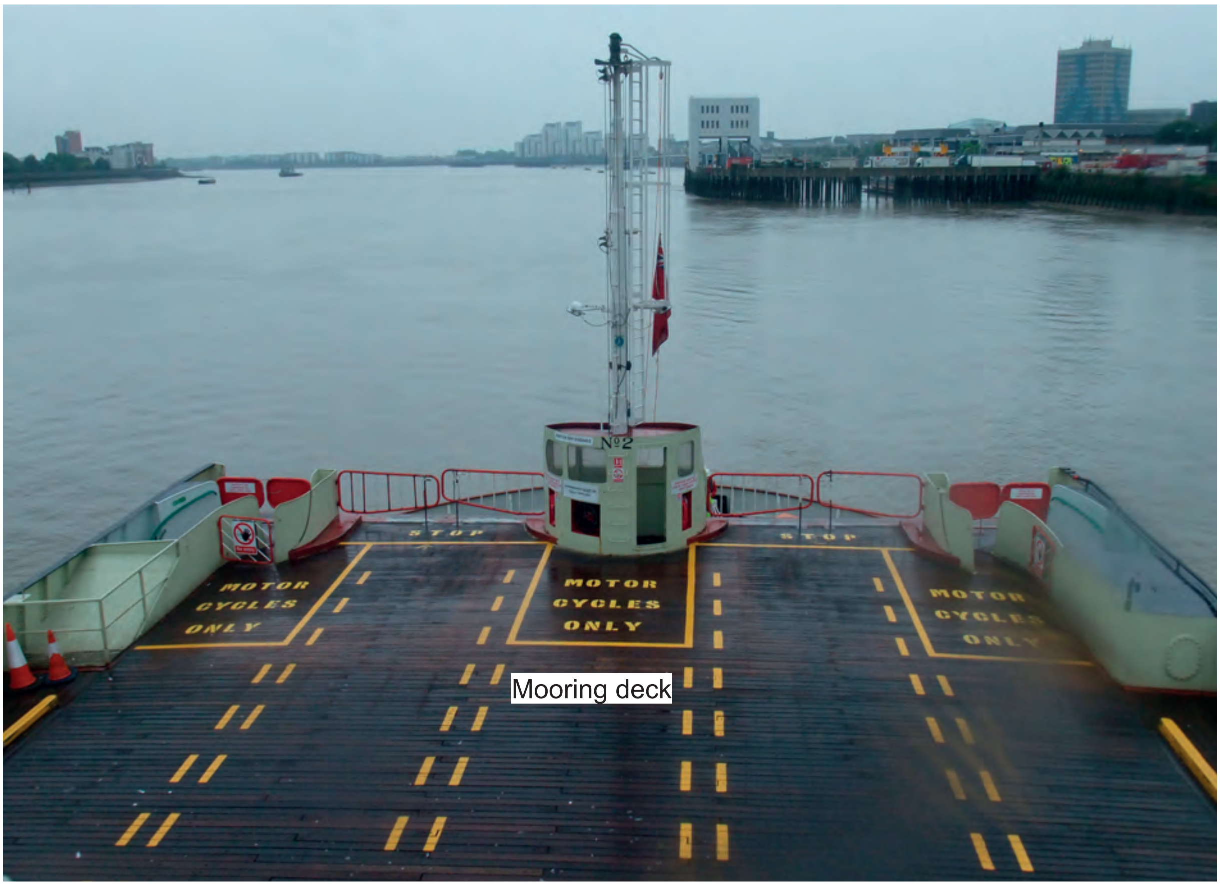


Figure 2: Master's obstructed view from steering position

The Lessons

1. Seamen are continually trained about the dangers of bights, and that under no circumstances should they stand in them. But sometimes, when rope is lying on the deck, bights are not always easy to spot. Always ensure you stand clear of ropes altogether, that way there is nothing to catch you.

2. The need for dedicated supervision in the absence of the mate was not recognised. The job had been carried out so many times before, and was such a simple task that what could possibly go wrong? Where ropes are in the water near propellers something can always go wrong - take nothing for granted. In the absence of the mate, one of the mooring team should have acted as the eyes for the master and supervised the process from start to finish.

3. The vessel used hand signals for communications when radios were available and more suitable. Furthermore, the handing of a portable radio to one of the mooring team would have identified that person as the supervisor, and enabled them to act accordingly.

4. In this case, the casualty's crotch strap for his inflatable lifejacket was not secured, allowing it to ride high and therefore not supporting his head adequately. Had he not sustained severe head injuries, a properly secured lifejacket would probably have saved his life.

5. The crew of the workboat struggled to recover the casualty due to its high freeboard. All workboats may be required to rescue unconscious persons from the water and should be equipped or adapted to ensure they are suitable for such tasks.

Just Because He's the Master Doesn't Mean He Can't Be Wrong

Narrative

On a fine, calm and clear early morning a 140m long feeder container vessel grounded on a rocky coastline, close to a major lighthouse. She had crossed a TSS and Inshore Traffic Zone without anyone having questioned her track until just before she grounded.

The master, who was the only person on the bridge at the time of the grounding, had fallen asleep 2 hours earlier shortly after ordering the OOW to leave the bridge. The OOW had attempted to persuade the master, who had been awake for about 20 hours, to go below and rest, and the master had struck the OOW during this conversation.

When he left the bridge, the OOW went straight to his cabin and slept. He did not tell anyone that the master was alone on the bridge, tired and acting irrationally, probably as a result of consuming alcohol.

Although there were other vessels in the area with the ability to monitor the vessel's AIS signal, none had questioned her track across the TSS and into the Inshore Traffic Zone (Figure 1) until she was close to grounding. An unidentified vessel then called the vessel by name, on VHF radio, without response. This call alerted the coastguard, who then monitored their AIS display and observed that the vessel was less than 2 miles from the shore. The coastguard then made several unsuccessful attempts to contact the vessel before she ran aground.

The noise of the vessel grounding, at full speed, awoke the master, whose first reaction was to place the engine controls to full astern in an attempt to refloat the vessel. However, the vessel did not move so the master then stopped the engine and began to assess the situation.

The coastguard had mobilised lifeboats and a helicopter, which stood-by the vessel while she was aground (Figure 2) as it was assumed the vessel had sustained damage. However, when the master eventually responded to the coastguard he informed them that the vessel was undamaged and that the crew were all safe.

It was subsequently found that the vessel had grounded on an isolated sandy area, within 50 metres of rocks. On a rising spring tide the crew managed to refloat her under her own power and within an hour of grounding she resumed her passage.

Later that day, when asked for information relating to the incident by both the authorities and the vessel's owner, the master denied the vessel had been aground, insisting he had been manoeuvring close to the shoreline.

The vessel continued her passage to a port in another country, where port state control inspectors and coastal state accident investigators boarded to investigate the grounding. The vessel's hull was surveyed by divers and, apart from loss of paint, was found to be undamaged.

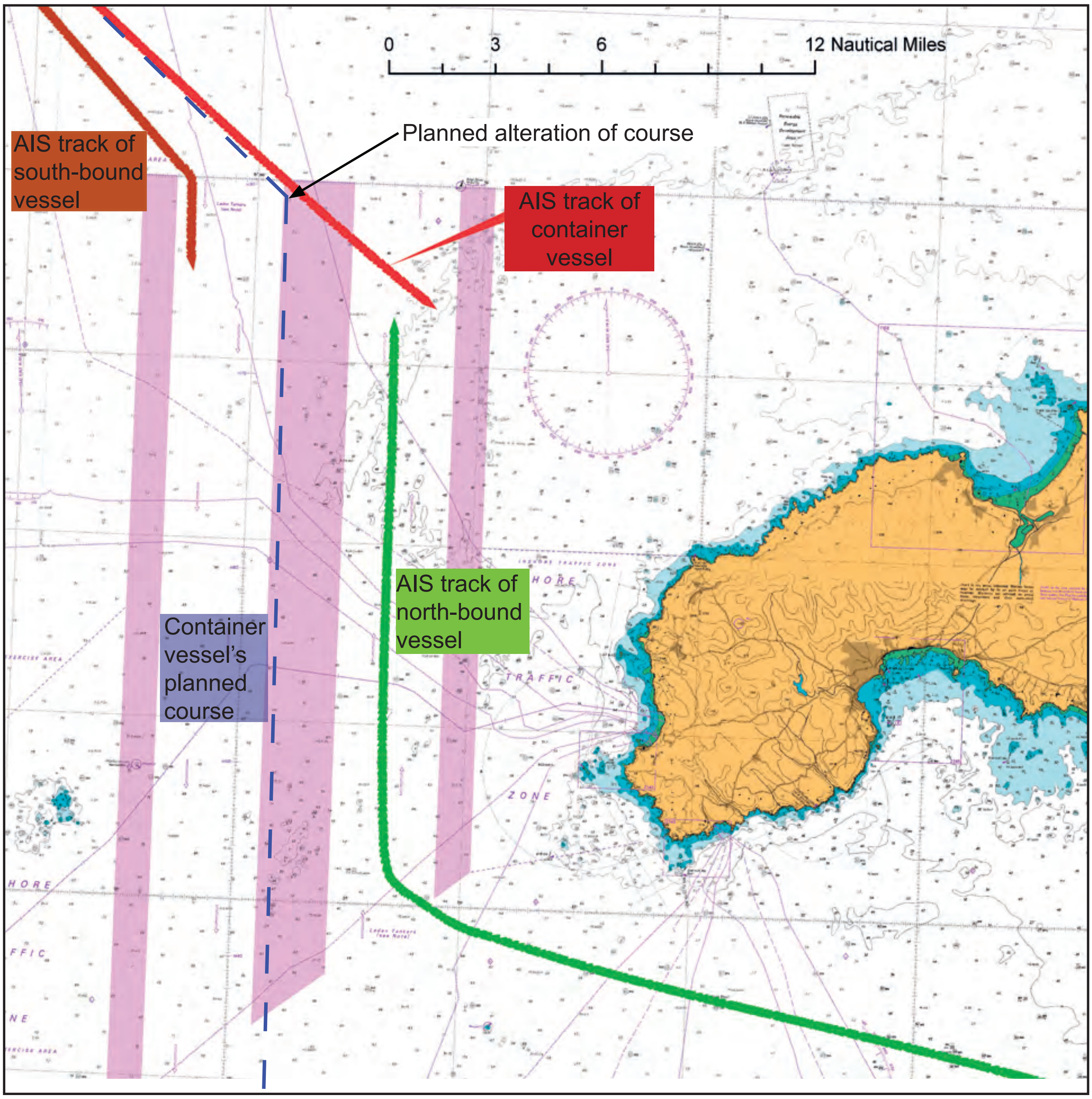


Figure 1: Container vessel crossing the TSS and AIS tracks of other vessels in the vicinity at the same time

Figure 2: Vessel aground

The Lessons

1. The fundamental requirements of keeping a safe navigational watch are to maintain a good lookout and ensure that a vessel maintains her course in accordance with her passage plan. In this case the master had probably consumed alcohol and demonstrated a gross dereliction of duty in being abusive to the OOW and ordering him from the bridge.

2. The master routinely did not require a lookout to be posted, despite Flag State and owners' requirements to do so. Owners and managers should ensure, when undertaking ISM audits, that the basic requirements of maintaining a safe navigational watch are complied with on their vessels.

3. The Bridge Navigational Watch Alarm System (BNWAS) was not switched on at the time of the grounding, and evidence gathered by accident investigators suggested that it was the master's normal routine not to use the BNWAS. Owners and managers should ensure that this equipment is in operation when their vessels are underway, as required by Chapter V of the SOLAS Convention.

4. Although other vessels, with AIS receivers, were in the vicinity at the time, no one alerted the vessel until she was very close to land. An earlier call would have alerted the coastguard (who do not routinely monitor AIS in all areas) to the vessel's situation and facilitated an earlier intervention. Crews should not hesitate to openly question the conduct of other vessels which they believe may be standing into danger.

5. The OOW did not call any other officer after he was ordered from the bridge by the master. The OOW was young, inexperienced and of a different nationality to the master, who he considered to be both tired and drunk. He should have alerted other officers to the situation before going to his cabin and sleeping. Where appropriate, owners and managers should consider providing officers with crew resource management training to prevent cultural barriers adversely affecting the safe navigation of their vessels.

6. When the vessel refloated, the coastal state authorities allowed her to resume her passage through their waters without an independent check of both her condition and that of her crew. Coastal state authorities should ensure that procedures are in place to assess the fitness of a vessel and her crew after an accident, before she is permitted to proceed on passage.

