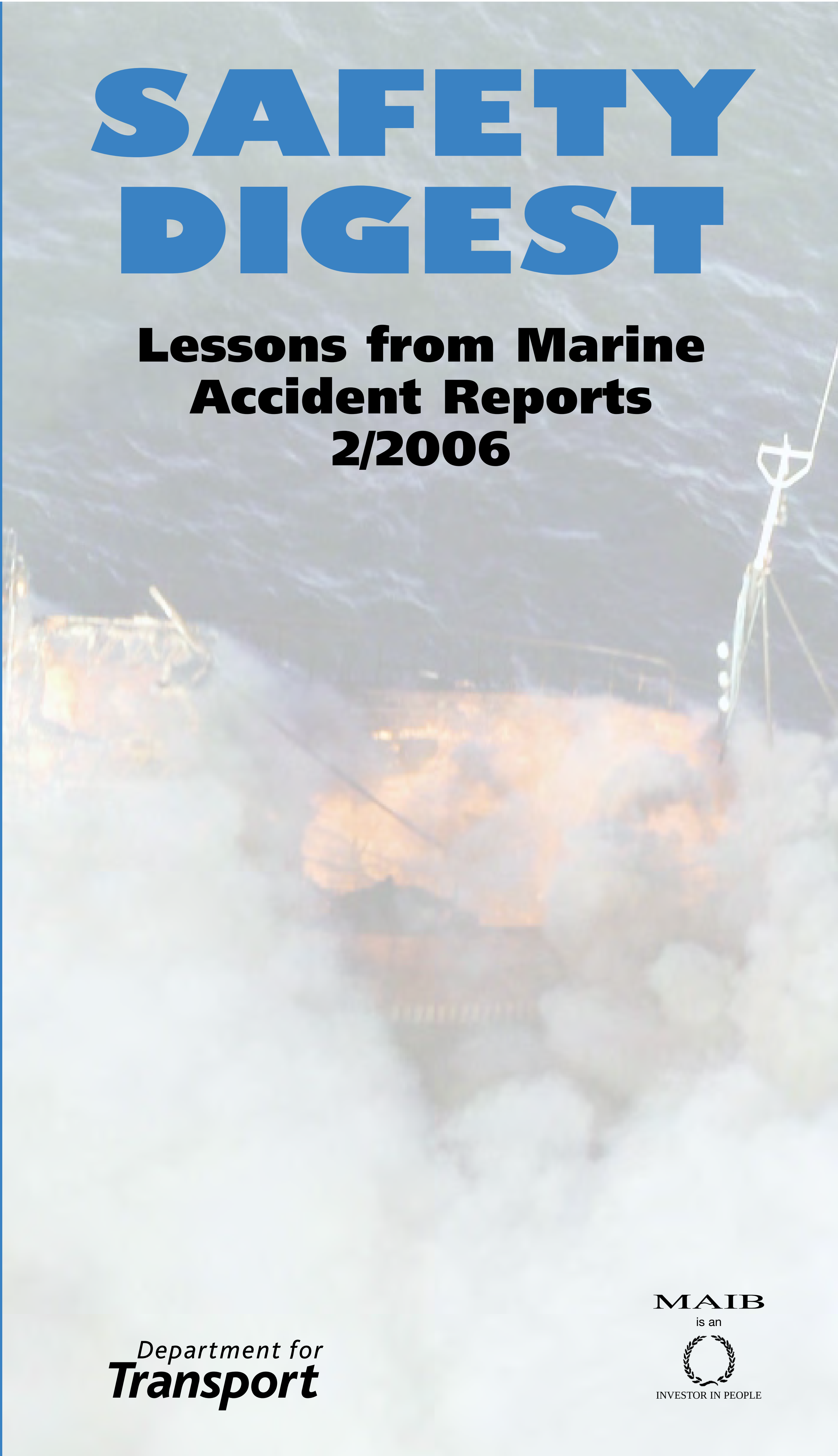
MAIB

MARINE ACCIDENT INVESTIGATION BRANCH

# SAFETY DIGEST

## Lessons from Marine Accident Reports 2/2006



Department for Transport

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## No 2/2006

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July 2006

# 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.

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

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

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.

The Branch fax number is 023 8023 2459.
The e-mail address is **maib@dft.gov.uk**

**Summaries (pre 1997), and Safety Digests are available on the Internet:**

**www.maib.gov.uk**

MAIB
MARINE ACCIDENT INVESTIGATION BRANCH

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

Extract from
The Merchant Shipping
(Accident Reporting and Investigation)
Regulations 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

"Mayday" – The international distress signal (spoken)
AB – Able Seaman
AIS – Automatic Identification System
ARPA – Automatic Radar Plotting Aid
C – Celsius
$CO_2$ – Carbon Dioxide
COLREGS – International Regulations for the Prevention of Collisions at Sea
CPA – Closest Point of Approach
DPA – Designated Person Ashore
DSC – Digital Selective Calling
EPIRB – Emergency Position Indicating Radio Beacon
GMDSS – Global Maritime Distress and Safety System
GPS – Global Positioning System
Gt – gross tonnes
HP – Horsepower
Kg – kilogram
m – metre
MCA – Maritime and Coastguard Agency
MRCC – Maritime Rescue Co-ordination Centre
OOW – Officer of the Watch
PPE – Personal Protective Equipment
RIB – Rigid Inflatable Boat
Ro-Ro – Roll-on, roll-off
SAR – Search and Rescue
SCBA – Self-Contained Breathing Apparatus
SOLAS – International Convention for the Safety of Life at Sea
STCW – International Convention on Standards of Training, Certification and Watchkeeping
TCPA – Time to Closest Point of Approach
VCU – Vessel Capacity Unit
VHF – Very High Frequency
VTIS – Vessel Traffic Information Services
VTS – Vessel Traffic Services

# Introduction

Again, a mixed-bag of cases in this edition of the Safety Digest, reminding us all that danger lurks in many different places. People who remain alert and aware of the risks are the most likely to avoid trouble. Please use all these articles to think about the problems others have encountered, and how you can ensure that they don't happen to you.

Case 4 is an account of the death of a motorman while working on deck. This is one of a number of accidents MAIB has investigated recently, where engine room or catering staff have been killed or injured while undertaking a seaman's tasks. If you are using non-deck ratings to assist in mooring and other seamanship evolutions, think carefully about their lack of training and awareness. Extra briefing and supervision is essential to ensure the safety of all concerned.

A large number of merchant vessel accidents we investigate could have been avoided if only people had fully utilised the tools they were given. In nearly all recent cases of collisions and groundings at night or in restricted visibility, the lookout had been stood down by the officer of the watch, in contravention of STCW and, frequently, company standing orders. In most collisions and groundings, electronic aids such as ARPA, CPA and TCPA alarms, waypoint alarms and depth alarms had not been used. It is complacent to believe that you don't need such support; we all make mistakes sometimes, these safety barriers will prevent your simple error becoming a disaster.

In the leisure craft section, Case 25 reports two near-fatal accidents while gybing. MAIB has had seven similar accidents reported this year, one of them fatal. However experienced you are, be prepared for a gybe, and remember that sheets and blocks can be dangerous as well as the boom.

Finally, Case 24 is yet another cautionary tale on kill-cords. Although the photographs on page 73 are not for the faint-hearted, this young man was lucky. Use the kill-cord.

Stephen Meyer
Chief Inspector of Marine Accidents
July 2006

**Postscript:**

1. After reading Case 17 in Safety Digest 1/2006, the MCA asked us to remind all seafarers that their Maritime Rescue Coordination Centres are always happy to answer telephone requests for local weather forecasts.
2. Our apologies to Chris Venmore, who wrote the Fishing Vessel introduction in Safety Digest 1/2006, for failing to print his name. Thank you Chris.

# Part 1 – Merchant Vessels

I am honoured and delighted to have been invited to provide this Introduction to the MAIB Safety Digest.

As the immediate past President of the Nautical Institute, the leading international professional body for qualified mariners and others in control of seagoing ships, I am privileged to visit many of our branches around the world. In various contexts it is quite amazing just how frequently the MAIB Safety Digest reports are referred to during these visits and during debate generally with our international membership. Without doubt the MAIB Safety Digest is regarded internationally as one of the most authoritative reference sources for learning lessons from the mistakes of others with regard to marine accidents.

There would appear to be many synergies between the goals of the MAIB and those of the Nautical Institute – both organisations are committed to reducing marine accidents and generally making ships safer.

The incident reports in this issue of the Safety Digest, along with their respective analyses, yet again makes for disturbing reading. With the benefit of hindsight we can say, with a high degree of certainty, that every single one of these incidents could and should have been prevented. The same old issues continue to raise their ugly heads – fatigue, insufficient crew, inadequately trained crew, failure to follow correct procedures, failure to manage situations, failure to contingency plan for emergency situations and failure to maintain ship and equipment. Virtually all these failures stem from a lack of leadership and belief in safety management from the top of the company.

At the Nautical Institute we have just launched our next five-year strategic plan – which has been produced after extensive consultation with our membership to identify the key issues which need to be addressed. I do not think it is a coincidence that the issues we will be tackling reflect very closely those issues which are causing concern to the MAIB. The Institute will be seeking, in cooperation with other organisations, solutions to the following main issues:

- Competence and core skills
- Manning levels
- Stress and fatigue
- Leadership and management skills
- Codes of practices

Readers who would like more detail about the Nautical Institute and how our strategic plan aims to address these issues are invited to visit our website at www.nautinst.org

Changing my Nautical Institute hat now for my ISM Consultants hat, I would invite readers to try a little experiment when you read these accident and incident reports.

My own belief is that accidents or incidents cannot be investigated or analysed in isolation from the requirements of the ISM Code. Although the MAIB does not get involved in blame or litigation, other organisations do! While the Law is still in its infancy with regard to considering the implications of the ISM Code and, specifically, the relevance of the Safety Management System (SMS), I am in little doubt that the bench mark against which the various legal tests will be measured will be the ISM Code. I believe the Courts, (Civil and Criminal), Prosecutors, Arbitrators, Lawyers and Insurers will look at issues of causation in any particular incident and will then examine very closely the SMS to identify points of contact. There will be three main questions in mind:

1. How was the SMS set up and structured? – i.e. the procedures, manuals, checklists etc will be examined – including procedures for training, familiarisation and recruitment etc.;

2. How well were these procedures implemented in practice? This will include reviewing internal audits, reports of accidents, hazardous occurrences and non-conformities, as well as minutes of safety

committee meetings, Masters' reviews, Company reviews and other relevant contemporary evidence such as details of any risk assessment undertaken, STCW hours of work/hour of rest records, passage plans, checklists, maintenance records – or whatever other records may be of relevance.

3. To what extent did a failure of the SMS contribute to the accident/incident under consideration? This will become evident when reviewing the evidence collected from the investigation of the incident with the requirements of the SMS.

When you read the reports try and keep in mind an idea of the contents of the ISM Code and consider, for each incident the following questions:

- Do you think the incident was a result of a non-compliance with some specific section of the ISM Code?
- Which specific section(s) of the Code did you identify?
- To what extent was the accident a result of a failure of a typical SMS?
- What failures of a SMS can you identify?
- What procedures should have been in place in the SMS which might have helped prevent the particular incident from happening?
- What could be done by way of corrective action to tighten up the SMS to ensure that the chances of the incident being repeated are reduced to a minimum?

I would encourage all readers, including the MAIB Inspectors, to consider utilising this simple methodology in their analysis of incidents which will help to bring the ISM Code, and the SMS, alive and more relevant in the way we look at and manage safety on board our ships. Although, of course, a preferred option would be to prevent the accidents and incidents occurring in the first place!

**Dr. Phil Anderson BA (Hons.), D.Prof., MEWI, AMAE, FNI**

Dr. Anderson is the immediate Past President of the Nautical Institute and regarded internationally as a leading authority on the ISM Code.

Dr. Anderson commenced a seagoing career in 1969 as cadet with the Bibby Line of Liverpool. He remained with the Bibby Line throughout his seagoing career, serving on board general cargo vessels, bulk carriers, OBOs, liquid gas carriers and container vessels. He came ashore in 1980, after obtaining a Class 1 Master Mariners' Certificate, taking up a career as P&I Claims Executive with Sunderland P&I Association. In 1987, he transferred to North of England P&I Association, in a similar capacity and was appointed to a unique new position in the P&I Industry in 1991 as Liaison and Training Executive responsible for all education, training and loss prevention initiatives. From 1998 he was Manager in charge of Risk Management and Loss Prevention and was appointed Director of North Insurance Management Ltd.

He was awarded the degree of Doctor of Professional Studies from the National Centre for Work Based Learning Partnerships at Middlesex University in 2003 – in respect of a major research project into the implementation of the ISM Code – 'Managing safety on board ships'.

In January 2005 he established ConsultISM Ltd., a specialist consultancy company providing advice to the shipping and marine industries, and as court expert witness, in the ISM Code – details can be found on the company website www.consultism.co.uk . He is Member of the Expert Witness Institute and Practicing Associate of the Academy of Experts.

In addition, he undertakes some academic work teaching in a number of universities. He has also written a number of technical and legal text books including: *'ISM Code – A practical Guide to the Legal and Insurance Implications'*; *'A seafarers guide to ISM'* and *'What have the World Cup and ISM got in common'* –; Lead Author – *'Cracking the Code'*; and his latest work, *'The Mariners Role in Collecting Evidence – in Light of ISM'*.

# CASE 1

# Radar Lookout – So Important

Figure 1

## Narrative

A 192m length bulk carrier was outbound at night on a UK river when she collided with five unlit barges. The vessel was holed in her fore peak and had to be repaired before she could continue her voyage (Figure 1). The barges were damaged to varying degrees and four of them sank.

Four of the barges were filled with containers of rubbish and were moored on one side of the river in preparation for being taken to a jetty at high tide for discharge. The barges containing rubbish (Figure 2) were tied up to a collar barge with breast lines. The mooring between the collar barge and the anchor was a chain, which incorporated a swivel. Additional lines were generally attached between the rubbish barges and the chain, for extra security (Figure 3). On a previous occasion, one of these "insurance" lines had dropped down the chain and had become wrapped around the swivel, jamming it. The line had been cut and left, and in the months preceding the accident, the barges had rotated around the mooring at each change of the tide, progressively twisting the chain until a shackle failed.

The bridge on the bulk carrier was well manned and the visibility was good. The pilot had the con and was navigating by eye, and the master and helmsman were looking ahead. The second mate was using radar for navigation, but was not using it for lookout. As the ship approached the barges, the master saw a shadow about 100m ahead of the bow and, shortly after, the second mate confirmed that it had a radar echo. However, an immediate turn to port did not prevent the collision.

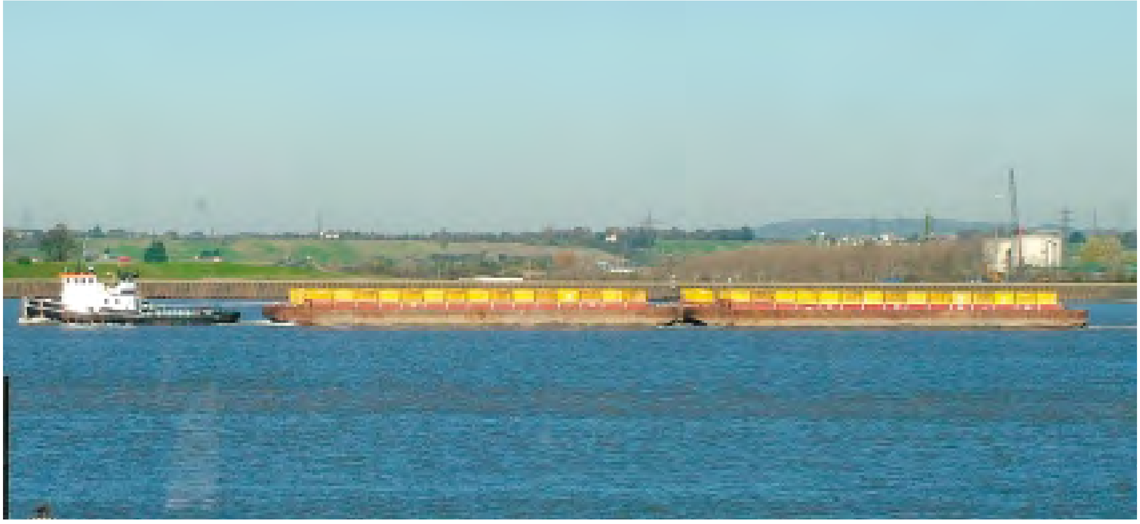


Figure 2


Figure 3

## The Lessons

1. Although unusual, dangerous unlit objects can be encountered on a river at night, rendering a visual lookout alone insufficient. This bridge team was keeping an excellent visual lookout, but it should have made use of *all* available means, including radar.
2. This accident has clearly demonstrated the importance of a properly functioning swivel in a river mooring system. Moorings should be frequently checked, and mooring practices that could lead to a swivel becoming jammed should be avoided.

# Problems Compounded!

## Narrative

A laden UK flag general cargo vessel grounded on a charted shoal and sustained serious hull damage while in Danish territorial waters. The master was standing the navigation watch.

At the time of the accident, the vessel was in thick fog, and had been for the previous 24 hours. The fog signal had been sounding for this period, which had disrupted sleep patterns for all those on board. This increased the fatigue of the master, who was already affected by the arduous 6 on 6 off watchkeeping routine over a 6 week period.

A rudimentary passage plan had been completed on the GPS, however many of the waypoints were positions of buoys. The navigators were in the habit of staying to one side or other of the course line to avoid hitting the buoys at the alter course positions. These GPS planned course lines were able to be displayed on the vessel's radar and some, but not all, had been drawn on paper charts.

