Department for Transport

MAIB
MARINE ACCIDENT INVESTIGATION BRANCH

SAFETY DIGEST

Lessons from Marine Accident Reports

No 2/2007

Department for Transport
Great Minster House
76 Marsham Street
London SW1P 4DR
Telephone 020 7944 8300
Web site: www.dft.gov.uk

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Marine Accident Investigation Branch
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SO15 2DZ

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MARINE ACCIDENT INVESTIGATION BRANCH

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

This Safety Digest draws the attention of the marine community to some of the lessons arising from investigations into recent accidents and incidents. It contains facts which have been determined up to the time of issue.

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

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 6

INTRODUCTION 7

PART 1 – MERCHANT VESSELS 8

1. Crew Prevents Disaster 10
2. All Secure Alongside? 12
3. Obey the 5P Rule – Prior Planning Prevents Poor Performance 15
4. Pyrotechnic Pandemonium 17
5. Follow Procedures – Don't Rely on Your Memory! 18
6. Corrosion – The Hidden Enemy 20
7. A Question of Control 22
8. A Bridge Too Low 25
9. Shore Worker Dies in Onboard 'Base Oil' Fire 28
10. Keep Your Eye on the Passage 30
11. Break Out 32
12. Ferry Comes to a Grinding Halt 34
13. Overloaded Gangway 36
14. Look Before .....! 38
15. Under Tuition 39
16. Slippery When Wet 40
17. A Turn for the Worse 41

PART 2 – FISHING VESSELS 42

18. Crush Stop! 44
19. Better to be Safe Than Sorry 47
20. A Rude Awakening 49
21. Poor Beam Trawler Practice Costs Three Lives 52
22. In Drink and in the Drink 54

PART 3 – LEISURE CRAFT 56

23. Fatal Injuries From Propeller 58

24. Mind Your Fingers 60

25. A Change of Mind 61

MAIB NOTICEBOARD **64**

APPENDICES 66

Appendix A – Preliminary examinations and investigations started in the period 01/03/07 to 30/06/07 66

Appendix B – Reports issued in 2007 67

Glossary of Terms and Abbreviations

3/O	–	Third Officer
2/O	–	Second Officer
AB	–	Able Seaman
ARPA	–	Automatic Radar Plotting Aid
CO_2	–	Carbon Dioxide
ECS	–	Electronic Charting System
EPIRB	–	Electronic Position Indicating Radio Beacon
FRC	–	Fast Rescue Craft
HMPE	–	High Modulus Polyethylene
HSC	–	High Speed Craft
HSE	–	Health and Safety Executive
ISM	–	International Safety Management Code
kN	–	kilo Newton
MCA	–	Maritime and Coastguard Agency
MGN	–	Marine Guidance Notice
MNTB	–	Merchant Navy Training Board
OOW	–	Officer of the Watch
PPE	–	Personal Protective Equipment
SOLAS	–	International Convention for the Safety of Life at Sea
TSS	–	Traffic Separation Scheme
VDR	–	Voyage Data Recorder
VHF	–	Very High Frequency
VTS	–	Vessel Traffic Services

Introduction

In our Safety Digests, we always group our cases into 3 generic sections: Merchant Vessels; Fishing Vessels; and Leisure Craft. However, I would urge you all, as seafarers, to look at each of the sections, as there are lessons for every one of us in all sections. In this edition: Case 20 involves a fishing vessel and a merchant ship; Case 22 could apply to any seafarer; Case 25 involves a motor yacht and a high speed craft; and the "noticeboard" on pages 64 & 65 contains a flyer that was produced for the leisure industry, but that should be read by all. More information on this accident, and lessons for merchant vessels, can be found in the full report on our website *www.maib.gov.uk*.