Near-Fatal Gas Release

Narrative

A service engineer was lucky to escape with his life after the routine maintenance on a fixed CO_2 fire extinguishing system on board a tug went badly wrong.

The two-man service team comprised a senior engineer and a trainee. It was the service team's first time on board the vessel, which they boarded as the tug's crew were preparing to move to a nearby refuelling berth. Although the service engineers were due to check all of the vessel's fire-fighting and fire detection equipment, the senior engineer chose to test the tug's fixed CO_2 fire extinguishing system first.

The senior engineer was directed to the CO_2 bottle room by an AB who was working on the aft deck, while the trainee prepared the release cabinet sited in the accommodation area. The AB opened the access hatch on the aft working deck (Figure 1) to enable the senior engineer to access the bottle room located in the hold below. The AB then continued with his work on the aft deck.

Figure 1: The hatch on the aft working deck

After the senior engineer had disconnected a number of CO_2 hoses from the six CO_2 bottles, he returned inside the accommodation to check the trainee's preparations. Having satisfied himself that all was ready, the senior engineer then instructed the trainee to prove the two pilot lines. Following a pre-agreed plan, the trainee allowed sufficient time for the senior engineer to return to the bottle room. He then activated the pilot line which would normally have released three CO_2 cylinders into the propulsion room just as the tug left her berth. The trainee then counted to 20 seconds before activating the pilot line, which would normally have released the remaining CO_2 bottles into the engine room.

Unfortunately, the senior engineer had left both pilot lines connected to the CO_2 bottles. As a result, the CO_2 was released into the hold through the hoses that the senior engineer had disconnected (Figure 2). The senior engineer quickly lost consciousness in the now oxygen-depleted atmosphere and collapsed on to the deck as he tried to escape from the hold.

The tug's skipper heard the CO_2 system activate and, on seeing what looked like smoke coming from the hold access, he quickly manoeuvred the vessel back alongside. The tug's chief officer donned breathing apparatus and entered the hold, where he secured a heaving line around the senior engineer.

The senior engineer was then pulled on to the open deck; he was unconscious and had no pulse. However, he was quickly attended to by medical personnel from a nearby warship and was later transferred to hospital by helicopter.

After a long period of recuperation and therapy, the senior engineer made a good recovery, although he has no recollection of the events of the day of the accident.

Figure 2: The disconnected hoses

The Lessons

1. Although service engineers are required to undergo specific training requirements in order to meet Class approval, this engineer clearly made a mistake when preparing the CO_2 bottle room for testing. When servicing fixed fire-fighting systems, engineers are frequently required to work on systems with which they are unfamiliar and, as in this case, with which support information such as system diagrams or the labelling of pipework is seldom available or provided. Insufficient information can only increase the likelihood of mistakes being made and it is well worth checking the extent of the information held or displayed on the fixed fire-fighting systems on board your ship.

2. Shore service engineers cannot just be left to 'get on with it' when working on board a ship. Their work must be agreed, co-ordinated with any other activities, and be properly risk-assessed. Ships' crew and shore contractors are equally responsible for ensuring a 'safe system of work' is in place. In this case, the lack of interface between the tug's crew and the service engineers resulted in the service engineer working in a potentially enclosed space and the tug sailing with its fixed fire-fighting system inoperable. It also potentially endangered the life of the chief engineer who was working in the engine room.

3. There was no means of communication between the senior engineer and the trainee. This left the trainee with little option but to follow the pre-agreed plan regardless of what was occurring in the bottle room. Good communication not only allows positive reporting during a routine task, but can also be an essential link when the unthinkable happens.

4. As soon as the tug's crew were aware that there was someone in the hold, they responded with an effective, almost text book rescue. Donning breathing apparatus before entering a known or suspected toxic environment does take a little time, but it saves lives without putting your own or others at risk.

5. Depending on the circumstances, no pulse does not always mean no life. Once CPR is started, if at all possible keep going until medical help arrives.

CASE 12

*Un*controllable Pitch Propeller

Narrative

A general cargo vessel suffered an accident when its CPP malfunctioned. While manoeuvring in port, her CPP control system misinterpreted a demand for half astern pitch and set the propeller pitch well in excess of full astern. The pitch indication needle reached the extreme of its scale and appeared to be stuck at 100% astern. The CPP control override button could have resolved the situation if activated, but the master was unfamiliar with its use. In an attempt to "catch the needle and pull it back", he put the pitch demand handle to full astern. This resulted in the pitch increasing to nearly 160% astern (Figure 1) and the ship picked up speed. By the time he used the emergency stop on the main engine, it was too late. The vessel made heavy contact with a berthed tug and her stern was breached above the waterline (Figure 2); the tug suffered minor damage. Fortunately, there were no injuries.

The vessel had suffered a major fire in the engine room a few months before the accident. Most of the electronic components of the CPP system were either replaced or repaired. During the post-fire sea trial, the technician for the CPP equipment had made an error in adjusting the astern pitch calibration settings; astern movements were not tested at the time except during a crash stop test. When the vessel commenced normal service, the problem with the astern pitch appeared a few times; however, the root cause of the problem remained unknown. It was only when an astern movement in excess of 50% was demanded that the latent defect manifested itself, resulting in the accident. The repairs to the hull's steelwork caused several days of lost time to the vessel.

The Lessons

1. ***Always carry out a full set of CPP tests, both ahead and astern.*** **Astern movements are not used as often as ahead movements. However, they are equally important. If the CPP system malfunctions in restricted waters, it is highly likely that it will result in an accident. Before every operation in restricted waters, carry out a complete set of engine tests in both ahead and astern directions.**

2. ***Familiarise yourself with the equipment you operate - in particular, understand what to do when it fails.*** **In an emergency situation, you will have very little time to think and reason. If you are not fully conversant with the failure modes of critical equipment, you may not be able to react quickly enough. Drills and exercises for main propulsion system failure should be regularly carried out.**

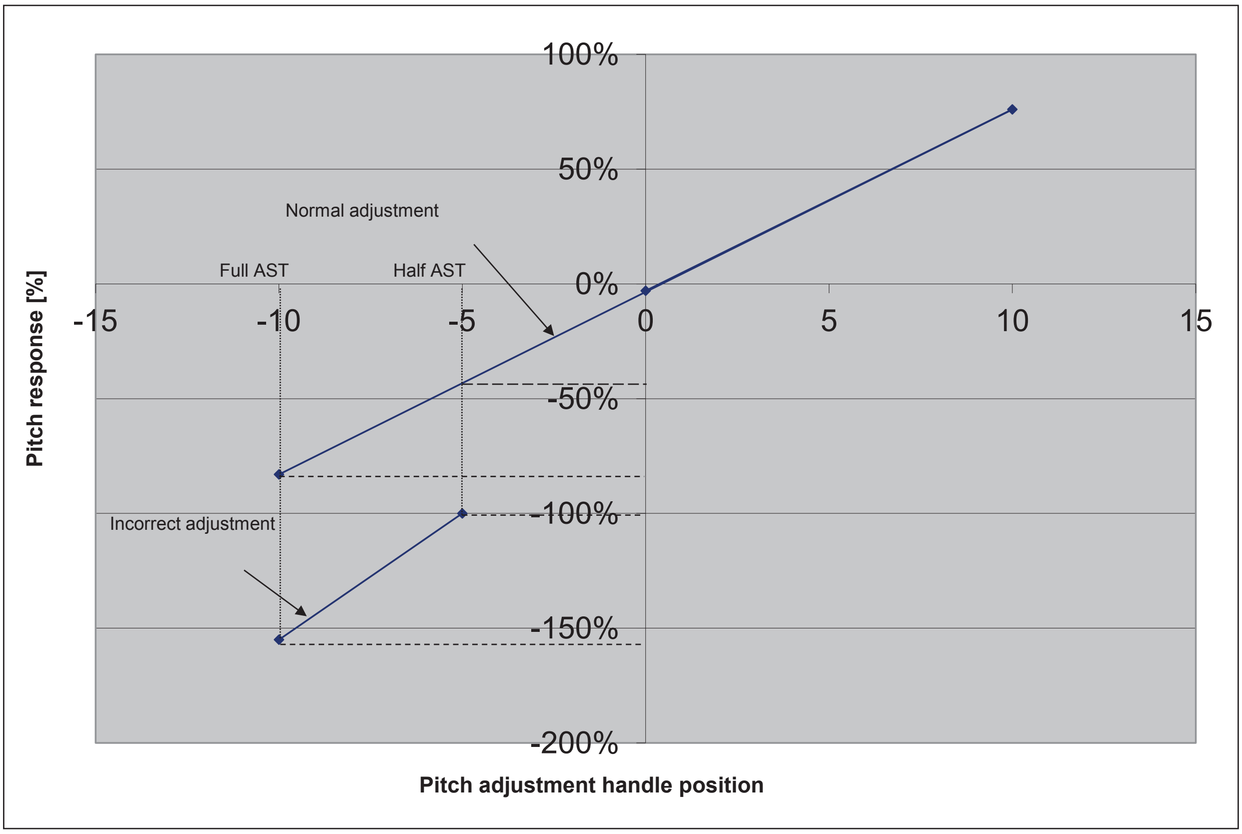


Figure 1: CPP behaviour with correct and incorrect adjustments

Figure 2: Damage to the vessel's stern

CASE 13

So Safe Yet So Dangerous

Narrative

A container ship was discharging her cargo in a non-tidal basin. An AB and an OS were releasing and removing the semi-automatic twistlocks used to secure the containers. To get onto the top of the container stacks after each tier had been discharged, the ratings were transported from the quay in a man-basket, which was lifted by crane (Figure 1). It was a cold, clear and still night.

The cargo operations were progressing well, and by the time the OS was relieved by another AB two container bays had been discharged and the discharge of the uppermost tier on a third bay was almost complete. The ABs agreed that one would go in the man-basket and clear the fastenings from the top of the stack while the other opened the hatch covers to enable the containers in the hold to be discharged. By now, the air temperature had fallen to about -1°C.

Shortly afterwards, the AB opening the hatch covers heard a scream. He immediately looked over the vessel's side and saw a safety helmet on the quay below the pilot gate sited in the guardrails (Figure 2). The AB quickly ran aft to the cargo room, where he found and alerted the second officer and the bosun. He then went to the aft deck to slacken the stern lines.

Figure 1: Man-basket

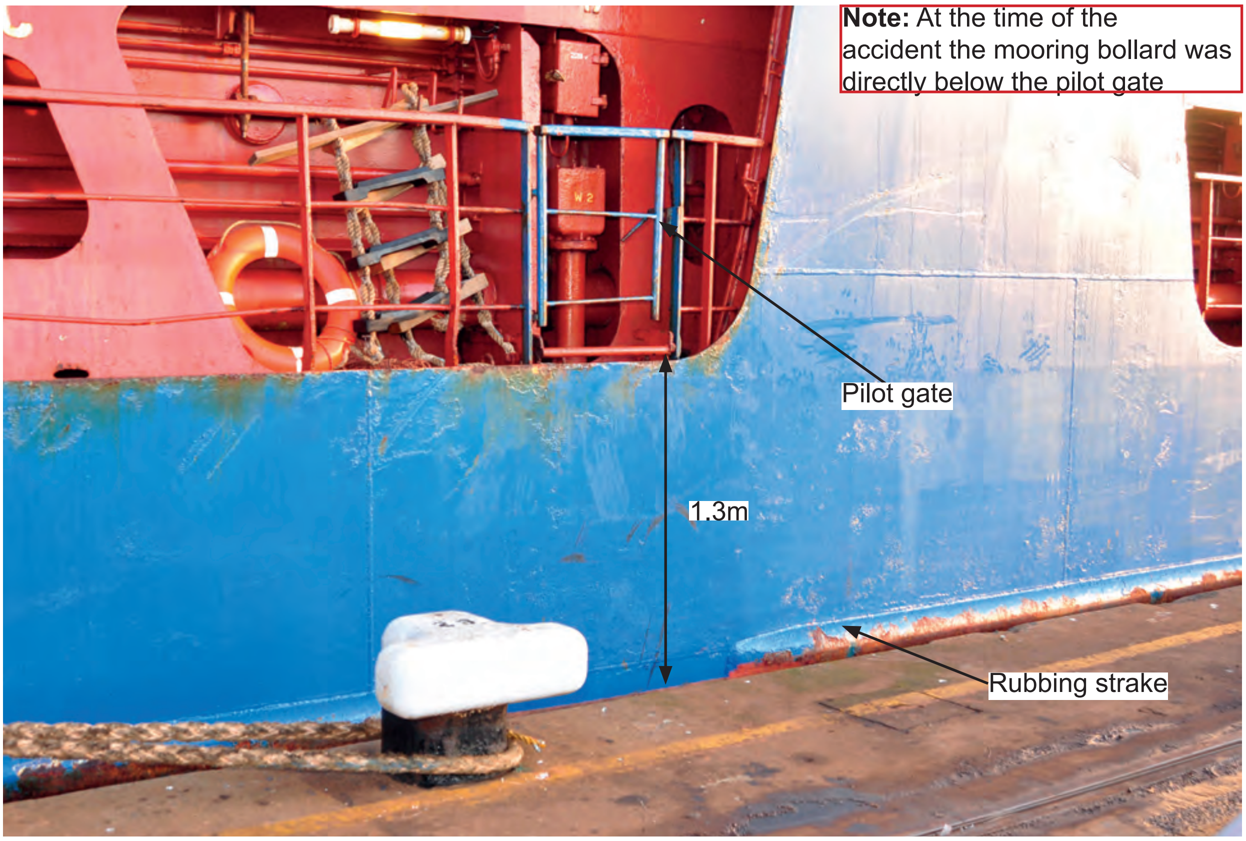


Figure 2: Pilot gate

The AB's scream was also heard by the driver of the road tug transporting the man-basket, which had just stopped alongside the vessel. He saw the safety helmet still oscillating on the quay below the pilot gate and immediately informed the terminal supervisor via hand-held radio that a crew man had possibly fallen overboard. The driver then went towards the pilot gate, which was open, and saw the AB in the water in the 50cm gap between the ship and the quay. The AB was on the surface and was moving his arms, but the vessel soon moved closer to the quay and the driver lost sight of him.