The master correctly plotted the vessel's position at 0850, 35 minutes before the grounding, as 2 miles to starboard of the course line. This did not alarm him. The master then changed charts and correctly transferred the position onto the new one. He noticed that the mate had not drawn the course line on the chart, but he did not draw it on himself. The course had been planned to pass 3 miles off a shoal which was not highlighted on the chart. By being 2 miles to starboard of the course line, he had reduced the margin for error to 1 mile.

Due to a combination of current and wind, the vessel was set further to starboard and towards the shoal. This danger was not recognised by the master because he plotted an incorrect position at 0920, about 5 minutes before the grounding, which, as luck would have it, showed the vessel to be roughly where he expected her to be (Figure 1).

The vessel grounded heavily but only momentarily. She immediately began listing to

Figure 2

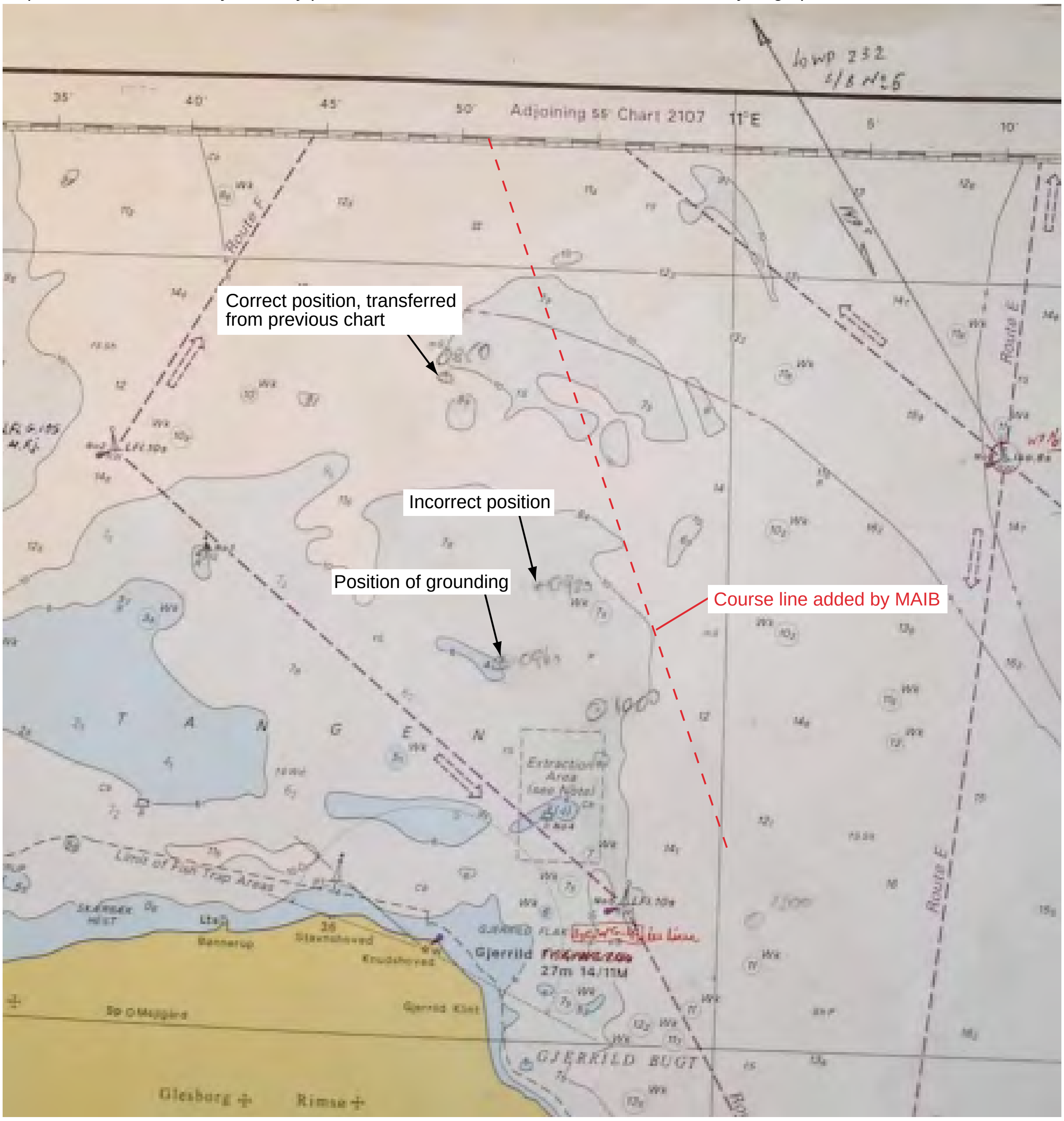



Figure 1 – Navigation chart on day of the accident. Note the lack of a course line laid down by the master

starboard and trimming by the head. Subsequent soundings found four ballast tanks had been opened to the sea (Figures 2 and 3).

The crew ballasted the vessel upright, but she was still trimming heavily by the head and was now below her marks. About 3 hours after the grounding, the master contacted the owners and managers to inform them of the situation. Unfortunately he did not inform the coastal state, which found out a few hours later.

The vessel steamed slowly to her next port, where the master was duly fined by the coastal state for not reporting the accident to them.

Figure 3

## The Lessons

1. Planning a passage using buoys as waypoints is poor practice. On this vessel it led to her routinely being allowed to track to one side or the other of the charted course line, and a lax attitude to chart work and navigation generally.

2. At the time of the accident, the guidance course line had not been drawn on the chart. Although the master was able to refer to the radar to see how far off the planned track he was, this did not give him information about his proximity to charted dangers such as the shoal.

3. The shoal was a hazard to navigation which lay close to the planned track, but it had not been highlighted on the chart. This is contrary to good passage planning practice.

4. The master incorrectly plotted a GPS position on the chart just before the grounding. The practice on board was to read the position directly off the GPS receiver and plot it without first recording it in a GPS log. This made it more difficult to check, and provided no record in case of an accident.

5. The master failed to inform the coastal state, despite grounding just 5 miles off its coastline. He did not report the incident to his own managers for 3 hours. This was contrary to his own company procedures and national and international obligations.

# Engineer's Nose Wins!

## Narrative

A large, newly built container ship was on passage when an engineer noticed smoke coming from the hatch covers, just forward of the accommodation. The general alarm was immediately sounded, followed by a message on the public address system.

Hold ventilation was shut down and emergency parties mustered, some of them going directly to the area of the deck by the hold access hatch. Two crew members entered the hold, wearing self-contained breathing apparatus (SCBA) and carrying a fire hose. The fire was found to be centred on a refrigerated container. The power supply cable to the unit was unplugged and the two men then requested portable fire extinguishers, which they used to extinguish the fire. The chief engineer, also wearing SCBA, joined them and a cooling water spray was used to cool the affected containers. The fire was confirmed out.

Ventilation was then restarted and the smoke cleared. An examination found the fire was probably started by the overheating of a coiled power supply cable to a refrigerated container (see Figure). This was probably aggravated by it being next to the discharge, and therefore hot side, of the unit's compressor.

## The Lessons

1. The vessel carried the required four sets of SCBA. At one stage, before the smoke cleared, three men were in the hold, leaving only one SCBA spare. Before committing three SCBAs to an incident, thought should be given as to how one person, wearing the single remaining SCBA, could recover any casualties unaided.

2. The fire was found by the engineer noticing smoke coming from the hatch; the automatic fire detection system did not activate. Later tests showed the system did function, but only after the sampling lines had been blown through. This suggests the possibility that these lines were not completely clear, and points to the importance of testing these lines, even on a new ship.

3. Being a new ship, this one was suffering from its share of false alarms; one of them being the general alarm sounding on a regular basis. As a result, the crew had become 'alarm weary'. The master prudently followed this general alarm with a voice announcement, to make it clear to the crew that this was not a practice or a false alarm.

4. In their enthusiasm to help, a number of the crew went directly to the area by the hold access hatch, rather than to their designated muster station. This generated some confusion and caused delay in getting a reliable head count. Such uncertainty can result in some fire-fighting activities being delayed, and should be avoided by having disciplined mustering routines.

# Fatal Accident While Recovering a Gangway

Figure 1

Photograph courtesy of FotoFlite

## Narrative

A motorman received a fatal head injury while assisting in the recovery of the gangway on a 145m (Figure 1) length tanker as it prepared to leave a refinery berth.

It was early evening and the bosun was in charge of the operation; he had the motorman and one able seaman to help him. The manifold crane could not be used initially as it could not reach the gangway in its deployed position. The inboard end was therefore manhandled from the main deck guardrail (Figure 2) up onto a walkway guardrail. The gangway was at a steep angle in this position. The motorman had stood just aft of the gangway on the main deck while he had assisted with manhandling it on board. He remained in this vulnerable position between the gangway and the crane as the lift began. The bosun was driving the crane using portable controls on a wandering lead. He could clearly see the gangway and the other crew involved.

The crane was still only just able to reach, and when the weight was taken, only the outboard legs of the bridle were effective. As the gangway was lifted further, the inboard end slid up the walkway railings and the load became unstable. The gangway, which weighed about 250kg, rotated, and the inboard end slid off the railings and hit the motorman on the side of his head. The motorman was wearing a hard hat which was attached with a chinstrap, but this was ineffective protection in that situation. First-aid treatment was given, and the emergency services arrived promptly after the accident, but the motorman could not be revived.

Figure 2

## The Lessons

1. The motorman did not appear to be aware of the dangers involved with lifting a gangway under these circumstances. The crew were not properly briefed on what to expect, and the risks were not being properly managed. The inboard end of the gangway, which was effectively unsupported by the lifting bridle, should have been controlled by the use of preventer lines.

2. The bosun, as the most experienced and senior seaman present, should have exerted positive control over the operation, which should have included ensuring that all crew were in safe positions before starting the lift.

3. It may not be a coincidence that the accident occurred to a motorman. The MAIB have come across other incidents where motormen or catering staff have been seriously injured while working on deck. Deck crew are taught to look after themselves, to be aware of the dangers, not to stand where moving loads could conceivably hit them, and to keep clear of snap-back zones. Anybody else who is called upon to work with mooring lines or lifting gear should receive relevant training and be very carefully supervised.

# Family in Hit and Run Scare

Figure 1

## Narrative

A 96 metre length cargo vessel (Figure 1) was approaching a course alteration point as the master arrived on the bridge to relieve the chief officer at the end of his 6 hour watch. The chief officer was aware of a fishing vessel on his starboard bow at a distance of about 2 miles, but he decided to alter course to starboard to pick up the next planned course, anyway. He did not assess the effect the course alteration would have on the potential for a collision.

The fishing vessel was on passage for her home port and the skipper was in his wheelhouse. He had noticed the cargo vessel on his starboard side when she was still quite a long way off, and had noted that she was going to pass clear astern. He had then turned his attention elsewhere. His two crew members were his son and nephew, who were processing the catch on the port side of the working deck.

A few minutes later, the skipper heard a loud whistle signal, and looked out to starboard to see the cargo vessel's bow bearing down on him at a very short range. He gunned his engine ahead as the cargo vessel's bow loomed over him, and swung the wheel to port. His actions were almost sufficient to avoid the collision, however, as the cargo vessel's bow passed his vessel's stern, it collided with the gantry, heeling his vessel heavily over to port and causing substantial damage to the gantry, power block and decking.

Prior to the accident, the master and chief officer had been looking at the fishing vessel which, since altering course, was on their port side. They had stood on, believing that she should – and would – give way for them. The master had attempted to call her on VHF channel 16, however there was no response as the skipper was monitoring only the local working frequency. The master sounded the whistle at the last moment and this finally alerted the fisherman to the danger.

Figure 2 – Starboard wheelhouse windows

After the collision, the fishing vessel continued towards her home port at full speed because the skipper feared that his vessel could be seriously damaged, and he wanted to get in as soon as possible. On arrival, he reported the collision to the coastguard.

The cargo vessel's master and chief officer were not sure if they had been in a collision, and on seeing the fishing vessel sail on, decided that no harm had been done. On arrival at their next port, the master checked the bow of his vessel and noticed some extra dents and new paint marks. This confirmed that the vessels had, indeed, collided. However, the master did not report this to anyone.

The local coastguards assumed the collision had been a "hit and run". However, after checking the AIS recordings for the area, they were able to identify the other vessel involved.

MAIB inspectors visited both vessels and spoke to everyone involved. The inspectors noticed, among other things, the poor condition of the Perspex type windows on the fishing vessel, which seriously obscured the visibility from the wheelhouse due to fading and crazing (Figures 2 and 3).

Figure 3 – Forward wheelhouse windows

## The Lessons

1. The mate on the cargo vessel routinely had a "suck it and see" approach to navigational planning. When reaching a waypoint, he would often alter course and then see what effect it had on the vessels in the vicinity. He mentioned the lack of automatic radar plotting devices on the bridge as the reason for this action. However, if he didn't have time to manually plot a trial manoeuvre, a rough estimate would have been good enough to indicate that the prudent action was to wait. In this case, he had ample sea room, and he should have waited until the fishing vessel was definitely passed and clear before altering course.

2. The alteration of course was made too late for the master to be able to assume the fishing vessel had become the give-way vessel under the Colregs. In any case, notwithstanding that he did consider her to be the give-way vessel, he took too little action himself, as the stand-on vessel, to avoid a collision (Rule 17).

3. After suspecting that he might have been in a collision, the master's actions were far removed from what was required, namely: stopping his vessel where possible; offering assistance; positively confirming the other vessel was safe and well; and reporting the accident to the relevant authorities.

4. The radio watch and visual lookout kept on the fishing vessel were not satisfactory, and the latter was not helped by the condition of the wheelhouse windows.

# CASE 6

# A Grounding in the Basics

## Narrative

A ro-ro ferry with 110 people on board was leaving a port at night via a 731-metre wide buoyed channel. The master had the con and was accompanied on the bridge by a third officer and a helmsman.

Following a VHF conversation with the pilot on board an inbound 25000gt bulk carrier, the master had manoeuvred the ferry close to the northern limit of the channel to avoid impeding the large inbound vessel. Course was 290° and speed was 15 knots over the ground.

As the bulk carrier passed down the ferry's port side, the third officer moved to the port bridge wing to check that she was passing clear. At the same time, the master ordered 'port ten' to keep the ferry within the buoyed channel and clear of its red lateral buoys marking its northern limit. The helmsman, who was using starboard rudder at the time, repeated the order, but applied 10° of starboard helm. Because the ship's head did not seem to be responding, the master then ordered 'port twenty' followed several seconds later by 'hard to port'. On both occasions, the helmsman again repeated the order, but increased the amount of starboard helm. When the master looked at the rudder angle indicators mounted on the bridge deck head, which was about 16 seconds after he had ordered port helm, the helmsman's error was immediately apparent. The helm was quickly put hard to port and the engines to full astern. However, by that time, the ferry was turning to starboard and was leaving the buoyed channel.

The corrective action was taken too late to prevent the ferry from grounding.

## The Lessons

1. **This is not the first time a helmsman has put the helm the wrong way in pilotage waters, and it won't be the last. However, such a mistake need not result in an accident, providing it is spotted immediately. Regardless of the experience of those involved, this can only be achieved by the good seamanship practice of habitually checking the rudder angle repeater after each helm order has been given. It will often be too late to rectify the error if the movement of the ship's head is relied upon.**
2. **To steer a course, helmsmen frequently need to carry large amounts of either port or starboard rudder due to a variety of reasons, including the weather, engine configuration and trim. In such circumstances, the procedure of taking control of the rudder, when initiating a turn, by ordering 'midships' just prior to the intended alteration prevents any delay in turning in the required direction, and also helps to reduce the risk of confusion. Conning is an extremely important but simple procedure on which the safety of a ship depends. In pilotage waters and in close proximity to other vessels it needs to be both positive and precise.**

# A Dare Too Far

## Narrative

A ship was lying at anchor. Shore leave had been granted, and a boat arranged to take crew members ashore. The last boat back was at 2315, and on its arrival at the ship, all personnel were accounted for by the OOW. Access to the ship was via the accommodation ladder, which was rigged on the starboard side.

Most of the returning crew went to bed, however three men remained chatting in the crew recreation room. They had all been drinking, and the chat led to a dare to see who could get through the escape porthole. All three managed to complete this task, which left them on the port side of the main deck underneath the lifeboats. A further dare was then made to see who could dive into the water and swim around the stern of the ship to the accommodation ladder. The dare was refused. At that point, one of the men received a mobile telephone call, so went to his cabin to answer it, where he fell asleep. This was the last time the remaining two men were seen.

A little after 0100, the OOW sent the on watch AB to see how the anchor cable was lying. On his return to the bridge, he mentioned that he had seen a pair of shoes under the starboard lifeboat. The OOW went to investigate, and, noting that they had been left carelessly, as if thrown off by someone jumping overboard, he called the chief mate and the master. Shortly afterwards, the crew were mustered to emergency stations, where it was discovered that two men were missing. A thorough search of the ship was carried out, and when the missing men were not located the coastguard was informed and a search and rescue operation started. Unfortunately, neither man was found; both were presumed to have drowned.

## The Lessons

1. **There is little doubt that alcohol played its part in this accident, in particular making a bad idea seem like a good one.**

2. **Swimming off a ship is never a good idea, especially when the water temperature is low and there is a strong tide running. The alcohol the men consumed would have further reduced their survival times once they were in the water.**

3. **The ship reacted positively and correctly. The quickest method of accounting for missing persons is to muster the crew at emergency stations. It will also provide an immediate pool of manpower for searching the ship.**

# CASE 8

# Just Because it Isn't Leaking, Doesn't Mean it is Right

## Narrative

A 7500gt cargo ship with a crew of 18 was on its regular passage from Nova Scotia to Europe. At about 0520 on the sixth day of the passage, the duty engineer was woken by an unidentified engine room alarm. Soon after, the fire alarm also sounded.

