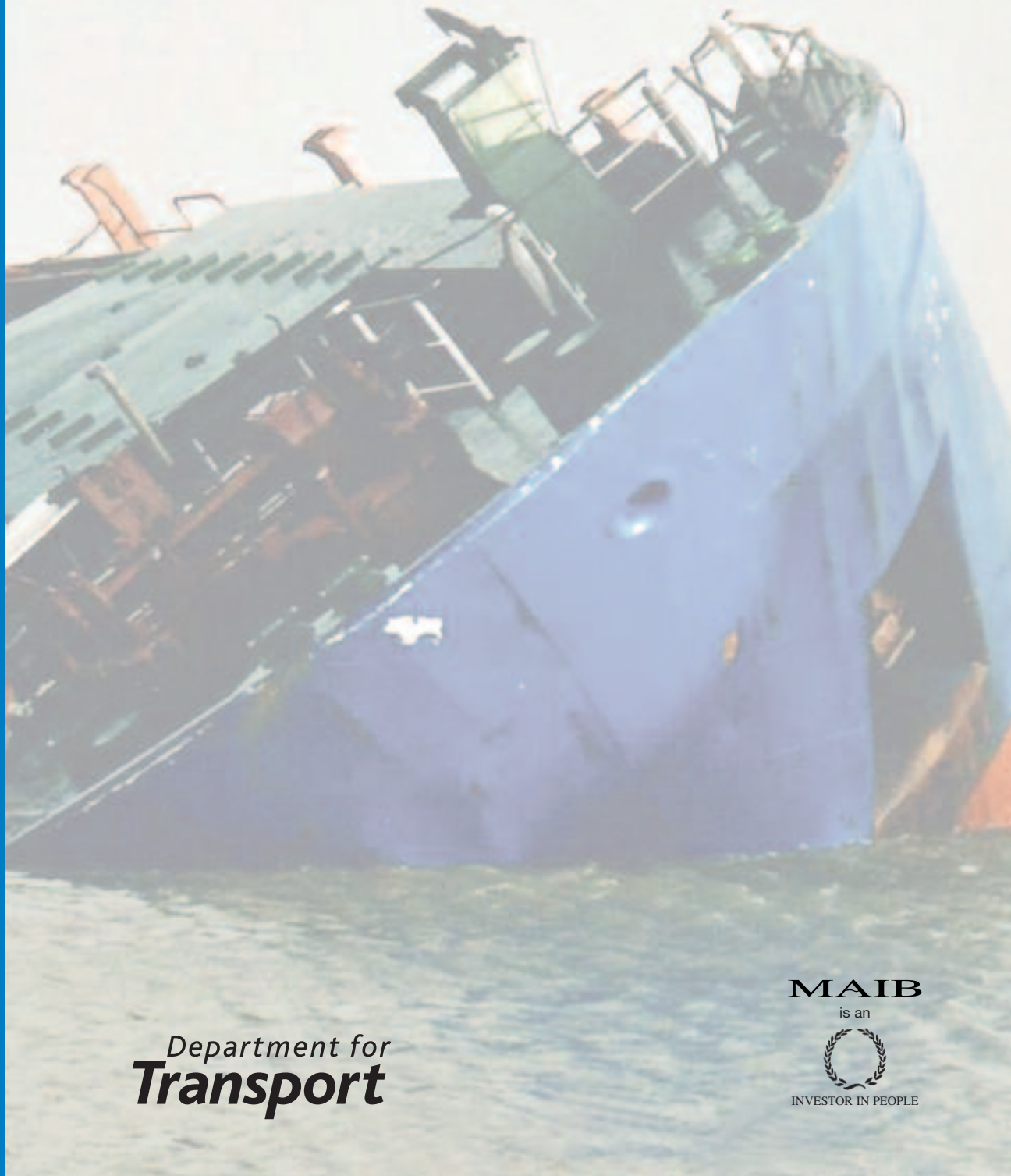
MAIB

MARINE ACCIDENT INVESTIGATION BRANCH

SAFETY DIGEST

Lessons from Marine Accident Reports 1/2007



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MARINE ACCIDENT INVESTIGATION BRANCH

The Marine Accident Investigation Branch (MAIB) is an independent part of the Department for Transport, the Chief Inspector of Marine Accidents being responsible directly to the Secretary of State for Transport. The offices of the Branch are located at Carlton House, Carlton Place, Southampton, SO15 2DZ.

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 facts which have 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.

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

The Safety Digest and other MAIB publications can be obtained by applying to the MAIB.

If you wish to report an accident or incident please call our 24 hour reporting line 023 8023 2527

The telephone number for general use is 023 8039 5500.

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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 2005 – Regulation 5:

"The sole objective of the investigation of an accident under the Merchant Shipping (Accident Reporting and Investigation) Regulations 2005 shall be the prevention of future accidents through the ascertainment of its causes and circumstances. It shall not be the purpose of 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
ARPA	–	Automatic Radar Plotting Aid
cm	–	centimetre
CO2	–	Carbon Dioxide
CPA	–	Closest Point of Approach
CPP	–	Controllable Pitch Propeller
DPA	–	Designated Person Ashore
DSC	–	Digital Selective Calling
ECDIS	–	Electronic Chart Display and Information System
EPIRB	–	Emergency Position Indicating Radio Beacon
ETA	–	Estimated Time of Arrival
FRC	–	Fast Rescue Craft
GPS	–	Global Positioning System
GRP	–	Glass Reinforced Plastic
Hp	–	Horse power
ISM	–	International Safety Management Code
kW	–	kilowatt
“Mayday”	–	The international distress signal (spoken)
MOB	–	Man Overboard
OOW	–	Officer of the Watch
PEC	–	Pilotage Exemption Certificate
PI	–	Parallel Index
RNLI	–	Royal National Lifeboat Institution
SAR	–	Search and Rescue
SCBA	–	Self-Contained Breathing Apparatus
UHF	–	Ultra High Frequency
VHF	–	Very High Frequency
XTE	–	Cross Track Error

Introduction

I start this edition of the Safety Digest by returning to the subject of complacency. Nearly all of us who go to sea, be it professionally or for leisure, rapidly become inured to the hazards of what we are doing. The media is largely disinterested in accidents at sea, unless they result in oil spills or BMW motorbikes appearing on beaches. So there is little to remind us of the dangers.

Let me use some early statistics for 2006, emerging from analysis of our database:

> Fishing still remains, by a very large margin, the most dangerous occupation in the UK. In 2006, 16 fishermen died in accidents, up from 9 in 2005. Although fishing vessel losses are slightly down, we have still lost a UK commercial fishing vessel on average every 13 days over the last 10 years.
>
> In 2006, 117 merchant vessel accidents were reported to us. Happily, this number is down from the 188 reported to us in 2005. However, numbers of accidental deaths in merchant ships were slightly up.
>
> Twenty four accidental deaths occurred in leisure craft (of all types), plus 4 in hired boats, which technically count as "other commercial" rather than leisure.

The message from these statistics is that none of us can afford to be complacent.

In reading through this edition, I am struck by a common thread in many of the cases in the merchant vessel and leisure sections: teamwork. Nearly all of the collisions and groundings in Part 1 would have been avoided if the bridge crew had been operating as a team. More training is being conducted on Bridge Team Management, but this training often fails to translate into actions at sea. A lookout is a vital member of the bridge team, and should not be ignored; equipment, alarms and other facilities must be utilised to support the watchkeepers; and integrating a pilot into the bridge team is a key element of safe operations in pilotage waters. In leisure sailing, briefing one's crew on what the plan is; of what could go wrong; and what to do if something does go wrong, is fundamental to safe sailing. Although not applicable to the fishing vessel cases in this edition, the same points apply to the fishing sector.

It doesn't take much to ruin one's day at sea – equally, it doesn't take much thought to stay safe.

Stephen Meyer
Chief Inspector of Marine Accidents
April 2007

Part 1 – Merchant Vessels

A hand injured when letting go a line; a grounding because the depth of water was less than expected; a collision while the ship's bridge was unmanned. The common theme running through most of these case studies is the failure to follow best practice or to apply established work procedures that were designed to minimise risk and prevent failure. While it is true that some procedures were not followed correctly, in many cases there was simply a lack of good seamanship.

The hand was injured because the rope was not handled correctly: the grounding occurred because the depth of water had not been checked: and the collision took place because the watch officer left the bridge after first sending the look-out on an errand.

In other examples, we see that a grounding took place on a ship because the master was unsure how to change the steering from manual control to river pilot; that a fire occurred when oil leaked and soaked into lagging; and that a cooking grill was switched on and left unattended. There is the case of a boatswain lost overboard whilst working without assistance lowering a pilot ladder, and standing on it at the same time; and that of a crewmember washed off the deck of a pilot-cutter because he was not using a safety line.

Accident prevention does not have to require major changes in legislation or radical overhaul of training systems. In many cases, simple application of common sense and good seamanship is sufficient. For example, ships' crews cut corners, or work long hours, in the belief that they are helping the owner; in fact, their actions have the opposite effect because they increase the likelihood of failure.

Additionally, the repetitive nature of life at sea can breed complacency and induce inadvertent risk taking.

Although accidents are often put down to human error, that 'error' is sometimes caused by a well meaning failure to follow laid down procedures. The challenge for the maritime industry is to impress upon the seafarer the importance of always being alert to what might go wrong when conducting shipboard tasks, to adhere to company procedures at all times, to get proper rest, to ask for assistance when needed and to avoid taking unnecessary risks. Such apparently simple things are often the most difficult to achieve, but we must continue to work on this challenge by focussing on safety issues, developing strong safety cultures and encouraging, at all times, good seamanship.

Eric Murdoch

Eric Murdoch was born in 1955. On leaving secondary school in 1973, he joined the P&O Steam Navigation Co as a deck cadet, rising to a second navigation officer before leaving the sea for further study. He obtained his Bachelor of Science in Marine Technology in June 1980 (UWIST) and his Master of Science in Ship Production in 1981 (Strathclyde). He subsequently worked as a design engineer with Cammell Laird Shipbuilders, Birkenhead, during a time when the shipyard was building destroyers, tankers, a semi-submersible drilling rig and a jack-up rig. He later worked for Lloyd's Register of Shipping in Liverpool and London as a ship surveyor specialising in international conventions, becoming a Chartered Engineer in 1986. After leaving Lloyd's Register of Shipping in 1987 and having a 2 year stint at Panama Bureau, he took employment with Charles Taylor & Co Ltd to head up and develop the Standard P & I Club's safety and loss prevention programme. This involved ship condition surveying, material on loss/accident prevention and an extensive seminar programme. Mr. Murdoch is presently the director of risk management for the Standard P&I Club and director Marine Technical CTC Marine.

He is a member of the Institute of Marine Engineers, Royal Institute of Naval Architects, and the Society of Consulting Marine Engineers and Ship Surveyors. He has written a number of articles on accident prevention, collision avoidance, piping corrosion, container lashing and hatch cover maintenance, and co-authored the Master's Guide series of publications. He is a member of the marine advisory Board of CHIRP – the UK Confidential Hazardous Incident Reporting Programme and has attended the IMO as an advisor.

What Lighthouse?

Narrative

A 90m cargo vessel was operating a regular route along the UK coast, transporting containers. The deck officers on board comprised a master and mate working a 6 hours on, 6 hours off watch routine.

The vessel arrived in port and moored alongside one evening, after two very tiring days for the master. He had only managed 4-5 hours sleep during the previous 2 days as he had been on the bridge for extended periods while in pilotage waters. However, he was able to get 6 hours sleep overnight in port. Next morning, he carried out ship's business during his morning duty period. The mate supervised the loading and unloading of the ship's cargo throughout the day.

After lunch, the master went ashore to have a drink with a fellow crew member and also to do some shopping. He then returned to the vessel late afternoon, and a short time later the vessel sailed. The master held a PEC, so no pilot was required to manoeuvre the ship off the berth or clear the harbour. Once clear of the port, but still in pilotage waters, the master left the mate on watch and went below to have a shower and eat his dinner.

The master returned to the bridge 20 minutes later and the mate went below to his cabin. The lookout reported to the bridge at 2000. The sea was calm, there was only a light breeze and visibility was very good. Other vessel traffic was light. At 2130 the master sent the lookout to conduct safety rounds, which took no longer than 20 minutes.

Sometime later, the ship passed an island, at which a course alteration of 12° to starboard was required according to the passage plan. The master altered course by only 3° as this appeared adequate to ensure the lighthouse on the next headland was on the port bow.

Bottom damage as a result of the grounding

On passing the island, the radar range was reduced from the 12nm to 6nm. After the turn, the vessel slowly diverged from her planned track and, eventually, the GPS alarm sounded as she strayed outside of the 2 cable cross track error (XTE) margin. This alarm was acknowledged, but the course was not corrected and the passage continued. No fixes were marked on the chart, and even the normal recording of GPS positions in the log was not carried out.

At about 2325, the master again sent the lookout on safety rounds and told him not to return to the bridge but to shake his relief after he had finished. Very soon after the lookout left, the master fell asleep, even though there was a functioning watch alarm on the bridge which needed resetting every 12 minutes. The act of cancelling the alarm was insufficient to rouse the master into effectively monitoring the ship's position.

The vessel vibrated as it ran aground, and the master awoke suddenly. He immediately set the pitch on the CPP to zero. The master could see the lighthouse, now on his starboard bow, very close by. His first reaction was to refloat the ship, so he put some astern pitch on the CPP. The general alarm was not sounded.

As soon as they felt the vibration, the chief engineer and oiler went to the engine room, where they started the auxiliary generators and decoupled the shaft generator. They then checked for any signs of damage. The mate went to the bridge shortly after the grounding, not really knowing what had happened. There, he plotted the vessel's position on the chart before checking the hold and hull for damage.

When the mate returned to the bridge a short time later, the vessel was afloat. There was some confusion and heated discussion on the bridge and, eventually, the mate took the con and set a course clear of the coast and back towards the vessel's intended track. No damage was found and the engine appeared to be running smoothly. As a result, the master decided not to report the incident to the authorities or the ship's management company, and the ship continued on its passage. The master left the bridge, leaving the mate to complete his midnight to 0600 watch.

Throughout the night, checks were made for flooding or signs of damage. The mate, having considered the situation further, decided at 0200 to report the incident to the DPA (Designated Person Ashore) by sending an anonymous text message on his personal mobile phone. However, the DPA did not find the text message until 0800. When the master returned to the bridge at 0600, the chief engineer reported having discovered flooding in three tanks, and at that point the decision was made to report the incident. Eventually, at 0900, the master made contact with the ship managers, although several unsuccessful attempts had been made from shore to contact the ship.

The company emergency response team convened, and plans were made to divert the ship to allow the damage to be assessed. At 1125 the ship was redirected to port and HM coastguard was informed. The ship arrived in port safely for cargo discharge and dry docking, 24 hours after the grounding.

There was significant damage to the vessel, with three long grooves in the double bottom, several small splits in the shell plating and damage to three of the propeller blade tips.

The Lessons

1. Fatigue will lead to errors, and it sometimes results in accidents like this. It is important to recognise when you are becoming tired, and ensure you are adequately rested. For example, after extensive periods of pilotage, make rest your first priority during your off-duty periods. If necessary, delay sailing from port.

   No vessel's schedule is worth the risk of having a grounding or collision because the officer of the watch (OOW) is tired.

2. The management company's policy permitted alcohol to be consumed, but not during the 4 hours before going on watch and not more than a prescribed limit. Tiredness and alcohol have similar effects: they dull the senses and slow the reactions – essential senses for navigating a ship. Combining them multiplies these effects.

   The old road safety slogan applies just as well at sea – Don't drink and drive.

3. The standards of navigation on this ship had sunk to the lowest level possible, resulting in the watchkeeper simply steering from one lighthouse to the next. There was no attempt to follow or monitor progress against the passage plan, or the route stored in the GPS. The radar was checked occasionally but, importantly, the coast ahead was not noticed by the master.

   It is vital to know where your ship is and whether you are standing into danger. Do not slip into bad navigational habits; they will catch up with you!

4. Following the grounding, chaos reigned: the master lost control, the crew was not informed of the situation, and the vessel was manoeuvred clear of the rocks before a full damage assessment was completed. It was fortunate in this case that the damage was contained within the tanks.

   Emergency procedures and checklists exist to help ensure all necessary actions after an accident are carried out – familiarise yourself with them, and use them.

5. The decision to cover up this accident demonstrated little consideration for the safety of the ship, her crew or the environment, and it was extremely fortunate that the outcome was not much worse. Accidents happen, and you will be judged less by what happened, than how you dealt with it.

   Report accidents to local authorities and management as soon as possible because time may be vital in preventing loss of life or averting pollution.

6. All too often, the MAIB finds that the lookout has been poorly employed and has added little to the safety of the ship. If used effectively, the lookout can not only alert the OOW to the immediate surroundings, but also his presence on the bridge will help ensure that the OOW is alert.

   International regulations are not written for fun – a lookout is an essential part of the bridge team.

7. Do not become complacent about operating in pilotage waters and, if necessary, take your meal on the bridge.

   The PEC holder must be on watch during pilotage.

Lagging Fires – Hidden Danger

Narrative

A fire occurred in the pump room of a small chemical tanker while it was loading a hot bitumen cargo at a refinery. The chemical tanker was on a long term charter to transport bitumen cargoes, and was designed for this trade.

On this occasion, the cargo was of a specialist variety for heavy industrial use, and its transport temperature of 220°C was much hotter than that of standard bitumen cargoes which are normally carried at 150°C. To prevent the bitumen from cooling and hardening in the cargo pipelines and the cargo tanks, a thermal oil trace heating and tank heating system was in operation at about 225°C. The piping system was covered by thick pipe insulation.

The bitumen was loaded into the cargo tanks via the pump room and, as an added precaution because of the higher temperatures involved, the pump room fire flaps and access door had been shut. This measure had been taken as part of the vessel's informal risk assessment for this cargo.

Four and a half hours after loading had begun, the chief engineer and chief officer noticed smoke coming from the pump room extraction fan. The pump room fire and gas detection alarms sounded very soon afterwards.