The driver was joined on the quay by the second officer, who stepped down from the pilot gate. The two men tried desperately to push the vessel away from the quay, but when the vessel eventually moved, the AB was no longer visible.

A top-lift truck used for stacking containers was used to keep the container ship off the quay while the emergency services conducted a search, but the body of the AB was not found until the following morning.

The Lesson

The AB fell between the container ship and the quay when using a pilot gate in preference to the vessel's accommodation ladder. Although the use of the pilot gate saved time and might have looked safe to use, the risks grew as the cargo operations progressed. In particular, the drop from the deck to the top of the shore bollard, the vessel's movement and the possibility of ice forming on top of the bollard would all have increased. Regulations covering means of access are there to make getting on and off ships safe. A shortcut is, and will always be a shortcut - don't make your next one your last one.

Lifeboat Drills - When Remote Control = Loss of Control

Narrative

It was a great day to be at anchor. The weather was fine and sunny and the master of a ro-ro cargo ship decided to take full advantage of the brief lull in the ship's busy trading schedule to carry out mandatory lifeboat drills.

The port and starboard, totally enclosed lifeboats, which were not designed for use with bowsing arrangements, were directly accessed from a raised platform on the deck (Figure 1). The lifeboats were arranged for gravity lowering, in the conventional manner, from the deck, by manually controlling the brake. They could also be lowered from within the lifeboats by means of a control wire, which operated the brake control lever. The 4mm control wire was wound onto an auxiliary drum, which was connected to the main winch drum (Figure 2).

Figure 1: Lifeboat embarkation platform

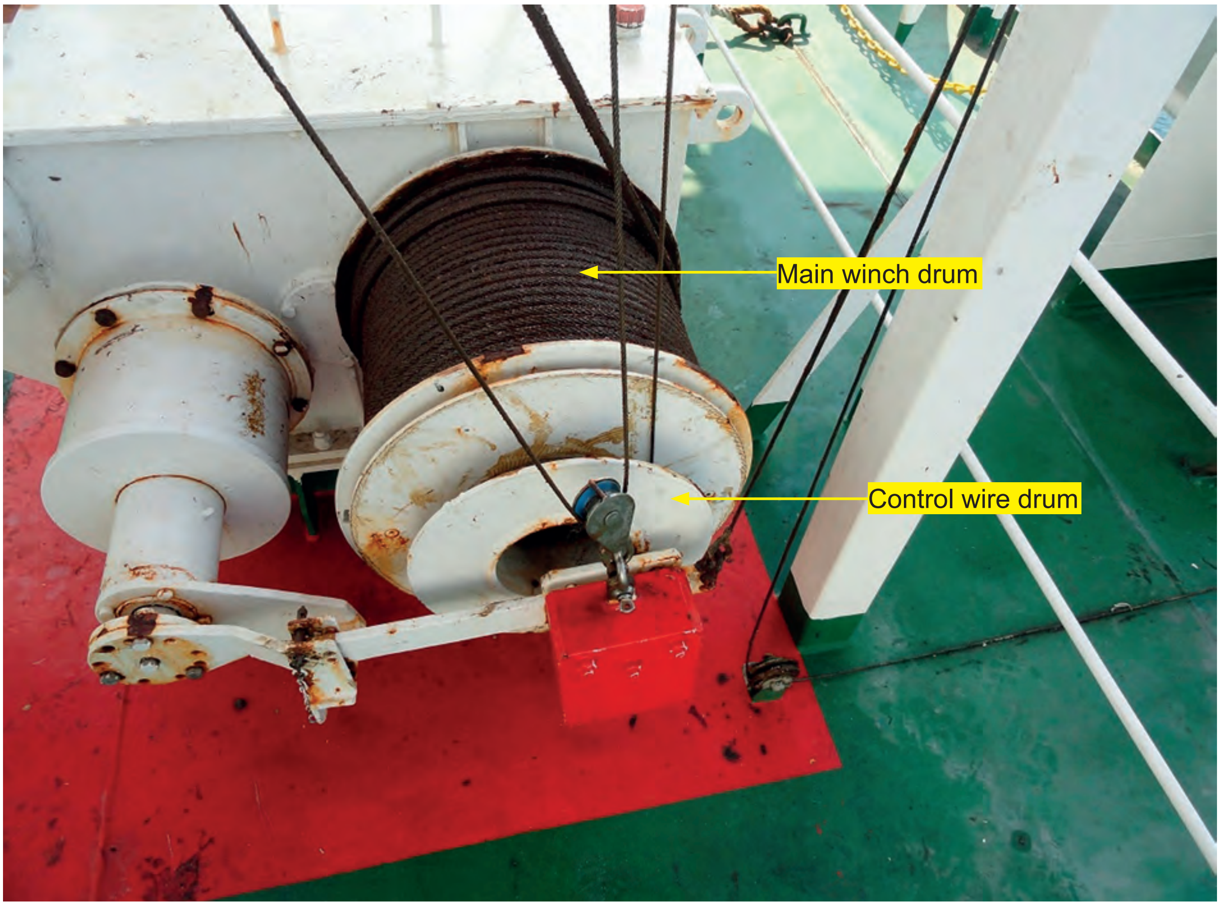


Figure 2: Main winch and control wire drums

Importantly, the instruction manual stated that, during hoisting, the operator should assist in evenly distributing the control wire on the drum to prevent "bunching". The control wire also passed through four sheaves before finally passing through the lifeboat's coach roof. Tension was maintained on the control wire by a 3kg counterweight which, according to the instruction manual, should be positioned approximately mid-way between the coach roof and the top sheave positioned at the davit head. This position provided sufficient clearance between the sheave and counterweight when the lifeboat was being hoisted and when fully stowed. The control wire and top sheave arrangements are at Figures 3 and 4 respectively.

In an emergency situation, the fully loaded lifeboat was designed to be lowered, with the crew already embarked, using the brake controls fitted within the lifeboat. However, during drills it was normal practice to turn out the lifeboat using the brake controlled manually from the deck position, and to lower it to deck level *before* the drill crew embarked, despite there being no bowsing arrangements. The reason for doing so was that, when lowering the lifeboat from the stowed position, the boat was prone to swinging and, from his position inside the lifeboat the coxswain, who operated the control wire system, had no visibility of what was happening externally.