On arrival at the control room, the duty engineer saw flames from the vicinity of the main engine through the engine room access door window. He alerted the bridge, raised a loud vocal alarm and stopped the main engine. Within 5 minutes of the alarm sounding, the chief engineer was on the scene, the crew were mustered and a fire-fighting team equipped with breathing apparatus was available.

The situation deteriorated, so the chief engineer decided to use the fixed $CO_2$ fire-fighting system. The quick closing fuel valves, main sea suctions, and remote stops for the ventilation fans and fuel pumps were operated. Within 10 minutes of the alarm sounding, and having confirmed that the crew were accounted for, he released the $CO_2$. The master also broadcast a "Mayday" by VHF channel 16 and via satellite phone to the appropriate MRCC.

After about 3 hours, a hotspot was discovered in an adjacent compartment. The chief engineer released a further charge of $CO_2$ into the engine room from the supply allocated to the cargo holds. This left sufficient $CO_2$ for one more full charge for the engine room.

Figure 1 – Example of fire damage

Figure 2 – Incorrectly fitted fuel inlet backing plate

The hotspot temperature continued to rise, so the chief engineer decided to wash down the engine room casing adjacent to the hotspot, internally, from above, using fire hoses. The casing soon began to cool, and the access door was then closed. The engine room remained sealed until a salvage tug arrived on scene 3 days later. Once the vessel was under tow, the engine room was ventilated and atmosphere tested with an $O_2$ meter, and confirmed safe before a full re-entry of the space was authorised.

The vessel sustained significant fire damage to the engine room equipment (Figure 1). There was also floodwater damage from the use of fire hoses, and collapse of some pipework systems.

Subsequent investigation showed that the fire was caused by the loosening and displacement of a main engine fuel pump inlet pipe securing plate. This allowed the inlet pipe to become detached, spraying IFO80 fuel at 5 bar and 100°C over the main engine, where it came into contact with the hot exhaust system and ignited.

The fuel pump had been last changed 5 months earlier. During the investigation, it was noticed that a similar fitting on another fuel pump on the engine had also been incorrectly fitted (Figure 2) – the securing plate had been reversed. This meant that the cap screws were only screwed into the fuel pump block by 2½ turns, as opposed to 8½ turns when correctly fitted. It is likely that the fitting which failed, was also incorrectly fitted, and it vibrated loose, leading to the accident.

## The Lessons

1. At least one of the main engine fuel pump inlet pipe securing plates was incorrectly fitted, leaving them in an unsafe condition. It is likely that the fitting that became loose, which then led to the fire, was also fitted incorrectly when the fuel pump was last replaced.

   Mistakes do happen during maintenance, and if it is possible to fit an item incorrectly, eventually it will be. The problem here was that, although the incorrectly fitted fuel pump fittings were clearly visible, they had not been spotted either on completion of the pump change or in the subsequent days and months during normal watchkeeping.

   Regardless of how often you inspect a piece of machinery, try to remain inquisitive and alert to the possibility that it is not as it should be. It is especially important for chief engineers to closely examine all machinery, following maintenance.

2. The master did not use DSC to broadcast the "Mayday", and this could have limited the awareness of others to the situation.

3. The chief engineer's decision to open up the engine room casing and cool down internally, while understandable, was potentially dangerous and could have caused re-ignition. Although the crew in this case were well above the fire, it should always be borne in mind that exposure to $CO_2$ could be fatal. The lesson is to avoid exposure until the atmosphere is proven to be safe.

4. Always consider boundary cooling to reduce hotspots; this will also help the $CO_2$ to extinguish fires by removing or reducing the heat.

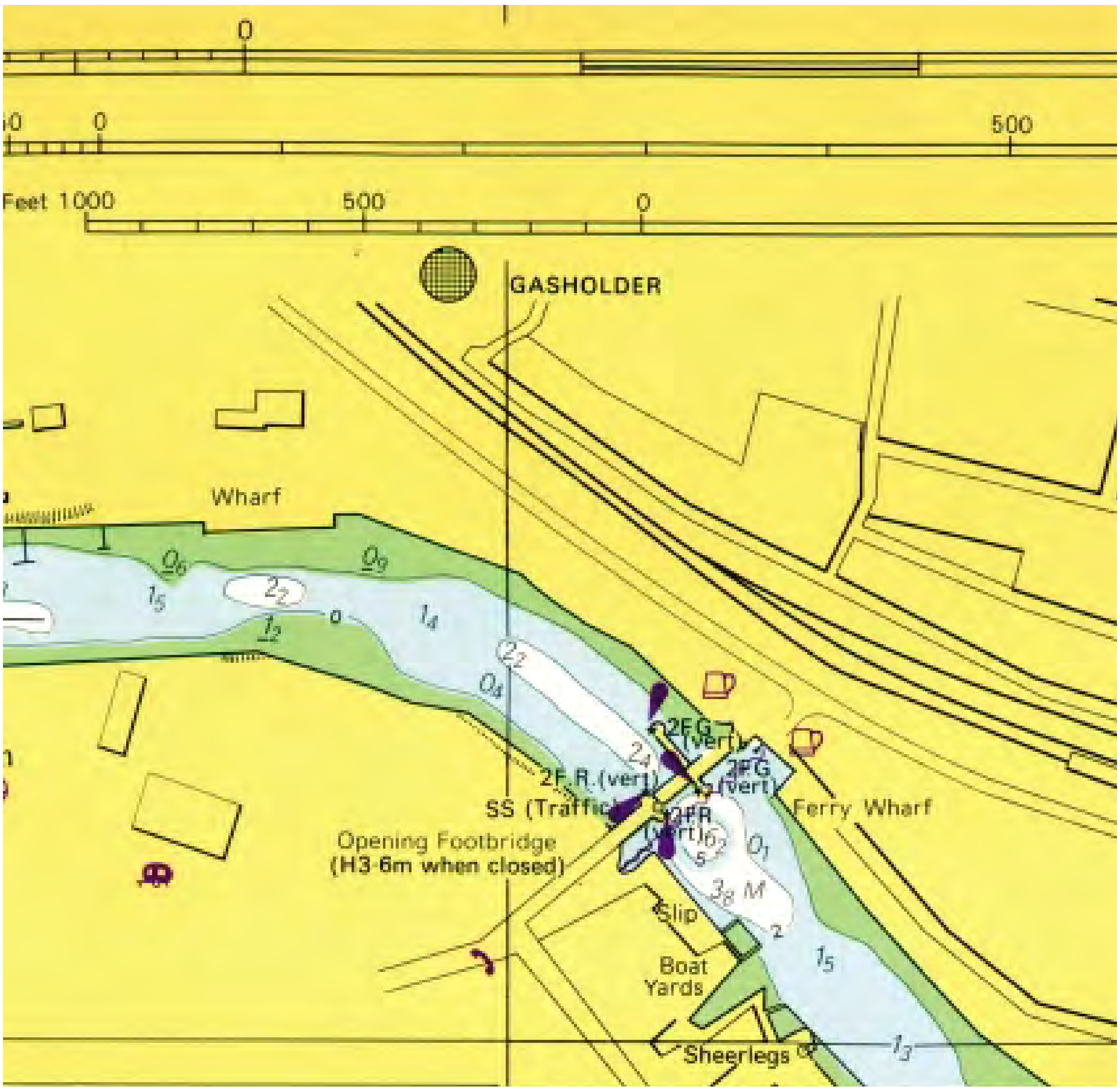
# Language Difficulties

## Narrative

A 794gt cargo vessel with a Polish master, officers and crew arrived off a port in southern England and a pilot boarded. It was about 2 hours before high water. The pilot informed the master how he wished the passage up the river to be performed, including the procedure he advised to adopt when swinging the vessel and berthing. The master appeared to understand the pilot's advice and, when asked if he understood, confirmed that he did.

The master steered the vessel between the breakwaters using the Aquamaster controls, and the pilot gave advice which the master seemed to understand. As the vessel neared a bridge, which was situated near the berth, the pilot repeatedly asked the master to slow down. On each occasion, the master replied "yes", and he appeared to obey the instructions although he was having trouble keeping steerage way (Figure 1 [chartlet]).

As the vessel closed the bridge, the pilot told the master that the vessel must be slowed further immediately after the bridge. As the vessel passed under the bridge, the pilot again advised the master to slow the vessel. The master did not reply, but spoke in Polish to the vessel's mate, who was on the forecastle head. The pilot then informed the master, yet again,




Reproduced from Admiralty Chart by permission of the Controller of HMSO and the UK Hydrographic Office that the vessel was going too fast and that he must slow her down. The pilot gestured, using the palms of his hands in a downward motion to indicate what he meant. The master appeared to take no action and the pilot could hear shouting in Polish over the intercom. The pilot received calls from the berth mooring team stating that the vessel was going too fast. The pilot shouted to the master to put the engines to full astern. The master then asked for confirmation that he wanted the engines put to full astern, to which the pilot replied "yes, full astern". Only then did the master comply.

Even though the forward speed of the vessel was reduced, her starboard bow struck the berth, causing the bow to sheer to port and the starboard quarter to strike a ladder on the berth.

During the subsequent operation to swing the vessel round in the river, the stern was temporarily grounded on the opposite bank because, again, the master didn't obey or didn't fully understand the pilot's advice.

## The Lessons

1. **Although the master's standard of English appeared to be good, he was saying "yes" to the pilot without fully understanding what he was being told. Language barriers can be a difficult problem for pilots, but there are a number of ways to mitigate this type of situation. One method is to ask the master or bridge officer to repeat back what has just been said to him, and then to ask him if he has understood the advice. Pilots need to monitor carefully the subsequent action of the master or officer to ensure the correct action is being taken.**

2. **The common language on board this ship was Polish, so the pilot could not understand the operational advice being passed between crew members. Key information should have been translated.**

# Transferring Equipment at Sea Causes Head Injury

## Narrative

An able seaman, who was working on the deck of a 26 metre multipurpose/anchor handling vessel, was seriously injured while assisting with the transfer of the second of two steel wire pennants onto his vessel from a similar vessel. The two vessels were involved in the construction of an offshore wind farm tower.

The pennants were being transferred using the crane on board the other vessel. The two vessels were not secured together at the time of the transfer operation because the two masters believed it was unnecessary. The weather was good and the sea was calm. There were low swell waves of about 40cm in height, and a strong tidal stream was running.

During the transfer, the vessel that was sending the pennants, moved astern and separated slightly from the other vessel, causing the crane block to swing across the deck and striking the crewman behind his ear. He complained of feeling dizzy, and the master noticed a swelling behind his ear. The master arranged for the man to be transferred to a boat and sent ashore for medical attention. The man's condition later deteriorated, and he remained in hospital until he was finally repatriated to his home country.

At the time of the accident, the able seaman was not wearing a safety helmet, although they were supplied and ready for use on board.

## The Lessons

1. Personal Protective Equipment (PPE), including safety helmets, was supplied on board, but it was up to the individual to ensure his or her own safety by wearing them. The crew member was wearing no safety helmet and was working in full view of the master, yet nothing was said. It is likely that a helmet would have made little or no difference to the injuries sustained, but the issue does indicate a lax safety management system.

2. All hazardous operations, such as the transfer of wires and anchors at sea, should be risk assessed and, if necessary, a detailed written operations procedure should be completed. A risk assessment in this case should have highlighted the dangers associated with not securing the vessels together before transferring items of equipment.

# Protect Yourself From the Sun

## Narrative

An 83 metre offshore supply vessel was returning to her usual port on a clear winter afternoon. The OOW was on the bridge, the visibility was 8 to 10 miles, and the sea slight with light winds from the south-west. The vessel was making about 9 knots on a southerly course, with the sun right ahead and low on the horizon.

The skipper and one crewman on a 9 metre creel boat were engaged in hauling pots on board. The appropriate fishing signals were being displayed. The skipper was keeping a watchful eye on the radar and he noticed a target at a range of about 3 miles, which was heading directly towards his stationary vessel. When it was about 1 mile away, he could see that the vessel was an offshore supply vessel and that it was still heading directly towards him. The skipper became concerned and tried to call the vessel on VHF channel 16. But he received no response, so when the vessel was about 0.5 mile away he called her again. Once again, he received no response and so, fearing for the safety of his crew and boat, he threw the rope off the pot hauler and sped out of the path of the approaching vessel's bow.

As the supply boat passed by at a distance of about 200 metres, the fishermen could clearly see a person moving on the bridge.

Subsequent investigation established that:

- The OOW on the supply vessel had only seen the fishing vessel at the last minute because the sun had been low and right ahead. He had tried to alter course to starboard, but very late.
- The fishing vessel's radar target was very weak, possibly due to a poorly adjusted radar on the supply vessel.
- The OOW had not called the master in accordance with his standing orders.

The events leading to this incident are almost identical to those involved in the 1995 collision between the fishing vessel *Sharridale* and the offshore supply vessel *Huntetor,* in which the fishing vessel sank with the loss of one life. The recommendations from that investigation are also pertinent to this case, including the need to keep a proper lookout and radar watch.

## The Lessons

1. **Be alert to the dangers associated with the sun being low and right ahead, and take precautions such as calling for a lookout, wearing sunglasses, or rigging bridge sunscreens across the wheelhouse windows.**
2. **Ensure that the radar controls are adjusted correctly so that small targets like those of small fishing boats and yachts will be detected.**
3. **Despite the advent of digital selective calling (DSC), continue to monitor Channel 16 VHF. Ensure the volume is turned up on VHF sets, especially when there is a chance of meeting small vessels.**

# CASE 12

# Mandatory Tests Are Not a Guarantee

## Narrative

The crew of a 22 year old bulk carrier were carrying out a launch and recovery exercise with the vessel's starboard lifeboat when, due to the failure of the davit's winch, the lifeboat plummeted into the water.

The lifeboat had been lowered into the water and was in the process of being recovered. It had been hoisted to the embarkation deck and stopped to allow the lifeboat's crew to disembark. One of the crew thought the gap between the lifeboat and the vessel's deck was too wide to safely step across. He asked the crewman at the winch to hoist the lifeboat a little further.

The winch motor was started to raise the lifeboat slightly and, coincidentally, the winch drum began turning rapidly, allowing the lifeboat to fall into the water about 10 metres below. Emergency services were immediately called.

After disconnecting the lifeboat from the falls, it was pulled to the quay, using its painter, where a shore crane lifted it ashore. There, all the crew managed to climb out unaided, and received medical attention. Two of the seven crew in the lifeboat suffered injury; the remainder were unhurt.

The winch failed because the drive between the wire drum and motor/brake was lost, as indicated by one end of the drum collapsing (Figure 1). The drive shaft of the winch passed through both ends of the drum and, at one end, was keyed to a boss welded to the drum's end. It was through this keyed connection that

Figure 1

Figure 2

the hoisting and braking torques were transmitted. The drum end had failed at this end due to corrosion, and the keyed boss had separated from the cylindrical part of the drum (Figure 2).

After the accident, the winch on the port lifeboat's davit was dismantled for examination. The drum, at the keyed drive end, was corroded to a degree that suggested it could have failed at any time, in a similar fashion to the starboard winch.

## The Lessons

1. **Both lifeboat winches on the vessel had been overload tested and examined as required by SOLAS. The next overload test was not due for over 2 years. These tests alone cannot guarantee a winch is able to operate safely for another 5 years.**

2. **The very small gap between the drum's ends and the winch's frame made it very difficult to visually examine the drum's ends for corrosion. Before the mandatory 5-yearly 110% load testing is carried out, it may be prudent to remove a drum to make a proper assessment of its condition.**

3. **Due to their limited power, many lifeboat winches are not designed to hoist a lifeboat with more than its launching crew on board. Procedures in the training manuals of many ships specify this, as was the case for the vessel involved in this accident. The motor on this winch was capable of hoisting a partially loaded boat, so the practice should have caused the winch/davit system no difficulty. However, the more crew there are in a lifeboat during recovery, the more people are placed at risk if things go wrong.**

# CASE 13

# Fatigue and Distraction Lead to Malacca Strait Collision

Figure 1

## Narrative

A fully laden 17,000gt UK flag container vessel (Figure 1) collided with a partly laden Panamanian flagged 4,000gt tanker (Figure 2). Both vessels were heading north-westerly in the Malacca Straits. The accident occurred at 0345 hours.

The tanker was proceeding at her full sea speed of about 10 knots. At about 0200, as there was little traffic around, the master and the seaman lookout went below to rest, leaving the second mate alone on the bridge. The company's policy was for the master to be on the bridge in traffic separation schemes and in areas of high traffic density.

At the time of the accident, the container vessel was building her speed towards her maximum of 19 knots. She had left her berth in Singapore shortly after midnight. At about 0300, the master had gone below to send some departure messages, with the intention of returning in about an hour. There was little traffic around, but this left the second mate and a lookout on watch. The company's policy was for the master to be on the bridge at this time. The second mate was suffering from fatigue as he had received just 3 hours of broken sleep in the previous 28 hours.

The container vessel's second mate had acquired the tanker on his ARPA as he approached to overtake. He elected to overtake on her starboard side, and he altered the course of his vessel slightly to starboard to leave more room.