The chief engineer made his way to the pump room. He donned self-contained breathing apparatus (SCBA) and entered the space alone. He was met by thick black smoke which prevented him from proceeding beyond the

Bitumen pipe with lagging removed

The source of the leak

top level. He retreated and returned to the bridge, where he informed the master of the situation.

The refinery was contacted and emergency procedures were implemented. The loading was stopped and the local fire brigade arrived on scene within a few minutes. The fire brigade were informed of the relevant facts, including the type of cargo being loaded, and along with the chief engineer, officers entered the pump room.

The seat of the fire was located at the lower level of the pump room using thermal imaging equipment. It was quickly extinguished with water hoses. Within a short time, the pump room was ventilated, enabling the cause of the fire to be investigated.

The seat of the fire had been the lagging of a cargo discharge pipe, which, although empty of bitumen, was being kept warm by the trace heating lines. Above the cargo discharge pipe a hydraulic hose was found to be leaking from an end fitting. It is thought likely that hydraulic oil had dripped onto, and subsequently soaked into, the lagging. Spontaneous ignition had eventually occurred.

Fire damage was limited to the lagging, and smoke damage confined to the pump room.

The Lessons

1. Laboratory tests have shown that spontaneous ignition can occur in oil-soaked lagging at liquid temperatures as low as 130°C. This can be considerably lower than the oil's auto-ignition temperature, due to the fluid's oxidisation. This phenomenon is well known and commonly labelled a *"lagging fire"*.

   A number of factors are involved in determining the likelihood of a lagging fire: thickness and type of insulation, type of oil, rate of leakage, oil temperature and air flow can all alter the balance between heat loss and heat generation. Of particular note is the fact that the liquid does not need a low flash point, and non-fuel oils such as thermal and hydraulic oils are more likely to generate a lagging fire.

   Good housekeeping and maintenance, including the prevention of leaks, cleanliness and the provision and regular inspection of sealed lagging are the simplest measures that can be taken to prevent lagging fires.

2. In his haste to determine the extent and cause of the fire, the chief engineer entered a smoke-filled space alone, wearing SCBA. This is poor practice, and with the visibility almost non-existent, he could easily have fallen or lost orientation and thus added a casualty to further complicate the situation.

3. The vessel had a fixed CO_2 fire-fighting system, but it was not made ready for instant use should the fire have got out of control or proved more serious than at first thought. Delays in using fire smothering systems can prove disastrous, and it is always good practice to expect the worst and make ready for an escalation.

4. The use of water to bring the fire under control was effective in this case but, taking into account the type of cargo and the unknown nature of the fire, it was risky. If the fire had been due to a spill of bitumen, the use of water would have caused flashing off to steam and rapid expansion, and possibly a violent explosion. All of this within an enclosed space! The crew were not familiar with these aspects of the cargo data sheets and did not pass this important information to the fire brigade.

A Touch Astern

The vessel's berth

Narrative

An ageing passenger ferry was approaching a port. The approach was being made an hour before low water, which according to the tidal predictions should have allowed an under keel clearance of 1.0m. The vessel was due to be in port for only 10 minutes, to board more passengers. This would take the total number of passengers on board to 715.

The approach was made with both the master and chief officer on the bridge, assisted by a helmsman. The normal approach to the berth took the vessel to the port side of the channel to make a steep approach to the jetty, and this plan was followed. The depth below keel was monitored, and a minimum of 0.9m was noted. The vessel berthed, and the passengers boarded. After the safety announcement, the vessel prepared to depart.

To assist the vessel's departure, the head lines were tightened, to swing the stern off the quay. This was intended to allow the vessel to go astern down the short approach channel, before turning and proceeding to her next port. With the stern now off the quay, the engines were ordered astern. The vessel had moved only a very short distance, when a touch was felt astern. The engines were stopped and then put ahead to move the vessel away from the obstruction.

Once the vessel was alongside again, the head lines were again tightened and the stern swung further off the jetty. Astern power was applied once more, and with the vessel having moved a short distance astern, a bump was felt. Once again the vessel was moved back alongside.

A third attempt was made to leave the berth, this time after having discharged all spare boiler feed water and domestic water, and having asked the passengers to move to the forward end of the vessel to lift the stern. The head ropes were tightened and the engines put astern. Another bump was felt, so the

vessel berthed back alongside to wait for the tide to flood before attempting to leave again.

Dredging work was being carried out in the port at the time. A survey carried out by the harbourmaster on the morning of the incident showed that, although the area in question had still to be dredged, there was sufficient water for the normal approach. However, the departure manoeuvre did not cause the stern to swing sufficiently into the approach channel and, hence, she touched bottom.

The Lessons

1. **Tidal heights in this area are affected by the wind direction, which either increases or decreases the heights of tide. On this particular day, a northerly wind was blowing, and the height of high water at the major port in the area was 30cm below predictions.**

2. **No contact was made by the ship with the harbourmaster before entry to the port. Advice contained in the Admiralty Sailing Directions for this port includes a suggestion to contact the harbourmaster before entry due to changing depths in the harbour. Because the tide gauge for the port is in the inner harbour, there is no way that an approaching vessel can find out the depth of water in the harbour, other than by contacting the harbourmaster. The vessel's routine has subsequently been amended to ensure that the harbourmaster is contacted before an approach is made to confirm the depth of water.**

3. **To assist approaching ships in assessing the depth of water available, MAIB has suggested to the harbour authority that a tide gauge is placed at the entrance to the port.**

4. **After any vessel touches bottom, it is important to sound all the spaces in the ship to check for damage, an action that was only belatedly carried out in this case.**

Watch That Grill

Narrative

A large container vessel was preparing to leave a continental port in the late evening. The crew who were not required to be at departure stations were relaxing in the accommodation.

The galley extraction fans and principal electrical equipment had been shut down some time earlier by the catering staff, but the galley was left unlocked to allow access from both the officers' and crew members' mess rooms to enable crew members to use the grill.

A popping noise was heard from the galley, and was investigated by the off-duty catering staff. They found a grill unit and the bulkhead behind it on fire.

The catering staff took prompt and effective action by removing the electric plug to the grill and discharging a dry powder extinguisher on to the grill and bulkhead. They then activated a 'break glass' fire alarm. Within minutes, crew members had been assembled and accounted for, the galley area electrically isolated, and boundary cooling of the galley area was in progress.

While the shore fire brigade was being requested, a shipboard fire team entered the galley, which by that time was full of thick black smoke, and reported that no flames were evident.

On arrival, the shore fire brigade quickly confirmed that no further hazard existed and the ventilation fans were re-started.

Food, which had been left on the grill cooking and unattended, had ignited and set fire to the bulkhead. The 15-minute grill timer was checked and found to be working correctly and no other faults were found on the grill.

Subsequently, the procedure for shutting down the galley in the evening, including locking the access doors, was reinforced.

The Lessons

1. The crew members' quick, effective action prevented this incident from developing in to a much larger blaze. Emergency drills and training pay dividends when an emergency occurs and the correct responses click into place.
2. This incident should not have occurred in the first place. Despite the fact that a timer was fitted to the grill, food should not have been left cooking on an open grill in an unattended galley. Had this crew member thought about the risks, he would probably not have wandered off. Prevention is better than cure, so think about your actions and the potential risks.

Grounds For Concern?

Vessel aground on rocks

Photograph courtesy of STV

Narrative

A 70 metre product tanker was steaming south in ballast, having discharged her cargo of gas oil the previous day. It was a miserable night, with squally showers and south-westerly winds of force 7 to 8, although the visibility was fairly good. The passage plan had been produced to take a more sheltered route in the lee of various islands due to the forecast high winds. This, however, required various areas of restricted waters to be transited, including some narrow straits notorious for high tidal streams. The plan therefore required a reduced speed to ensure they reached the straits at slack water.

The vessel entered restricted waters about 3½ miles before the entrance to the straits, making good at a speed of about 7 knots. The mate was on the helm, with an AB on lookout and the master acting as OOW. After about a mile, the vessel passed a buoy, and the master moved aft to the chart room to record their position, estimated visually and using the GPS cross-track function. While in the chart room, the master ordered a course change in accordance with the plan to safely pass some small islands on the port side, which the mate duly carried out. The master also switched off the echo sounder and heard the wind noticeably pick up. As he returned to the main control area a couple of minutes later, the AB shouted "rocks". Despite the engines being put full astern immediately, the vessel ran aground seconds later on one of the small islands. Fortunately there was no pollution and no injuries, but significant damage was sustained in way of several tanks, including water ingress into No.1 DB.

Initial attempts to refloat the vessel using the local lifeboat failed, and overnight she listed to 14° as the tide fell. At high tide the next morning, the vessel was towed off the rocks by a large tug, some 12 hours after the grounding. The vessel then proceeded to a sheltered anchorage, where diver surveys were conducted prior to the vessel's passage to dry dock.

Bottom damage

The Lessons

1. Although the size and experience of the vessel's bridge team is not in question, it is clear that the manner in which they were being used was far from ideal. The master effectively lost the mate's support, while he remained at the helm, and the AB was unable to provide any relevant information until it was too late. It is arguable that if the AB had been on the helm, and the mate had been acting as OOW, the master would have been far better placed to have monitored the vessel's overall position and take appropriate action. This highlights the need for efficient management of the available bridge resources, to ensure responsibilities and skills are optimised at all times.

2. Although complying with the regulatory requirements, the equipment available to the bridge team was quite basic. Not only did the radars lack mapping facilities, but also only a single parallel index (PI) could be plotted at any one time. Indeed, this might have contributed to the lack of any PIs being used at the time of the grounding, as the passage through restricted waters would have required several PIs to have been plotted in quick succession. However, it would be harsh to attribute this accident to the failings of this equipment, which was operational and should have still prevented the grounding if it had been used properly. Nevertheless, it is worth noting that since the incident, the owners have recognised these deficiencies and have begun the installation of electronic charting systems on their vessels.

3. Fairly fundamental navigational errors were made which contributed to the grounding. The vessel's position as they passed the buoy was not accurately estimated or plotted, and the period of position fixes did not agree with the passage plan requirements. Correct monitoring of the vessel's position would have highlighted the close proximity of known dangers.

4. Perhaps it was complacency that caused these errors. The master had been through the area many times before, which was an accepted route, especially in poorer weather. Switching off the echo sounder somewhat prematurely was also unwise, and indicative of a general relaxation after passing the buoy. Accidents happen when you least expect them. So keep thinking: "am I taking my eye off the ball?"

5. Any passage plan produced before a voyage should take into account the likely effects of wind and tide. Analysis of such effects should consider whether a higher transit speed is desirable, to minimise any effect these may have on the vessel's course, and/or whether greater passing distances from known hazards are necessary.

6. It is perhaps easy to suggest in hindsight that the master should have anchored up prior to entering the restricted waters, and waited for the weather to ease. All parties have confirmed that there were no commercial pressures at play, so was it really worth the risk to press on in marginal weather? A few hours of delay would probably have saved several weeks in dry dock – and a six figure repair bill!

Differing Perspectives

Narrative

On the morning of a calm, clear summer's day, a group of recreational divers had started to ascend from their wreck dive. They were beginning to congregate, several metres underwater, around the shot line before returning to the surface and the charter dive boat.

Since dropping the divers off earlier, the charter dive boat, with only the skipper on board, had slowly drifted away from the shot line and surface buoys due to the tide, and was about 0.5 nautical mile away. The dive boat was displaying an International Code 'A' flag to denote diving operations in progress.

The skipper noticed a vessel some distance away, which appeared to be on a collision course with the dive site. Checking his radar, he confirmed that the heading of the unknown vessel had a very small Closest Point of Approach (CPA) with the dive site. Through binoculars, the skipper identified that it was a tug, but he was unable to distinguish its name.

Taking the Collision Regulations (Rule 2) in to account, the skipper decided that he should attempt to force the tug to alter course away from the dive site. He set his heading on a reciprocal course to the tug at near full speed in the expectation that the tug would take avoiding action to prevent a head on situation as defined by the Collision Regulations (Rule 14). He switched on his searchlight and his 'Restricted in Manoeuvrability' lights, hoping to attract the tug's attention (Collision Regulation Rules 36 & 27(b)(i)). Time limitations prevented hoisting the 'Restricted in Manoeuvrability' day shapes.

The tug maintained its course, and the dive boat skipper was forced to take avoiding action to prevent a collision (Rule 14a). As the vessels passed, the dive skipper noted the name of the tug and attempted to call her on channel 16. He also sounded his horn in compliance with Rule 34d. But the tug made no response. Hearing the channel 16 call, a shore listening station advised the dive boat skipper to call the tug on channel 11, which was also not replied to. No response was given by the tug when the skipper also attempted to bring the 'A' flag to the attention of the tug crew, one of whom could be seen in the wheelhouse.

The dive boat came astern of the tug and turned to follow, but was unable to keep pace as the tug passed close to the dive site. One of the first divers to reach the shot line was still holding it when it was rapidly jerked up to the surface. The diver and the surface buoys appeared in the wake of the tug.

The skipper brought the dive boat close to the diver, who had clearly suffered injuries and equipment damage. The diver was brought on board, having suffered arm, chest and face injuries. Rescue services were contacted and the injured diver was transferred to a lifeboat and taken to hospital.

The tug continued on her voyage without stopping.

The Lessons

1. Unfortunately, poor standards of lookout are all too frequently encountered at sea. No ship should completely rely on being seen by another vessel – contingency plans should be in place in case you have not been seen.

2. The surface buoys which mark the shot line will not be readily visible from the bridges of ships; therefore the best indicator of a dive site is the dive support vessel itself. Skippers should not let their dive support boats drift far from the dive site. The divers would also appreciate the dive boat being in the vicinity of the shot line if, due to some problem, they had to surface sooner than expected and required assistance.

3. Dive support vessels should not rely too heavily on other vessels seeing and identifying an "A" flag correctly. Flags are difficult to spot from the bridge of a larger ship, especially where bright sunlight, lack of wind or some other environmental condition might further obscure it. Additionally, motoring at full speed (not the usual actions of a dive support vessel) will not help in the identification and interpretation of the problem.

4. If a dive support vessel detects another vessel approaching the site, and believes the other vessel is not taking sufficient avoiding action, he must try to attract the other vessel's attention. VHF channel 16 is an obvious possibility, but the following advice has been provided by the Maritime and Coastguard Agency:

    - Vessels should try calling the other vessel on channel 13 (bridge to bridge channel which appears to be monitored by commercial vessels and may be under used (or not known about) by the leisure community);
    - If you have DSC radio, you could try a 'securité' DSC alert followed by a voice broadcast;
    - During an emergency, a DSC Pan alert should be made, followed by a VHF voice broadcast stating the situation and danger. This would be justified as a vessel or person is believed to be at risk but not (yet) in distress;
    - You could call the coastguard (if there is time) and ask them to put out a direct DSC call (if the name of the vessel can be ascertained), or ask the coastguard to make a DSC Securité or Pan broadcast on the vessel's behalf. Sport and commercial dive boats should consider refitting their radios with DSC-VHF (if not already fitted) as this enables the above options to be used;
    - Commercial and sport dive boats should invest in some white hand and rocket flares for warning-off use;
    - Red flares could be used in extremis, but bearing in mind that red hand flares might be better as they may be more easily seen from the bridge sight-line (where the watchkeeper is most likely to be looking) than rocket flares which might go straight out of sight as they climb. Also, the hand flares would reduce the chance of flare reports being made to the coastguard from vessels out of sight of the situation;
    - Divers and commercial dive boats should consider the overall risk when operating in busy shipping lanes. If the risk assessment is too high they should, perhaps, reconsider diving there.

When "One Hand For the Ship and One Hand For Yourself" Wasn't Enough

Narrative

A 16m, twin screw pilot launch was tasked to disembark a pilot from an 81m general cargo ship. Both vessels were heading on an easterly course and the offshore, westerly, near gale force winds were producing 1-1.5 metre seas from astern. It was winter and it was dark.

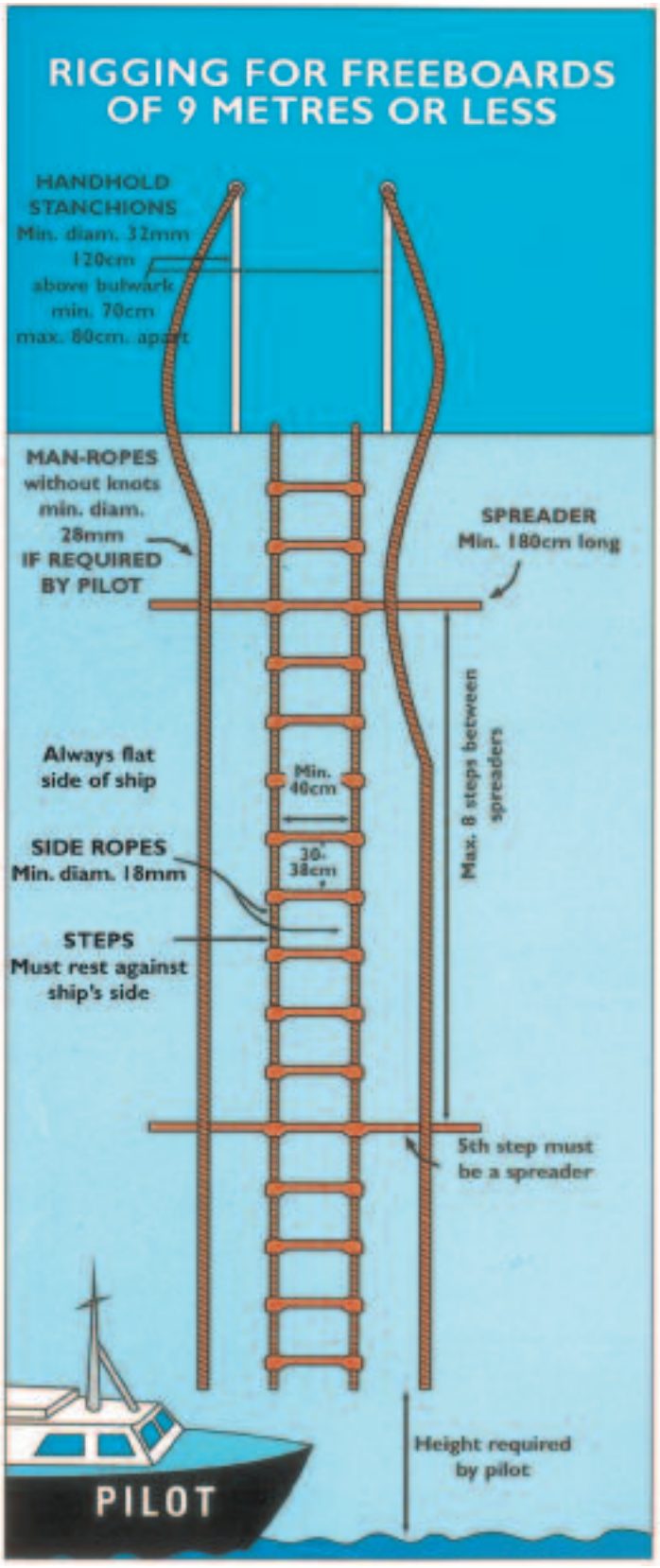
The pilot launch settled starboard side alongside the cargo vessel's pilot ladder, which was rigged on the ship's port side just forward of the after accommodation. Because the pilot had told the pilot launch's coxswain that he wished to disembark as quickly as possible, due to the poor weather conditions, the deckhand went out on deck before the pilot was sighted. The deckhand waited for the pilot at the forward part of the launch, with one arm wrapped around the pulpit rail, while holding the pilot ladder with his other hand. The pilot ladder had been rigged such that it was nearly 2 metres too long. The deckhand had not secured his harness to the travelling rail and light spray was being shipped over the pilot launch's bows.