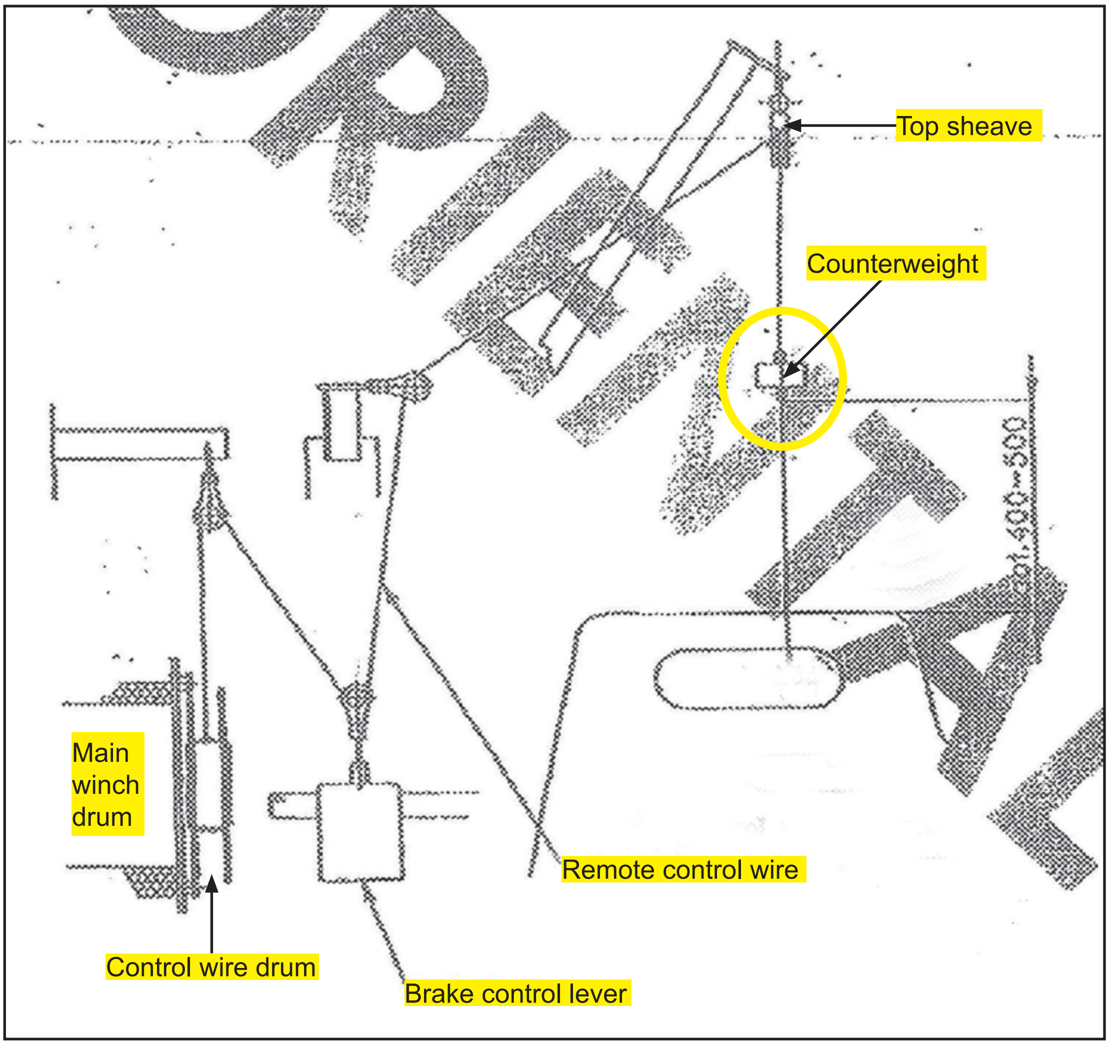


Figure 3: Control wire arrangement

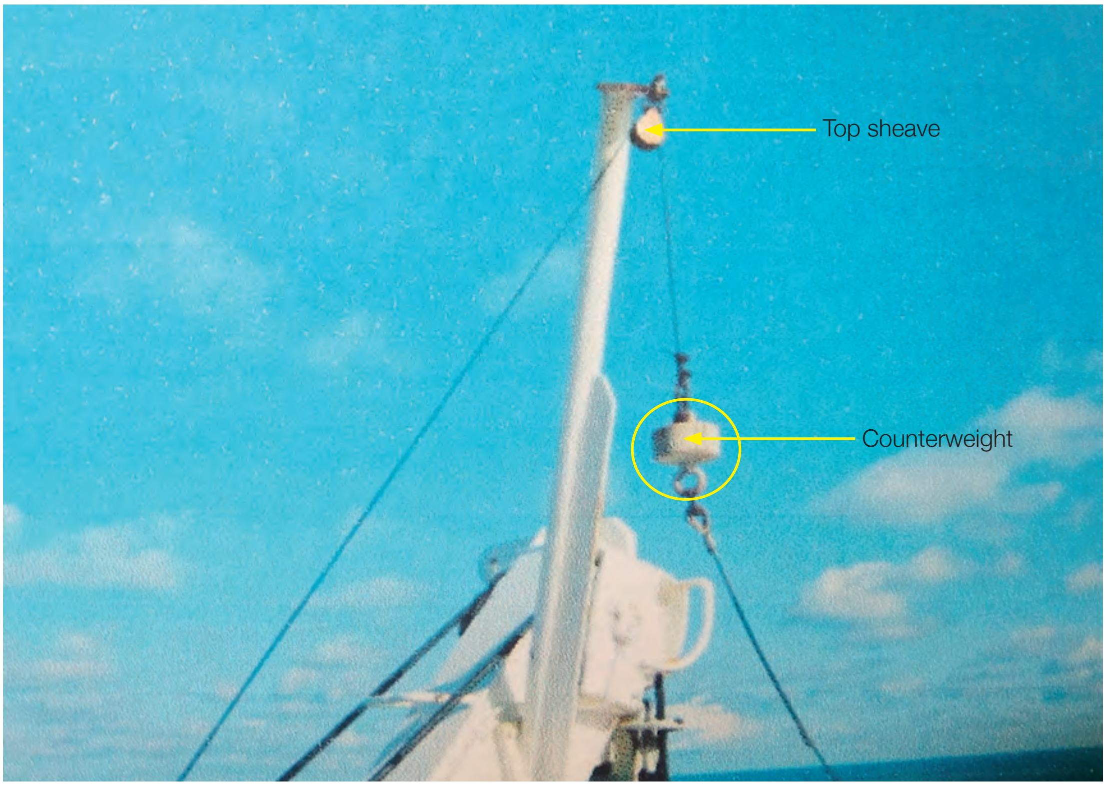


Figure 4: Control wire top sheave and counterweight

It was also the ship's procedure to lower the lifeboat to the water and then hoist it to prove system functionality before embarking the drill crew. Before the drill started, those involved were briefed on the procedure, at which time the master noted that the counterweight was at its designated position. The lifeboat was lowered and hoisted successfully. The master then noted that the counterweight had moved very close to the top sheave. To correct this he instructed that one turn should be removed from the control wire drum, which brought the counterweight close to the lifeboat's coach roof. The master then gave permission to lower the lifeboat before he then entered the wheelhouse.

The third officer and two crew embarked the lifeboat and fastened their seat belts. Then, contrary to the ship's normal practice, the third officer started lowering the lifeboat by pulling on the internal control wire, under the direction of the chief officer. As the davit arms turned out, the lifeboat swung on the falls and the counterweight was seen to land on the coach roof. Without tension on the control wire, the winch brake closed, causing the lifeboat to swing violently. The brake then opened and the lifeboat lowered a short distance until the brake again applied itself and the boat swung violently onto two angled plates at the ship's side, causing the two crew to be thrown about - despite them wearing seat belts. Immediately afterwards, the brake once again released as the third officer maintained tension on the control wire. The lifeboat then continued to be lowered into the water and was later recovered without further mishap.

Despite the violent impact with the ship's side, the two crewmen suffered only bruising, which required them to take 24 hours' rest. However, the impact also resulted in a 28cm crack to the underside of the lifeboat's hull, which compromised its watertight integrity.

The Lessons

The intermittent application of the winch brake was caused by tension being taken off and then being re-applied to the internal control wire as the wire was payed out during the lowering process. This was due to a number of riding turns which had built up during the lifeboat's initial hoisting phase, partly caused by misalignment of the sheave closest to the control wire drum. As the control wire winch rotated, the riding turns were released, which caused additional control wire to be payed out. This caused the counterweight to fall onto the coach roof, which released tension on the brake, causing it to close. As the lifeboat swung on the falls, the counterweight came clear of the coach roof, which tensioned the control wire, allowing the brake to release.

1. On hoisting the lifeboat, the master noticed that the counterweight was in a different position from that when the lifeboat was lowered. While action was taken to lower the counterweight by taking a turn off the control wire drum, no effort was made to find out the cause of the variation in its position. Do investigate the causes of defects thoroughly; far too many lifeboat-related accidents are due to acceptance of defects and a need to get the drill done taking precedence.

2. Lifeboat systems can be complicated, and there are many examples of accidents due either to taking shortcuts or to over-familiarity. Do ensure that you have a thorough understanding of your lifeboat equipment and launching systems.

3. Do not rely on your past knowledge - your current lifeboat and launching systems do merit your close attention. Consult the instruction manuals and ensure the applicable instruction posters are clearly visible at the launching positions.

4. In this case, the instruction manual clearly stated that careful attention must be paid to ensuring that the wire on the control wire drum was evenly distributed to prevent riding turns and resultant uneven paying out. This was not considered, and was the root cause of this avoidable accident.

5. The reason for lowering the lifeboat to the deck using the brake's deck manual control position is understandable; it is nevertheless very important to conduct drills using the emergency procedure. This will highlight any problem areas which can then be addressed. The time to find these problems is NOT when the real emergency occurs, but early enough to enable remedial action to be taken.

6. Control wires are often led through a number of sheaves, all of which have the potential for snagging the wire. It is vitally important that the wires and sheaves are properly maintained to ensure freedom of operation and that alignment of the sheaves is checked where problems are experienced.

RIB and Spinal Injuries

Narrative

An 8.5m RIB was on passage in the sheltered waters of a tidal river when a passenger, seated forward of the driver, was momentarily lifted from his seat due to the boat's motion. When he landed back onto the surface, which was the lid of an equipment locker routinely used as a seat, he experienced an excruciating pain in his lower back and collapsed, in agony, onto the fore deck of the RIB.

The driver reduced speed and diverted the RIB to a nearby pontoon landing place. There, ambulance personnel boarded and treated the injured person, who was then taken to hospital, where he was diagnosed with anterior wedge fractures of the first and third lumbar vertebrae of the spine.

The injury resulted in him being off work for several months and required follow-up medical treatment for almost a year after the accident.

Figure 1: Reconstruction of the injured person's position at time of accident with skeletal respresentation of probable spinal alignment

Exposure to shock and vibration
Analysis of this and several other similar accidents in which RIB passengers suffered serious spinal injuries concluded that operators and drivers of RIBs are not generally aware of the risks posed to their passengers by shock and vibration forces when their craft are operating at speed.

Data obtained during trials conducted on an 8.5m RIB during a high speed passage in calm conditions showed a constant force of 2g[1] acting through the deck of the RIB with intermittent shocks of between 6g and 10g. Occasional shocks of up to 20g were recorded during the trials.

The magnitude of the repeated shocks experienced during a high speed passage in a small craft can be sufficient to cause impact injuries to both passengers and crew.

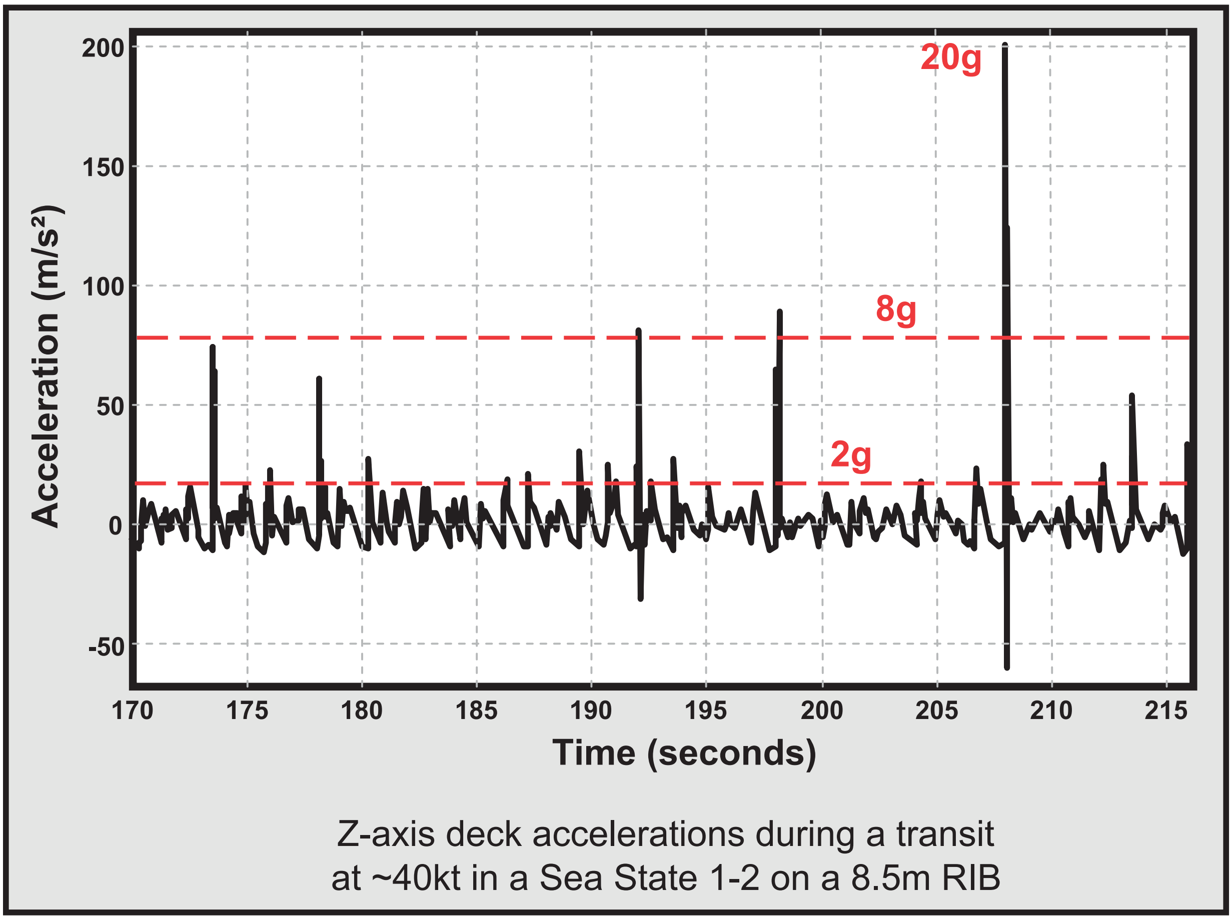


Figure 2: Magnitude and frequency measurements for repeated shocks recorded on an 8.5m RIB

The Lessons

1. Operators of high-speed craft should conduct Whole Body Vibration (WBV) and shock risk assessments in accordance with the requirements of the Merchant Shipping and Fishing Vessels (Control of Vibration at Work) Regulations 2007 (SI2007/3077).

2. MGN 353[2] and MGN 436[3] provide guidance on the above regulations, and suggestions on control measures to mitigate the risks from WBV. Reference is made to the provision of suspension seating, which should be considered for boats operating at high speeds.

3. Drivers of small craft, whether operating commercially or for pleasure, should be aware of the risks to crew and passengers from shock impacts when on high speed passages. The possibility of injuries occurring when large waves or wakes of other vessels are encountered should be considered, and the craft slowed down accordingly.

[1] g is the acceleration due to gravity, where 1g equals the force of gravity at the earth's surface (9.8metres per second)

[2] The Maritime and Coastguard Agency has issued MGN 353 to provide guidance on the protection of workers from the risks of whole body vibration. http://www.dft.gov.uk/mca/mcga07-home/shipsandcargoes/mcga-shipsregsandguidance/marinenotices/mcga-mgn.htm

[3] The Maritime and Coastguard Agency has issued MGN 436 to provide guidance on mitigating against the effects of shocks and impacts on small vessels. http://www.dft.gov.uk/mca/mcga07-home/shipsandcargoes/mcga-shipsregsandguidance/marinenotices/mcga-mgn.htm

Part 2 - Fishing Vessels

The rescue and recovery of personnel involved in the operation of fishing vessels forms a fair percentage of our day to day work. From persons taken ill at sea, on board accidents through to vessels sinking they are often amongst our most hazardous taskings particularly where vessels are small and/or cluttered and the sea state is high.