The second mate on board the tanker had acquired the container vessel on his ARPA, and he was also plotting two small targets which

Figure 2

were approaching on his starboard bow. He had decided that the overtaking vessel was going to pass clear, but he neglected to keep monitoring her position and course. During the build up to the collision, he plotted his vessel's position a number of times in the curtained-off chart room. He might have noticed, and been reminded of the overtaking vessel, but the window in the chart room was permanently blocked to prevent light reflecting from the paintwork on the starboard bridge wing (Figure 3).

The Malacca Strait VTIS operator called the tanker to remind him that he had two targets on his starboard bow, and this prompted the second mate to alter course to bring them onto his port bow. He had altered into the path of the overtaking vessel but, by that time, was concentrating on the two other targets.

The VTIS operator then called him again to let him know about the overtaking vessel. He looked to starboard and saw the foremast light of the container vessel broad on his starboard bow and very close. He ran to the steering position and put the wheel hard to port.

The seaman lookout on board the container vessel had noticed the tanker alter course to show a green light and mast lights, but thought it unnecessary to inform the second mate. He assumed that he was aware because he was standing close by and was looking out of the window. In fact, the second mate had not noticed, and did not become aware of the dangerous situation until the tanker was very close to his own port bow. He then ordered the watchman to change to manual steering and put the wheel hard to starboard as he called the master by phone.

The two vessels' bows collided first, and they then swung apart and the starboard quarter of the tanker collided with the container vessel's hull just forward of the accommodation. The two hulls then scraped together until the faster container vessel finally pulled ahead and clear.

Both vessels went to anchor in the inshore lane to assess damage. They both informed the local VTIS of the situation, however, surprisingly, they did not communicate with each other.

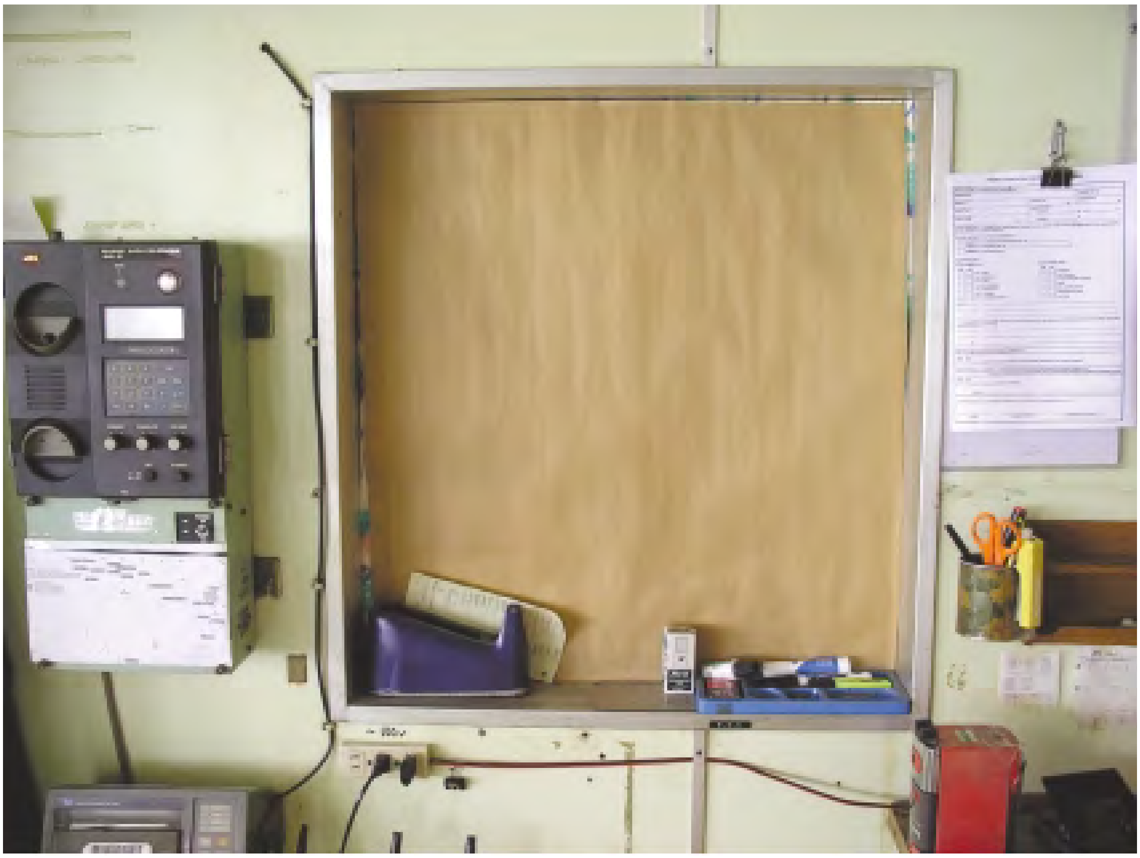


Figure 3 – Blocked starboard side chart  room window

Figure 4 – Tanker's starboard quarter damage

The master of the container vessel followed company instructions and informed the vessel managers and owners using 24-hour emergency contact numbers.

Despite the company orders requiring immediate notification after an accident, and the fact that 24-hour numbers were available, the master of the tanker chose to tell his designated person by e-mail as there was no satellite phone on board. He did not attempt to make a radio link call and, due to the time difference, the DPA was not aware of the accident until many hours later.

Both vessels were seriously damaged but, fortunately, nobody was injured and there had been no pollution as a result of the accident.

## The Lessons

1. The ARPA CPA and TCPA alarm functions on both vessels were set to the minimum possible for each unit. Neither officer therefore received a timely warning of the impending close-quarters situation. Although frequent alarms can be considered a nuisance in busy traffic areas, these safety features should be used. When set to sensible limits, they help to avert collisions like this one.

2. The second officer on board the container vessel had elected to go ashore during the previous evening in port instead of sleeping prior to his watch. He would have been fatigued during the lead up to the collision, and this might explain his inattention. Every OOW has an individual responsibility to ensure that he is properly rested before taking over the watch. If that means not going ashore, then so be it.

3. The second officer on board the tanker was standing a single-handed navigation watch at night, contrary to international regulations. This led to him having to take VHF radio calls, navigate and plot positions, perform anti-collision manoeuvres and monitor for other vessels without assistance. The inevitable result was that one of the tasks, in this case monitoring other traffic, was not done satisfactorily. STCW 95 requires a dedicated lookout to be posted at night. This is a sensible requirement and one which should be complied with in all circumstances.

4. The owners, flag state and coastal state should be informed of an accident by the quickest possible means as soon as practicable after an accident. Masters should bear in mind that it is still possible to place a link call through the local coast radio station in many parts of the world.

5. The bad practice of permanently obscuring chart room or wheelhouse windows should be avoided. Good all-round visibility is an essential requirement in order to maintain a proper lookout.

# CASE 14

# Tug in Trouble

Figure 1

## Narrative

A Twin Azimuth Stern Drive tug (Figure 1) was one of a pair of tugs assisting a ship (Figure 2) into locks in a UK port. The tug in question had been nominated to act as the bow tug. This would require the tug to approach the ship bow to bow, and result in the tug towing over the bow, manoeuvring astern.

All was going well, the stern tug had attached, and as the ship's speed reduced, the forward tug approached and passed the towing gear. An engine room alarm sounded, and the engineer left the forecastle where he had been assisting the apprentice with the towing gear, to go and attend to the alarm. As the tug backed away from the ship, it began to move to one side of the ship's bow. The ideal position was right ahead, and the tug master manoeuvred his tug to gain this position. However, due to the peculiarities of the propulsion system, turning the tug also slowed it down, which required an increase in engine speed to counteract. The tug closed the ship's bow before the increased revolutions took effect, and the tug moved ahead of the ship. A short while later, the tug again drifted to one side of the ship, and in recovering from that position, found itself very close to the ship's starboard bow (Figure 3). Unable to manoeuvre clear from this position, the tug was struck on the starboard side by the ship, and heeled heavily to port.

Seeing what was happening, the ship's pilot and master both ordered astern pitch on the propeller, and the pilot ordered the stern tug to pull back at full speed. This prompt action probably saved the tug from further damage.

Checking for damage on the tug, the mate discovered the engineer lying in the cross alleyway with his arm at a funny angle. Noting that he was not bleeding and seemed safe for

Figure 2

the moment, the mate went on deck to check on the apprentice. The ship had released the tow line, and the tug was drifting clear of the ship. The mate and apprentice checked the engine room, where they found a large amount of water entering through a split in the side and through a crack in the starboard main engine jacket water cooler heat exchanger. The pumps were coping with the ingress of water, and the tug master put the tug alongside a landing stage where some of the company's other tugs were also awaiting their next task.

An ambulance was called by mobile telephone, and the engineer taken to hospital. Crew from the other tugs assisted in damage control efforts, and after contacting the company managers, it was decided to beach the tug to effect temporary repairs (Figure 4). These were carried out and the tug was successfully re-floated on the next tide.

Neither the ship nor the tug contacted the VTS station to advise them of the incident, and it was some 2 hours later that the coastguard was finally informed.

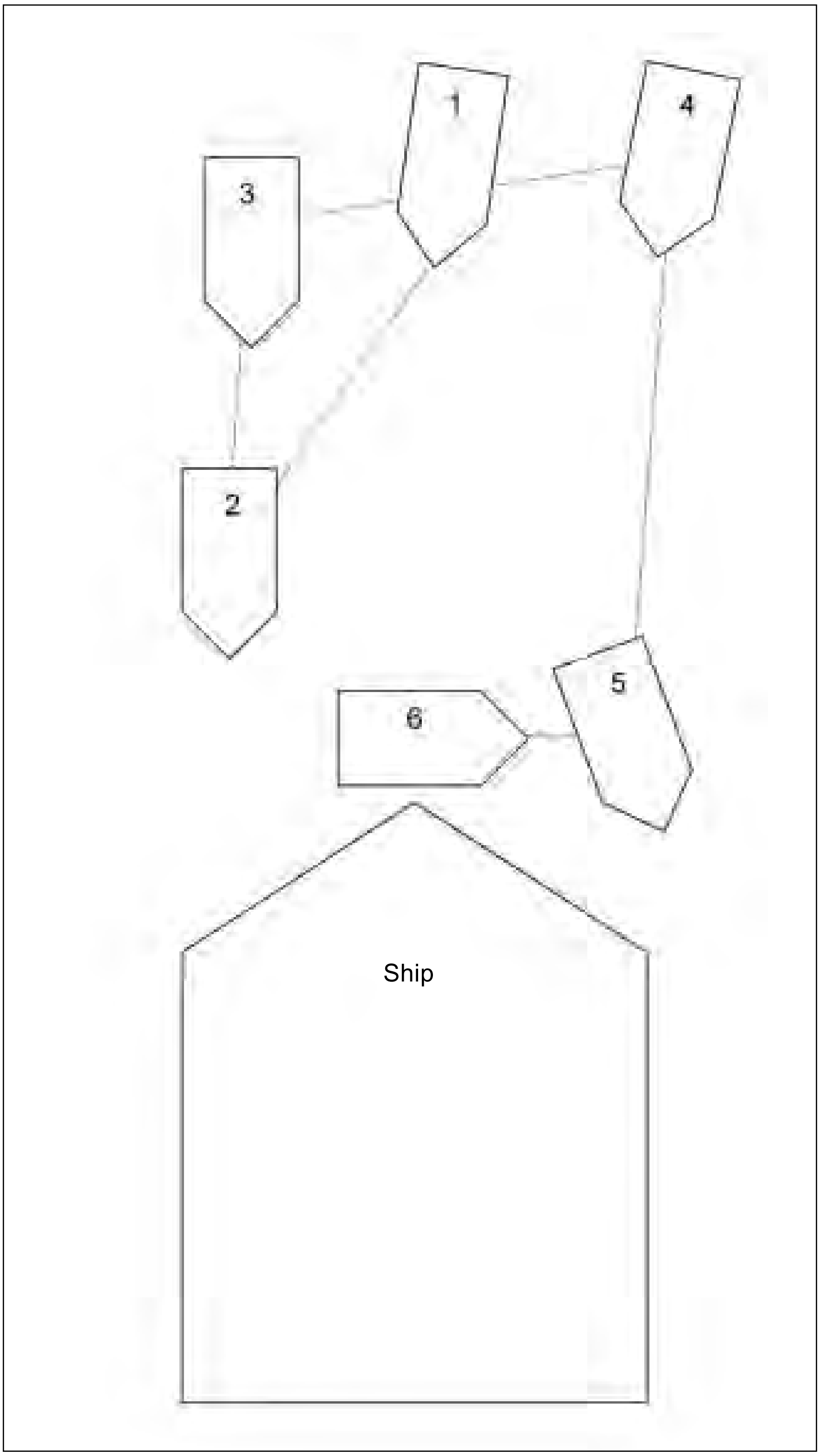



Figure 3 – Diagram showing movement of tug (not to scale)

Figure 4 – Vessel beached for repairs

## The Lessons

1. The tug master was coming towards the end of his probation period as a new master, and had taken over this tug during the previous week. He had seen this operation carried out many times, but had never been in charge of the tug for the manoeuvre.

2. Due to the low turnover of staff, the management company had assumed that every prospective master would have seen every possible manoeuvre as mate of the tug, and would have carried them out while overseen by the master. This was not the case, as highlighted by this incident. The company has introduced a system of tracking its employees' experience and expertise, to assist in identifying areas where additional training may be required.

3. The port's VTS service was not informed of the incident. They would have been vital to the co-ordination of any rescue attempts, had they been necessary.

# Splash!! – Freefall Lifeboat has a Mind of its Own

## Narrative

A foreign flagged, 3500 tonnes coastal product tanker arrived late in the evening at a sheltered anchorage in preparation to embark cargo later the following day. Of the crew of nine, the master, chief officer, chief engineer and cadet were British; the remainder were Polish, whose grasp of English varied.

The chief officer decided to take advantage of the good weather conditions and planned a routine 6 monthly freefall lifeboat drill for the following morning, involving the cadet and the Polish crew.

Prior to the exercise, the chief officer took the sensible precaution of testing the lifeboat's "A" frame recovery system. Unfortunately, and to his frustration, the frame's hydraulic system developed a leak, so the freefall exercise was abandoned. Not wishing to lose the opportunity to carry out a drill, he decided to conduct an undocumented, simulated freefall drill. On this occasion, it involved releasing the restraining hook using the secondary manual release instead of using the primary hydraulic release system (Figure 1).

The weight of the lifeboat was taken by the "A" frame hanging chains, allowing the release hook to be safely operated. The chief officer did not explain the purpose of the drill, nor did he describe the system or the methods of release. Despite this, one of the ABs was instructed to enter the lifeboat and operate the manual release hand wheel. However, neither the AB, nor the chief officer checked that the hydraulic by pass valve was open, as clearly required by the instructions next to the hand wheel (Figure 2).

After the release hook had operated, an AB tried unsuccessfully to reset the hook (Figure 3). Suspecting the problem was that the release hand wheel had not been fully wound out, the chief officer shouted to the AB to get out of the lifeboat. The chief officer then leaned into the boat and unwound the hand wheel at the same time. After repeated attempts, the AB managed to reset the hook.