Without warning, the pilot launch's bow dipped into the trough of a wave and a large amount of water was shipped over forward.

The coxswain's immediate reaction was to reduce the speed on both engines, but the water travelled up even further along the launch. The coxswain stopped both engines and the cargo vessel moved ahead. During these events, the pilot, who was still on board the cargo vessel, and the coxswain, lost sight of the deckhand and realised that he had been washed overboard. The coxswain immediately made a "man overboard" broadcast on VHF radio, which the VTS duty officer responded to by alerting the RNLI and the local paramedics. The broadcast was also heard by a second pilot launch, which was close astern of the first pilot launch.

The coxswain very quickly saw the casualty in the water by the reflective tape and light on his lifejacket. He manoeuvred the launch as close as possible downwind of the casualty, but because the coxswain was alone, rescuing him proved very difficult. The second pilot launch arrived on scene, and a pilot and a deckhand were able to lasso the casualty, bring him alongside and lift him on board. The casualty had been in the water for about 6 minutes.

The casualty was landed ashore and taken to hospital. He was released later that day and was able to return to work.



Picture courtesy of the International Maritime Pilots' Association
The full Pilot Boarding poster is available to download from its website: www.ukmpa.org

The Lessons

1. The casualty was very fortunate that he sustained no injuries after he was washed off the deck, especially from the propellers. This illustrates the great value of the crew's harness being attached to the travel rail on board pilot launches while embarking or disembarking pilots. The harness equipment is provided for the crew's safety, and they should use it.

2. By applying knowledge gained from a sea survival course, the deckhand prolonged his survival time and delayed the onset of hypothermia by keeping his limbs close to his body and remaining still to conserve body heat.

3. Stern seas can help reduce excessive rolling when carrying out embarkation or disembarkation operations. However, there is always the possibility of the stern being picked up by a wave, causing the bow to become submerged in a trough and endangering any deckhand standing forward. Coxswains and pilots should always be aware of this danger.

4. Ships' officers are reminded that a pilot ladder should be rigged so that it is not too long and so that the bottom meets the deck of the pilot launch. This will prevent damage to the ladder and will avert a trip hazard to the pilot from the excess length lying on the deck. Additionally, if a pilot ladder is rigged to the correct length, the deckhand will not be required to hold it. Instead, he will be able to concentrate on his prime role – that of assisting with the safe embarkation/disembarkation of the pilot.

"Let Go the Tug!" Easy, Not So

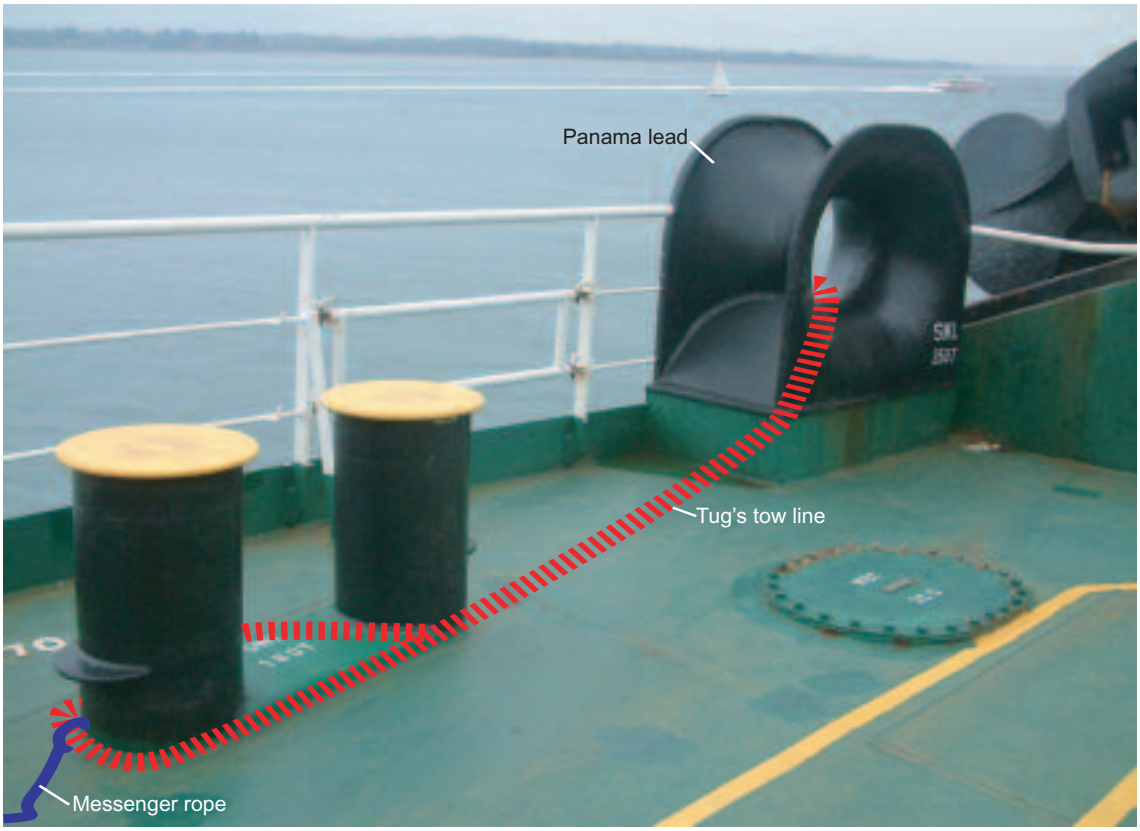
Narrative

A ballasted tanker had been made fast port side alongside to a berth at an oil terminal. Soon afterwards, the pilot asked the master to let go the harbour tug, which had its tow line fast to a bollard on the starboard side, just aft of the forward mooring station. The pilot also told the tug master by VHF radio to let go. The pilot's instruction was relayed by the ship's internal VHF radio to the bosun, who, with three able seamen and a deck cadet, went quickly to the tow line. They looked over the side of the ship and saw that there was some slack in the line, but they could not see any of the tug's crew. An able seaman, the bosun and another able seaman stood in line between the panama lead and the bollard and began to pull the slack of the tow line in by hand.

Meanwhile, in the tug's wheelhouse, the chief engineer moved the tow winch control joystick to pay out the line and to give the ship's crew some more slack. However, when he looked up at his CCTV monitor, he was surprised to see the line was being heaved in onto the towing winch. He looked down at the towing winch control panel and saw that the automatic tensioning mode switch was still illuminated. He switched the tensioning mode switch off, which gave him control of the joystick and he was then able to pay the tow line out.

On the ship, when the load suddenly came onto the tow line, the able seaman, who was standing nearest the panama lead, had his hands drawn towards it. He managed to let go of the line with his right hand but his left hand was badly crushed when it became caught between the tow line and the panama lead. His injured hand was released when the tug's chief engineer slackened off the tow line.

The seaman lost the top parts of three fingers of his left hand which also had soft tissue damage that needed 3 weeks of plastic surgery. It is not known whether he will ever be able to use his left hand properly, and it is unlikely that he will be employed at sea again.



The Lessons

1. It is important that ships' mooring teams remain alert to the possibility that, when securing or letting go tugs' lines, these may unexpectedly come under tension and cause serious injuries.

2. Communications should be established directly between the person in charge of the mooring team and the tug's personnel; the line should not be let go before the tug's crew signals that it is ready to receive the line back on board; and the person in charge of the mooring team should monitor the operation and the tug's tow line so that warning can be given to the rest of the team if sudden load comes onto the line.

3. It is essential that tugs' lines are always handled safely. The Code of Safe Working Practices gives guidance on this. When letting go tow lines, the attached messenger should be heaved on by a winch warping drum to take in some of the slack on the tow line, and a stopper should be used to hold the slack, while the tow line's eye is lifted off the bollard. Then the tow line can be slackened off, under control, back to the tug by surging turns of the messenger around the bollard.

But We've Always Done it that Way

Narrative

Poor bridge team management practices while approaching and entering a narrow channel led directly to the grounding of a 1,845gt tanker. It had been the early hours of the morning and the vessel was returning to her usual load port, in ballast. The bridge watch consisted of an officer of the watch, a lookout and the master.

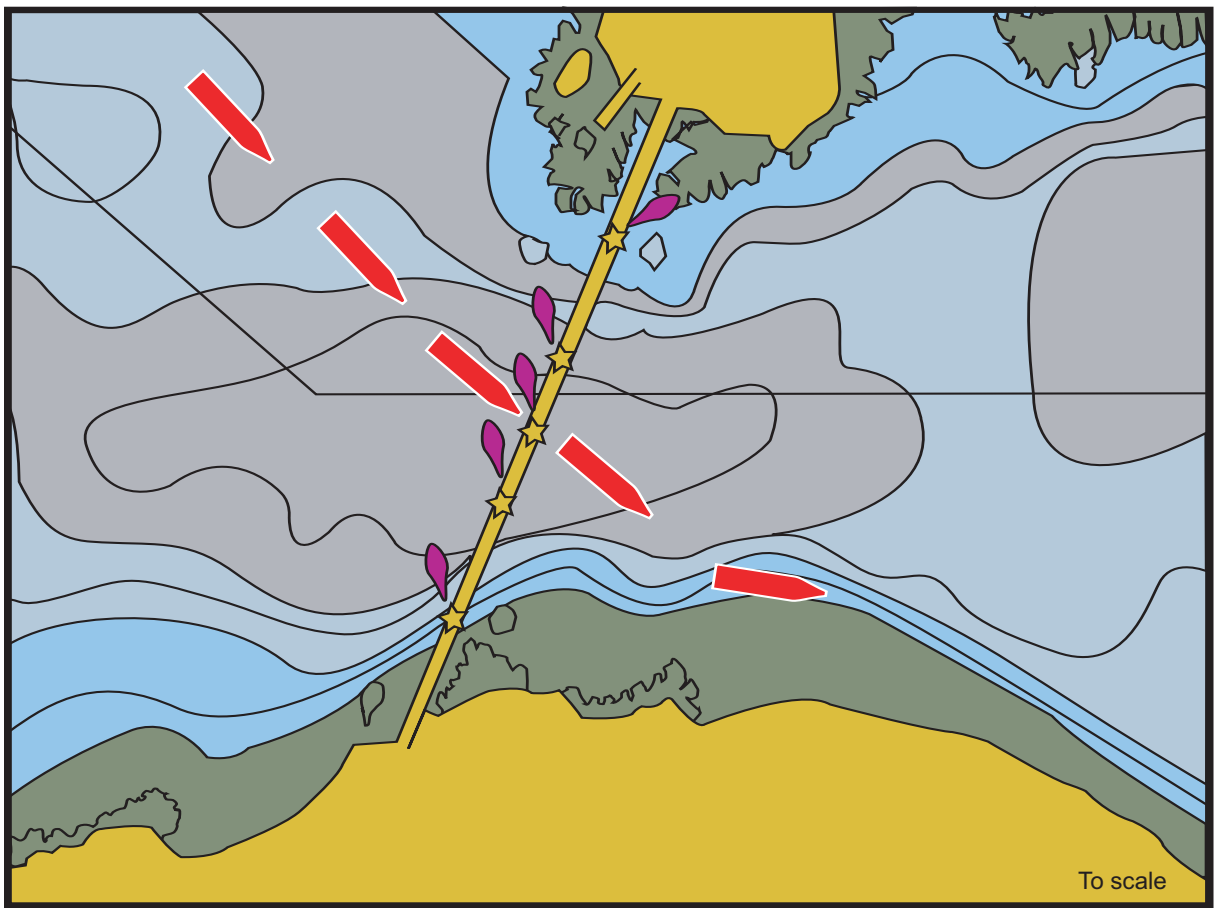
The vessel had passed through the same channel a few days earlier on her loaded passage, and reciprocal courses had been chosen for the return passage. The planned track involved a 40° alteration of course just one ship's length before the entrance to the channel. The bridge that spanned the narrow passage at its entrance had a white transit light which marked the centre of the bridge and the channel.

As the vessel approached the channel at full sea speed, the master took the con, switched the helm to hand steering and, against company instructions, started to steer the vessel himself towards and through the narrow entrance. The officer of the watch was looking on without a defined monitoring role. However, he had plotted a position on the chart, which showed the vessel to be north of the charted course line, and the master had altered the vessel's heading slightly in an attempt to partly compensate. Before the vessel had moved far towards her track, the master decided to steer directly for the white light which indicated the centre of the bridge's span.

The vessel had recently been fitted with an electronic chart system following a similar accident on another of the company's ships. The master could see the electronic chart display, but was not using it other than to give him a rough indication of her position. He had never received any formal training in the use of this equipment.

As the vessel passed under the centre of the bridge, the master used 10° of port helm to bring her around 40° to the required heading for the passage. No allowance, mental or otherwise, had been made for the vessel's advance and, unsurprisingly, she grounded on the southern edge of the channel.

The vessel sustained significant hull damage. She was holed in one segregated ballast tank but, fortunately, there was no pollution as a result of the incident.



The Lessons

1. The MAIB has frequently heard it argued that it is unrealistic to expect coastal shipping to adopt the navigational practices that would normally be found on deep sea vessels, because of the nature of the trade and the size of the crews. Owners and masters must ensure that they do not use this argument to justify bad practice and complacency.

2. This wheelhouse was well manned with qualified personnel, but the team was not used effectively to ensure the vessel's safe passage. In this case, a better arrangement would have been for the seaman to have steered the vessel while the OOW plotted positions and the master oversaw the whole safe operation.

3. Passage planning was ineffective. A planned track that allowed the vessel to alter course and steady up on the new heading well before the entrance to the channel would have ensured this accident was avoided. Reciprocal courses were chosen for expediency, without consideration of this and possibly other factors. The use of parallel indexing techniques would have helped ensure the vessel was on, and maintaining, the correct track.

4. Some of these lessons had been discovered by the company as a result of a very similar accident a few months previously. However, the lessons had not been effectively communicated to this vessel or her master. It is an unfortunate truth that accidents are a key source of useful safety advice, and every effort should be taken to learn and promulgate the lessons so that a recurrence can be avoided.

Lookout – What Lookout?

Narrative

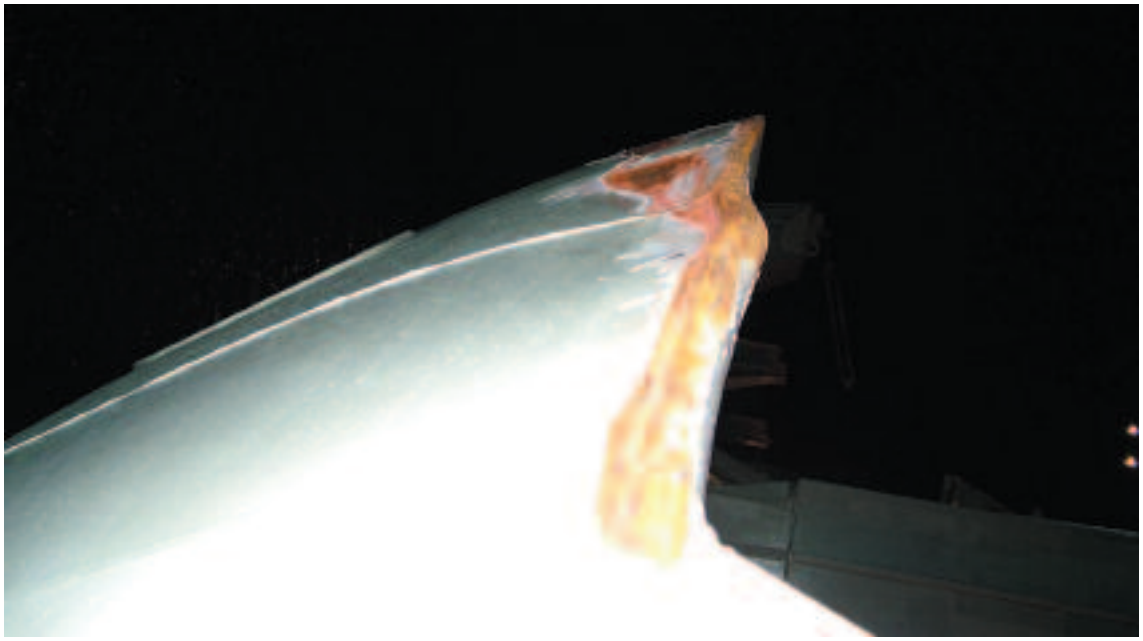
A UK flagged container vessel collided with a fishing vessel at just before midnight on a clear November night in the Baltic. The container vessel was on a coastal passage and making about 18 knots, while the fishing vessel was stopped and drifting between hauls.

The container vessel's master released his AB lookout to call the next watch and carry out fire safety rounds. He then checked his radar before going to answer the call of nature. He did not set the ARPA auto acquisition or CPA alarm functions on the radar. He remained in the bridge toilet for 15 minutes prior to the collision, but he'd left the door ajar to enable him to hear any VHF call from another vessel.