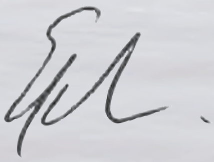
Operating over such a hostile environment requires us to consider our own safety in the event that we also end up in the water - even in the dry and warm environment of the cockpit we wear dry suits and lifejackets with location beacons and flares. We regularly practise our drills for evacuating in an emergency and consider how to maximise our survival if we end up in the sea.

I would like to think that I am much less likely to end up getting wet than those that work on the fishing fleet, but I still consider my and my crew's safety to be of the highest priority. I know that if we are unfortunate enough to ditch into the sea, if we can avoid succumbing to drowning or hypothermia then someone will be along to rescue us in fairly short order.

UK Search and Rescue Helicopters are equipped with the latest technology in search equipment such as the ability to home to all types of beacons, a Thermal Imaging (FLIR) camera, Night Vision goggles and powerful search lights. If a person is alive in the water, we have a very high chance of finding them. Our winchmen are highly trained in recovering people from the water and as they are trained to Paramedic standard, are immediately able to provide a high standard of medical care. If we get called to a sinking fishing vessel or a man overboard then what awaits us on arrival will depend largely on the safety equipment being worn by the fishing crew, their ability to carry out safety drills and any location aids (i.e beacons/flares) carried.

One rescue operation I was involved with springs to mind - we were called to a fishing vessel, 14 POB, without power that was drifting on to the rocks. It was night time with Force 10 winds and snow showers. On arrival we could see that there were several boats in the area, at least 3 of which could have been the casualty vessel as they were all close to shore. The English of the crew on the sinking boat was poor and they were relaying through another boat. However, shortly after our arrival, the Captain of the sinking boat fired off 2 red flares - this instantly identified them to us. They were actually tucked in behind the rocks at this point. As we hovered alongside to commence winching, all the crew were on deck and wearing their lifejackets. The Captain of the vessel was able to effectively carry out the Hi-Line drill which we use to speed up the process of winching a large number of people and also to enhance the safety of the winchman and casualties. All personnel were quickly winched on to the helicopter and taken to a place of safety.

From the rescuer's perspective I would like to emphasise this message - If you have the equipment available, I would urge you to wear it correctly and ensure you have the knowledge to effectively use your survival and location aids. Nothing pleases us more than rescuing people *alive*.



Liz Forsyth

Liz Forsyth was born and brought up in Manchester. After studying at Keele University, she joined the Royal Air Force and trained as a Search and Rescue Helicopter Pilot flying the Sea King at RAF Lossiemouth. This was followed by training as a Qualified Helicopter Instructor and a posting to the Search and Rescue Training Unit at RAF Valley where she trained pilots to carry out Search and Rescue duties.

In 2007, she moved on from the RAF and joined CHC Helicopters who provide the Search and Rescue Helicopter service for the UK Coastguard. Based in Stornoway flying the latest generation of SAR helicopter, the S92A, she has extensive experience of SAR in the Maritime, Mountain and Coastal environments.

CASE 16

Fatal Flip-Flop Fall

Narrative

On a lovely summer's morning the unthinkable happened.

It had all started off perfectly. It was a fine sunny morning, with slight seas and a gentle breeze, and a small potting vessel was heading out of an estuary to shift some pots. The skipper was in the wheelhouse, while the other two crew men slept in the cabin below.

As they approached the grounds, the skipper woke the two crew members, and they started to haul the gear. Three strings of around 60 pots each were recovered without incident and stacked up to four high at the aft end of the vessel's working deck (Figure 1); the back ropes and strops were left in a pile near the hauler on the starboard side of the deck (Figure 2).

While the two crew men cleared up on deck, the skipper started to steam the vessel back into the estuary, where the pots were going to be redeployed. The weather was still fine and the vessel was moving very little in the seaway. The two crew men got changed and then had a coffee, before one went below to the cabin to watch a DVD. The other had already seen the DVD and, instead, briefly chatted to the skipper, who remained in the wheelhouse reading a book.

About $1\frac{1}{2}$ hours later, the vessel was well inside the estuary and the skipper called the crew to get ready to shoot the pots. The crew man who had been watching the DVD immediately emerged; however the other did not. The skipper and the crew man quickly searched all areas of the small vessel, including the wheelhouse roof, where the other crew man often went to sit. However, he could not be found on board.

Figure 1: Pots stacked on the working deck

The skipper was in a state of shock, and immediately contacted the coastguard to raise the alarm, while he turned the vessel round and headed back out to sea at full speed to look for the missing crew man. Despite an extensive search and rescue operation involving a large number of vessels and a helicopter, he was not found. He had been wearing a t-shirt, jogging bottoms and flip-flops, similar to those in Figure 3, but not a lifejacket.

Figure 2: Back ropes and strops

Figure 3: Similiar flip-flops to those that w e worn by the crewman

The Lessons

Tragically, it will never be known what happened to the crew man, given there were no witnesses to the accident. He was young, fit and healthy, and well-rested. His behaviour had been normal; there was no suggestion at all of alcohol or drugs contributing to the accident.

Clearly, he must have gone overboard, probably not long after the vessel had left the grounds. As they were steaming, the other two crew members had simply assumed that he was elsewhere on board; it was, after all, a normal day, with benign conditions, and everyone was relaxed and in good spirits. The delay in recognising that he was missing was, of course, unfortunate and certainly highlights the merits of maintaining a general awareness of where others are on board.

It would appear most likely that the crew man fell over the starboard bulwark, which was particularly low; the port side was well-protected by a framework, and the aft end of the deck was blocked by the wall of pots. Perhaps most significantly, the large pile of back ropes was also on the starboard side, lying on deck where they had come off the hauler. Not only would these ropes have introduced a significant slip and trip hazard, but they would also have reduced the effective bulwark height in this area, increasing the risk of a fall overboard. It's possible that the crew man fell while crossing the ropes to access the ladder up to the wheelhouse roof on the starboard side.

A number of simple measures could have helped prevent this accident:

1. Although the vessel had a risk assessment, the hazards posed while transporting the fishing gear on deck, in addition to the low bulwark, had not been considered. Had they been, various means of reducing the risk of falling overboard on the starboard side could have been identified, including:
   - segregating the ropes on deck from the crew;
   - relocating the gear away from the low bulwarks; and
   - increasing the bulwark height, perhaps with a portable guard wire.

2. While working on deck, the crew man wore rubber boots, with adequate non-slip soles. However, when off duty he regularly wore flip-flops, despite most of the same hazards associated with slips and trips on deck still existing. Flip-flops and fishing vessels are really not a good combination. Their smooth soles and loose-fitting nature make them particularly inappropriate for use in hazardous areas, such as a pile of rope. They should not be worn at these times.

3. Lifejackets were worn on board the vessel…but only in poor weather. Given the fine conditions on the day of the accident and the fact that he was off duty, the crew man chose not to wear his. Tragically, this story is proof that accidents often happen when they are least expected. Had he been wearing his lifejacket, his survival chances would have been greatly increased.

4. Likewise, had he been wearing a PLB, his colleagues would have become aware immediately after he had fallen overboard, rather than up to $1\frac{1}{2}$ hours later; just as important, his location in the water would have been known. Modern PLBs are typically small and unobtrusive; by making it second nature to wear one at all times while on deck, it may give you a further chance of survival should the worst happen.

5. The crew man had not completed the required Seafish safety awareness course. Had he done so, it should have helped increase his appreciation and awareness of the onboard hazards and risks, including the issues listed above. It might even have caused him to reconsider the wisdom of wearing his flip-flops on deck.

Wake up to the Reality of Falling Asleep!

Narrative

A 15m crabber was returning to port late in the afternoon when she ran aground in fine weather and clear visibility.

During the week before the accident, the vessel had been potting and landing every 2 to 3 days. The crew had been working 18-hour shifts with the skipper in the wheelhouse operating the winch and the three deckhands on deck attending to the gear. Each of the deckhands took a lone $1^1/_2$ hour watch in the wheelhouse, either during overnight breaks at the grounds or while the vessel was steaming to and from port.

On the day of the accident, the crew had been potting since the early hours. At lunchtime, the skipper decided to head in to land and re-store, and elected to take the 6-hour navigation watch back to port.

The passage was initially uneventful but, as the vessel approached the coastline, a combination of the effect of the warm, unventilated wheelhouse and the low sun and slight sea contributed to the skipper falling asleep in the wheelhouse chair. A watch alarm, which could be cancelled from the wheelhouse chair, was reported to be in operation.

The impact from the grounding immediately woke the skipper and the deckhands below. They quickly mustered on the shelter deck top and donned lifejackets. One of the liferafts was manually deployed and all of the crew boarded it as the vessel sank rapidly. The skipper contacted the coastguard by mobile telephone and a deckhand ignited a distress flare. A nearby fishing vessel proceeded to the scene and recovered the liferaft and crew, who were then transferred to a lifeboat and transported safely ashore. The EPIRB activated over 3 days later.

The Lessons

1. The crabbing industry has been hit hard by rising costs and lower market prices, which has led to a culture of long working hours and limited rest. Nevertheless owners, managers, skippers and, indeed, crew members themselves need to ensure that everyone on board is sufficiently rested and fit to work, whether this is through compensatory rest or increased manning.

2. It is not difficult to imagine the skipper falling asleep after a hard week's work, while sitting in the comfort of the wheelhouse chair in a warm, stuffy environment in the late afternoon sunshine. It is important to ensure that there are sufficient stimuli present to keep lone watchkeepers alert, and to not allow them to remain seated for extended periods.

3. In the absence of a second person in the wheelhouse, an effective watch alarm is one way of providing the required stimulus. The watch alarm in this case was clearly ineffective; a good alarm should require the watchkeeper to move from the wheelhouse chair to cancel it and, when not cancelled in the wheelhouse, should alert other crew members below.

4. The stowage of lifejackets in a dedicated container on deck adjacent to the liferafts allowed the crew to readily access them. How easily could you get to yours in an emergency?

5. The abandonment and subsequent rescue, although successful, could have been more assured had a DSC radio alert been broadcast and the EPIRB and/or available hand-held VHF radio been taken to the liferaft. It was fortunate that the skipper's mobile telephone had battery power and network coverage. Training and regular drills are key to ensuring emergency preparedness. Are you prepared?

6. It is unclear why the EPIRB failed to transmit immediately after the vessel sank. It is possible that it was unable to float clear of the vessel, which highlights the importance of considering carefully its installation position. Would your EPIRB float free?

Carbon Monoxide Kills

Narrative

A fisherman died when he was poisoned by carbon monoxide produced by a petrol engine-driven salvage pump on board a trawler employed as a guard ship. Two other fishermen were also poisoned by the gas; they were airlifted to hospital and recovered fully following treatment.

After breakfast two fishermen took a petrol engine-driven salvage pump (Figure 1) into the fish hold to pump out oily water from a void space. One of them started the engine, but the pump would not prime. He persevered for over an hour to get the pump to work with the engine running for most of that time.

The fish hold - similar to most fish holds - had no forced ventilation system and the hatches, except for a small access hatch, were left closed. The pump was labelled *'The engine emits toxic carbon monoxide. Do not use in an enclosed space'* (Figure 2).

The first fisherman continued to work in the hold until he collapsed from the effects of the carbon monoxide which had quickly filled the space. The second fisherman went into the fish hold to help, and then ran to tell the skipper what had happened.

There was no gas monitor on board so the crew were not able to check whether the fish hold was safe to enter in order to rescue their collapsed colleague. Similarly, they were unable to enter the toxic atmosphere of the fish room safely as there was no breathing apparatus on board to allow this.

The three remaining crewmen then risked their lives, and two were seriously affected by carbon monoxide, as they entered the fish hold to try to rescue the collapsed man.

Figure 1: Pramac MP 36-2 petrol engine-powered pump

Figure 2: Warning notice on the petrol tank

The Lessons

The risks of using petrol or diesel-driven portable pumps are well known. Despite knowing these dangers, and warning signs being placed on the equipment, tragic accidents like this one still happen.

1. Do not use portable petrol or diesel engine-driven pumps in enclosed spaces, such as fish holds, unless the engine exhaust is vented to fresh air outside the space.

2. Ensure you are fully aware of the risks of carbon monoxide poisoning.

3. Think about the risks of operating portable pumps on board your boat, and where these should be best placed to avoid the risk of carbon monoxide poisoning.

4. The temptation to rescue a crewman from an enclosed space such as a fish hold can be overwhelming. However, no attempt should be made to enter the space, which may be hazardous, unless suitable rescue equipment, including breathing apparatus, is available and used. In most cases you should seek help from the emergency services or other vessels fitted with suitable rescue equipment.