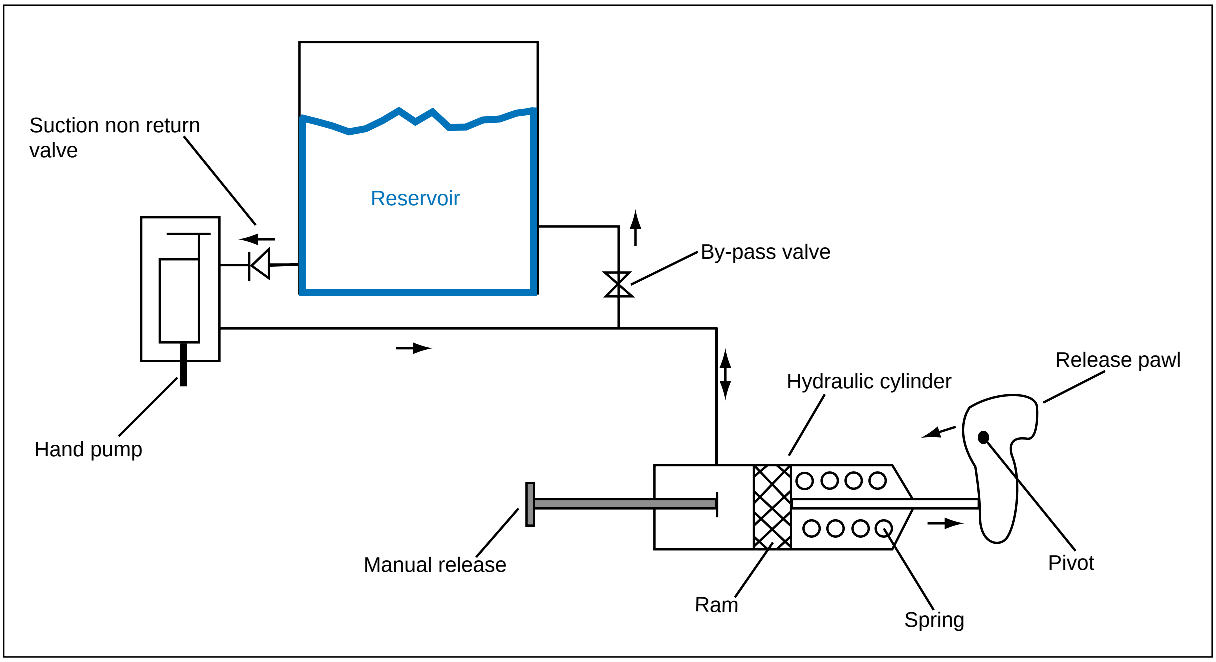



Figure 1 – Release system


Figure 2 – Signage adjacent to manual release

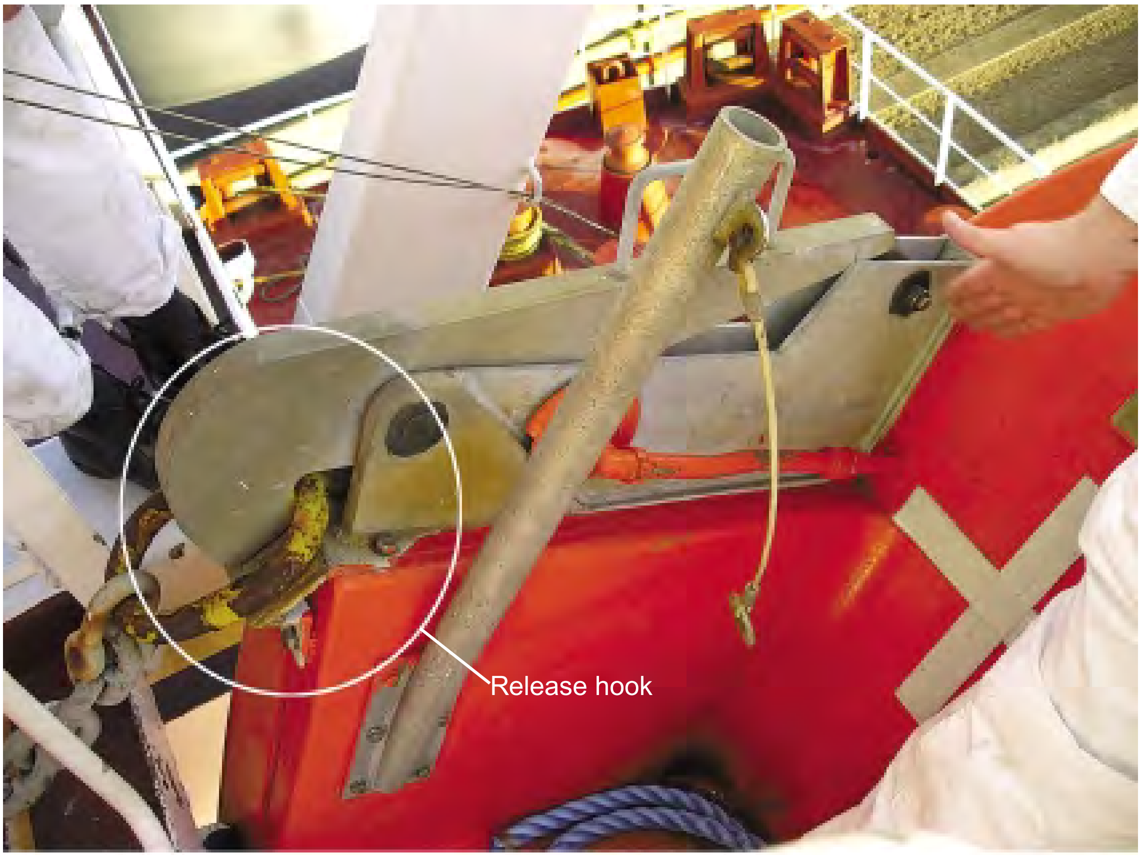



Figure 3

Following the drill, the hydraulic system by pass valve was left in the shut position. This was considered to be the normal standby position, but was contrary to the operating instructions posted in the lifeboat. Although there were no formal checks for the standby condition of the lifeboat, the chief officer confirmed the release hook chain was in position, but no checks were made on the correct position of the release pawl (Figures 4 and 5).

With the drill now completed, the chief officer dismissed the crew, but he neither debriefed the exercise nor gave the crew the opportunity to raise questions.

The vessel subsequently loaded her cargo and sailed. In the meantime, the second engineer conducted routine maintenance on the lifeboat's engine while on the 2 day rough passage to the next discharging port, but saw nothing untoward with the release system.

On manoeuvring at the next port, the master applied half astern power. As usual, there was vibration around the after end of the ship. What was not usual, was the inadvertent release of the lifeboat into the harbour. Luckily, the area astern of the vessel was clear, and there were no casualties.


Figure 4


Figure 5

## The Lessons

There is some mistrust among the maritime industry regarding the safety of freefall lifeboat systems. The facts do not support this perception. Indeed, there have been very few recorded instances of inadvertent freefall lifeboat launchings.

In this case, the first officer confirmed that the release hook and chain were correctly positioned following the drill period, but it was not realised that the release hook position in relation to the release pawl was incorrect. This meant that the hook was only just in contact with the pawl because the by pass valve was shut, retaining hydraulic pressure in the system and preventing the pawl returning to its correct position. The vibration experienced when berthing was just sufficient for the hook to drop off the pawl and release the lifeboat.

1. It is extremely important that the crew, and those managing the drill periods are fully familiar with all aspects of freefall lifeboat operation, including:

   - Free fall release
   - Simulated release
   - Controlled release
   - Recovery procedures
   - Standby condition checks

2. Sometimes, manufacturers add or amend various operating instructions. The operating instructions posted inside this lifeboat were ambiguous. In particular, it was possible to interpret that the hydraulic system by pass valve could be open or shut when in the standby condition, when it should have been open. Do check the manufacturer's operating manual instructions against the posters, to ensure they are correct and are easily understood.

3. Drill periods form an essential element of emergency preparedness. When considering drills, think them through in a logical manner, allow time to explain what you want to achieve from them and encourage questions. Remember, no safety related question is a stupid question – it is probably the one you wanted to ask anyway. It is equally important to recognise that there can be some misunderstanding for crew whose first language is not English. Do not rush the drill.

4. Do not assume you know the operating system of your lifeboat – it might be different to that previously seen. Check it out now. It may well be too late when you want to use it for real!

# CASE 16

# Inadequate Protection

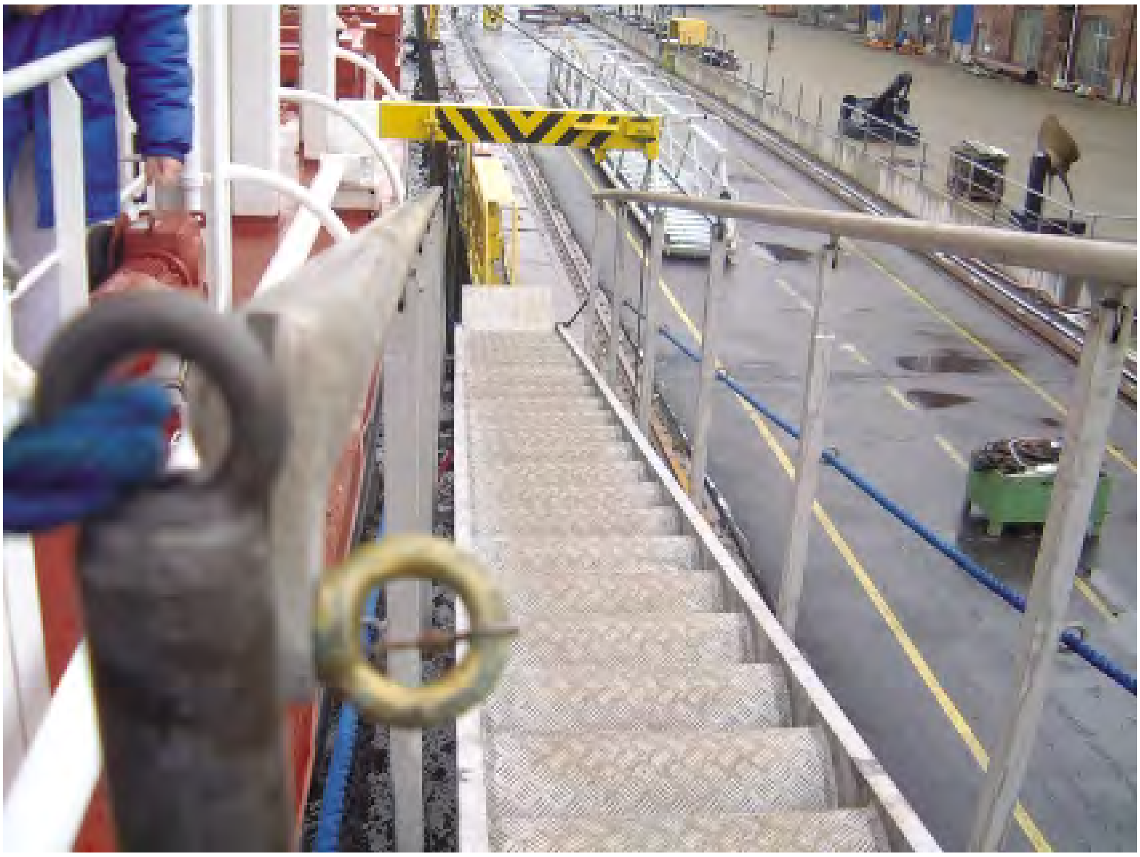


Figure 1

## Narrative

A small container ship was moored at a tidal river berth. Discharge was completed at 1924 in readiness for shifting to a dry dock at 0500 the following morning. Access to the ship was via the starboard accommodation ladder. High water was at 2115 and low water was at 0405. The deck watch comprised an officer and an AB. From 0030 the duty deck officer remained on the bridge, correcting charts, and the duty AB remained inside the accommodation, laying deck coverings.

The duty AB was relieved at 0300, but he continued to lay deck coverings. After being informed of the tasks he was expected to complete during his watch, the oncoming AB went on deck to check the accommodation ladder. He saw that the inner rail had become lodged against the davit arm as the tide had fallen. The AB working inside the accommodation was alerted, and as the ship was due to shift berths in 2 hours, the two able seamen decided to stow the ladder.

They removed the safety net and the pins securing the inner rail to the vertical stanchions at the end of the ladder (Figure 1). However, the inner rail remained wedged against the davit arm. After slackening the aft spring, which was possibly pushing against the upper platform of the ladder, one of the able seamen descended the ladder. As he did so, the other AB, who was standing on the ladder's upper platform, managed to pull the rail free. But the sudden release of the rail caused him to fall backwards over the rope protection fitted at the top of the ladder (Figures 2 and 3), which was only 65cm high. As he fell from the platform, the AB hit a large berthing fender, before landing in the water 8m below. The remaining AB heard his ship mate fall, and immediately ran to the position

Figure 2

Figure 3

on the quay adjacent by the fender. The casualty was laying face-down in the water and was motionless.

The AB ran to the top of the accommodation ladder and alerted the duty officer on the bridge by hand-held VHF radio. He also grabbed a life ring, but did not throw it into the water because he could no longer see the AB in the water and did not want to hit him with it. The duty officer quickly attended the scene, before advising the master of what had happened. The master informed the local authorities and, although a search by the local river police was quickly initiated, the AB's body was not found.

Following the accident, the ship's bulwark was modified to enable guard rails to be secured at a greater height (Figure 4).

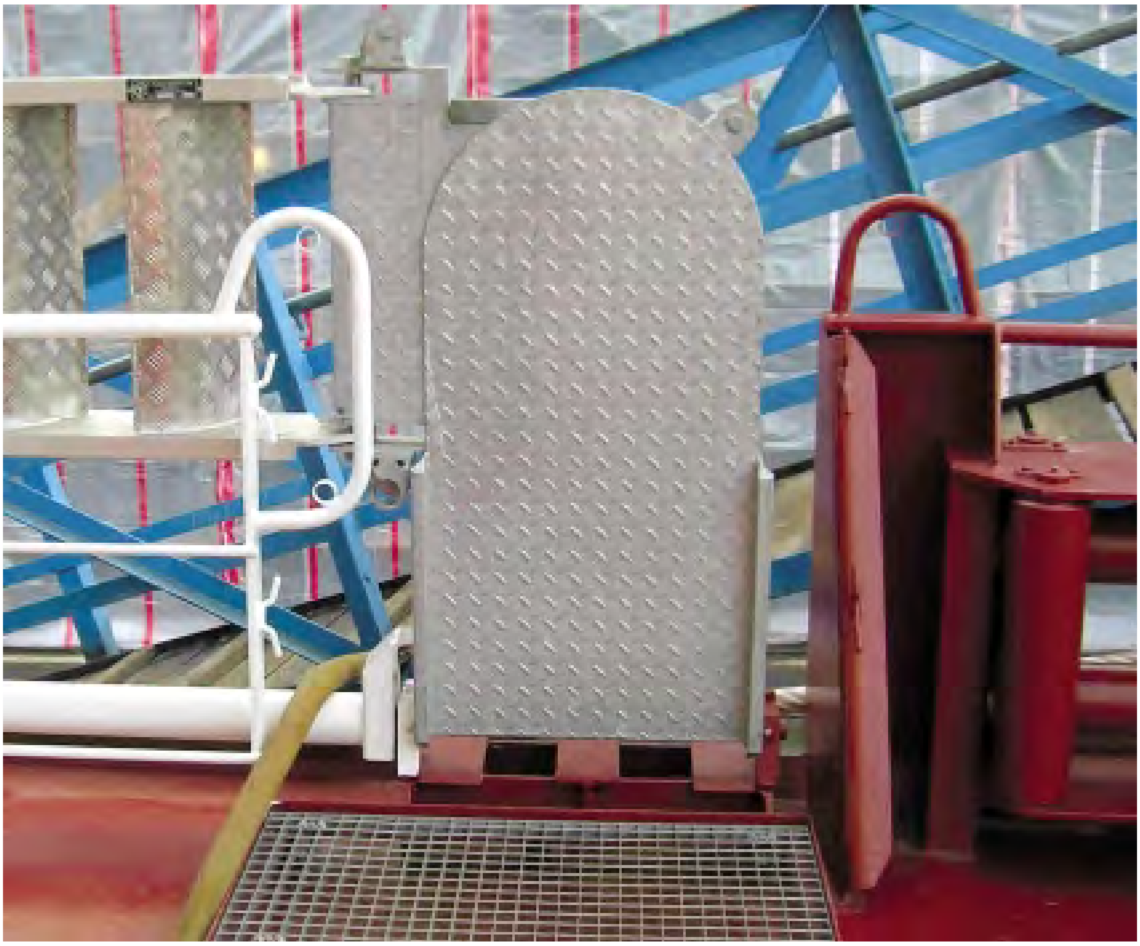


Figure 4

## The Lessons

1. To be effective, bulwarks, guard rails, guard wires and chains need to be at least 1m high. In this case, both the ladder and bulwark had been inspected during separate surveys, and both were deemed to meet the required standard: the platform was fitted with 1m high stanchions and the deck with 1m bulwarks. However, when the ladder was rigged in situ, the rope between the two was only 65cm at it lowest point (Figure 2), and therefore afforded inadequate protection. The low height of the rope guard rail would have been evident every time the ladder was used, but was either not noticed or was ignored. Does your ship have any similar problem areas? Don't wait for an accident to find out.

2. The Code of Safe Working Practice requires that when working at heights of 2m or more, a safety harness or belt should be worn. It also states that a lifejacket should be worn when working over the side. Neither was worn on this occasion, despite the fact that at least one of the able seamen would have had to remain on the ladder to lower its guard rails to allow it to be stowed. A safety harness would have prevented the AB from falling, and a lifejacket would have kept him afloat even if he was unconscious.

3. In a tidal harbour, mooring lines and means of access to and from a ship need to be frequently monitored and adjusted. This can only be achieved by 'walking the patch'. It cannot be achieved from the warmth and security of the bridge.

4. General alarms are provided to alert the crew to an emergency, regardless of whether a ship is at sea or in port. They should be used whenever a quick response is required from the crew. Had the duty officer sounded the alarm immediately the accident to the AB was reported to him, the crew could have quickly initiated an intensive search, possibly involving the ship's rescue boat, before the river police arrived.

# Part 2 – Fishing Vessels

Despite the enforced decommissioning in the >15m fleet (approximately 150 vessels in Scotland), and the ageing tonnage, fishermen still have a burning desire to go down to the sea in ships and do business in great waters.

Vessels are still pursuing the same species and using the same fishing methods as was the case 50 years ago. Although equipment is now more sophisticated, crew still have to deal with the daily rigours and dangers experienced on longer trips far from their home ports.

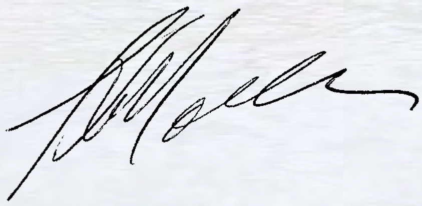
Today, the combination of legislation and the introduction of VCUs, has made it nigh impossible to build larger, more comfortable, safer ships. Industry has simply avoided the restrictions imposed on them by downsizing. “Putting a quart into a pint pot”. This, in itself, could be a source of concern.

Many of the accidents which MAIB has investigated, have been due to materials failure such as sea intakes, cooling pipes, particularly in older tonnage, resulting in serious losses. The MAIB reports, widely acknowledged in the Industry, highlight such incidents.

Clearly there are specific problem areas previously mentioned, and others, such as towing points and stability, which must be addressed. Maybe we need more innovative **vessels** to match the demands for safety and reliability. However, Industry cannot afford to finance such projects without government assistance. The MAIB has an excellent record, and is highly respected. It has to be hoped that it can influence government departments to help upgrade our fleet.

At present, the emphasis seems to be on catch, preservation and presentation (for the markets) rather than safety and modernisation of the fleet. That said, it is surely the case anyway, that a safe and efficient vessel will be more likely to land first class catches at least equal to market demands.

Also, given the importance of training, it has to be hoped that the proposed closure of the Fisheries Department of the Banff & Buchan College can be averted, as the College has a key role in the training of young fishermen.