The wheelhouse of the fishing vessel was also unmanned. The fishermen were eating dinner together in their mess room. So that any approaching vessel would see them and keep out of their way, they had switched their halogen deck lights on.

The container vessel's master emerged from the toilet in time to see the fishing vessel's lights close by and on the starboard beam. He had not felt any impact so, despite the protestations on the VHF from the angry and frightened fishermen, he continued on voyage. Although the container vessel was only superficially damaged, its ice strengthened bow had seriously damaged the fishing vessel. Fortunately, the fishing vessel was able to limp into harbour without further incident, although the master was unaware of this at the time.

The fishermen informed their local coastguard of the collision, which then intercepted the container vessel further up the coast.



Damage to the container vessel's forecastle bulwark edge

The Lessons

1. **Do not rely on other vessels seeing you for collision avoidance. Maintain a proper lookout at all times. In this case, the master should have called his AB lookout back to the bridge when he realised he had to visit the toilet. The fishing vessel's skipper should not have allowed his wheelhouse to be left unmanned – although not as sociable, mealtimes should be staggered.**

2. **Use the radar functions, including ARPA auto acquisition and CPA warning features, to give warning of other vessels and developing close-quarters situations.**

3. **Even if a collision is only suspected, stop your vessel and render such assistance as is required. Stay with the other vessel until you have made certain they have no need for further assistance.**

4. **Remember that you must report any accident, including a collision, to the Flag State and, if relevant, the coastal state authorities.**

From Small Beginnings …

Narrative

A small coastal tanker was on its regular run between two ports having sailed on a Sunday morning at 0540 with a cargo of 1500 tons of mixed product.

The weather was poor, the wind was from the south at force 7, the sea was rough and there was a 4 metre southerly swell running. Although the weather was set to worsen, the master was unconcerned. After all, why should he worry, he had been in far worse conditions, he had a good team on board and his main engine had never let him down.

The ship settled down to a quiet, if somewhat rough passage. All was normal – but not for long.

At about 1445, having just completed his set of rounds, the chief engineer left the engine room to finish some paperwork in his cabin. The dry sump, 620kW Callesen main engine had been thoroughly checked, it was running very sweetly and the lubricating oil pressure was normal at 4.5 bar; all was fine.

The chief engineer's peace was soon disturbed. At 1450, the engine room alarm panel repeater sounded in his cabin, so he immediately ran the short distance to the engine room access where the panel was situated. There, he found the main engine lubricating oil, low level warning in alarm. As he checked the level in the engine oil tank the engine low lubricating oil pressure alarm sounded. With no level on the dipstick, it was clear that the 220 litre oil charge was being lost or was not being returned from the sump by the oil scavenge pump (Figure 1).

Immediately recognising the risk of catastrophic damage to the engine, the chief engineer set the telegraph to stop and contacted the master on the bridge using the talkback communications system. With no

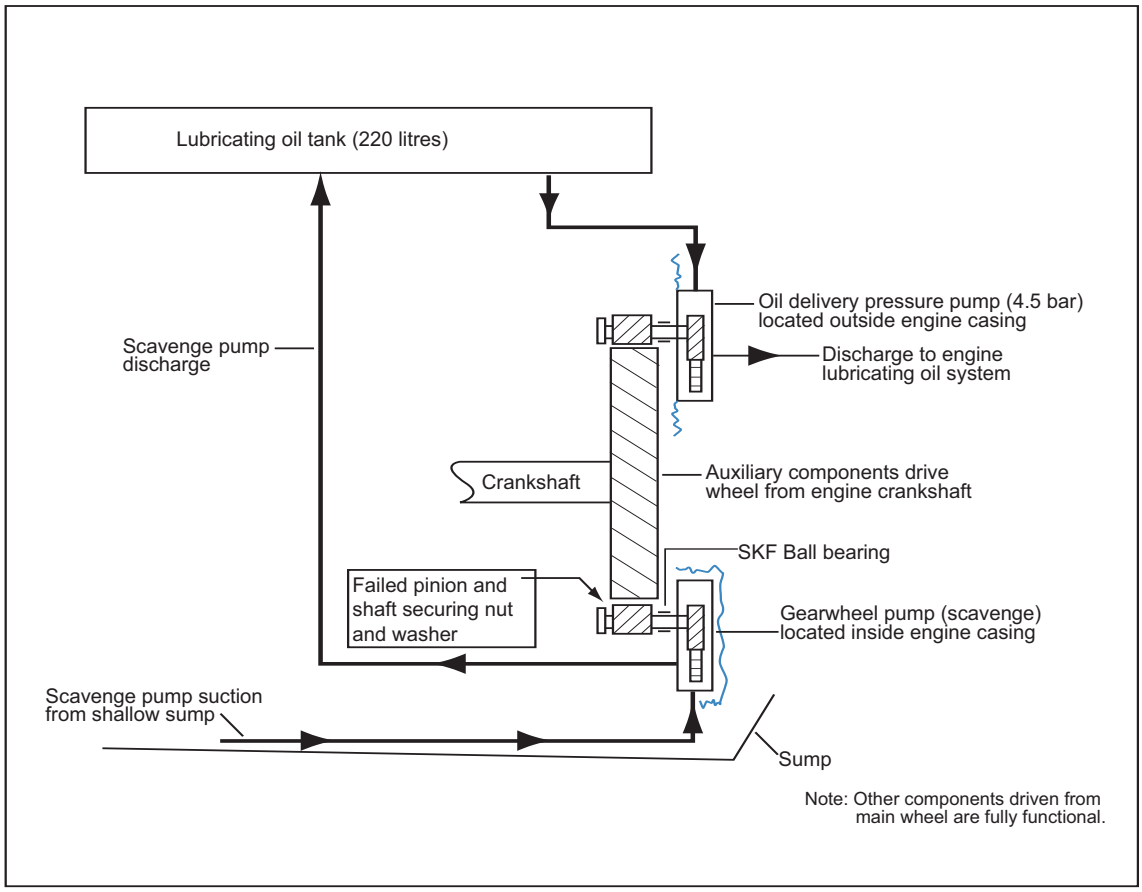


Figure 1 - Schematic of engine lubrication oil system

Figure 2 – Sheared drive shaft and pinion

acoustic booth fitted, and with the system severely degraded by the engine room noise, the master could not hear the chief engineer. However, he did reduce engine power. The chief engineer passed the second engineer on the engine room ladder as he made his way to the bridge to brief the master of the significant risk of the engine seizing.

The ship by that time was about 4 miles from the coast. The wind force had increased to 8 to 9 and the prevailing sea conditions were setting the vessel onto the coast. The master felt he had no option but to maintain power for as long as possible. The alternative was to risk running aground, with the strong possibility of polluting the environment. The master immediately alerted the management company, which arranged for tug support.

Unfortunately, they were not expected to arrive on scene for a further 10 hours; despite this, it was another 55 minutes before the master alerted the coastguard.

In the meantime, the crew were assembled and told to don their survival suits and lifejackets, and the anchor was prepared for letting go.

By now, the chief engineer had joined the second engineer in the engine room. Because there was no gravity feed line, they feverishly transferred oil to the engine by oil can from the oil storage tank. The oil level failed to increase and the pressure remained at zero. Conscious of the need to protect the engine, they then used buckets to transfer the oil because this was much quicker. Understandably, lubricating oil hygiene was not foremost in their minds.

It was believed that the oil was still in the sump as the oil cooler discharge overboard

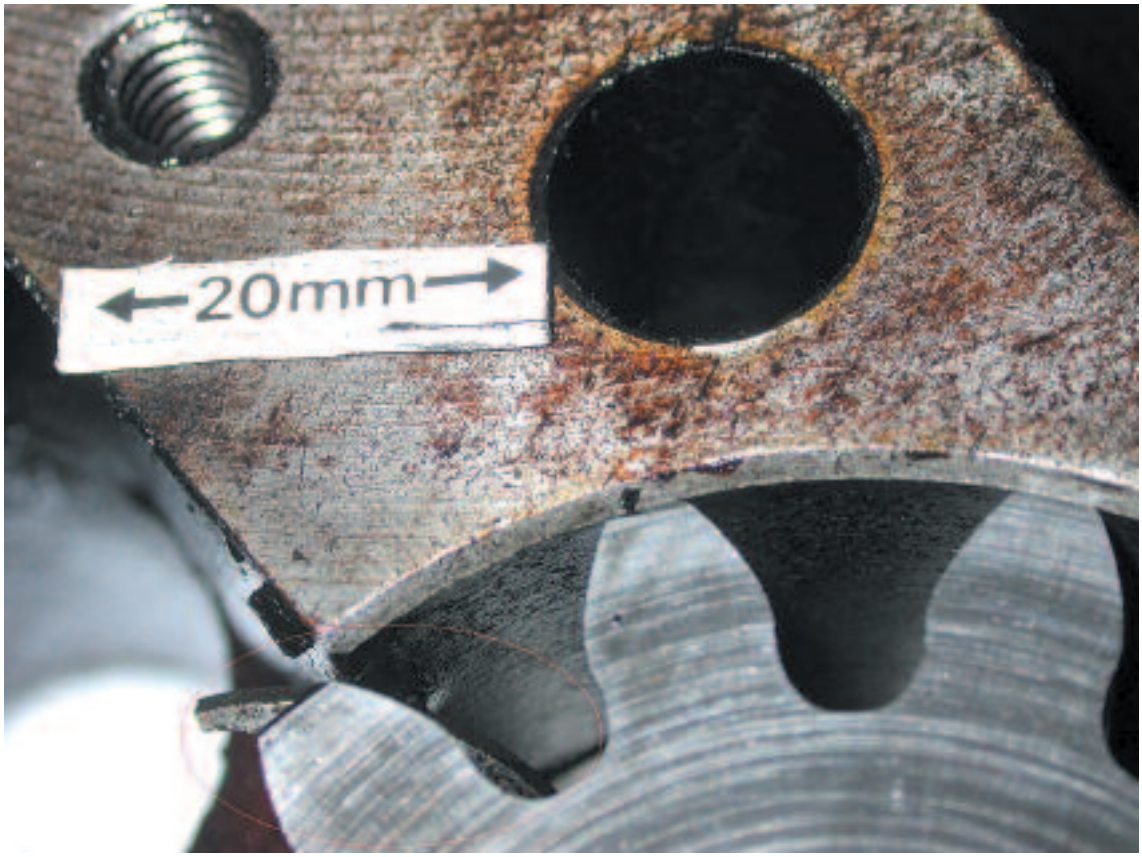


Figure 3 – Seized gear wheel pump

had been checked in case a failed tube was the cause of the loss. There was a layer of oil on the surface of the bilge water – but then that was not unusual. The engine was kept running until 1604, when the master authorised it to be shut down and de-clutched, now that the immediate navigational dangers had passed. Two lifeboats and a navy vessel arrived on scene and connected a tow line pending the arrival of the tugs.

The engineers searched for the cause of the oil leakage. They reconfigured the hand pump priming system but were unable to transfer any oil from the sump, proving it was empty. They did not appreciate the significance of the oil shimmer on the bilge water. They refilled the engine oil tank and decided to re-start the engine, but the oil level was immediately lost and the engine was shut down and left to cool back.

Once the vessel was safely alongside, investigations revealed that the sump, oil return gearwheel pump drive shaft had sheared due to torsional overload (Figure 2), which was itself caused by the pump becoming seized by a sliver of metal (Figure 3). This allowed the drive pinion to fall into the sump which was thrown about the engine, detaching a section of No 1 cylinder liner (Figure 4) and fracturing the cast steel sump through which the oil escaped. The origin of the metal sliver is being assessed by the engine manufacturer, but laboratory analysis suggests it is part of a roller bearing race which had probably been in the engine for some considerable time and was drawn up from the sump by the scavenge pump.

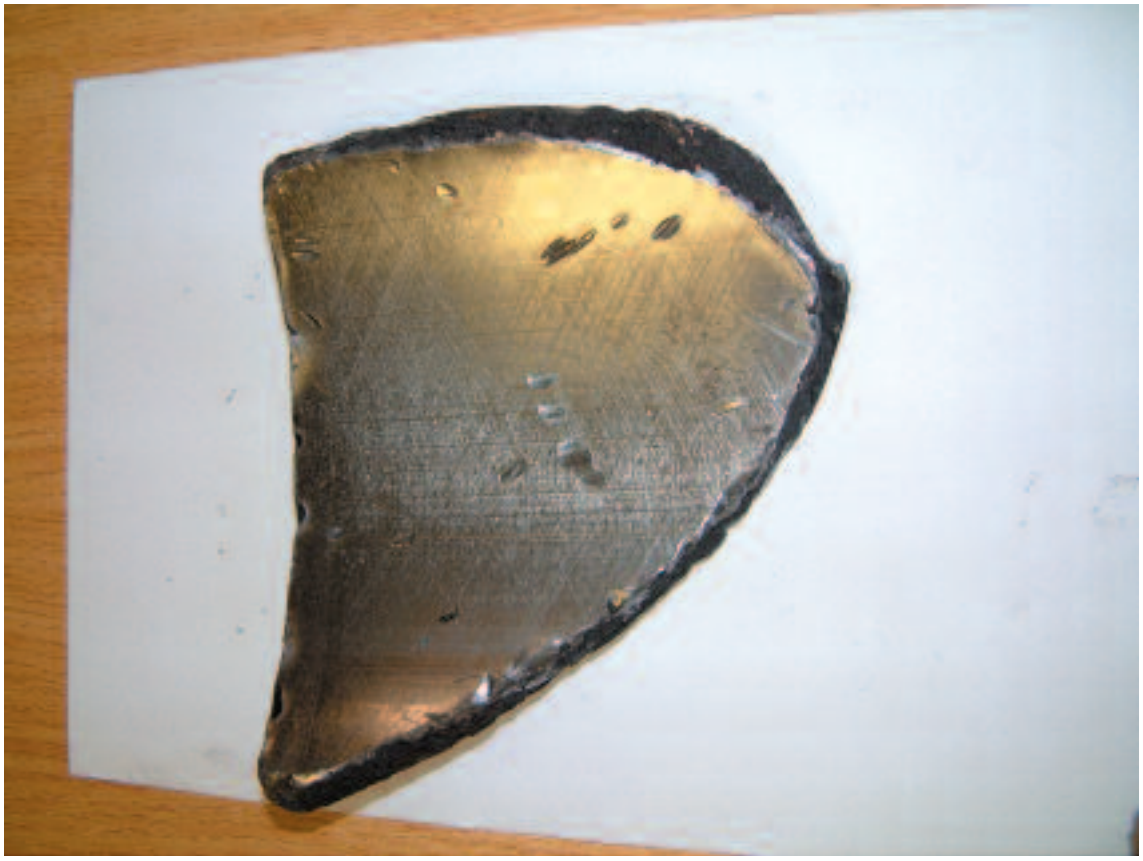


Figure 4 – Detached section for No 1 cylinder liner

The Lessons

The loss of lubricating oil supply pressure to a main engine invariably leads to catastrophic engine failure if it is not shut almost immediately. In this case, the master assessed that his navigational situation was potentially perilous, and that propulsion power was needed to safeguard his vessel and crew. The engineering team did extremely well in keeping the engine running in very difficult circumstances.

The following lessons can be drawn from this accident:

1. Masters are sometimes reluctant to advise shore authorities to a potential emergency situation. In this case, had the main engine failed – and there was a real risk of this happening – there would have been a delay in attempts to keep the vessel off the shore. Do not delay in alerting the emergency services to a problem.

2. It is important to ensure that communication equipment is fit for purpose, that the systems are regularly checked from all operating positions and that defects are promptly attended to.

3. Keep bilges free of fluids to both prevent the risk of fire and to aid identification of sources of leakage.

4. Ensure that engine sumps are thoroughly cleaned and examined to ensure that all debris is removed post maintenance activities.

5. Consider if it is appropriate to fit a gravity run down system from lubricating oil storage tanks to sumps/engine oil tanks to rapidly fill these in an emergency.

Galvanic Action – the Hidden Danger

Narrative

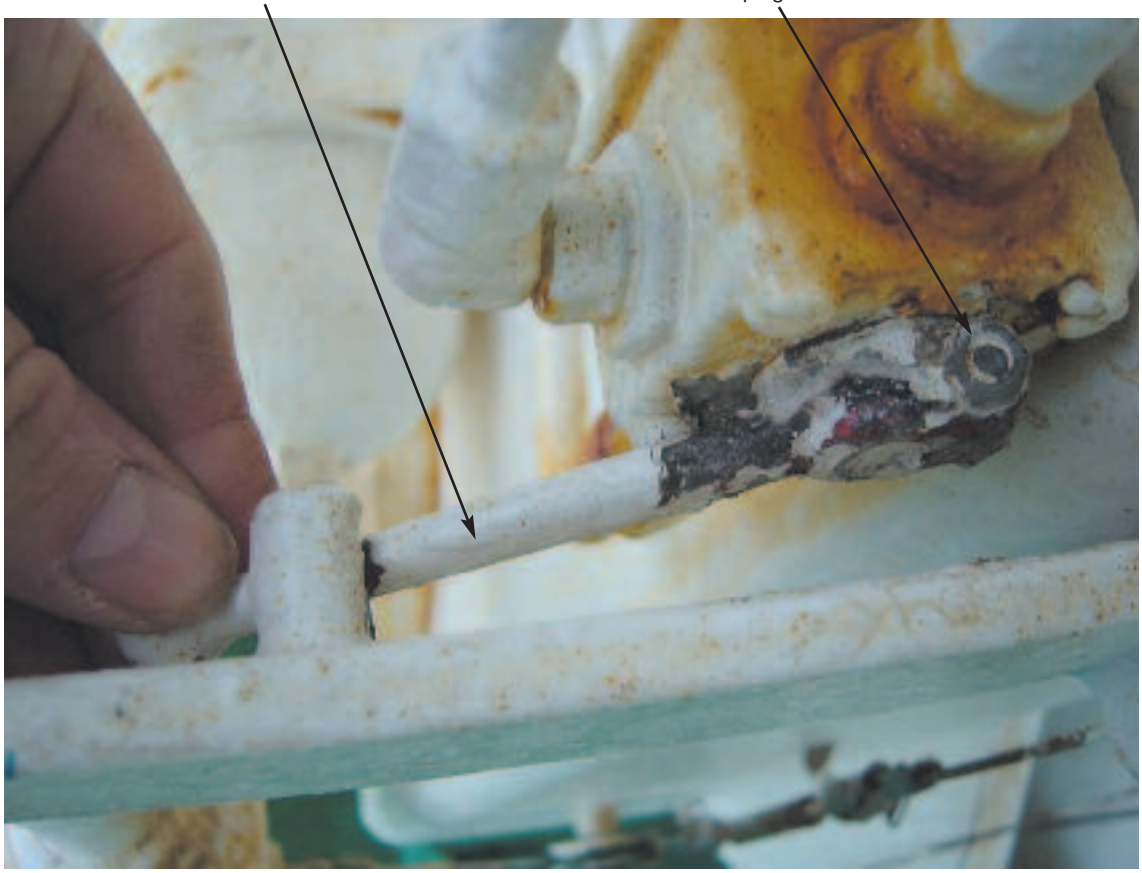
This incident happened on board a vessel during the lowering of one of its lifeboats as part of a monthly planned maintenance routine. The boat was prepared according to the normal procedure and was to be lowered only to the main deck. The bosun lowered it from the winch position by lifting the brake lever with nobody inside the boat.