Ground(ing)Hog Day!

Vessel hard aground

Narrative

A fishing vessel had stopped fishing late in the afternoon and had headed into port to land the catch. Meanwhile the mate carried out some work in the engine room. Having arrived alongside fairly late in the evening, the landing took a bit longer than usual due to a delay waiting for the lorry that was collecting the catch. There was also a bit of urgent maintenance to be carried out on deck, replacing a damaged derrick. Crucially, this meant that the mate, who normally went to bed after dinner and came back on watch in the early hours to relieve the skipper, remained awake.

With the landing complete, the skipper started to consider the options for the next trip. Unfortunately, the weather forecast was not good for the area in which they had just fished. The skipper therefore decided to head round the coast to more sheltered fishing grounds, and to recommence fishing as soon as possible. However, this meant that they would have to head out immediately to gain best advantage of the tide when transiting a particularly hazardous area of the coastline.

The mate had already been up for nearly 24 hours and the skipper, realising that the mate was tired, instructed him to go to bed and get some rest. The skipper also felt tired as he was now due off watch for his usual 8-hour rest. However, he decided that he would navigate the vessel for the initial, most hazardous leg of the voyage. He anticipated that this would take about 3 to 4 hours, following which the mate could take over the watch while the skipper grabbed some rest before commencing fishing again later that morning.

The weather was better than forecast, with slight seas and force 3 to 4 winds as the skipper steamed out of port and then altered course to head round the coast. He was alone on watch, sitting in the warm wheelhouse and steering by autopilot. The vessel had a watch alarm fitted in the wheelhouse, but it was not working.

The skipper fell asleep and his next recollection was when his fishing vessel grounded heavily on the rocky coastline of an island. His initial reaction was to attempt to go astern, without success. The crew mustered, donned lifejackets and deployed a liferaft as a precaution. Two lifeboats and a rescue helicopter headed to the scene, the latter airlifting the crew off the vessel, uninjured. The vessel unfortunately didn't fare so well and was later declared a constructive total loss.

The Lessons

It might not have been "groundhog day" for this particular vessel or skipper, but it certainly was for the vessel's owner, one of whose other vessels had previously grounded after the watchkeeper had fallen asleep. It also certainly is for the MAIB, which over the years has investigated numerous similar fishing vessel groundings. The crew were lucky on this occasion; the vessel not so.

The safety lessons are all too familiar:

1. Always plan ahead and take all of the circumstances into account when considering options for the forthcoming trip:
   - On this occasion, had the mate been able to get some decent rest, either as the vessel headed in or during the time in port, he would have been refreshed and able to navigate the vessel out when he was due back on watch. Instead, by remaining on watch beyond his normal shift, the skipper significantly increased the risk of his falling asleep in the early hours.
   - The obvious option available to the skipper was to delay sailing, given that he and the mate were tired, rather than to push on to start fishing again as soon as possible.

2. Try to ensure a bridge environment that positively discourages sleep. Warm, stuffy wheelhouses on cold nights may seem cosy, but they're also conducive to napping. Likewise, remaining seated for extended periods in a nice, comfortable chair may end up with unwelcome discomfort in the long term.

3. Ensure all possible stimuli are available to reduce the risk of falling asleep:
   - Fit an effective and functional watch alarm that not only alerts the bridge watchkeeper, but also everyone else on board should the former become incapacitated in any way.
   - Waypoint and cross track error (XTE) alarms on chart plotters can be another useful means of alerting a watchkeeper to the fact that there's a need to take action.

4. Although using one of the crew as a lookout can seem like a luxury on a hard-working fishing vessel, their presence not only acts as a second pair of eyes, but also as yet another deterrent against falling asleep.

5. Finally, in the unlikely event that none of the above has worked, and you find yourself aground, there can be serious risks involved in attempting to immediately refloat the vessel unless you are truly confident of her structural and watertight condition. Tragically, other similar attempts to refloat vessels have resulted in rapid flooding, foundering and loss of life.

Alarmed When the Alarms Didn't!

Narrative

A 20m trawler sustained catastrophic flooding while on passage, prompting the crew to abandon ship in darkness before being rescued by helicopter.

The vessel's high-level bilge alarms failed to activate and alert the crew to the water ingress, and the first sign that all was not well was when the wheelhouse electronic equipment started malfunctioning. Upon lifting the engine room hatch to investigate, the skipper saw water up to the top of the main engine gearbox. Due to the constant agitation of water within the engine room it was impossible to establish the source of the ingress, and the sea inlet valve remote shut-offs were already below water and were inaccessible.

The skipper started the pumps that were available, and for a period these seemed to hold the flooding in abeyance. However, as a precaution, a liferaft was launched and fastened alongside soon after the flooding was discovered. Despite this, it was the skipper's perception that they could cope with the situation, and he therefore did not notify the coastguard until it became clear to him that the flooding was in fact beyond control. This was more than an hour after the initial discovery and just before the crew abandoned successfully, taking a portable radio and flares with them. A SAR helicopter rescued the crew about 45 minutes later and brought them ashore safely.

The subsequent MAIB investigation revealed that:

- A few days before sailing, the vessel's engine cylinder liners had been found to have suffered severe electrolytic corrosion as a result of poorly maintained electrical equipment and a non-attached earth strap to the main engine.
- The vessel had an automatic submersible bilge pump with no "pump running" indicator in the wheelhouse.
- A petrol-driven salvage pump was stored in the forecastle, but was buried beneath spare trawl netting.
- The auxiliary engine had been seized for several months.
- The primary deck wash and bilge pump ran continuously with no means of disengaging it from the main engine.
- The vessel's bilge alarms had not been tested or maintained for a period of over 14 months.

Electrolytic corrosion on vessel's cylinder liner

The Lessons

1. The source of water ingress was unknown, but probably resulted from the failure of a critical sea water fitting due to electrolytic corrosion. When such corrosion is found, always consider if anything else may be affected, and take action to inspect and replace damaged items.

2. Yet again, here is an instance where bilge alarms have failed to do their job. Their activating switches are frequently placed out of sight in the dirtiest places on board. This makes regular testing, cleaning and maintenance of them all the more necessary. Getting early warning from this essential safety equipment is a critical weapon in the battle against flooding, so ideally they should be tested at least weekly.

3. The coastguard was not notified in the early stages of the emergency, so was unable to send additional pumps to the vessel in time to prevent it from sinking. The coastguard cannot help if they are not made aware of situations; it is far better to call too early than too late.

4. The inoperable auxiliary engine meant that the vessel had lost its main emergency services backup, which severely reduced the vessel's potential pumping capacity.

5. The automatic submersible pump masked early signs of flooding by initially removing water until it could no longer cope. Due to the lack of a "pump running" indicator, there was nothing to show that the pump was operating for a prolonged period. Such an indicator would have acted as a further warning of increased water ingress.

6. This vessel's main deck wash/bilge pump ran permanently. This resulted in reduced efficiency, increased risk of flooding and wasted energy. Make sure your pumps can be disengaged from whatever source drives them.

7. Salvage pumps are generally purchased for emergency use, and therefore should be stored ready for that event. Store them in a convenient place and you will have the peace of mind that they will be available when needed.

8. On the positive side, the crew abandoned safely to a well prepared liferaft, which they had launched early. This gave them time to prepare the raft and, if need be, launch their second raft if the first failed to inflate.

CASE 21

Siesta Disaster

Narrative

A day-working creel vessel went aground while steaming close to the shore. The boat was steering by autopilot, with the skipper and a deckhand in the wheelhouse and a further crew man resting below in bed.

The boat was shifting grounds for an hour before her last fleet of creels was shot for the day. They sailed at 0700, and the crew worked hard in the fresh air all morning hauling and shooting creels. While shifting grounds, the skipper and deckhands took the opportunity to eat a late lunch. The full stomachs and earlier exertion combined with the gentle rolling of the vessel and the warm wheelhouse to create a sleepy atmosphere, and the deckhand soon fell asleep on a bench seat, knowing that his capable skipper was keeping a good watch. At some point after this the skipper also nodded off, to be awoken by the vessel grounding on a rocky foreshore.

Unfortunately, they were unable to get the vessel off the rocks immediately and were forced to abandon ship as the boat lay over dramatically in the ebbing tide. Neap tides and strong onshore winds in the following days resulted in the boat being completely destroyed before she could be salvaged.

Figure 1: The abandoned vessel

Figure 2: Fishing vessel aground on the rocks

The Lessons

1. This was not an issue of fatigue; the crew were getting adequate sleep every night. This accident was caused by something that everyone has encountered at some time: a good meal, a warm atmosphere and lack of stimulation. All are ideal ingredients for nodding off. Counteract this sleepy feeling by: ensuring there is sufficient through ventilation (not just an open leeside window); getting off the seat and standing up to steer; drinking a cup of coffee; and switching on the radio, even if it does wake up your mate in the corner. And then, why not persuade him to take the wheel.
2. Fit a watch alarm onto the autopilot and make sure the reset switch is far enough away to force you to get off the wheelhouse seat to reset it every few minutes. Additionally, make sure the siren is loud enough to sound throughout the boat on its secondary alarm mode, not just in the wheelhouse. In the absence of anything else, resetting the watch alarm will hopefully provide the stimulation needed to prevent that "afternoon nap" feeling. Radar guard zones and echo sounder shallow water alarms can also help to give warnings of impending danger.

Own a Leaking Boat?

Narrative

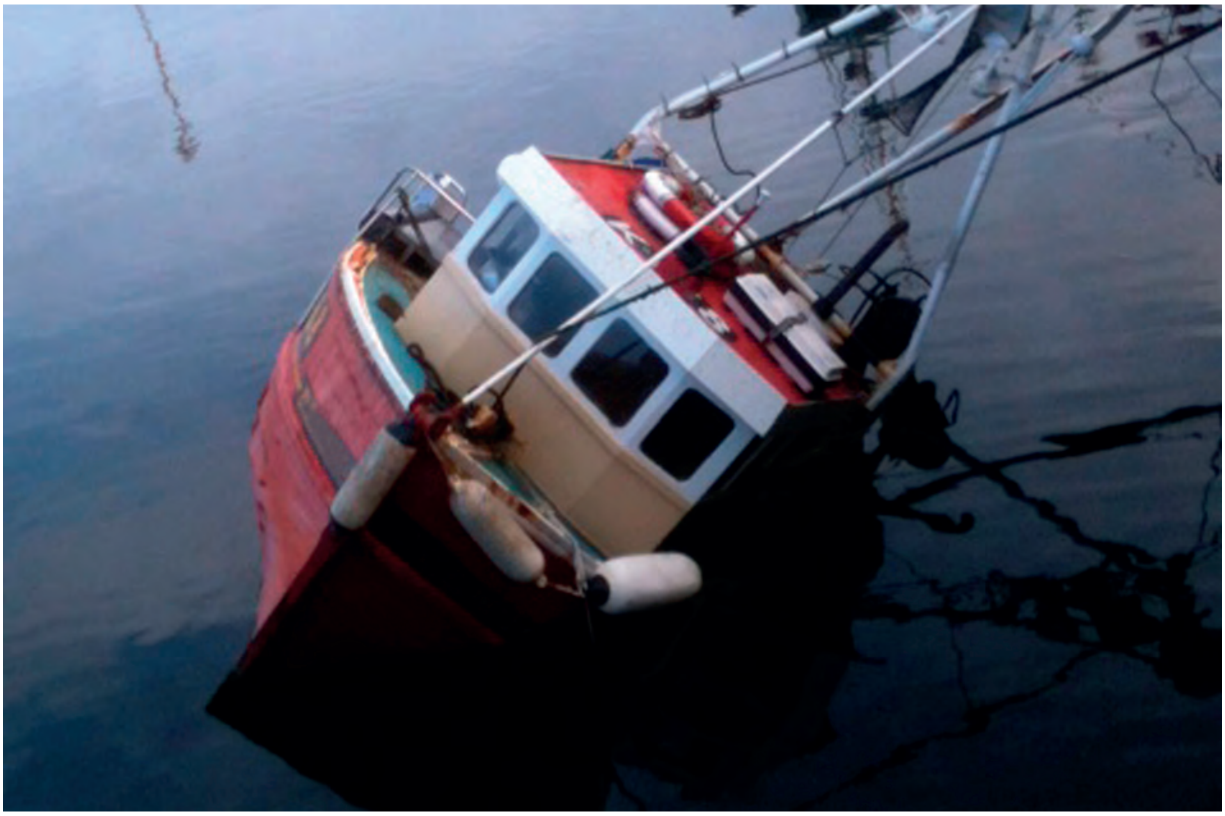
A small wooden potter was moored alongside. She had been loaded with a fleet of new creels and bait, and was ready to sail. On the intended day of the trip, the skipper came down to his boat, but decided the weather was unfavourable and that he would wait until the following day.