**John Noble**

John Noble has been in the fishing industry since 1950. His previous appointment was Manager of the last Scottish Distant Water Fleet consisting of vessels from 26 to 40 metres – freshers and freezers.

He is a Director of the Fishermen's Association Ltd (FAL) and a member of the MCA's Fishing Safety Group.

John is also a board member of the Scottish Fisheries Museum at Anstruther.

# CASE 17

# With the Best of Intentions …


## Narrative

The owner of a 14 metre potter had looked at the shooting operation on his vessel and, recognising the number of fishermen who had been lost overboard by being caught in a bight of line, decided to modify his boat. In effect, he did a risk assessment and took action on its results; a commendable initiative.

To avoid the hazard of a bight around an ankle, it was decided to move the crewman handling the pots well away from any lines on the deck. This was done by putting a hinged door in the bulwark at one side of the deck which, when opened, allowed the pots to be drawn across the deck by the vessel's forward motion, with only limited intervention from the crew (see Figure).

This arrangement appeared to work well for several months, until a crewman was left working alone on deck one day, just after a string of pots had been shot. The weather conditions were reasonable, but the vessel was rolling a fair amount. He finished the job he was doing and walked past the still open shooting door to return to the wheelhouse. Unseen and unheard by the rest of the crew, the crewman lost his footing and fell overboard through the open door.

His absence was quickly noticed. The skipper broadcast a "Mayday" and turned the vessel around to retrace its track. A number of aircraft and surface vessels took part in the search, but nothing of the crewman was found. He had been wearing nothing to give him any buoyancy.

## The Lessons

1. The owner's risk assessment did not extend to considering the hazards associated with the modifications, namely the dangers of the open shooting door.

2. Whenever a risk assessment suggests modifications to equipment or procedures might be beneficial, the hazards associated with the changes should be run through a new risk assessment. Only if the level of risk is reduced by the proposed changes are those changes worthwhile.

3. The practice of blocking off a second access route between the working deck and the wheelhouse forced this crew to walk past the shooting door, which was a substantial hazard when open.

4. Once in the water, the crewman was unable to stay afloat because he was not wearing a lifejacket or other buoyancy aid. His loss from the vessel had been noticed so quickly that, had he been able to remain afloat, for even a few minutes, he might have been safely recovered.

# A Continuous Navigational Watch Must Be Kept

Figure 1

## Narrative

A prawn trawler (Figure 1) was returning to port after a night's fishing. The skipper was helping the deckhand tail prawns on the working deck, but was periodically returning to the wheelhouse to attend to the navigational watch. He saw another small fishing vessel ahead during one of the periods when he was looking out. The skipper thought that this vessel was either hauling or shooting pots, and was underway at about 2 knots, in which case he would pass well astern of her. Having made this assumption, he returned to the working deck, thinking that he was safe. But the other fishing vessel was in fact adrift, and was not under command, after having suffered an engine failure. The vessels collided about 10 minutes later.

Both fishing vessels were a little less than 10 metres in length. The wind was force 2 and the visibility was good. The trawler was steaming at slow speed to give the crew time to tail the prawns before reaching port. The other fishing vessel was a potter (Figure 2), and had broken down when on passage to her grounds.

About 15 minutes before the collision, the potter's skipper saw the prawn trawler and steered to pass well in front of her. However, the problem with his vessel's engine led to him stopping directly ahead of her. He tried to attract attention by using his VHF radios and a portable foghorn, but these messages were not heard. No one appeared to be in the other vessel's wheelhouse. The skipper and his deckhand watched the trawler as it bore down on them, and they jumped onto the other vessel once the collision had taken place. It was just as well that they did this, because the potter's hull was penetrated and she flooded and sank shortly after the impact.

The prawn trawler had just two crew members, although three was optimum. It was

Figure 2

difficult to get people to take up fishing in the vessel's home port and an untrained eastern European labourer had been employed.

The liferaft had recently been fitted to the potter and had been supplied free under a local initiative. However, it failed to deploy when the vessel sank – either because the hydrostatic release was incorrectly fitted, or because it became snagged in the mast or rigging.

## The Lessons

1. The skipper of the prawn trawler was away from the wheelhouse for at least 10 minutes before the collision. It is not acceptable to leave the wheelhouse to help with processing the catch; a continuous navigational watch must be kept. The collision regulations are quite clear on this.

2. The difficulty in recruiting should not be used as an excuse for dangerous practice. The skipper should have been in the wheelhouse dealing solely with the navigational watch while the prawn trawler was steaming. It was therefore probably necessary either for two deckhands to be on board to deal with the labour intensive task of tailing the prawns, or for the task to be carried out when the vessel was safely back in harbour.

3. It is possible that the liferaft on the potter failed to deploy because it had been incorrectly fitted or poorly sited. The free issue of liferafts is an excellent safety initiative, but they must be installed correctly. Fishermen who fit liferafts should follow the instructions very carefully. If there is any doubt about the correct procedure, assistance from an experienced seafarer such as a lifeboat man or harbourmaster should be sought.

# CASE 19

# Capsize – a Question of Stability

Figure 1 – General view of vessel

## Narrative

A 26 metre mussel dredger (Figure 1) converted from a Dutch river barge, built in 1908, was flagged into the UK register in 2002 having been inclined and surveyed. An MCA approved stability book was produced, setting out loading conditions, but it was not normal practice to hold it on board. Modifications, which added weight to the vessel, were made following inclining, but the MCA was not notified.

The vessel was arranged with a single continuous double bottom extending only under the two holds. A "tell tale" pipe with valve fitted in the after engine room drained any water which accumulated in the double bottom. The skipper noticed that there was a trickle of water coming from the pipe, but was unconcerned about it and did not investigate it further. There were no wing tanks to aid buoyancy.

On sailing, the weather was fine and the skipper and two crew were relaxed as they approached the mussel seed beds. All was normal, but the collection of the wild mussels was curtailed because of a failure of a steel wire rope used in the dredging operation. At that point, the skipper believed he had about 15 tonnes of mussels on board in the after of the two holds. This estimate was based on his experience of the volume taken up with previous dredgings. In fact, he had about 60% spoil in his catch, which consisted of large stones and gravel, with the amount totalling nearer 30 tonnes.

The return trip to the mussel bed to be seeded with the catch was uneventful. At 0230, the weather was fine, the water flat and there was no hint of the impending disaster. The skipper did his usual positional checks and opened the centreline circular seeding hatch at the after end of the hold. He noticed water entering the hold as normal. He then started the high

Figure 2 – Slusher jet

pressure salt water "slusher" pump used to drive the mussels out of the seeding hatch using the directional "slusher" jet (Figure 2).

The skipper began his usual 2-3 knot circular seeding pattern. One of the crew was operating the "slusher" jet, the other crewman was adjacent to the after hold. He believed the water level in the hold was higher than usual, but did not recognise the significance of this, so did not inform the skipper. After about 5 minutes, the skipper turned to starboard and the vessel listed about 10 – 15 degrees into the turn. Instead of righting herself as expected, she continued to slowly list over, submerging the deck edge, which resulted in downflooding of the forward hold. The vessel continued to roll over, coming to rest on top of the mussel bed, leaving her port side clear of the water (Figure 3).

The skipper managed to collect two lifejackets and the hand-held VHF radio before joining the two crewmen on the port side of the hull. The coastguard was alerted and a lifeboat rescued the crew soon after. Happily, there were no injuries – other than severely dented pride.

Salvage was agreed and the MAIB was subsequently able to closely examine the vessel.

Figure 3 – Vessel capsized

Figure 4 – Plate corrosion

## The Lessons

During the accident investigation, it was found that the double bottom "tell tale" pipe isolating valve was blocked. Once cleared, water gushed out, proving that the double bottom was flooded. The cause of ingress was found to be plate corrosion in the after hold bilge suction well (Figure 4). Now this is not a big problem if the double remains pressed full, but the slight drainage into the engine room removed some water, which resulted in a large free surface effect.

It was also found that the mussel seed contained large stones and a considerable amount of gravel. This increased the weight of the catch and exceeded the maximum loading condition as set out in the stability book. During discussions, neither the owner nor the skipper was aware of the vessel's maximum loading condition as set out in the stability book.

Following remodelling of the stability of the vessel, it was found that the probable cause of capsize was an obstructed seeding hatch. This led to an increase in the water level in the after hold, coupled with free surface in the double bottom and a cargo shift.

The following lessons have been identified from this accident:

1. It is no use signing the stability book just to satisfy a regulatory requirement. It is a live document which must be carried on board for reference purposes to check that loading conditions are not exceeded. Keeping the book in an office serves no purpose!

2. It would be very helpful to skippers if holds were indicated internally with a load line, to ensure that loading is not exceeded. A welded plate could serve such a purpose.

3. If water is seen to be leaking from a "tell tale" system it should be investigated without delay. The investigation does not end there: the cause of water ingress must be determined and rectified. Your life could depend on it.

4. Where additions or disposition to weights are made to the vessel, the MCA should be notified, as stipulated in the stability book, so that the effect on stability can be assessed.

5. In this case, the catch had an unusual amount of spoil. Remember that gravel, and to a slightly lesser extent stone, acts in a fluid manner and can easily shift, especially when under water in flooded holds.

6. Should you notice anything unusual, don't keep it to yourself. Had the crewman alerted the skipper about the increased water level in the hold, he might have considered the seeding hatch to be obstructed, and taken corrective action.

# CASE 20

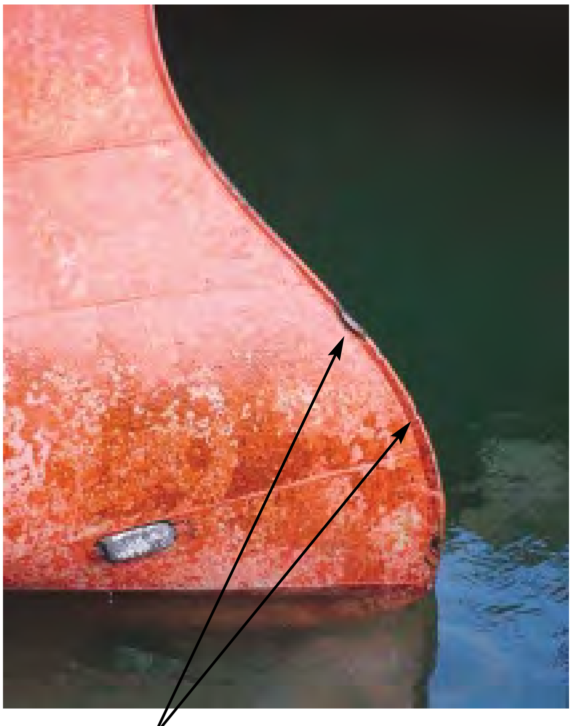
# Collision and Sinking While Pair Trawling

## Narrative

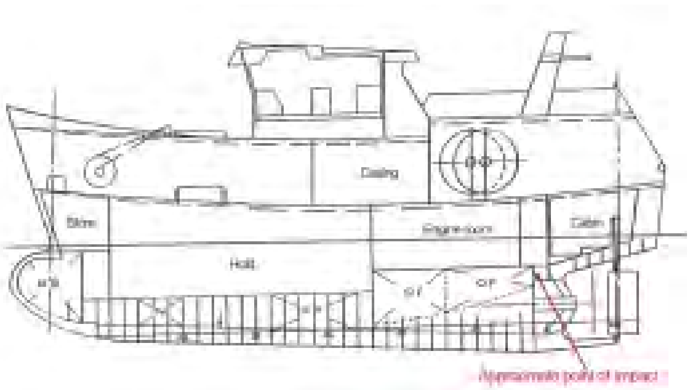
Two steel trawlers had been pair trawling together for about 2 months. On this particular trip both sailed with a crew of 5, including 2 Latvian crew members on each vessel. The weather was reasonable, with a wind force 4 to 5, and this was to be the last haul before returning to shore.

The vessels clutched in their hydraulics and removed the towing chains in preparation to haul. The skipper of the first vessel set his autopilot to 15° starboard helm. Shortly after, the auxiliary engine of this vessel shut down. The skipper started his second auxiliary engine and left the wheelhouse to go to the pump room to change over the hydraulics, and other services, onto the running generator. On his way to the pump room, the skipper indicated to one of his crew to go to the wheelhouse to take over the watch. He then continued on to the pump room as intended. On returning from the pump room, after changing over the services, the skipper met the crew member on the open deck; he had misinterpreted the skipper's signals and had followed him to the pump room, leaving the wheelhouse unattended.

Meanwhile, the skipper on the second vessel had started to haul, and was donning his oilskins in the wheelhouse when he looked up to see the other vessel coming straight at him. Although he took avoiding action, by releasing the haul and swinging his vessel to starboard, it was too late and the vessels collided, with the oncoming vessel striking the other at frame 6, the bulkhead situated between the engine room fuel tanks and crew accommodation. The bulbous bow penetrated the vessel's hull, and sea water immediately began to flood into the accommodation spaces, which started to fill rapidly. The skipper, realising his vessel was badly damaged, put out a "Mayday" call on VHF channel 16 and ordered his crew to launch the liferafts. He then ordered his



Minimal damage caused to bulbous bow of first fishing vessel



Latvian crew members to transfer to the first vessel by liferaft while he, and his remaining crew, assessed the state of his vessel. This they did. However, they failed to use the lifejackets provided, even though these were available.

On realising that the vessel was flooding rapidly, the skipper decided to abandon ship, and all crew members transferred, via the liferaft, to the adjacent vessel. Again, even though they were available, the crew failed to use their lifejackets during the transfer. The badly damaged vessel sank some moments later. The EPIRB floated free and activated.

The "Mayday" call was picked up by a nearby offshore platform, which launched a rescue boat to the scene and alerted the Coastguard of the incident. Fortunately, the first fishing vessel had suffered little damage from the collision and was able to return to port with all the crew members from both vessels safely on board.

## The Lessons

1. **The standard of lookout and communication between the vessels was poor and contributed directly to this accident. Pair trawling is an inherently dangerous operation; the MAIB has investigated a number of accidents which have occurred while engaged in such procedures. Extreme vigilance and good communication, at all times, is essential if the operation is to be conducted safely. This is particularly true while shooting and hauling nets.**

2. **The skipper of the first vessel left his wheelhouse unattended while he went to the pump room to change over services after starting his standby generator. During this period, his vessel's heading changed to a collision course with the other vessel, without warning. To leave the wheelhouse unattended for any period is unacceptable, and endangers both your own vessel and those around you.**

3. **The use of foreign national crew within the fishing industry is an increasing practice. This is perfectly legitimate; however the ability to communicate effectively, particularly during an emergency situation, is essential for the safe operation of the vessel and all its crew. On this occasion, the skipper recognised this and controlled any risk by evacuating these crew members early in the emergency. This, however, left him with fewer crew members to tackle the flooding.**

4. **A "Mayday" call was initiated immediately following the accident. This was a commendable action because it thwarted any possible delay had the situation worsened. However, the use of VHF Channel 16 for this call restricted those able to receive it to the local area of the incident, and might not have alerted the coastguard, who are best placed to co-ordinate any rescue operation. For this reason, any such emergency call should be initiated via DSC, on an appropriate frequency, to ensure it is received and acted upon. There is, of course, nothing lost by making a VHF "Mayday" call in *addition* to activating the DSC, if time and circumstance permits.**

# CASE 21

# Water in the Bilges – So What?

## Narrative

A 16 year old, 24.5m steel trawler was 7 days into her usual 10-day period at sea, when she flooded and sank. She was operating in deep water, and towing for about 6 hours at a time. All had been going well, with the gear shot away at about 1800. The catch was processed by 1930, the skipper took the towing watch and the other three crew members went to bed.

At about 2130, the engine room bilge alarm sounded. This was not unusual, as the generally small amount of water that got into the bilges could, if the boat was rolling, slop around and set the alarm off. With a 3 metre swell running, this was initially thought to be the case, so the driver was called to pump the bilges.

On arriving in the engine room, the driver started the bilge pump and then returned to the wheelhouse. He checked the overboard discharge to ensure that water was coming out, and spent the next half-hour chatting to the skipper. At approximately 2200, a gearbox high oil pressure alarm went off, so the driver returned to the engine room. He found the water level now halfway up the engine, and returned to the wheelhouse to inform the skipper. The skipper went to the engine room, saw how much water there was, and returned to the wheelhouse. The skipper then instructed the driver to wake the remaining crew. He did this, and then returned to the engine room, where he attempted to shut the seacocks. These were situated just below deck plate level, and were now under about 0.9 metre of water. No extension spindle or remote closing device was fitted to the sea cocks, and all attempts to close them were unsuccessful.

While the driver was in the engine room, the skipper told the other crew men to launch the liferaft and don their lifejackets. On returning to the cabin to fetch the lifejackets, it was noted that there was water on the deck. The liferaft was launched and the youngest member of the crew was put into it to fend it off the boat's side.

The skipper had, by that time, broadcast a distress message on 2182kHz, which was received by the coastguard. The SAR helicopter was scrambled with a salvage pump on board, and a "Mayday" relay was broadcast to inform other shipping. A number of other vessels responded to this, and the coastguard began organising the recovery of the crew members. The skipper was advised to put the EPIRB and hand-held VHFs in to the liferaft, which he did.

Shortly after that, the vessel lost electrical power. With the radios now working from the emergency power supplies, the coastguard could no longer hear the fishing vessel, but the fishing vessel could hear the coastguard. It was decided to abandon the fishing vessel, with water in the cabin, the engine room almost full of water and the deck aft awash.

The coastguard received a call from another fishing vessel saying that they were alongside and taking the men from the liferaft. This second fishing vessel had not responded to the initial call from the coastguard. The four crew members were put ashore from the second fishing boat later the following morning.