As part of the normal procedure, the boat was stopped about half way out of its trackways to test the hydraulic stop/holding brake. However, when the brake was applied, it failed and the boat continued to descend.

The bosun quickly identified the problem, the brake valve handle (see photos) had fallen off. This handle was quickly re-fitted to the valve spindle and the valve was repositioned, with a result that the hydraulic pressure was cut off, causing the brake to activate. The descent was arrested and the boat was subsequently hoisted back in its position and secured.

On investigation, it was found that the handle had fallen off because there was excessive corrosion to the clamping screw which held the handle in place, and it was not visible because it had been over painted. The materials in use for that assembly consisted of three different metals, giving rise to accelerated corrosion in the marine environment.

Since the incident, the manufacturers have issued a product awareness notice to their service engineers and have fitted a new handle made from a more robust material.



Original handle

New handle fitted

The Lessons

1. Layers of paint which had built up over the years had masked the galvanic corrosion, thus hiding the actual condition of the clamping screw.

2. The davits were serviced annually by the manufacturer's service engineer and regularly inspected by the crew as part of their planned maintenance. However, both parties were unaware of the dissimilar metals in use because they had been over painted. Maintainers of critical equipment should watch out for this problem and should ensure that dangerous corrosion is not occurring under the layers of paint.

Master/Pilot Confusion Results in Grounding

Narrative

A general cargo vessel left an upriver discharge berth in a lightship condition. It was high water, dark and the visibility and weather were good. A specialist river pilot took the helm to navigate the vessel around the tight bends as she made passage down the river. The pilot had previous experience of the vessel and knew that she required constant helm input to resist her tendency to yaw.

About 1½ hours later, the vessel momentarily went alongside a berth to change pilots. A single mooring line was put out, the two pilots passed each other on the gangway, and the vessel cast off to continue her passage to the sea.

The new pilot had no experience of the vessel and was given brief instructions on the propulsion and steering controls by the master. Within a minute of leaving the berth, the pilot offered to take the helm. After relinquishing the con, the master did some passage planning while occasionally checking the radar and looking out through the bridge windows.

The vessel was in hand-steering, joystick control, and the pilot was unhappy with having to continually check the only rudder angle indicator which was sited above his head. He asked the master to change over to river-pilot steering mode. This is a steering method employed on vessels which frequently navigate on rivers and which provides a selectable rate-of-turn. Masters and pilots find that this steering mode can give a faster and more controlled response than manual steering. On this vessel, river-pilot was controlled using the joystick to select the direction and rate of turn.

The master, who had not used river-pilot steering on this vessel, felt that it was unsuitable for the section of the river they were on and he made his concerns known to the pilot. The pilot, who had experience both on the river and with the use of river-pilot, persuaded the master that they should try it. The master then turned the steering mode selector switch.

For 9 minutes, the vessel maintained a fairly steady heading towards the confluence of two rivers. The pilot moved the joystick occasionally, but found that only minimal adjustments were necessary. As the vessel approached the confluence, she began to be set bodily to starboard. On noticing this, the pilot selected a rate of turn to port and, noting that no change in heading was occurring, increased the demand to full to port. A glance at the rudder angle indicator showed that he was not getting the response he required. He told the master, and asked for the steering mode to be returned to manual.

The master noted that the beacon, which marked the confluence of the two rivers, was very close to starboard. He quickly changed over the steering to manual and the pilot pushed the helm lever hard to port. He observed that the rudder angle indicator showed the correct response.

Unfortunately the rudder's response came too late to prevent the vessel colliding with and demolishing the beacon. The vessel came to a halt with her stern grounded on one of the river training walls. As the tide fell her bow came to rest on the riverbed.

At the following high tide, the vessel was refloated, and with the assistance of two tugs was taken to a safe berth for inspection. No injuries or pollution had occurred, but the vessel had suffered damage to her hull and propellers.

A plot of the vessel's track had been recorded on her chart plotter. This showed that her heading, between the change of pilot and the contact with the beacon, had been suspiciously steady. This conflicted with her known tendency to yaw and need for constant steering adjustment. This, combined with the evidence gained from the master and the pilot, indicated the likelihood that autopilot had been inadvertently selected instead of river-pilot.

The vessel operated with just five crew members, and the master doubled as bridge watchkeeper and engineer. He worked a six-on six-off watchkeeping routine and had a tour length on board of 9 months. The collision occurred over 5 months into his tour of duty.

The Lessons

1. The pilot had taken the con in the middle of the night, on an unfamiliar bridge and with only the minimum time to familiarise himself with the idiosyncrasies of the vessel and her controls. In these circumstances it would have been more sensible to let the master continue to steer the vessel while the pilot gave the appropriate navigational advice.

2. Having effectively handed the con to the pilot, the master should have monitored the pilot's actions very carefully. Too often, masters use the presence of the pilot on the bridge as an excuse to relinquish responsibility and get on with other work.

3. Bridge team management, and particularly the communication between the master and the pilot, was poor on this vessel. The key to good team management is to ensure sufficient checks and balances are in place so that a mistake by any one person does not go unnoticed. If the master had been monitoring the track of the vessel, he would have noticed as soon as she began to be swept towards the beacon.

4. After any change of control, it is essential that a check is made to see the change has been made correctly. In this case, the pilot should have moved the joystick and monitored the rudder response very carefully until he was satisfied that river-pilot was working correctly.

5. On this ship, the inadvertent change to autopilot, instead of river pilot, was an easy mistake to make. A lack of lighting on the controls made it difficult for the master to ensure he had selected it correctly and for the pilot to check. Important controls should be fitted with adjustable lighting to help avoid expensive mistakes like this one.

6. The hours of work/rest records on this ship showed a uniform 6-on 6-off routine shared between the master and the chief officer, day and night, and whether in port or not. This was clearly unworkable. The master was the engineer on board as well as the bridge watchkeeper; it would have been impossible for him to perform all the necessary duties while keeping strictly to the recorded routine. It is very likely that he worked considerably longer and less uniform hours than those recorded, and this, combined with the 5 months that he had been working the routine, were firm indicators that his actions were likely to have been affected by fatigue. It is the MAIB's view that fatigue is endemic on vessels like this, on the short sea trade, and where the master shares the watchkeeping responsibility with one other officer.

Cable Laying Vessel Requires Better Lines of Communication

Narrative

A cable laying vessel was returning to port from a long deployment recovering underwater cables. Weather conditions were good: the wind was north easterly force 2 to 3, the seas calm, and the visibility was moderate in patches of drizzle.

The intention was to embark a pilot at 0600 and berth at 0800. To achieve the ETA at the pilot station, minimum speed was selected, but the stronger than expected flood tide left the OOW with the choice of either advancing his ETA, or turning the vessel to stem the tide. The master decided to advance the ETA, and the OOW contacted the pilots to arrange an 0540 embarkation.

As a consequence of the revised ETA, the crew was required to rig the pilot ladder at 0515. The bosun and the bosun's mate had been advised of the change of plan by radio at 0510 and met on the main deck at 0515. Rigging the pilot ladder was a 4-man evolution, but at 0515 only one of the two designated ABs had arrived, the second AB believing that the ladder was required for an 0600 ETA. While the first AB went to check on the whereabouts of the second, the bosun and bosun's mate began rigging the ladder. For the task, the bosun's mate was wearing the obligatory working life-vest, but the bosun was dressed in a coverall and riggers boots.

Normally, two men were required to lower the ladder from its vertical stowage, and two to ease it over the ship's side and into position. On this day, the bosun's mate lowered the ladder on his own, while the bosun controlled its egress over the side. The pilot had requested that the bottom of the ladder be positioned 1 metre above the water, so the bosun was leaning over the ship's side, assessing its height, while using his right foot on a rung to prevent further egress. He asked

Pilot embarkation position

Pilot boarding position

Space available for rigging the pilot ladder

Position of crew for lowering pilot ladder overboard

the bosun's mate to slack back and, as he did so, the weight came off the rung, causing the bosun to lose his balance. His body weight then carried him overboard.

The bosun's mate raised the alarm using a hand-held UHF radio, and the fast rescue boat was launched within 5 minutes. The bosun was recovered, unconscious, from the water 9 minutes after falling overboard but, despite good medical care, did not recover. He was pronounced dead on arrival at hospital 43 minutes after the accident.

The Lessons

1. Inadequate manpower was a causal factor in this tragic accident. Last minute changes to the plan must be properly communicated to all those involved.

2. Leaning over the side to judge the height of the pilot ladder above the water is ineffective and potentially dangerous. A simpler and safer method is to mark the ladder in metre lengths, and compare these with the known freeboard.

3. On board procedures did not include instructions for rigging the pilot ladder, a complicated procedure on this vessel. Had they done so, the requirement for a minimum of four personnel would have been included, as would the need to wear life-vests while performing the task. There is a reason why establishing procedures for complicated tasks is part of good ISM – it saves lives.

4. The fast rescue boat launch and recovery was expedited quickly and efficiency, but the absence of a dedicated man overboard action check-off list meant that the OOW omitted some key actions:

   - Sounding the general alarm.
   - Using the main broadcast system to keep people informed.
   - Marking the GPS and ECDIS plots at the MoB position.
   - Using the VHF to immediately inform the coastguard and other ships in the vicinity and when the incident occurred.
   - Mustering a full medical team with all necessary equipment.

5. Commercial pressures can make man overboard drills difficult to schedule. Easy to follow check-lists can help mitigate lack of familiarity with key procedures.

Part 2 – Fishing Vessels

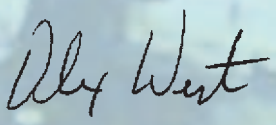
I am very pleased to have been asked to write the introduction to the Fishing Vessels' section of this edition of the Safety Digest.

As a man who has earned his living from the sea for more than 40 years, I have always understood, with the utmost clarity, the potential for danger that our chosen environment can present to us and to our crews. We cannot afford to be unwary or ill prepared.

This edition covers – amongst other things – the dangers of fire, and no one who has experienced this onboard will be in any doubt about the speed with which things can get out of hand.

Complacency is our enemy, whether dealing with the risks of fire, stability, Rule of the Road or weather. The great and increasing assistance offered by modern technology should not lead us to imagine that the potential for danger is any less. The protection offered by common sense, careful attention to maintenance, proper training and awareness of the situation shines from the recommendations.

I commend them to you and wish you safe and profitable fishing.



Alex West

Alex West has had extensive involvement with fishermen's organisations since 1970. Originally a pelagic skipper, Alex has since built up a strong commercial interest in the industry through vessel ownership. He is involved with S&S Co-operative (pelagic) and Westward Fishing Company (prawns, whitefish). Alex spent 36 years as a Director of the Scottish Pelagic Association, 5 of them as Chairman. Since 2004, he has served as President of the Scottish Fishermen's Federation and has also been on the board of the Scottish Fishermen's Organisation since 1978. He is a long-serving member of the Seafish Pelagic Advisory Committee and also serves on the board of Seafood Scotland.

Smoking Kills!

Narrative

After a short trip fishing for scallops, an under 10m fishing vessel returned to port around midday and moored outboard of another fishing vessel in port. The skipper and crewman spent some time sorting out the boat before going to a local pub.

In the early evening, the skipper left the crewman at the pub and went home to prepare for his evening job, working at a night club. During the evening, the crewman continued drinking, and at 0200 went to the club where the skipper was working. Both men were given a lift from the club at about 0430; the skipper went home, and the crewman returned to the fishing vessel as his usual shore accommodation was unavailable.

The crewman managed to climb down the quayside ladder and cross the boat alongside to his own fishing vessel where, using a spare key hidden on the boat, he entered the wheelhouse. He did not turn on any lights, leaving the vessel's main batteries isolated, but picked up the wheelhouse ashtray and descended into the small accommodation space in the dark. There, he partially undressed and sat on one of the bunks to smoke a cigarette.

As he smoked, the crewman either fell asleep or became unconscious, and his cigarette started a smouldering fire which burnt a small amount of the bunk's foam mattress and woodwork (see photograph). The crewman died without regaining consciousness as the fire consumed the oxygen in the space and gave off toxic fumes.

The owner boarded the fishing vessel later that morning, and smelt smoke as he opened the wheelhouse door. Taking the wheelhouse fire extinguisher, he first checked the engine room for fire before returning to the wheelhouse and entering the accommodation space. He found the crewman in the smoke-filled accommodation space. There were no flames, the fire having burnt itself out during the night.

The Lessons

1. **Neither the owner nor the skipper permitted smoking in the accommodation space, for good reason. However, perhaps due to the influence of alcohol, the crewman forgot this policy and paid the ultimate price.**

2. **A smoke alarm might well have prevented this tragic accident. A simple domestic fire alarm costs very little and merely requires a new battery periodically. Fitting a smoke alarm is easy, and it may well save you or your crew's life. It is intended that a smoke alarm will be required on all decked vessels covered by the revised Small Fishing Vessel Code to be issued in the future.**

3. **Where possible, use non-combustible materials on board your vessel, or materials which are resistant to ignition. They will reduce the chances of a fire starting, or, if one does start, will help prevent it spreading quickly.**

Assumptions (Based on Scanty Information) Lead to Collision

Narrative

On a dark night, with good visibility, an 11 metre GRP fishing vessel was trawling when its skipper saw another vessel's lights, two white and both sidelights, fine on the port bow a few miles away. The skipper assumed this to be a power driven vessel, greater than 50 metres in length, and decided that, although a risk of collision existed, he would stand-on as there were obstructions/wrecks on the sea bed on his starboard side.

On the other vessel, the watchkeeper observed the fishing vessel, visually, at about the same time, fine to port showing trawling lights and a red sidelight. However, the vessel was, in fact, a 26 metre tug towing a 50 metre long, 18 metre wide barge on which the navigation lights had recently failed.

Both vessels had radar; although neither had ARPA facilities, no plots were made.

With a strong wind (force 6) on its starboard bow the tug, which was making some 4 knots into a strong tide, had its barge displaced on its port quarter; the length of tow was just less than 200 metres.

As the vessels drew closer, the skipper of the fishing vessel, which was making about 3 knots, lost sight of the other vessel's green sidelight and assumed that it had altered course to starboard to avoid collision. Meanwhile, on the tug, the bearing of the fishing vessel was observed to be opening to port and an assumption was made that no risk of collision existed.

The skipper of the fishing vessel next sighted the other vessel as it came abeam on the port side. When he saw its working deck illuminated with a floodlight, he realised, for the first time, that it was a tug and that it could be towing something!

The skipper altered course by 10 degrees to starboard before altering back to port, as he did not wish to pull his trawl gear too far off track. Shortly after this the skipper noticed the vessel's speed reducing and instinctively put the engine astern. The vessel was then pushed across, first to port and then to starboard, just before the vessel started to list heavily to port to an angle of 30 degrees. The skipper reports that the port gunwale was under the water and that water reached the level of the fish hatch.

At no time did the skipper see the barge with which his vessel had undoubtedly collided. The fishing vessel, probably now trapped under the port "bow" of the barge, began to make sternway and then came free of the barge and returned to the upright. Electrical power was initially lost as the batteries had shifted. However, the skipper reacted very well to the situation; he checked the compartments for water ingress, using a torch strategically positioned for such emergency situations, and then rigged an emergency supply connector and restored some electrical power.

The vessel remained seaworthy, despite damage to its starboard bow (see photograph). The skipper called the coastguard by mobile phone, as power was not initially restored to the VHF; he calmly reported his position, that he had just been in collision with something he had not seen, and that he could see a tug steaming away from the scene. The coastguard then called out the local lifeboat to escort the fishing vessel, under its own power, back to its home port.

The coastguard then called the tug, who responded immediately and stated that they had assumed the fishing vessel had passed safely, albeit closely, down the side of the tow. Another vessel in the area, monitoring this conversation, volunteered to stand-by the fishing vessel until the lifeboat arrived. The tug was then allowed to resume its voyage.

Photographs showing bow damage

The Lessons

1. The assessment of risk of collision on both vessels was poor as both made assumptions based on scanty information. The International Regulations for Preventing Collisions at Sea, Rule 7, identifies the correct way to assess risk of collision. If both vessels had complied with this Rule the accident could have been avoided.

2. The lookouts kept by both vessels failed to enable a full appraisal of the situation and of the risk of collision, (Rule 5). It is important to ensure that as much information as possible is gathered from the lookout, in this case had both vessels scrutinised each other with binoculars, they might have realised that their initial assumptions were not reliable and that an earlier alteration of course was required by both vessels.

3. The tug could and should have warned local shipping via a "Securité" VHF broadcast when the navigation lights on the tow failed. Vessels should consider the use of such broadcasts if they have information which could be of significance to other vessels in their immediate vicinity.

4. The tug could have elected to show the lights and shapes for a vessel "restricted in her ability to manoeuvre" as the size of the barge and adverse weather conditions did restrict the tug's ability to deviate readily from its course [Rule 3 (g) refers]. The display of these lights would have facilitated a more thorough assessment of the situation by the fishing vessel by alerting it to the fact that this was not a normal power driven vessel as the skipper assumed.