Before leaving the vessel, he checked the boat over and went below to operate the electric bilge pump to ensure the bilge was dry. The vessel had a small leak believed to be associated with the planking behind the hull sheathing, which the skipper hadn't been able to fix. The electric bilge pump was, therefore, always left in automatic so that a float switch in the bilge would start the pump as required. The skipper also looked over the side of the boat and observed that both the engine exhaust and bilge discharge overboard were clear of the waterline.

The skipper received a call early the following morning informing him that his boat was sinking. By the time he reached the harbour, the stern quarter of the boat was under water. There were no pumps immediately available and it was deemed too dangerous to go on board, so the vessel sank alongside, ending up sitting on the harbour bottom.

The fleet of creels was recovered by another fishing vessel, while a crane and diver were organised to salvage the boat. After salvage, the main engine could be restarted, but all the electrical systems were damaged.

The cause of the sinking was failure of the electric bilge pump, leading to the bilge slowly flooding. This eventually caused the discharge overboard to become submerged, which allowed back flooding into the vessel.



The vessel as it started to sink

The Lessons

1. Don't rely on a bilge pump to ensure your fishing vessel stays afloat. The number one priority must be to ensure that your vessel's hull and weather deck are watertight. Fishing boats are employed in arduous conditions as it is. Don't put yourself at even greater danger by going to sea in a sieve!

2. This vessel was fitted with a bilge alarm which alarmed in the wheelhouse, but like the engine-driven pump and manual bilge pump, it was of no use when the vessel was left alongside unmanned. Consider fitting an additional visual indication for the bilge alarm, for example on the wheelhouse roof or mast, so there is an early external warning of dangerous flooding.

3. Fit non-return valves to discharge overboard or re-site them to above the freeboard deck, or at least above the maximum loaded waterline, to reduce the risk of back flooding. Also, ensure there are as few hull penetrations as possible to minimise the risk of flooding problems.

4. The above lessons and further advice on the risks of flooding can be found in the MCA's MGN 165(F) (Fishing Vessels: The Risk of Flooding).

Part 3 - Small Craft

The UK marine industry boasts world leading naval architects, boat builders, electronic and safety equipment manufacturers, training specialists, and these are all supported by a leading regulatory system. All these elements combined make our industry the envy of the marine world and one the British Marine Federation is proud to have supported for 100 years (the BMF is celebrating our centenary year in 2013).

With all the best will in the world however, industry cannot make navigation of the world's rivers, seas and oceans a risk free activity, be it for work or pleasure. Every issue of the MAIB Safety Digest highlights the dangers even the most experienced of sailors can face and just how easily a lapse in concentration can lead to problems. The vast array of sailing talent that has written this foreword before me will testify to this.

There are numerous reasons though why our industry has remained at the forefront of marine excellence for so many years. Its ability to adapt technology and innovate on the back of its work with accident investigators and safety regulators is just one of those reasons. And the BMF is proud to have an excellent track record in assisting industry and the MAIB to work together. The team at the BMF continually works on standards and codes across national bodies, including the Maritime & Coastguard Agency, Navigation Authorities and BSI; within Europe on directives like the Recreational Craft Directive and Whole Body Vibration; and internationally with the International Maritime Organisation and International Organisation for Standardisation.

This active participation of industry in drafting groups ensures that codes / standards reflect not only the state of the art nature of our boats, equipment and training, but also that this is all manageable and affordable to industry. And while the Safety Digest provides details of incidents and accidents where something has gone wrong, I do not think I would be speaking out of turn if I said that due to the efforts of the industry, the users and regulators that, considering the huge amount of leisure activity that takes place in UK waters, these incidents are comparatively rare.

Overwhelming the majority of water based activities provide for a safe and fun day. Preparation and, as highlighted in Case Study 25 in this report, knowledge of operating limits is key. But as I commented earlier, we have an excellent industry in the UK which is always looking to provide the correct and proper training and knowledge to sailors, to make their time on the water as safe as possible.

Howard Pridding
Chief Executive

Howard joined the British Marine Federation (BMF) in 1991, following a two year secondment from government and has worked in a number of positions within the Federation before being appointed Chief Executive in October 2012. Prior to joining the BMF, Howard worked in Government for 13 years for the Department for Trade & Industry.

He has an enviable record of success in representing the industry to successive governments to help improve the trading climate for British marine companies and has long been one of the most significant personalities in the industry.

As Chief Executive, Howard oversees both the work of the Federation, which this year is celebrating its centenary, and its two world-renowned boat shows in the Tullett Prebon London Boat Show and PSP Southampton Boat Show, where his many years of working with hundreds of members on commercial and reputational matters are invaluable.

CASE 23

At Night, at Speed and Without Lights - What Do You Think Happened Next?

Narrative

Four RIBs departed, in darkness, from a yacht club located on one side of an enclosed man-made bay, to transport a group of young sailors to the other side. All the RIBs were owned by the club but none were fitted with navigation lights or carrying lights of any kind for the passage across the bay.

The group of young sailors were undertaking a training course based at the club during the day and had remained at the clubhouse in the evening for supper, followed by a social event. Shortly after leaving the yacht club two of the RIBs, driven by young persons who were neither qualified for nor experienced in night navigation, took divergent courses. The remaining two boats, with more experienced drivers on board, went ahead and took a more direct route across the bay.

The two young drivers then turned their boats onto convergent courses, although they did not realise this at the time as neither could see the other in the darkness. One of the drivers then saw the other boat very close ahead and began to turn to starboard just before the collision occurred. The power of the impact, with both boats proceeding at about 20 knots, was such that three of the passengers went overboard into the dark waters of the bay; another was thrown from one boat into the other. Several others were thrown from the inflatable collars into the central console/seats of the RIBs.

The drivers were then faced with the challenge of locating and recovering three young sailors, wearing dark clothing with dark coloured buoyancy aids, from the water. This task was further complicated as some of the sailors' kit bags had been thrown from the boats into the water by the force of the impact, and these were initially confused as being persons' heads.

The other two boats then returned to the scene as their drivers, one of whom was the experienced chief sailing instructor of the yacht club, had wondered where the young drivers had gone. However, as the boats involved in the collision were not carrying radios, and as none of the boats was equipped with lights of any description, he could not see or contact them without retracing his course towards the clubhouse.

Once the young sailors had been recovered from the water, the boats continued across the bay and took them to their hostel, where they were warmed up and checked by the group leaders, some of whom were medically trained.

Although it was not initially evident that any of the group had been injured as a result of the collision, several of them later reported feeling unwell and they subsequently required extensive medical attention. One of those thrown overboard by the impact was later diagnosed with post-concussion syndrome, and experienced associated neurological problems which remained unresolved more than a year after the accident. Several of the other young sailors suffered whiplash and muscular injuries which also required prolonged medical treatment.

The RIBS involved in the collision

The Lessons

1. Event organisers must guard against complacency when assessing risks for events in their local area. The yacht club agreed to undertake the transfer of young sailors in their boats without undertaking an adequate assessment of the risks involved. To embark on such a passage at night and in unlit RIBs was contrary to the requirements of the COLREGS. However, this was not appreciated by the organisers, who had an intimate knowledge of the waters of the bay and were unable to envisage any risks or dangers in undertaking this trip.

2. The club appointed two young persons to drive the two RIBs involved in the collision. While the drivers had been recently qualified to drive the RIBs during daylight hours, neither was trained nor experienced in night navigation. The fact that the boats involved in the collision were not carrying radios to communicate their predicament demonstrated the inadequate planning for the passage. Event organisers must ensure that the personnel used for any such transfer are suitably experienced, trained and qualified. They should also be provided with appropriate equipment to undertake such a task safely.

3. Following the collision, some of the young passengers were ejected into the water while some were thrown from the inflatable collars into the boats. The Royal Yachting Association's guidance on seating and safety in RIBs states *"passengers should be provided with a seat and, where passengers sit on the inflatable collar all passengers should have suitable hand holds"*. It is incumbent upon RIB operators and drivers to ensure that passengers are properly seated at all times, particularly when the boat is proceeding at speed.

4. It was not apparent to the group leaders that the young sailors had suffered any injuries following the collision, and the young people themselves did not, initially, report any injuries to the leaders. However, it later transpired that some of them had sustained a variety of serious injuries. Group leaders should be aware that there might be a reticence for young people to report non visible injuries following an accident, and should therefore include the need to seek prompt medical attention in an event's emergency contingency plans.

Saved By His PLB

Narrative

An experienced yachtsman was sailing an 11.9m sloop single-handed at between 7-9 knots on a broad reach in a force 5-6 under full main and 140% genoa. He decided to shorten sail and began to reef the headsail using the furling gear. However, because he was on a starboard tack and the furling line was on the port side, he was having to ease out small amounts of genoa sheet before pulling in the furling line a few inches at a time, then repeating the exercise.

He decided that if he bore away a little to reduce the pressure in the sails it would make his task easier. Having set the autopilot accordingly he carried on, but the genoa collapsed and the sheets became entangled around the forestay and the pulpit.

Wearing a lifejacket and harness, but without clipping on, the yachtsman went forward to try to sort out the mess. Seeing that this was not going to be possible he was starting to return to the cockpit when the yacht lurched and sent him over the port side.

He managed to cling on to the top guard-rail and as the yacht had almost certainly broached to windward and stayed effectively hove-to, its speed through the water was substantially reduced. He was able to make his way towards the stern, where he hoped to be able to get back on board via the 'sugar scoop' stern which had a grab rail attached to a bathing ladder in the stowed position. However, as he reached for the grab rail his lifejacket automatically inflated and he was pushed away from the yacht.

The yachtsman was wearing several layers of clothing and a waterproof sailing jacket. Crucially, he carried a PLB, which he activated immediately. PLBs transmit on the same 406 MHz frequency as EPIRBs, so the alert was raised quickly. The yachtsman realised that being several miles offshore made it pointless for him to try to swim to shore, so he lay with his head to wind, his face sheltered by the cotton brimmed hat he was wearing.

After about 1 hour and 10 minutes in the water he was rescued by a search and rescue helicopter and taken to hospital with mild hypothermia. He was released the following day.

The yacht and type of personal locator beacon involved in the accident

The Lessons

1. As soon as the yachtsman left the cockpit to go forward, he was putting himself at increased risk. Clipping on would have been prudent, and given the fact that he was going to the bow, a short tether would have been most appropriate. The MAIB's report into the fatal accident involving the skipper of the yacht *Lion* (report 4/2012), in 2011, deals with this subject in some detail. Harness tethers with three attachment points give the option to clip on 'short' or 'long'.

2. PLBs are now available for around £200 and are a vital piece of safety equipment for single- or short-handed sailing. In this case the PLB was properly registered with all the yachtsman's details so that the coastguard was able to contact his daughter, who was able to confirm that her father was sailing that weekend and that he usually sailed single-handed. This was important information for the ensuing search and rescue.

3. The signal transmitted by the PLB was weakened by the fact that the yachtsman was holding the device when he was in the water, with his arm over it. This meant that it was less able to transmit an exact GPS position and that his location had to be determined via the less precise "Doppler" method. It is possible that this prolonged his time in the water. For good reason, PLBs are marked to show where the GPS transmitter is located, with an instruction "do not obstruct". Make sure you don't!

Know Your Operating Limits

Narrative

A day's diving nearly had tragic consequences when a dive boat flooded and partially sank. Fortunately, a lifeboat was on exercise nearby and recovered everyone safely.

A dive school purchased an 11m boat to supplement a dive boat already in its possession. The new boat had previously been certified under the Small Commercial Vessel Code (MGN 280) for a maximum of 12 persons and category 2 operation. On change of ownership, the boat had to be re-surveyed to enable a new certificate to be issued. A local surveyor for the certifying authority conducted an out-of-water survey and was satisfied that a stability test was not required as one had been conducted when the vessel was certified previously. Following the survey, all that was required was the processing of the paperwork to enable a new certificate to be issued.