The vessel sank in about 200m of water, about 2 hours after the flooding was first discovered.

## The Lessons

1. **The fact that there was water in the bilges, and that this had set the bilge alarm off, was not unusual. However, it is good practice to check around the engine room and see if there is an obvious cause for the water being there.**

2. **By the time the driver made his second visit to the engine room, the water was too deep for him to be able to reach the seacocks. Had they been fitted with extended spindles, or had another remote closing apparatus been available, the seacocks could have been closed from above the level of the water. This could have stopped the ingress of water and saved the vessel.**

3. **Had a portable bilge pump been carried on board, as recommended, it might have been possible to reduce the floodwater level and gain access to the seacocks.**

4. **The early launch of the liferaft, and the well ordered evacuation of the vessel is to be commended.**

5. **The fishing vessel that picked up the survivors had not responded to the coastguard's distress relay, and the coastguard therefore did not know that the fishing vessel was in the vicinity. A lot of effort was wasted by the coastguard co-ordinating the responses of other vessels which were much further away.**

6. **The distress call on 2182kHz should have included the use of the DSC alert on 2187.5kHz, since ships are no longer required to maintain watch on 2182kHz. It was fortunate that the transmission was heard by the coastguard, which maintains a speaker watch at selected stations around the coast.**

# CASE 22

# Rapid Capsize Causes Loss of Life

Figure 1

## Narrative

An 8.7m potting vessel (Figure 1) capsized rapidly and without warning while starting out on passage back to her home port at the end of a day's fishing. The two crew members were thrown into the sea; neither was wearing a lifejacket. The vessel righted herself, and the deckhand returned to the partially submerged hull and was able to release the liferaft. He managed to inflate it, and board it from the water. The skipper, who had been seen on the surface, was lost from view before the deckhand could paddle the liferaft to him and was not seen again. The vessel sank shortly afterwards.

Analysis of the evidence indicated that flooding of the engine space, caused by a failure in the salt water cooling system, probably led to the loss. The vessel was not fitted with an operational bilge alarm, and there was no other warning that flooding was taking place. The engine space extended the length and width of the working deck, and had a free surface area of over half the vessel's water plane area. Consequently, the amount of floodwater to cause instability did not have to be great. This could be why neither crew member noticed any change in the handling of the vessel before she capsized.

The liferaft had not been serviced for many years (more than 12), and it was fortunate that it inflated when the deckhand pulled the painter, particularly as the gas cylinder was badly corroded (Figure 2). The condition of the liferaft fabric and equipment was also very poor, resulting in the deckhand spending a very uncomfortable night in it. The flares, torch and liferaft lights did not work, and no reflective tape was fitted to the canopy.

The vessel had not carried an EPIRB, so the search for survivors did not begin until a number of hours after the accident, by which time it was dark. During the night, the raft was


Figure 2

almost impossible to see without any form of illumination. The buoyancy tubes were leaking air, and the floor was leaking water, so the deckhand spent most of the night either pumping or bailing.

Fortunately, after being sighted by a passing ferry the next day, the deckhand was airlifted to safety. The skipper's body was recovered from the sea bed near the wreck some time later.

## The Lessons

1. Bilge alarms have been mentioned many times before in Safety Digest articles. They are a vital piece of safety equipment, and must be tested before the start of every voyage to ensure they are working. Bilge alarms should be fitted in all the main compartments, but especially in the engine space. A single alarm is sufficient if it is robust and of good quality; better still, two units can be fitted.

2. Lifejackets are another regular feature of the Safety Digest, and their importance cannot be overemphasised. Over many years, MAIB inspectors have heard all the arguments highlighting the problems associated with the constant wearing of self-inflating lifejackets. But the problems are minor in comparison to those faced by a person in the water, with no support. Many fishermen have recognised this and now wear lifejackets all the time when working. The rapid capsizing of fishing vessels is relatively common; the wearing of lifejackets is one of the main defences to try to ensure that lives are not lost. Many fishermen would be alive today if they had been wearing a lifejacket, including, very probably, the skipper of this vessel.

3. A fishing vessel of this size does not have to carry a liferaft, although the benefit of having one has been dramatically demonstrated by this accident. Government agencies in many parts of the country now issue liferafts free of charge, so if you own a small fishing vessel, you should take advantage of this initiative if it is available. Once a liferaft is installed, it should be serviced in accordance with the manufacturer's instructions.

# Part 3 – Leisure Craft

Analysis of an accident always relates to the actions of people. Without training or experience they may have had little idea of what they were doing. They may have been well trained in theory but had little practical experience. They may have had great practical experience but little formal training. Or they may have been simply human, and despite good training and experience, done the wrong things anyway.

Thorough *training* includes theoretical and practical work. A defined framework equips a student with a set of skills that in a seagoing context must include an expectation of having to "think outside the box". In the UK, training courses designed by the RYA (Royal Yachting Association) do an excellent job in a wide variety of applications. Offshore sailors now also have an ISAF (International Sailing Federation) course, much of which follows the IMO STCW (International Maritime Organization Standards of Training, Certification and Watchkeeping) model. In other countries, the member national authorities of ISAF also promote courses. The quality and value of RYA courses is recognised by their application in countries as far apart as the USA and Australia, and the expansion of training in the leisure sector ensures that standards of competence are steadily improving.

*Experience* may mean that you have sailed thousands of miles over a given period. However, its value depends on the conditions encountered, the types of boat sailed, and the circumstances and problems dealt with. Without training, experience alone can leave you exposed. In the Hobart 98, for example, one highly experienced yachtsman with many Hobarts to his credit admitted that performing the tricky task of boarding a liferaft was something he had never ever done.

But, in leisure sailing, as in all seagoing, however well training and experience is combined, there are always gaps. And this is exactly where the MAIB Safety Digest scores heavily.

Here, distilled from thousands of hours of seafarers' experience are real-life crises. Here we learn in simple, direct language how the problem was "set up", how it developed, what the crew did about it, and what the results were. None of this is theory. In some incidents, people died or were injured. The reality of these cases is what gives them "bite" compared with imaginary scenarios invented in a classroom.

In my experience, presentations that command total attention are those given by real-life survivors. As they recount their experience in person their audience takes a deep, direct interest: "What would I have done?" "Would I have seen this coming?" "Have I ever behaved like this?" "How must I prepare, so this never happens to me?!" We get caught up in the drama. Lessons are learned almost as well as if the audience, too, had been there.

So it is with the Safety Digest. For this, MAIB, thank you.

Alan Green

25th May 2006

**Alan Green FRIN**

Alan Green began sailing offshore in 1960 and passed the Department of Transport yacht master examinations in 1965. He co-founded and sailed in the 600-mile Middle Sea Race with Jimmy White in 1968, and is a life honorary Rear Commodore of the Royal Malta Yacht Club. From 1970-2000 he held office in the permanent staff of the RORC (Royal Ocean Racing Club) including that of Secretary from 1978-1990 and Director of Racing and Special Events from 1990-2000, and was made a Life Honorary member of RORC in 2005. He sailed in the 1977-8 Whitbread Round the World Race, was a member of that and the Volvo Ocean Race committee and is immediate past Chairman of the Special Regulations committee of the Offshore Racing Council and ISAF (International Sailing Federation). He was elected a Fellow of the Royal Institute of Navigation in 1981. He is Chairman of the ISAF International Regulations Commission, a member of the Committee of Honour of the Offshore Racing Congress and an honorary member of JOG, the London Corinthian Yacht Club, the Royal Hawaiian Ocean Racing Club, Norddeutscher Regatta Verein and the Associacao Brasileira de Veleiros de Oceano. In 2005 he was Race Director of the inaugural Baltic Sprint Cup, a series linking 8 countries in 3 weeks of offshore racing. His *Offshore Special Regulations Handbook* was published by Adlard Coles in 2005.

# CASE 23

# Junior Powerboat Racing Accident Raises Safety Concerns

## Narrative

A 13 year old boy suffered a serious head injury during a national junior powerboat racing event. He had been the co-driver of one of 9 boats competing in a race for drivers aged 8 to 12. The field of boats was arriving at the first 90° turn marker, having completed a 400m long straight leg from the start line, when one boat *hooked* and effectively stopped dead in the water broadside on to the following boats. One of the following boats collided with it, and rode up and over the stationary boat, striking the young co-driver on the head and shoulder (Figure 1).

At some stage in the accident, the co-diver's safety helmet came off. It was later found in the water by one of the race safety boats: its chin strap was still done up. A paramedic, who had been stationed afloat on another safety boat, was quickly on scene to give vital first-aid treatment to the boy. The boy was transferred to the shore and then to hospital where he was found to be in a coma.

Junior offshore powerboat racing had been started 3 years earlier, with the intention of giving youngsters aged between 8 and 16 training and experience so that they could easily and safely transfer to compete in adult racing. In drawing up the rules of the new class, the organisers were aware that safety had to be paramount, but they had to juggle this requirement, to some extent, with the necessity to make the activity exciting and the need to mirror adult racing as far as possible. In forming the rules and introducing the new class, the organisers were monitored by the governing body for all offshore powerboat racing in the UK. The rules for the class were published in the governing body's annual powerboat racing handbook.

Prior to the first season, a commonly available 4.8m ski boat, with a 20hp outboard engine, was chosen as the standard boat for the class. The ski boat and engine combination had been trialled extensively by the organisers, who had concluded that it was responsive and handled positively and well. It was capable of attaining

Figure 1 – Following boat rides up over stationary boat

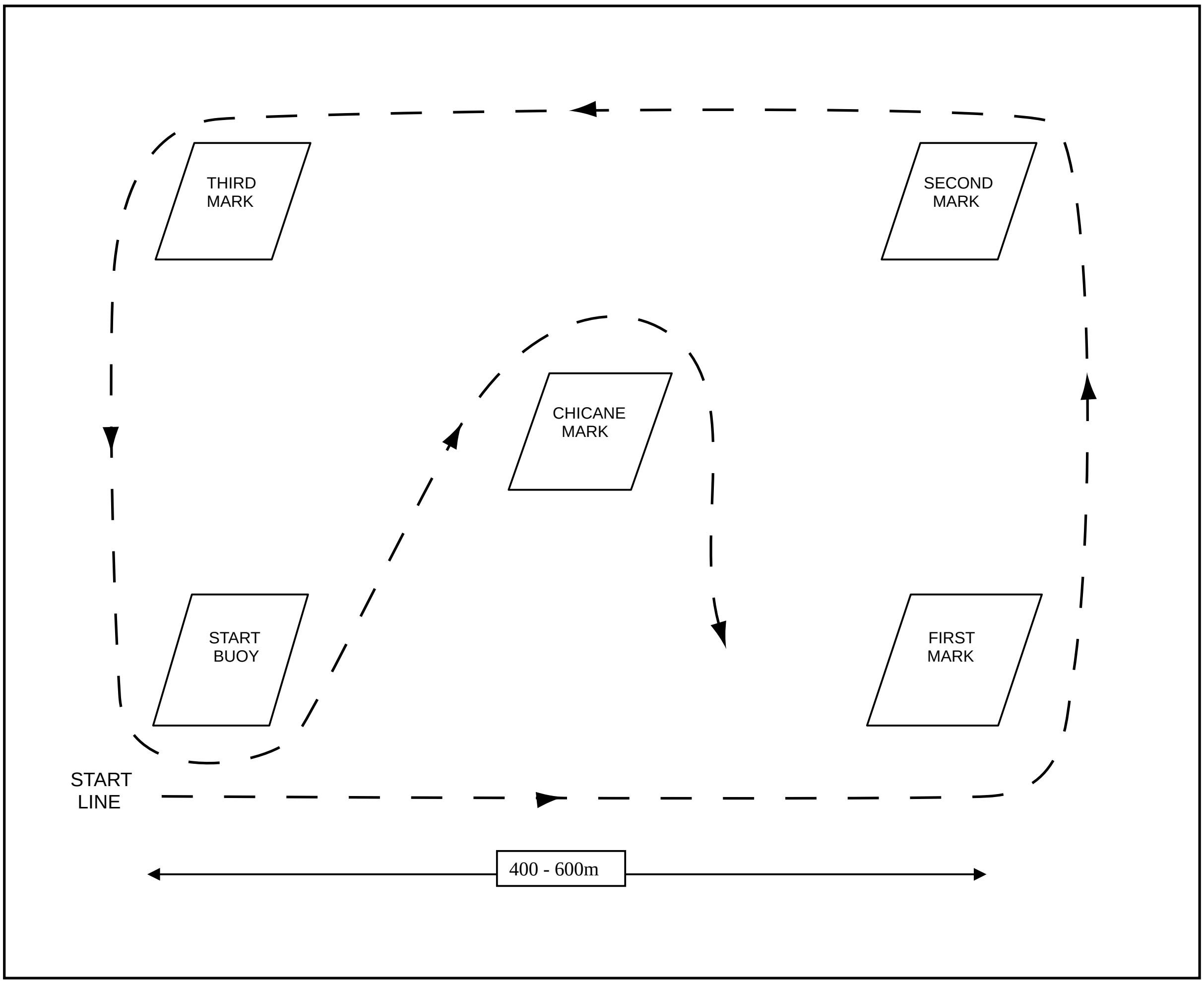



Figure 2 – Typical course

speeds of about 27mph in calm conditions. Consideration had also been given to the optimum standard race and course design for the new class. It was decided that head-to-head racing around a smaller, but similar, course to that used by adults, would best meet the objectives. The chosen course design was roughly rectangular, with a dog-leg in one of the longer sides (Figure 2).

Racing was designed to continue for about 10 minutes, before being brought to a finish.

The rules detailed the safety equipment and protective clothing requirements for all competitors. Among many other items, they each had to wear a crash helmet. There were no minimum training standards laid down, except that, in order to race, each competitor had to have a licence issued by the governing body. The governing body only issued a licence when the class organisers were satisfied that the child was competent to race safely.

Prior to the first season, the would-be competitors underwent fairly extensive training both in the classroom and on the water. The training was provided by the class organisers and, at this early stage, overseen by the governing body. During the winter between the first and second season, new and existing competitors continued receiving training over many weekends. At this time, most new competitors had undergone at least 40 hours of supervised training before being issued with licences by the governing body. This high standard of initial training seemed to reduce prior to the third season, when the accident occurred. The 10 year old driver of the boat in which the injured boy was co-driver, had only undertaken 1 or 2 weekends of training before competing at the first race of the season. Both the 11 year old driver, and the 12 year old co-driver of the following boat, had each received only 1 weekend of training before being issued their licences.

For the third season, the size of the engine was increased to 25hp because the original choice of engine was no longer readily available in the UK. This had the effect of increasing the top speed to 30mph.

Throughout the inception and first years of junior powerboat racing, the organisers considered the safety of the children as their first priority. The practical organisation of the race days, the frequent safety briefings, and the resource and effort put in to monitoring the safety of the race events, was faultless. However, there were some shortfalls in other aspects of safety management. From the first season, a number of minor accidents and incidents occurred which were not fully investigated, and lessons were not learned. The formal reporting of accidents by the class organisers fell short of requirements, and this was not noticed by the governing body.

One accident that did result in safety improvements occurred during the first season, when one boat collided with another that had stopped ahead of it at the first turn, in a very similar way to the accident in question. On that occasion, both the driver and co-driver were taken to hospital for a check-up; fortunately neither was seriously hurt. This accident highlighted the vulnerability of the driver and co-driver of the boat which was hit, and resulted in anti-intrusion bars being fitted to all boats to try and prevent injury in the event of one boat riding up over the stern of another. However, the detail of the design of the anti-intrusion bars, including their strength, was left to the boat owners (mainly parents), and the factors which had led to that accident were not put through a formal risk assessment process by either the organisers or the governing body. Had either done so, they might have realised that the combination of head-to-head racing, ski boats with low freeboard, a course design with all competitors arriving bunched at the first 90° turn, and young inexperienced drivers, provided too high a risk for the children's safety. Better still, these factors could have been used to inform a risk assessment when the rules for the new class were being considered.

It is not known whether the injured boy's helmet becoming dislodged during the accident contributed to, or indeed mitigated, the injuries he received. Despite rigorous analysis of video and witness evidence, it could not be established at what stage it had come off. However, the investigation did discover that many of the children were wearing marine safety helmets that had only been tested for adult head sizes, and that there had never been a proper risk assessment to establish the most suitable helmet type and strength for powerboat racing in general. As a result, the MAIB issued a Safety Bulletin which made recommendations to the governing body and powerboat racers on this subject.