5. The skipper of the fishing vessel reacted well to a potentially dangerous situation. The fact that he knew the location of his emergency torch and then quickly restored electrical power to his vessel, shows the value of being prepared and becoming very familiar with what to do in an emergency on your vessel.

6. The master of the vessel which volunteered to stand-by the damaged fishing vessel demonstrated the best traditions of good seamanship.

Fire at Sea – Be Prepared, Be Trained – It Could Be You Next

Narrative

Two fishing vessels from the same port caught fire while at sea within a few weeks of one another. One vessel burnt out and sank; the other's wheelhouse and mess room were destroyed.

Fortunately, in both accidents, the crews were able to abandon ship into a liferaft and were later rescued unharmed. The survivors of both accidents all remarked on the extremely fast spread of the fires and that they only had time to save themselves by abandoning ship. That there were no fatalities from either accident, can be partially attributed to the fact that both of the skippers had attended sea survival and fire-fighting training courses, and were able to react very well in the short time available to them when disaster struck.

On one vessel, the skipper had the presence of mind to grab a portable VHF set from the burning wheelhouse before abandoning ship. He was then able to make a "Mayday" call from the liferaft, which had been quickly and efficiently released from the wheelhouse top by the crew, who were familiar with the procedures required.

On the other vessel, the spread of the fire was even quicker, and the skipper did well to broadcast a "Mayday" call from the wheelhouse before assisting the crew (who were all asleep when he called them from the cabin) in launching the liferaft.

One fire probably started in the galley/cooker area; the other might have been caused by an electric cabling fault. In both cases, however, the speed of fire spread and the damage incurred means that the exact causes will probably never be known.

The Lessons

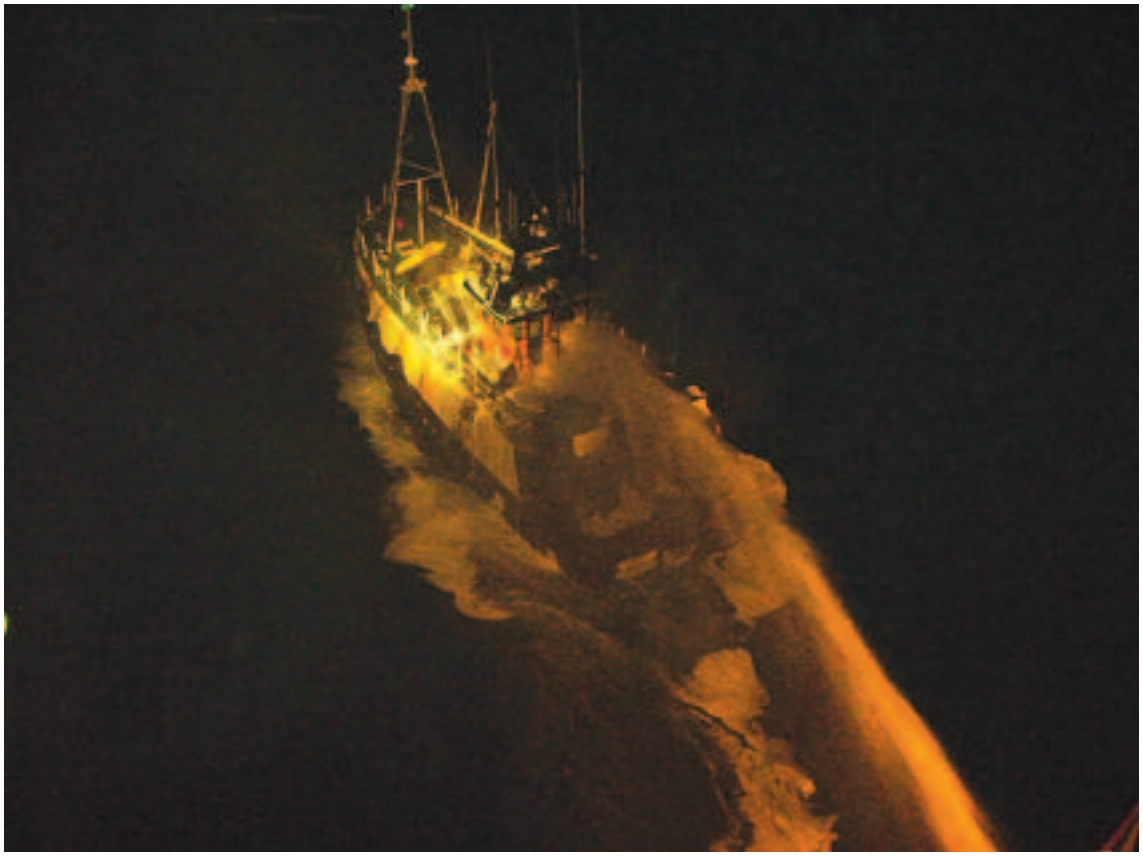
1. **Ensure that everyone on board has attended the requisite statutory training courses in fire-fighting, sea survival and first-aid. These accidents, and the fact that no lives were lost, demonstrate the importance of fishermen attending these courses.**

2. **Ensure that everyone on board is very familiar with the emergency equipment carried: both location and use. Both these skippers had ensured that their crews knew where the safety gear was and how to use it.**

3. **The galley stove provides an obvious source of ignition. Ensure that this is only for heating up food and drink – and not the boat!**

4. **The insulation of electrical wiring should be checked at regular intervals. It is almost impossible to visually inspect wiring on board any vessel, and the only way to ensure it is in good condition is to have it tested by a professional. It *is* worth the cost!**

"Invited Back On Board"



Narrative

In the early hours of the morning while on watch in the wheelhouse, the skipper of a 20m wooden fishing trawler smelled smoke coming up through the engine room control panel. The engine room smoke alarm activated, but the boat was towing hard against the tide and the skipper thought it likely to be caused by heat and exhaust from the turbocharger. A few minutes later, the smell grew stronger and the skipper called the mate from the shelter deck to investigate. The mate went below and, shortly after, the skipper decided to follow him.

The mate went into the engine room and saw an orange glow near the deck, in the area of the main batteries. He and the skipper set off two fire extinguishers, but were beaten back by thick smoke. They closed down the engine room ventilation openings on the upper deck and tried to operate the emergency fuel shut off valves. One worked, but the other was very stiff and did not shut correctly. The skipper tried the main engine stop button, but this did not work either, so he reduced engine speed and engaged the hydraulics to try and stall the engine. The engine kept running and was finally stalled by fouling the propeller with a rope thrown over the stern. With the engine stopped, the mate operated the CO_2 drench system.

Smoke now filled the wheelhouse, having risen through unsealed conduits and wiring looms between the engine room and wheelhouse control panel. The skipper had to stand outside and use the radio through an open window to send a "Mayday" signal. The mate switched over to the emergency power supply, but could not isolate the main batteries. The crew put on lifejackets and immersion suits, and then launched the liferaft. Before climbing down to the liferaft, the skipper and mate attempted to rig a towing bridle forward, but

were prevented by dense smoke escaping from the shelter deck through a missing hatch cover.

The crew abandoned the burning fishing vessel safely, using the liferaft to transfer to a nearby fishing vessel which had responded to the "Mayday". Despite their ordeal, the crew were all safe and well. Soon afterwards, an offshore supply vessel arrived on scene and began to fight the fire with a powerful foam monitor.

As daylight approached, the smoke appeared to have died down, and the master of the supply vessel suggested to the skipper that he return to his boat to see if the fire was out and to check for damage. Only a few hours had passed since the fire started, and the coastguard advised that no-one should go back on board because the fire could re-ignite or the boat capsize as a result of the water used to fight the fire. The supply vessel was keen to assist, and offered to tow the fishing boat back to port. Soon after, it launched the Fast Rescue Craft (FRC) to collect the skipper and mate from the other fishing vessel. The deckhands were then transferred and the other fishing boat was released by the coastguard.

The master of the supply vessel repeated his suggestion of the skipper going back on board the fishing vessel. Weather conditions were good and the smoke had almost gone. The skipper agreed, and he and the mate went across in the FRC, still wearing their immersion suits and carrying a torch and portable VHF radio. With the FRC standing by, they began to look over the boat.

Smoke from the wheelhouse had dispersed, and down below, the galley appeared undamaged. The mate entered the cabin and saw where fire had damaged the starboard side. He went forward to the engine room door and cracked it open. Thick smoke and noxious gases escaped and the skipper pulled him clear. They waited on the upper deck for a few minutes and then returned to the engine room. The smoke had cleared, and the mate was able to enter the engine room. He heard a crackle and then saw a glow of fire in the far corner.

The skipper and mate evacuated to the upper deck and managed to rig a tow as the fire escalated. The fishing gear was cut away and the crew returned to the supply vessel in the FRC.

Over the next few hours, the supply vessel fought the fire and towed the fishing vessel clear of sub-sea pipelines in the area, until satisfied that the fire was finally extinguished. Soon afterwards, the tow was passed to another fishing vessel and the supply vessel returned to standby duties.

For a while all seemed well, with the boat having a small list and sitting only slightly lower in the water than usual. However, in the early hours of the following morning she broke her tow and sank.

The Lessons

1. Electrical systems and insulation material should be checked carefully to minimise the risk of fire.

2. Emergency engine and fuel system shut down methods should be tested regularly and repaired if they do not operate correctly.

3. Engine rooms should be checked to ensure that they can be fully closed down in a fire situation to prevent smoke spreading and to give CO_2 drench systems the maximum chance of success.

4. Do not put yourself back into danger by returning to the scene of a fire too soon. Re-opening a compartment causes air to enter, which may then allow a fire to re-ignite. Engine room fires may require many hours to cool before re-entry can safely be made. Compartment re-entry should be made by properly trained firefighters with the correct fire fighting equipment and breathing apparatus.

Part 3 – Leisure Craft

There once was a time when the only people who went to sea did so because they had to – they were either fishermen, merchant seamen or members of the Royal Navy. In doing so they recognised that from time immemorial the sea has claimed the lives of the unwary, unprepared or unlucky. About 100 years ago there began to be a small group of people who, to the amazement of the professionals, actually went to sea for pleasure.

Around half a century ago, the people who went to sea for recreation tended to be wealthy, and usually owned either a 'gentleman's sailing yacht' or a 'gentleman's motor yacht'. They often had paid hands to help with the more physical tasks, but took pride in their amateur seamanship and ensured that they were aware of, and able to cope with, the inevitable dangers.

Recently there has been an explosion in the use of the sea for recreation and the reason for this is a combination of factors which, when added together, produced a remarkable phenomenon.

Fast forward to the modern age. You can still be wealthy and go to sea in a 'gentleman's sailing yacht' or a 'gentleman's motor yacht', but there is now a plethora of other ways in which to enjoy the sea. Apart from more accessible sailing and motor yachts, you can also have a small sailing boat, a small motorboat, or a PWC (Jet-ski). You can go angling, waterskiing, kayaking, diving, rowing, surfing, kite surfing, or windsurfing. Many of these craft can be towed behind a car, or carried on a roof-rack. The sea is more accessible than ever before; nowhere in the British Isles is more than 72 miles from the coast and, with our highly developed

motorway network, that is little more than an hour in anybody's book.

Couple this with the fact that the real cost of boating is now much less than it ever was, and that certain aspects of boating (in the sun) are a lifestyle choice, and you have the rationale for the extraordinary popularity of leisure boating.

However, this freedom to enjoy time at sea comes with a price tag. The massively increased use of the sea has come together with a corresponding decrease in knowledge about, and awareness of, the dangers that the sea presents. It has been killing people for a long time and will continue to do so. Sadly today's recreational boater is often unaware of 'the basics', not just the 'rules of the road', but much more fundamental issues like the fact that the tide goes in and out, left and right, up and down; and that the weather can, and does, change. The RNLI's volunteer lifeboat crews are constantly attending incidents where it is evident that there is simply no knowledge whatsoever that the sea is in any way different from a wet road.

The theory of unconscious incompetence says that you only know what you know. It is possible that this paucity of knowledge is the responsibility of the educational system; but nonetheless it seems that the lack of awareness of the potential of the sea to ruin a good day out is prevalent.

Even those who have acquired the basics of training, and even a modicum of experience, can find that a lack of preparation or specific attention to safety equipment can, when things go wrong, produce a chain of events which may culminate in death or serious injury.

It is interesting that this first Safety Digest of 2007 features more leisure craft than ever before, and the lessons that the recreational boat owner can learn from it are salutary. Complacency and ignorance play their part, and sheer bad luck sometimes can play a major role. The reports seem to span that spectrum.

There are, of course, things that everybody could and should do, in order to enhance their chances of survival when it all goes wrong. On that warm, bright sunny day with a gentle breeze, kind sea and the prospect of a pleasant landfall, an unchecked lifejacket, a missed weather forecast, poorly maintained equipment or simple naivety doesn't tend to have calamitous consequences. How that all changes when things go a little wrong, the weather pipes up, and the sea rolls up its sleeves and flexes its muscles.

The RNLI, whilst being most famous for the lifeboat service that it provides around the coast of the UK and Ireland also has a strong programme of trying to address the lack of knowledge of all those who aspire to use the sea for pleasure. It boils down to five key safety tips, which, if applied and combined with the appropriate amount of training by those boating within their own limits, can go a long way to helping the rescue services bring safely ashore those who are reasonably prepared for the eventualities they may meet.

The MAIB's Safety Digests and reports are a valuable contribution to the cause of safety at sea, and if all those who read the articles in the leisure section ponder a minute and think "What if that happened to me?" or, "Am I prepared to cope with that?" then, at the very least a thought process will have started to make their recreation safer and happier.

Peter Chennell

Peter Chennell is the RNLI's Sea Safety Manager. With about a quarter of its seven thousand launches being to those who use the sea for pleasure, the charity sees a need to get these users to be more aware of the issues they should be aware of, in order to enjoy the sea safely, and to try and reduce the number of occasions they might need a Lifeboat.

He is Chair of the National Water Safety Forum's 'Sea Advisory Group', and contributes to many other marine safety related panels and committees. He is also a keen and experienced yachtsman.

Check Your Knots

Narrative

A charter yacht left harbour for a corporate team building day, in good weather with a pleasant force 3 to 4 breeze. It took about 15 minutes to clear the harbour limits and raise the mainsail and genoa. After 10 minutes of sailing it was decided to tack, and the yacht was swung round on to a port tack. A crew member was crouched over the starboard cockpit winch, taking in the genoa, when the main halyard suddenly failed. The sail and boom dropped, hitting the crew member on the head and causing facial injuries. The yacht returned to harbour and the crew member was taken to hospital.

On examination, it was found that the knot which attached the halyard to the shackle at the head of the main sail had come undone. This knot had been secure on the previous charter and appeared satisfactory before the sail was hoisted. As the sail flogged during the hoist and during the tack the knot had come adrift.

The Lessons

1. **Although securing halyards to sails using knots is a generally accepted method, the securing arrangement must be checked regularly to ensure a situation like this incident does not occur. Flogging sails will impose demands on halyard connections and an appropriate secure knot is required.**
2. **For a more secure attachment, consider splicing the shackle to the halyard. This does not remove the need to check the connection, but it will ensure an incident of this type is less likely.**

The Sailing "Taster" that Left a Bitter Taste

Narrative

Nine people from a social and adventure activities group booked a 1-day "sailing taster", suitable for novices, which was to provide the opportunity to act as crew.

An IMX 38 yacht was designated for the trip. It was certified to carry up to 10 people in Category 2 waters (up to 60 miles from a safe haven). Regulations required it to be manned by the skipper and one other designated crew determined to be *"one other person on board deemed experienced by the skipper"*. The operating company had conducted some risk assessments, but none specific for operating with a totally inexperienced crew.

The group arrived at the marina at 0830, full of expectations. For most, this would be a new experience and they were looking forward to testing their sea legs.

Things did not go well from the outset. There was no one to meet and greet the group. The nominated vessel had been changed, but the group were not told this. When they eventually found the yacht, the nominated skipper said that he was unwell and was waiting for the replacement skipper (who was also the director of the company) to arrive. To make matters worse, the boat had been out of the water for 8 months and little had been done to prepare it: the yacht was dirty, both below and between decks; ropes were tangled, some were covered in algae and the locking cleats did not work properly; the deck was slimy; and the impression was, that the yacht had been uncared for and very poorly prepared.

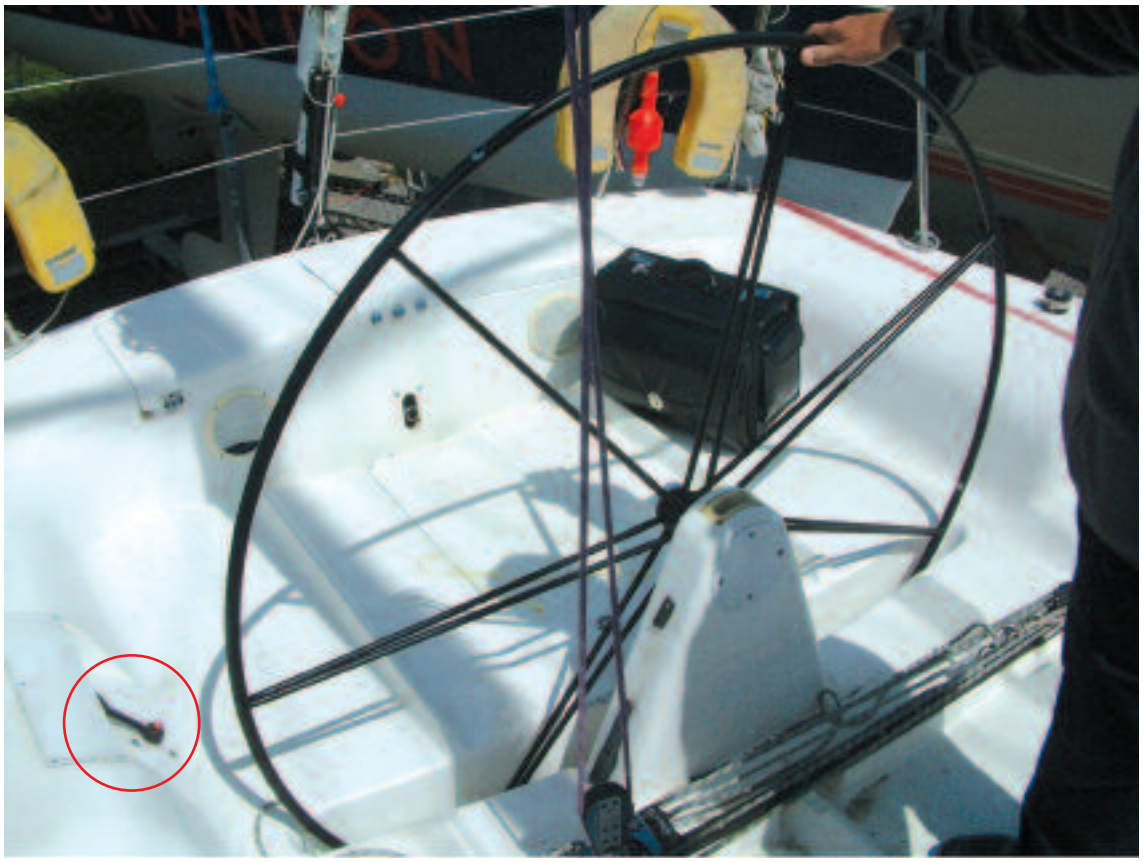


Figure 1 – Position of engine control lever

Figure 2 – Day skipper's leg position on the traveller rig

The replacement skipper arrived at about 0920. He agreed that the unwell skipper could remain on board in his bunk during the trip. The skipper then introduced himself and was advised that there was a Day Skipper qualified person among the group, but he was unaware of the group's experience prior to this.