The dive school decided to conduct a trip to a local dive site. The boat left the harbour with nine divers and two crew on board. Initially there was a gentle force 2-3 breeze, but as the voyage progressed the breeze picked up to force 4-6 and the sea conditions worsened. The skipper decided to abort the dive and turn back to port.

As the boat neared the harbour it slowed down to allow another vessel to enter first. A wave then swamped the stern of the boat. The bilge pump was running, but shortly afterwards two more waves swamped the stern. The crew started to hand out lifejackets, but didn't complete the task as the stern of the boat sunk beneath them.

A nearby lifeboat crew on exercise had seen events unfold and were able to recover the people in the water. Some of those on board were initially trapped in the wheelhouse and had to escape through a sliding window, but within 10 minutes everyone was recovered. All were checked by paramedics ashore. Fortunately, there were no serious injuries.

The dive boat

The Lessons

1. The owner was well aware that his vessel would be certified for a maximum of 12 persons and would be permitted to operate in category 2 waters (up to 60nm from a safe haven in favourable weather). However, the requested certification also included a maximum allowed combined weight of cargo, activity-related equipment, and persons on board of 900kg. The standard weight assumed for a person is 75kg meaning 12 people alone weigh a total of 900kg. What was not appreciated was that the weight of dive equipment for the nine divers would inevitably mean that the boat was overloaded and therefore lower than intended in the water. It is vital that operators ensure they are fully conversant with all of the operating conditions stipulated on the certificate.

2. This boat appears to have submerged by the stern relatively quickly. Donning lifejackets may not always be possible in rapidly deteriorating situations, but ensuring they are easily to hand and ready to use will maximise the opportunity of putting them on. In this case, it was highly fortunate a lifeboat was nearby to recover the persons from the water.

3. If purchasing a vessel for commercial operation make sure it is fit for <u>your</u> purpose. A maximum of 12 persons means 'maximum'. The number may have to significantly reduce depending on the amount of cargo or activity-related equipment to be carried.

Investigations started in the period 01/09/12 to 28/02/13

Date of Occurrence	Name of Vessel	Type of Vessel	Flag	Size (gt)	Type of Occurrence
17/05/2012	*Purbeck Isle*	Fishing vessel potter	UK	11.64m	Foundering (3 fatalities)
10/06/2012	*E.R. Athina*	Service ship offshore	Liberia	4 488gt	Occupational accident (1 fatality)
02/07/2012	*Coastal Isle*	General cargo	Antigua and Barbuda	3 125gt	Grounding
09/07/2012	*Denarius*	Fishing vessel trawler	UK	22.40m	Fire
23/07/2012	*Betty G*	Fishing vessel trawler beam	UK	9.92m	Capsizing
01/08/2012	*Alexander Tvardovskiy*	General cargo	Russian Federation	2 319gt	Collision with multiple ships
	UKD Bluefin	Dredger	UK	4 171gt	Collision with multiple ships
	Wilson Hawk	General cargo	Barbados	2 811gt	Collision with multiple ships
10/08/2012	*Audacious*	Fishing vessel trawler	UK	27.60m	Foundering
01/09/2012	*Chloe T*	Fishing vessel trawler	UK	26.24m	Foundering
11/09/2012	*Sarah Jayne*	Fishing vessel dredger	UK	14.94m	Capsizing (1 fatality)
19/09/2012	*Vixen*	Recreational craft motorboat	UK	9.00m	Foundering
02/10/2012	*Wah Shan*	Bulk carrier	Panama	91 165gt	Occupational accident (1 fatality)
15/11/2012	*Amber*	Bulk carrier	Malta	10 490gt	Grounding
21/11/2012	*Windcat 9*	Special purpose ship	UK	31gt	Contact fixed objec
21/11/2012	*Island Panther*	Special purpose ship	UK	22gt	Contact fixed objec
25/11/2012	*Timberland*	General cargo	UK	13 066gt	Occupational accident (2 fatalities)
05/12/2012	*Arklow Meadow*	General cargo	Ireland	9 682gt	Occupational accident
12/12/2012	*Beaumont*	General cargo	UK	2 545gt	Grounding
16/01/2013	*Amy Harris III*	Fishing vessel trawler	UK	19.92m	Fire
28/01/2013	*Vidar*	Fishing vessel trawler	Belgium	37.81m	Occupational accident (1 fatality)
28/01/2013	*JCK*	Fishing vessel potter	UK	6.45m	Flooding (1 fatality)
05/02/2013	*Endurance*	Tug	UK	36gt	Occupational accident (1 fatality)
16/02/2013	*Finnarrow*	Passenger vessel and ro-ro cargo	Finland	25996gt	Contact fixed objec

Reports issued in 2012

About Time – fatal man overboard, off Pembrokeshire on 14 June 2011
Published 8 March

Blue Note – derailment of the hatch-lid gantry crane while alongside in Londonderry, Northern Ireland on 22 July 2011
Published 29 March

Cameron – serious injury to a chief officer, Crosby Channel, Liverpool on 21 November 2011
Published 1 June

Chiefton – collision, capsize and foundering, with the loss of one crew member at Greenwich Reach, River Thames on 12 August 2011
Published 23 May

Clipper Point – contact, Port of Heysham's South Quay on 24 May 2011
Published 14 June

Clonlee – electrical blackout and subsequent grounding of the feeder container vessel on the River Tyne on 16 March 2011
Published 28 March

CSL Thame – grounding in the Sound of Mull on 9 August 2011
Published 1 March

Dette G – man overboard during cargo operations, Queen Elizabeth Dock, Hull on 16 January 2012
Published 17 May

Ernest Bevin – fatal accident on the Woolwich ferry, River Thames, London
Published 16 August

Golden Promise – grounding on the Island of Stroma on 7 September 2011
Published 1 March

Karin Schepers – grounding at Pendeen, Cornwall on 3 August 2011
Published 17 May

Lion – fatal man overboard from the Reflex 38 yacht, 14.5 miles south of Selsey Bill, West Sussex on 18 June 2011
Published 8 March

Moon Clipper – steering control failure and subsequent contact, River Thames, London, resulting in injuries to several passengers and crew on 5 October 2011
Published 8 August

Morfil/Sun Clipper – collision between the rigid inflatable boat *Morfil* and the passenger vessel *Sun Clipper* by Blackfriars Road Bridge, River Thames on 1 June 2011
Published 18 April

Moyuna – grounding at the entrance to Ardglass Harbour, Northern Ireland on 21 November 2011
Published 9 July

Norcape – windlass damage, grounding and accident to person, Firth of Clyde and Troon, Scotland on 26-27 November 2011
Published 20 December

Onward – fire, 60nm off the north coast of Scotland, resulting in the loss of the vessel on 11 April 2012
Published 21 November

Pride of Calais – machinery failure leading to contact with berth, Calais, France on 22 October 2011
Published 9 July

Saffier – failure of the controllable pitch propeller of the cargo ship, resulting in heavy contact with a berthed tug in Immingham harbour on 25 June 2011
Published 10 May

Saga Sapphire – two men overboard while conducting a lifeboat drill alongside No 106 berth, Southampton on 29 March 2012
Published 8 November

Scot Pioneer – fatal injury to a crewman, Belview Port, Waterford on 27 October 2011
Published 1 June

SD Nimble – accidental discharge of carbon dioxide, resulting in serious injury to a shore-based engineer at HM Naval Base, Faslane on 23 August 2011
Published 22 August

Spring Bok and Gas Arctic – collision, 6nm south of Dungeness on 24 March 2012
Published 26 October

Starlight Rays – fatal accident to a crewman, 126nm north-north-east of Aberdeen on 25 August 2011
Published 14 June

Stena Feronia and Union Moon – collision, Belfast Lough on 7 March 2012
Published 15 November

Tempanos – fatality while berthed in Felixstowe, UK on 17 December 2011
Published 3 August

Tombarra – fatality of a rescue boat crewman, Berth 3, Royal Portbury Docks on 7 February 2011
Part A – the failure of the fall wire
Part B – the weight of the rescue boat
Published 19 July

Vellee – flooding and foundering in the Little Minch on 6 August 2011
Published 23 February

Reports issued in 2013

Betty G – capsize while trawling in Lyme Bay
on 23 July 2012
Published 7 February

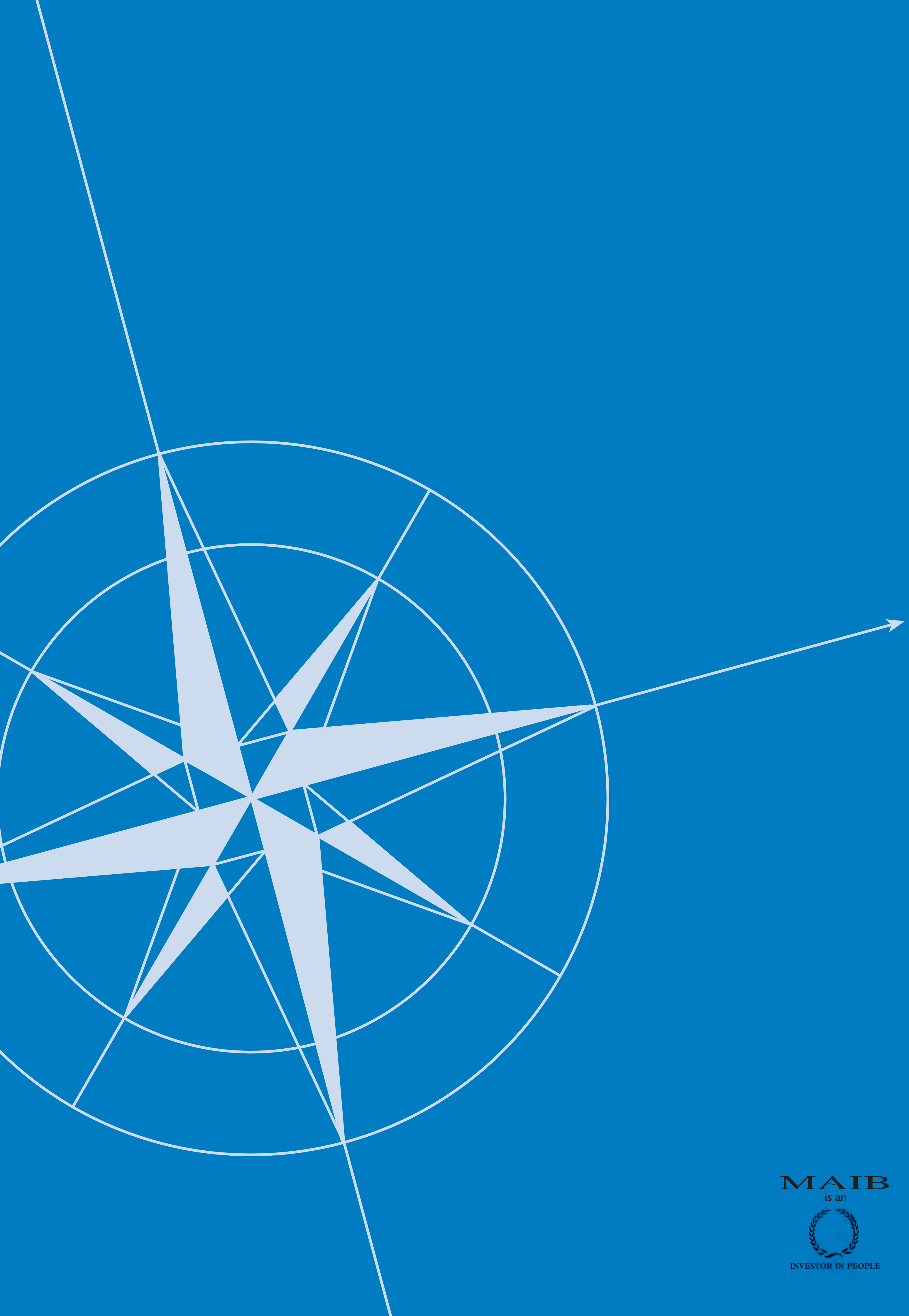
Denarius – fire and abandonment,
83 miles north-north-east of Kinnaird Head
on 9 July 2012
Published 6 February

E.R. Athina – fatal injury to a crew member
while vessel at anchor off Aberdeen
on 10 June 2012
Published 23 January

Heather Anne – capsize and foundering,
resulting in the loss of one crewman,
Gerrans Bay, Cornwall on 20 December 2011
Published 10 January

St. Amant – loss of a crewman, off the coast
of north-west Wales, on 13 January 2012
Published 9 January

Zenith – fatal manoverboard accident,
29 miles south-east of Kilkeel
on 29 January 2012
Published 24 January



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