## The Lessons

1. **Both at the inception of the new class, and then after incidents and accidents, junior offshore powerboat racing lacked detached and objective oversight. More formal risk assessment processes should have been applied to the principal elements of the sport to ensure that it was fully safe. Following a formal process can and does uncover and highlight risks that otherwise may go undetected.**

2. **Accidents and incidents provide a valuable opportunity from which lessons can be learned for improved safety. Don't waste the opportunity by only paying lip service to accident and incident reporting: do it properly, it may save your or someone else's life.**

3. **All users of safety or crash helmets should ensure that their helmet is tested for their head size, is fit for purpose and is properly fitted and secured.**

# CASE 24

# Almost a 'Deadman's' Handle

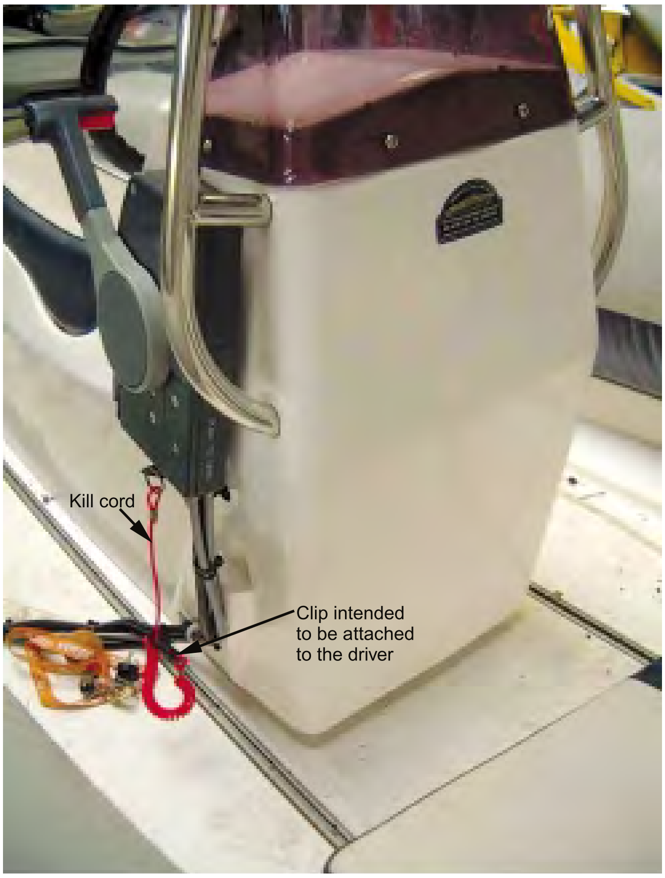



Figure 1 – Photograph showing console and kill cord

## Narrative

As a 4.5m RIB with three teenage occupants approached the beach to pick up a wakeboard, it passed a line of markers indicating the boat was entering an area in which a 4 knot speed limit applied. The driver reduced speed to about half throttle, and commenced a slow left-hand turn. During the turn, the console on which the driver was sitting, and to which the steering wheel was mounted, detached from the deck (Figure 1). The driver was unable to maintain his balance, and fell over the boat's port side and into the sea.

The RIB immediately turned sharply to starboard, and a passenger who had been sitting on the rubber tube to the driver's left was thrown into the water. He was immediately struck by the RIB's rotating propeller. A few seconds later, the remaining passenger panicked, and jumped out of the boat, leaving the now unmanned RIB to circle in a clockwise direction, at a speed of between 10 knots and 15 knots. While circling, the RIB passed sufficiently close to the driver, who was assisting the injured passenger, for its propeller to rip his fleece top. None of the RIB's occupants were wearing buoyancy aids.

Fortunately, the accident was seen by another powerboat in the vicinity, which managed to pass a line to the people in the water and tow them clear. The injured passenger sustained deep lacerations to his chest and left side (Figures 2 and 3), and was taken to hospital by air ambulance. He remained hospitalised for 3 weeks. The RIB, escorted by a local lifeboat, circled for about 30 minutes until it finally beached in an area which had been cleared of many other, varied activities by local authority officials. The flares carried on board the RIB were found to be out of date.

Figures 2 and 3 – Injuries to passenger

## The Lessons

1. Had the kill-cord fitted to the RIB been used, the injuries caused by the propeller would have been avoided. A RIB driver does not expect to be thrown from his or her boat, and therefore it is not difficult to see why some drivers might see the wearing of kill-cords as unnecessary, or even as an insult to their ability. However, this accident shows that the unexpected does happen, and that people do get seriously injured as a consequence. It is common sense to use the kill-cord; it is foolish not to.

2. Although many boats' fittings and accessories might appear to be secure, this should not be taken for granted. Wear and vibration take their toll over time, and can result in catastrophic failure of some fastenings, particularly on high-speed craft. Periodic inspection of these items takes little time, and increases the probability of the detection of loose items in time to allow remedial action to be taken and potential accidents averted.

3. Speed limits are usually imposed for several reasons including the prevention of wake damage, and the reduction of the risk of collision in busy areas of diverse activities. Disregard for such limits is potentially dangerous, not only for the vessel in question, but also for the other water users in the same area, which includes swimmers, divers, and young children paddling, who are unable to move out of the way quickly should the need arise.

4. A buoyancy aid is of no use whatsoever unless it is worn. On this occasion, it was fortunate that the injured passenger did not lose consciousness. Had he done so, his chances of survival without a buoyancy aid or lifejacket would have been considerably reduced.

5. Thankfully, most boat owners never have to use their emergency flares in danger. However, all flares must be periodically checked and renewed when past their "use-by" date. Otherwise they may fail to work, when needed.

# When Danger Lurks Between the Sheets

## Narrative

Two recent accidents on board identical yachts bear remarkable similarities in every respect including, regrettably, the nature of the very serious injuries suffered by a crew member of each boat.

The yachts were both Jeanneau Sunfast 37s which were rigged for racing, on bareboat charter, and were sailing in the Solent in winds exceeding 30 knots.

One accident occurred as the yacht was manoeuvring before the start of a championship race while the other happened as the vessel was entering Portsmouth Harbour when racing had been cancelled due to freshening winds.

The yachts were sailing under mainsail only; one with a single reef and one with 2 reefs in the main, and in both cases the injuries occurred as the boats were gybed. Both injured persons were struck by the fine tuning block (Figures 1 and 2), which is part of the falls of the main sheet, as the boom passed across the cockpit.

The crews of the boats all had previous sailing experience, although in some cases this was limited to smaller boats. One crew was an experienced racing team while the other had not raced together as a team before.

Both skippers were very experienced, competent, yachtsmen, as required by the charterer, who had significant previous sailing experience on similar boats.

The gybe manoeuvre was planned and properly forewarned in both cases, though in one case the manoeuvre could be considered a crash gybe, as the crew were physically forcing the main across during the manoeuvre in order to position the boat in a favourable position for the start of a race.

As the boats were gybed the injured persons were both struck in the head by the fine tuning block and were thrown against the side of the cockpit. Both suffered life threatening injuries as a result of the accidents and spent a considerable time in the intensive care unit of the same hospital.

## The Lessons

1. **Skippers should ensure that their crew briefing takes account of the individuals' previous experience and their familiarity with the rig and fittings on the boat.**

2. **The main hazard associated with a gybe is generally perceived to be from the boom. This accident shows that all crew must be aware of the dangers of being struck by the sheets and associated gear as the boom passes safely overhead.**

3. **Charter companies should take into consideration that the members of a crew taking a boat on bareboat charter might not have sailed together before, and their handover briefing should include reference to the particular hazards on the vessel which the less experienced members of the crew might not have previously encountered.**

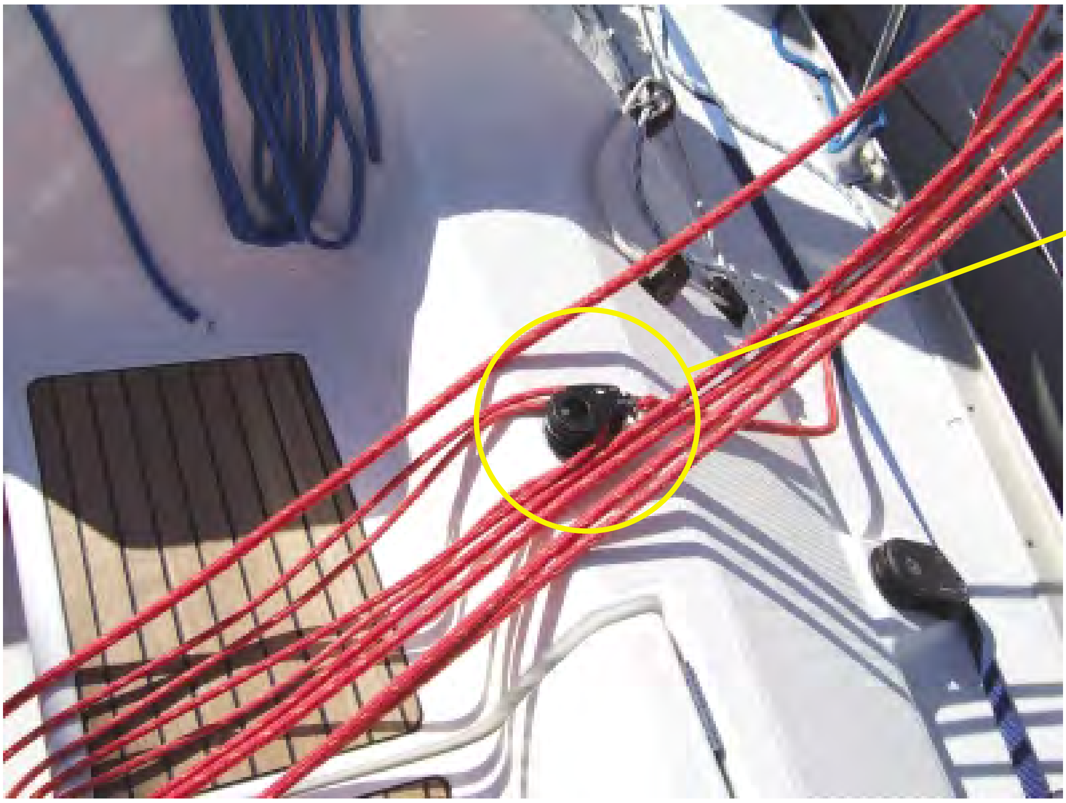
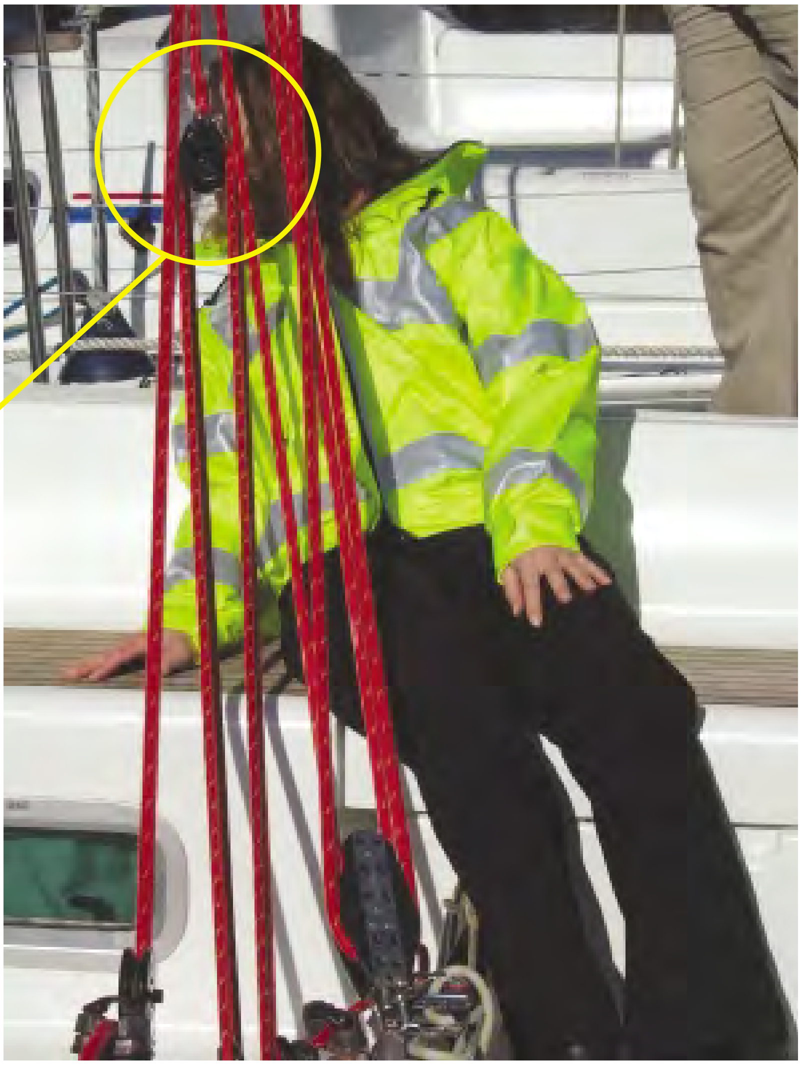



Figure 1



The fine tuning block is at head height when sailing — crew should keep clear of this, particularly during a glybe

Figure 2

# Smoke Without Fire

## Narrative

An inland passenger craft with 55 people on board was on a sightseeing tour of a large inland waterway. At 1732, she was approaching lock gates when her engine started to overheat and a sudden reduction in power was experienced. The skipper then saw what appeared to be black smoke coming from the engine compartment, and decided to put the vessel alongside adjacent to the lock gates. The vessel berthed at 1735 and, after the skipper ordered everyone to abandon ship, using the public address system, the vessel was clear of passengers by 1740.

The skipper then broadcast a "Mayday" via VHF channel 16. The broadcast was acknowledged by the coastguard, which requested an exact position. In order to save time, the skipper opted to send this information by activating the vessel's GMDSS DSC alarm. This alarm was not received by the coastguard, but sufficient information had been given during the initial broadcast to despatch the fire service to the correct location. The skipper readied the vessel's fire extinguishers, activated the fuel cut off switch and removed a gas cylinder from the galley. Fumes continued to come from the engine room vents, but the space was not entered until the fire service arrived at 1753. It was discovered that there was no fire, and that the fumes were engine exhaust gases that had escaped from a rubber hose, which had melted.

Investigation revealed that during the skipper's checks before sailing, a rubber 'O' seal had been misplaced from a screw top while cleaning out the weed trap associated with the engine's cooling water system. Consequently, air had been drawn into the system, starving the engine and its exhaust system of its cooling water.

## The Lessons

1. **GMDSS DSC is a simple and effective distress alerting system with which all UK coastguard stations are equipped. However, users of inland waterways should note that the UK VHF DSC network is predominately oriented seawards, and might not provide DSC communications on inland waterways. In these waters, the use of VHF radio remains the primary means of distress, safety, and calling communications.**

2. **After working on any pressurised system, it is important that all seals are checked before the system is used. It is also good practice to ensure that the seals are re-checked shortly after start up.**

3. **Had there been a fire in the engine room, the prompt action taken by the skipper to get his passengers clear of danger, and to request assistance, would probably have prevented serious injury, or even saved lives.**

## Preliminary examinations started in the period 01/03/06 – 30/06/06

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 |
|---|---|---|---|---|---|
| 04/03/06 | *Calon Mor* | Fishing vessel | UK | 9.29 | Fatal acc to person |
| 17/03/06 | *Ocean Challenge* | Fishing vessel | UK | 113 | Fire |
| 26/03/06 | *BreakSea* | Tanker | UK | 992 | Machinery failure |
| 02/04/06 | *Sunsail Twenty* | Sail Trg vessel | UK | 11 | Acc. to person |
| 08/04/06 | *Crescent Connemara* | Tanker | UK | 1845 | Grounding |
| 18/04/06 | *Nicos I.V* | Tanker | Greece | 31183 | Acc to person |
| 26/04/06 | *Lowlands Marine* | Combination carrier | Panama | 40039 | Grounding |
| 05/05/06 | *Atlantis RIB* | Leisure craft | UK | Unknown | Fatal acc to person |
| 01/06/06 | *Brothers* | Fishing vessel | UK | 15.09 | Grounding |
| 05/06/06 | *Danielle* | Fishing vessel | UK | 226 | Acc to person |
| 15/06/06 | *Lomur*<br>*Freepsum* | General cargo<br>General cargo | Norway<br>Antigua & Barbuda | 1516<br>1990 | Collision |
| 17/06/06 | *Pamela S* | Fishing vessel | UK | 3.42 | Capsize, fatality |
| 21/06/06 | *Hugh Jars* | Leisure craft | UK | Unknown | Fatal acc to person |

## Investigations started in the period 01/03/06 – 30/06/06

| Date of Accident | Name of Vessel | Type of Vessel | Flag | Size (gt) | Type of Accident |
|---|---|---|---|---|---|
| 06/03/06 | *Spruce* | Barge | Marshall Islands | 7258 | Acc to person |
| 07/03/06 | *Ocean Harvest II* | Fishing vessel | UK | 96 | Fire |
| 10/03/06 | *Red Falcon* | Ro-ro pass. ferry | UK | 3953 | Contact |
| 17/03/06 | *Pastime* | Leisure craft | UK | Unknown | Fatal acc to person |
| 23/03/06 | *Star Princess* | Cruise Ship | Bermuda | 108977 | Fire |
| 27/04/06 | *Neermoor* | General cargo | Antigua & Barbuda | 1589 | Fatal acc to person |
| 06/05/06 | *Calypso* | Cruise ship | Cyprus | 11162 | Fire |
| 20/05/06 | *Roaring Meg* | Sail trng. ves | UK | Unknown | Acc to person |
| 07/06/06 | *Samskip Courier*<br><br>*Skagern* | Container<br><br>Dry cargo | Antigua & Barbuda<br>Sweden | 7852<br><br>4426 | Collision |

# Reports issued in 2006

***Abersoch RIB*** – serious injury sustained when falling overboard on 7 August 2005
Published 29 March

***Anglian Sovereign*** – grounding, near the island of Oxna, Shetland Islands on 3 September 2005
Published 30 June 2006

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

***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 2006

***Harvester/Strilmoy*** **–** collision in the North Sea on 4 November 2005
Published 14 June 2006

***Lerrix*** **–** grounding off the Darss peninsular, Baltic Sea, Germany on 10 October 2005
Published 11 April

***Lykes Voyager/Washington Senator*** – collision in Taiwan Strait on 8 April 2005
Published 10 February 2006

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

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

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

***Sea Snake*** – 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

***Recommendations Annual Report 2005***
Published June 2006

***Annual Report 2005*** Published May 2006

***Safety Digest 1/2006*** Published April 2006