A superficial safety briefing followed. The skipper emphasised the need to keep low under the boom and that the lifelines were to be always clipped onto the jacklines. Contrary to the Company's Safety Policy, there was no mention of the use of liferafts, flares, radio operation or how to start the engine, and the Day Skipper found the VHF radio to be switched off. At this point, some of the group were on the point of leaving, but they decided to see the day out; after all, they were due back alongside at 1700.

There were further delays as the mainsail and genoa were rigged. Fuel and water were then loaded before the yacht finally left the pontoon at 1130 – 2½ hours behind schedule. The group were disgruntled, but at least they were on their way.

Once into the wide channel, the group were more relaxed and they settled down to the business of sailing. The Day Skipper was by now on the wheel, with his safety harness clipped onto the rod backstay. A light lunch was made, and at 1350 the yacht came about and made a straight run back down the channel. The wind was from the WNW at force 6-7 and the yacht was making between 7-8 knots over the ground. As the yacht was heeling to port, the skipper instructed three of the group to sit on the high side to try to bring the vessel onto an even keel. Being inexperienced they felt uneasy about this.

As the yacht approached the channel entrance, the weather had worsened. It began to rain, the wind was gusting force 8 and there were

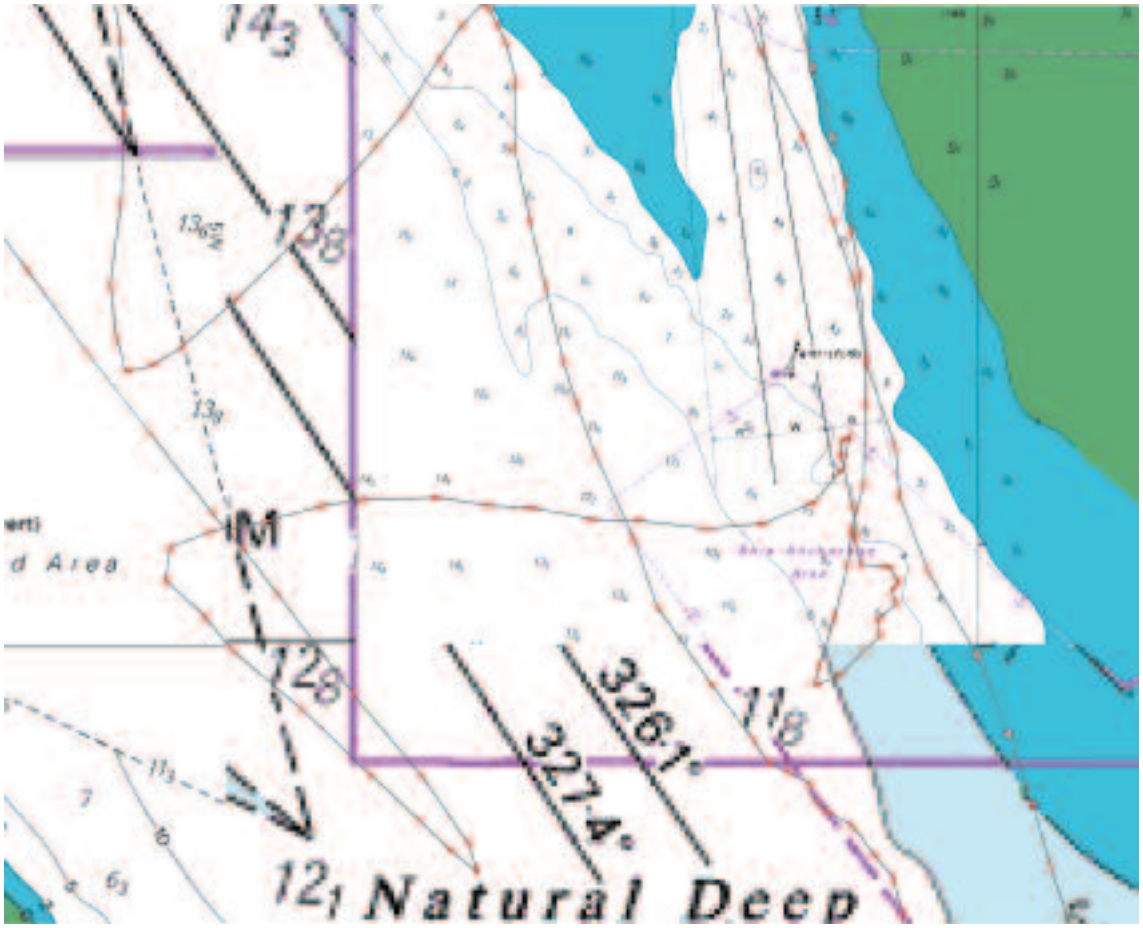


Figure 3 – Detailed GPS track showing key accident points

white horses on the wave tops – the group were obviously unsettled. The skipper suddenly decided to return to the marina and, with that, things immediately took a dramatic turn for the worse.

At 1426 the yacht was tacked back up the channel. The skipper then asked the Day Skipper to start the engine. The Day Skipper unclipped his safety line as he prepared to check that the engine control was in neutral, but he found the lever to be seized (Figure 1). He spent the next 2 minutes releasing it; he then moved in front of the wheel to go down below to start the engine, but he was brought to an abrupt halt. His foot became entangled in the traveller because his safety line became taut (Figure 2). His line had not been released as first thought. The skipper, now distracted, turned round to release the safety line and, at the same time, the yacht conducted an inadvertent gybe. The boom moved rapidly from starboard to port, trapping the Day Skipper's leg with the mainsheet, causing multiple fractures to his right leg. The boom immediately returned to the starboard side.

The Day Skipper clambered to the forward part of the cockpit. At the same time, another of the group, with the help of the unwell skipper, managed to start the engine. At about 1432, as the tension increased, the skipper mentioned the need to lower the mainsail, but he did not direct his instruction to anyone in particular. The lady operating the traveller stood up, possibly to help with the sail, and at the same time the yacht conducted its second inadvertent gybe. The boom moved rapidly from starboard to port, hitting the lady on the right side of her head, causing her severe injuries and forcing her partially overboard. The skipper and two of the group pulled her

back inboard. Bleeding profusely from her ears, nose and mouth, her situation was potentially life threatening. The skipper now busied himself in trying to get the sail down. A GPS track identifying the accident points is at Figure 3.

The injured lady was then attended by the group. They kept her airways clear, but it was a further 5 minutes before a VHF "Pan Pan" call was transmitted to the coastguard. The yacht then motored to a nearby jetty where the emergency services attended to the casualties.

The Lessons

The Day Skipper suffered multiple fractures to his leg, and the lady was in a critical condition for a lengthy period. Happily, they both made a full recovery.

The accidents were caused by a combination of the skipper being distracted and the possible snagging of the Day Skipper's lifeline around the wheel, as well as inattention to the weather conditions.

The organisation for the day was very poor, the yacht was ill prepared for the trip, and the manning was insufficient to cope with an emergency and did not comply with the regulations. There was no excuse for the very poor safety briefing, which is fundamental to preparing those on board for an emergency. The delay in alerting the coastguard to an obvious very serious injury was avoidable, and the safety briefing should have included the use of the radio, as promulgated by the company's own Safety Policy.

In this case, the skipper failed to pay sufficient attention to the wind conditions and the limitations of the novice crew. Time spent in preparing the vessel and those on board, is time well spent. Inadequate preparations and planning make stressful situations worse. Once things start to go wrong, anxiety levels increase while confidence fails and apprehension compromises the ability to make clear decisions – think and plan well ahead.

The following lessons can be drawn from this accident:

1. **Ensure that vessels are properly prepared and equipped.**
2. **Take time to give a thorough safety briefing.**
3. **Ensure that manning levels are sufficient and in accordance with the regulations.**
4. **Risk assessments should be comprehensive and cover use of the vessel with a completely novice crew.**
5. **Alert the coastguard promptly about injuries to crew.**
6. **Wherever there is a serious injury, a "Mayday" call would be appropriate.**

The Tragic Consequences of Not Wearing a Lifejacket

Narrative

A sailing club was holding its regular summer Wednesday evening race for the keelboat members of its club. That evening, a force 5-6 was anticipated outside the harbour breakwater. After a short discussion with the race officer to decide on a particular course, the yacht crews prepared their boats to race. Seven boats took part in the race, the majority of which were cabin cruiser/racers.

One of the racers was a distinctly different type of boat. This was an 8m sportsboat, equipped with an asymmetric spinnaker on a retractable bowsprit which enabled it to plane at speeds over 20 knots. The boat did not have an inboard engine fitted but, as required by class rules, did have a small outboard which was stored inside the hull near the mast.

The sportsboat had a crew of six on the evening of the accident. Earlier in the year, the sportsboat had been bought jointly by five of the crew on board. The helmsman was a very experienced and accomplished sailor who had sailed a variety of different craft over many years. The rest of the co-owners had only crewed sailing boats occasionally prior to buying the sportsboat. The sixth member of the crew had been invited along by the helmsman. He was an experienced racing crew, but this was his first time on the sportsboat. All of the crew were wearing sailing waterproofs. Two of the crew were wearing no personal buoyancy: the helmsman, who had chosen not to wear a lifejacket, and a crewman who had left his lifejacket in his car.

Prior to the race, the crew on the sportsboat completed some practice manoeuvres,

including raising and lowering the asymmetric spinnaker. The race then began and the sportsboat, with the asymmetric spinnaker flying, crossed the starting line on a starboard tack (sails on the port side). Sometime later, the crew successfully gybed the sportsboat on to a port tack (sails on the starboard side) and set course to pass the end of the breakwater into the open sea. The sailing was exhilarating and everyone on board was enjoying themselves.

Just as the sportsboat cleared the end of the breakwater, the retractable bowsprit pole snapped at the point where it passed through the hull. The boat slowed down and the crew lowered the spinnaker and retrieved the broken bowsprit over the open transom on the starboard side. The helmsman asked if everyone was content to continue racing under the main and jib only, to which they all agreed. The helmsman then tried to gybe to head for the first racing mark, but could not as the boat was moving too slowly. All of the crew apart from the helmsman were on the starboard side of boat clearing the spinnaker. After attempting to gybe on two occasions without success, the boat suddenly did gybe and heeled heavily to port. As a result, the helmsman fell overboard from his position on the port quarter.

The crew noticed the helmsman in the water, just as he shouted to them to turn the boat around. The guest crewman took the helm, but was unable to manoeuvre the boat as it had turned bow into wind and was caught 'in irons'. The crew shouted to another yacht that was racing to raise the alarm. That yacht then started his inboard engine and, leaving his sails to flog, made towards the man in the water. The skipper on this vessel also called the coastguard, and the inshore lifeboat was requested. Unfortunately, the rescuing yacht missed the man in the water on its first pass.

Meanwhile, on board the sportsboat, another crewman had taken the helm to try and steer the boat towards the casualty, while two crew members stood on the foredeck looking for him. While steering, the helmsman also tried to unlock his VHF hand-held radio in order to change channels to channel 16, but with only one hand free was unable to do so.

The man in the water was spotted floating face-down 10-12m away. One of the crewmen on the foredeck, who was wearing a buoyancy aid, dived in and started swimming towards the casualty. The sportsboat then started to make some progress towards the casualty and passed the swimming crewman. As it approached the man in the water, two of the crew grabbed hold of him, but were unable to hold him because the boat was still moving. One of the crewmen – who was wearing no personal buoyancy – jumped in when he realised he couldn't hold on. He tried to hold on to a line trailing behind the boat, but had to let go. The swimming crewman arrived at about the same time, and took the casualty from the crewman with no personal buoyancy to allow him to swim to the now nearby rescuing yacht and climb out of the water. The rescuing yacht then managed to come alongside the casualty and crew in the water but, with a freeboard of 0.9m, the crew on board the yacht only managed to hold the unconscious casualty vertically, half out of the water with the aid of a rope.

The lifeboat arrived soon afterwards, the casualty was taken on board and first-aid administered – some 10 minutes after the casualty had fallen in the water. The sportsboat crew, meanwhile, had fitted their outboard on to the stern bracket, but the engine would not start.

The casualty was winched aboard a rescue helicopter and taken to hospital, where he was pronounced dead.

The Lessons

1. The sportsboat had a low freeboard and sea conditions were moderate to rough, so the chances of someone falling overboard were significant. As this was a keelboat race, there was no rescue boat. Personal buoyancy was, therefore, important to ensure anyone falling into the water stayed afloat. *In this case two men risked their own lives in an attempt to rescue a man who was not wearing a lifejacket. Don't be selfish, wear your lifejacket!*

2. The man who fell in the water was the only experienced helmsman on board the sportsboat. No man overboard drills (MOB) had been carried out since buying the vessel and none of the crew knew what to do in the event of someone falling in. *Ensure that at least two members of your crew can carry out an MOB recovery effectively.*

3. Although not a contributing factor to this accident, there was some difficulty using the radio that was on board the sportsboat. The crewman at the helm trying to retrieve the MOB owned the radio, and the rest of the crew were not readily able to use it. *All your crew should be familiar with using the VHF radio, sufficient to raise the alarm in an emergency.*

4. In this case, no first-aid resuscitation could be carried out on the casualty until he was in the lifeboat because neither of the boats involved in the rescue had an effective means of recovering an unconscious person from the water. *Think about how you might get an unconscious person back on board your boat. It could mean the difference between life and death.*

To Sail or Not to Sail?

Narrative

Three friends in their 60s and 70s joined several yachts from their local sailing club for a summer trip to mainland Europe in a bilge keeled yacht. The trip was intended to take 3 weeks, with the yacht owner's son joining them at some point.

The 11m yacht had been bought new earlier the same year and was described in the owner's manual as "exceeding the minimum requirements for category "A" offshore". It was therefore suitable for the voyage.

The skipper of the yacht had sailed since his youth and had owned progressively larger yachts during the last 25 years. He had sailed his yacht on several occasions along the English coastline in mixed conditions. The other two original crew members were experienced sailors, with many years of sailing around the UK coastline and occasional trips to mainland Europe, although one was physically limited in his ability to move quickly around the boat.

The voyage across was uneventful and very enjoyable, with everything going as planned. The skipper's son joined the party of three on board. Planning to return by themselves, they parted company with the other yachts from the sailing club.

Some days later, the yacht arrived at its last port before sailing to the UK. The crew was in no rush to return home and, having read the weather forecast for the area, decided not to sail and to review the weather later on. The following day, the midday shipping forecast predicted winds veering north force 5 to 7, perhaps gale 8 later in the west, becoming cyclonic, 4 in the east. A further forecast received on a mobile phone predicted winds of maximum force 6, weakening later.

The yacht departed port at lunch time, motoring into winds of force 4 to 5 from the west, with no sails set. The crossing was expected to take about 30 hours. Overnight, as the wind decreased slightly, the jib was unfurled to steady the boat and provide some additional way. The early morning weather

Photograph of yacht taken after the 3 crew were lost overboard *Image courtesy of the RAF*

forecast the next day gave the forecast wind as increasing to force 7 or gale 8.

During the morning, the weather deteriorated, the wind increased and the yacht crew decided to wear lifejackets on deck and use lifelines when outside of the cockpit. The sea conditions continued to worsen as the wind, now gusting at 40 knots, was against the tide. The waves appeared to the skipper to be "the size of houses". Despite the heavy seas and the conditions being worse than any of the yachtsmen had previously experienced, the yacht seemed to be handling well and the steering remained in autopilot.

As the wind increased, the skipper attempted to contact the coastguard to let them know his position and planned destination. On the third attempt, his call was intercepted by a rig support vessel in the area and relayed to the coastguard. The coastguard passed the report to the RNLI, who agreed to launch a lifeboat to escort the yacht back to safety. The rig support vessel headed towards the yacht to monitor progress and provide a means of communication until the lifeboat arrived.

Meanwhile, one of the yacht's crew had gone below to change into dry clothes when the vessel was unexpectedly "knocked down", rolling heavily to port. The three crew in the cockpit, including the skipper, were washed overboard.

The skipper, by chance, had his hand-held VHF in his hand, and had sent a brief "Mayday" message before being swamped by a wave. The remaining crewman on board also attempted to send a "Mayday" call, but realised the yacht's VHF set had failed. As the "Mayday" message was incomplete, the rig support vessel was unable to confirm the origin of the call, although the radio direction bearing was similar to the heading on which they were proceeding. Shortly after, the coastguard established with the rig support vessel that they had heard a brief "Mayday" distress message, so the rescue helicopter was requested.

Of the three crewmen in the water, two were conscious, with their lifejackets inflated, the third was unconscious and his lifejacket had not inflated. One of the survivors managed to

manually inflate this lifejacket, but it rode up under the casualty's arms.

The rig support vessel reached the yacht and after several attempts managed to manoeuvre close to the vessel. The rescue helicopter was now also on scene. A call by loud-hailer finally confirmed that there were three crew members in the water. The rig support vessel gave the last known position of the yacht to the rescue helicopter which, seven minutes later, found the three men in the water and winched them on board. The three men had been in the water for almost an hour. The unconscious crew member was declared dead on arrival at hospital. The skipper and his son both made full recoveries. The remaining crew member on board the yacht was transferred to the RNLI lifeboat and then transferred to hospital for observation.

The Lessons

The professional and proactive actions of the rig support vessel undoubtedly saved the lives of two of the three men washed overboard. In monitoring the progress of the yacht, they ensured their vessel was at the scene as quickly as possible when disaster struck. By noting the radio bearing of the yacht, and persevering in communicating with the remaining crew member by loud-hailer, they were able to direct the rescue helicopter to the position of the casualties in the water and ensured their rapid removal to hospital.

1. **Weather forecasts must be carefully studied before embarking on long trips, bearing in mind that conditions may become much worse during the passage. Poor weather options should be considered, including turning back, heading for ports of refuge and "heaving to", and these should be reviewed regularly during passages when the weather deteriorates.**

2. **Do not rely on the autopilot to helm in heavy seas. A helmsman can react quickly and alter course for individual waves to minimise the risk of broaching.**

3. **Before commencing a passage with the prospect of bad weather, ensure the physical ability of ALL crew is taken into account. Setting a sensible weather limit is the prudent and safe approach to take.**

4. **Lifelines should not only be used on deck in heavy weather but also while in the cockpit. A knockdown following a rogue wave is always a possibility in steep heavy seas.**

5. **Make sure your lifejacket is fitted correctly and has a crotch strap. A badly fitted lifejacket will severely hamper you in the water, at which point it is virtually impossible to make adjustments.**

6. **When making longer sea passages, ensure your boat has an appropriate level of safety equipment. A liferaft, in this accident, could have been deployed by the crewman on board to provide both protection from the sea and act as a marker for the rescue helicopter. An EPIRB would have made certain the rescue services were alerted when out of VHF range.**

Cheap, Cheerful and Dangerous

Case 1: Narrative

The owner of a 4.43m (14 foot) speedboat was involved in the pleasure boat building industry. This boat was old and run down and needed a bit of work, but he had bought it cheaply and, with his background, he was happy to refurbish it himself. There were several problems with the boat, notably the 60hp engine was unreliable and the navigation lights weren't standard – in fact the lights were from a car, and included one red brake light and two white reversing lights. They were all-round and very bright.

Unfortunately the temptation to use the boat before refurbishing it was too great. He managed to get hold of a used 70hp outboard, which he installed. It needed a service and ran on only two of its three cylinders most of the time, but it was an improvement on the first engine. Since he wasn't going to use the boat regularly, it did not seem important to have any insurance.

The weather was lovely, so he and his girlfriend did a bit of waterskiing and fishing. That night, the boat was left downriver. The following evening, the owner went out again, this time taking along two friends.

They were stopped by the harbour patrol for speeding. They explained that the boat could fire on all three cylinders only if the throttle lever was left fully open. They did not want to pull the throttle back as the engine would misfire. But this didn't impress the patrol, who told them to slow down until they left the harbour limits.

After they had been out for about 2 hours they stopped off at a local pub, staying there for about 1½ hours. At 2345, they said their goodnights and all left to go home. As it was dark, the owner turned on his navigation lights – they were very bright and it was a dark night on an unlit river.

It was now low water, so the boat was constrained to take the deep water channel where many small craft had swinging moorings.

They began feeling their way using the dim shapes of these small craft to guide them. The throttle lever was set at about three quarters

ahead to give slow speed on two cylinders. Suddenly the outboard fired on all three cylinders and the boat leapt forwards and began climbing up onto the plane. Seconds later, it ploughed into the stern of a moored motor cruiser.

The next thing the driver remembers was being in the back of the boat, alone, covered in blood and with serious facial injuries. His first thought was to stop the engine, so he reached for the throttle control; it was no longer there. He had not been wearing a killcord, and now the engine could only be stopped by disconnecting the fuel supply. He was not aware of it at the time, but his two friends had been thrown clear of the boat and into the water.

The rescue services were quickly on scene and the driver and his two friends were taken to hospital. A little time later, the boat sank.

The driver had suffered a broken jaw and required over 100 stitches to his face. Fortunately, the passengers suffered only minor injuries.

The Lessons

1. **This boat and engine were not fit for purpose, and the owner should have had it properly refurbished before use.**

2. **Over-confidence and the excitement of the moment can sometimes make a person blind to a bad decision. Using this boat on a very dark night, in an unlit river, with blindingly bright navigation lights and an unreliable engine, was asking for trouble.**

3. **Alcohol and boating do not mix. Even in relatively modest quantities, it dulls the senses and reduces one's awareness of risks.**

4. **No killcord was fitted. If the passengers had been thrown out close to the boat, they could have sustained extremely serious injuries before the engine was stopped by cutting off the fuel supply.**

Cheap, Cheerful and Dangerous

Case 2: Narrative

The owner of the 4m boat in this next case had no experience in boat safety or how to handle his craft. He had bought the RIB very cheaply and it was in poor condition, but his lack of knowledge meant that the defects were not noticed. The main problem was the unreliability of the outboard engine, and in particular the throttle linkage. The linkage was not securely fixed to the throttle and was connected so that putting the lever in the forward position put the engine astern, and vice versa.

On the day of the accident, the owner took the boat to the coast with his wife and three daughters. The idea was to give everyone a ride around the harbour. He embarked with his family and launched from the public hard landing. This was the passengers' first time in a RIB and it was only the driver's second time.

The trip passed quickly, with no problems, and after 30 minutes they headed back towards the landing. As the boat got closer he tried to slow down, but the throttle linkage slipped and there was no response from the engine. He was coming in far too fast for beaching. He tried again to throttle back, but in his haste he increased the speed. The boat was now very close to the landing, so he turned the boat round and headed back out to deeper water to give him time to sort out the problem.

Without warning his passengers, he put the wheel hard over. The boat turned around almost within its own length. The passengers were not ready, and were thrown about in the boat; one fell backwards into the water. As he straightened up the boat to head out to sea, the boat surged forward and ran over his daughter in the water. She received four deep cuts to her head as the propeller struck her.

The driver of the boat was now in panic and did not know what to do next. He thought his daughter in the water was most in need of help, so he jumped in to assist her. This left the boat running at high speed, with no-one on board experienced in how to control it. The boat began circling, and it soon grounded close to the landing, luckily without further injuries to those in the water or in the boat.

After helping his injured daughter ashore, the driver waded out to the boat and stopped the engine by disconnecting the fuel line.

The girl was taken to hospital, where she was treated for cuts; luckily no other injuries were found. She was discharged the following day.

The Lessons

1. **The skipper of any boat is responsible not only for his own safety but also for that of his passengers and others using the water. It was irresponsible of this skipper to put to sea with no training and little experience.**

2. **This engine's control linkage was not fit for purpose. It was dangerous and resulted in the engine being uncontrollable at a vital part of a manoeuvre. Before buying any craft, make sure it is in good condition and is safe to use. If you do not know enough to spot problems, ask a professional for advice.**

3. **No kill-cord was fitted. A kill-cord would have been the fail safe way to stop the engine without having to resort to drastic manoeuvres.**

4. **The consequences of using a cheap unreliable boat can be grave. The girl suffered serious cuts to her head. But it could have been much worse: it is rare for anyone struck on the head by a propeller to survive.**

Steering Seizure

Narrative

Three crew on board their 11m yacht left their home port in the early morning, having determined that the weather should be good for their intended passage. The wind was south west force 5-6 and good progress was made, the yacht sailing first on a beam reach and then a broad reach. The mainsail had one slab reef taken in, and the roller reefing foresail was also reduced.

Some way into the passage, when the yacht was about 1 mile off a lee shore, the steering wheel mechanism started to make a clicking noise. Soon afterwards, the mechanism jammed completely, leaving the yacht with no steering. The boat gybed, and swung round 180 degrees, through the wind and into a hove-to position with the genoa secured on the windward side. The crew rigged the emergency tiller, but the rudder would not budge. At this time, the depth of water was 25m, but the yacht only had 20m of anchor chain attached to the anchor.

The crew tried to investigate the steering mechanism further, but at 1350 the skipper decided to make a "Mayday" call, following which the local lifeboat and SAR helicopter were launched. The yacht drifted inshore, but once in a water depth of 15m, the jib was furled and the anchor let go. Despite using the engine to alleviate the drift, the snatching of the anchor on the bottom caused such loads that the rope connecting the bitter end of the chain to the anchor locker failed and the anchor was lost. With nothing now to restrain it, the yacht continued to drift ashore.

At about 1415, and with the lifeboat in sight, the yacht beached. The lifeboat manoeuvred in close to the shore to try and pass a tow line, but grounded on a small reef. After freeing itself, the lifeboat stood further offshore and the crew fired a rocket speed line to the yacht. It missed, but a passer-by ashore helped get the speed line to the crew on the yacht, which allowed a tow line to be passed. The tow line was secured and the lifeboat started to pull the yacht off the beach but, unfortunately, the line parted and the yacht beached once again.

At this stage, the lifeboat coxswain decided that the risk to the yacht's crew was too great, and they were evacuated from their vessel by helicopter. The crew suffered no injuries during their ordeal, and returned to the vessel at low tide to salvage some belongings. The yacht, however, was not able to be salvaged and became a total loss.

The Lessons

1. If your yacht has wheel steering, make sure you are fully conversant with the emergency tiller system. The chances of needing it are probably remote, but solving a steering problem quickly will keep you out of trouble. Pay particular attention to the linkage between the rudder stock and the wheel because, as was the case in this accident, disconnecting the two can be the only way the rudder becomes free to move.

2. Be alert to navigational dangers and, where possible, keep well clear of a lee shore. On this occasion, there was no great need to be sailing 1nm off a very rocky coast. Standing further off will give you extra breathing space to deal with emergencies and the unexpected.

3. Ensure you have sufficient chain and rope attached to your anchor, and that it is of the correct size. For the yacht in this accident, 20m of chain was half the amount recommended. If weight is a major consideration on your yacht, then rope and chain can be used; but ensure you have sufficient chain to assist holding. The prudent mariner will also carry a kedge anchor, which can be used as a back-up in an emergency.

Preliminary examinations started in the period 01/11/06 – 28/02/07

A preliminary examination identifies the causes and circumstances of an accident to see if it meets the criteria required to warrant an investigation, which will culminate in a publicly available report.

Date of Accident	Name of Vessel	Type of Vessel	Flag	Size (gt)	Type of Accident
03/11/06	*Ben-my-Chree*	Ro-ro vehicle passenger ferry	Isle of Man	12504	Grounding
04/11/06	*Our Roseanne*	Beam Trawler	UK	8.93	Fire
08/11/06	*Perth*	Dry cargo	UK	24836	Grounding
13/11/06	*Fri Stream*	Dry cargo	Bahamas	2051	Machinery failure
14/11/06	*Pride of Bilbao*	Ro-ro vehicle passenger ferry	UK	37583	Lifeboat incident
01/12/06	*Peadar Elaine*	Fishing vessel	UK	128	Acc. to person
03/12/06	*Grande Detroit*	Vehicle carrier	Italy	38651	Heavy weather damage
08/12/06	*Ras Laffan* *Ashlon*	Tanker Fishing vessel	Marshall Islands UK	57066 43	Collision
12/12/06	*Portland Isle*	Fishing vessel	UK	23.67	Fatality
13/12/06	*Unity*	Fishing vessel	UK	9.40	Capsize (fatality)
21/12/06	*Humber Energy* *Red Eagle*	Oil tanker Ro-ro vehicle passenger ferry	UK UK	380 3028	Collision
29/12/06	*Fehn Mistral*	Dry cargo	Gibraltar	2478	Hazardous incident
29/12/06	*Emsland*	General cargo	Antigua & Barbuda	1857	Grounding
02/01/07	*Sunna*	General cargo	Norway	1980	Grounding
27/01/07	*Evening Star*	Fishing vessel	UK	118	Foundering
30/01/07	*Sea Seeker* *Port Menai*	Fishing vessel Landing craft	UK UK	19.48 Unknown	Collision
06/02/07	*Iled Yeu* *Dutch Progress*	Pleasure craft Chemical tanker	UK Netherlands	3003 2137	Collision
08/02/07	*Mounts Bay*	Naval support & RFA	UK	23569	Accident to person
14/02/07	*Jeppesen Maersk* *Sigas Centurion*	Dry cargo Tanker	Denmark Singapore	30166 2169	Hazardous incident
21/02/07	*Nova*	Dry cargo	Netherlands	1978	Grounding
24/02/07	*Prudence*	Dry cargo	Netherlands	1556	Contact
26/02/07	*Annabella*	Dry cargo	UK	9981	Hazardous incident

Investigations started in the period 01/11/06 – 28/02/07

Date of Accident	Name of Vessel	Type of Vessel	Flag	Size (gt)	Type of Accident
11/11/06	*Aqua-boy*	Specialised carrier	Norway	312	Grounding
	FR8 Venture	Oil tanker	Singapore	42010	Accident to person (2 fatalities)
10/12/06	*Prospero*	Tanker	Sweden	11793	Machinery failure
18/01/07	*MSC Napoli*	Container	UK	53409	Flooding
20/01/07	*Lindy Lou*	Pleasure craft	UK	Unknown	Fire (fatality)
03/02/07	*Hooligan V*	Yacht	UK	Unknown	Capsize (fatality)
03/02/07	*Alaska Rainbow* *Sea Express 1*	Bulk carrier High speed craft	Greece UK	Unknown 13898	Collision

APPENDIX B

Reports issued in 2006

Abersoch RIB – a serious injury sustained when falling overboard on 7 August 2005
Published 3 February

Anglian Sovereign – grounding of UK registered emergency towing vessel near the island of Oxna in the Shetland Islands, 3 September 2005
Published 30 June

Auriga – loss of fishing vessel off Portavogie, Northern Ireland on 30 June 2005
Published 3 February

Berit – grounding, Trindelen Bank, near Gedser, Denmark on 5 January 2006
Published 6 July

Big Yellow – hull failure of RIB, Porthmeor Beach, St Ives Bay, Cornwall on 26 August 2005
Published 24 March

Blue Sinata – foundering in Weymouth Bay on 8 September 2005, with the loss of one life
Published 2 March

Border Heather – explosion and fire in Grangemouth, Firth of Forth, Scotland on 31 October 2004
Published 16 February

Bounty – capsize and loss 4 miles off Berry Head, South Devon on 23 May 2005
Published 2 February

Carrie Kate/Kets – collision near Castle Point, St Mawes, Cornwall resulting in one fatality on 16 July 2005
Published 24 February

CP Valour – grounding in Baia da Praia do Norte, Faial, Azores on 9 December 2005
Published 17 August

Dieppe – grounding of ro-ro passenger ferry on the approaches to Newhaven on 5 December 2005
Published 17 July

Emerald Star – investigation of vessel making contact with Chevron Texaco Number 6 berth at Milford Haven on the evening of 18 January 2006
Published 24 August

Greenhill – grounding and subsequent foundering off Ardglass, Northern Ireland on 19 January 2006
Published 8 August

Harvest Hope – capsize and founding of fishing vessel, 40 miles north-east of Peterhead on 28 August 2005
Published 15 August

Harvester/Strilmoy – collision in the North Sea on 4 November 2005
Published 14 June

Kathrin – grounding of merchant vessel, Goodwin Sands, Dover Strait on 12 February 2006
Published 1 September

Lerrix – grounding off the Darss peninsular, Baltic Sea, Germany on 10 October 2006
Published 11 April

Lykes Voyager/Washington Senator – collision in Taiwan Strait on 8 April 2005
Published 10 February

Mollyanna – capsize of sailing dinghy, off Puffin Island, North Wales, resulting in two fatalities on 2 July 2005
Published 15 March

P&O Nedlloyd Genoa – investigation of the loss of cargo containers overboard, north Atlantic Ocean on 27 January 2006
Published 11 August

Neermoor – fatal accident due to collapse of a portable bulkhead, Teignmouth, 27 April
Published 14 December

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Noordster – capsize of the fishing vessel with the loss of three crew on 13 December
Published 22 November

Pamela S – capsize and foundering, Carmarthen Bay on 17 June, one fatality
Published 20 December

Pastime – loss of one man overboard from sailing yacht, in the English Channel on 17 March 2006
Published 8 September

Portland Powerboats – collision during a junior racing event at Portland Harbour, 1 serious injury, on 19 June 2005
Published 31 March

Red Falcon – contact with the linkspan at Town Quay, Southampton on 10 March 2006
Published 3 October

Roaring Meg of Cowes – two serious injuries, Southampton Water on 20 May
Published 9 November

Savannah Express – engine failure and subsequent contact with a linkspan at Southampton Docks on 19 July 2005
Published 7 March

Seasnake – grounding at high speed of leisure powerboat near the entrance to Tarbert harbour, Loch Fyne on 10 July 2005, with the loss of three lives
Published 20 March

Solway Harvester – capsize and sinking of fishing vessel 11 miles east of the Isle of Man on 11 January 2000 with the loss of 7 lives
Published 20 January

Spruce – serious injury to member of crew of the LASH vessel, at Victoria Docks, Hartlepool on 6 March 2006
Published 18 October

Star Princess – fire on board *Star Princess,* off Jamaica on 23 March 2006
Published 23 October

Annual Report 2005 Published May 2006

Recommendations Annual Report 2005
Published June 2006

Safety Digest 1/2006 Published April 2006

Safety Digest 2/2006 Published August 2006

Safety Digest 3/2006 Published December 2006

APPENDIX C

Reports issued in 2007

Arctic Ocean, Maritime Lady and ***Sunny Blossom*** – collision and grounding in the Elbe River on 5 December 2005
Published 1 February

Brothers – investigation of the grounding of vessel with the loss of two lives off Eilean Trodday on 1 June 2006
Published 31 January

Sian Elizabeth – investigation of the injury to a crew member, 3 miles north of King's Lynn on 14 September 2006
Published 12 March 2007