One of the recurring themes of many of the most serious accidents is seeing and being seen:

> The case for keeping a good lookout is overwhelming. Regardless of who you are, it is essential that you keep a keen visual lookout and, where fitted, a good radar watch. With closing speeds now of 20 or 30 knots, and with an ever wider utilisation of the sea, OOWs, skippers and helmsmen cannot afford to lower their guard. Make sure your radar is well adjusted, and that your visual lookout regime is right, particularly in darkness, poor visibility etc.
>
> But there is an equal responsibility to be seen, particularly in smaller vessels. Radar is not the universal panacea that some believe; small contacts (including quite large yachts and fishing vessels) will not necessarily be seen, particularly in choppy seas. Some lights, e.g. yacht sidelights, have a visibility range requirement of only 1 mile; these visibility ranges can be further reduced by crazing of the lenses or by the vessel heeling. In many cases they will not be seen in a large ship before it is too late. It makes sense to invest in a good radar reflector, and to have a powerful light to hand to draw attention to yourself in good time.

Please use the enclosed tales of others' misfortunes, to ensure that you stay safe.

Stephen Meyer
Chief Inspector of Marine Accidents
August 2007

Part 1 – Merchant Vessels

It gives me great pleasure, as Chairman of the Merchant Navy Training Board (MNTB), to be asked to provide the introduction to the Merchant Vessels section.

Since its inception in 1937, the MNTB has existed as the UK shipping industry's body for developing and promoting the training and qualification of seafarers.

Today, the MNTB is the authoritative centre of expertise and information on careers, qualifications, training opportunities, training provision and skill needs and issues in the industry.

The MNTB brings together shipping Employers, Trade Unions, Training Institutions and the MCA to ensure that the Merchant Navy suite of certificates and qualifications meets the needs of industry, regulator and seafarers.

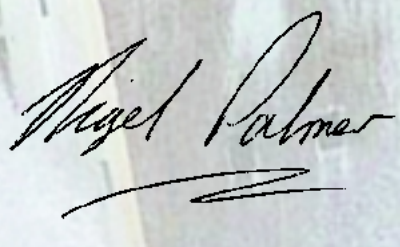
The work of the MAIB in identifying and publishing the causes of incidents provides valuable information which assists in identifying areas of deficiency in training. It is only by understanding the causes of accidents and incidents – and taking action on the findings – that we can continue to improve safety at sea.

Most incidents are preventable. They are the result of a chain of events that can be broken by properly trained people operating good equipment with appropriate working practices and procedures.

Many of the incidents in this edition of the Safety Digest are the result of poor (or no) risk assessment, or complacency when performing familiar operations. To prevent this requires good leadership – onboard and within shipping company and port management. It is not sufficient for ship and shore personnel to be technically competent; they must also have the skills to ensure that operating standards are established and maintained at a level commensurate with the risks inherent in shipping activities. We also see in these incidents examples of good leadership and training serving to mitigate the effects of an incident.

Leadership and management are areas that have not necessarily received the same level of training as technical competence. The MNTB has recently moved to degree level training with a Foundation Degree as the main entry route and prime Officer Trainee programme, and has used this opportunity to place greater emphasis on leadership and management as an integral part of this programme.

The MAIB Safety Digest enables us all to see examples of what can so easily go wrong; good leadership will take these lessons and embed them into daily shipboard operations.



Nigel Palmer, OBE

Captain Palmer commenced his career at sea as a Cadet with BP Tanker Co. in 1967 and served on a variety of ship types before attaining command in 1984. He subsequently gained experience in a number of shore appointments before attending Business School in London and Japan in 1988.

He was seconded in 1991 to the Australian North West Shelf LNG Project in Tokyo and Melbourne, returning in 1997 to BP Shipping in the UK to head up the Operations Group, with responsibility for the management of 30+ Oil, Gas & Offshore vessels. From August 2002 he became Director, Group Marine Assurance and subsequently Government & Industry.

Following retirement from BP Shipping in 2004 he continues to be involved in the shipping industry, and formed his own company in 2005 providing general industry marine advice.

Captain Palmer has been Chairman of the Merchant Navy Training Board since 2000 and the Maritime Skills Alliance (which brings together the Merchant Navy, Ports, Fishing and Leisure industries on maritime training issues) since its formation in 2004. He is a Trustee of the Slater Fund, CHIRP and the Shipwrecked Mariners Society and sits on the Boards of Glasgow and Cork Nautical Colleges. He is also a member of the Sea Vision UK National Core Group. Captain Palmer has just received an OBE in the Queen's Birthday Honours list.

He lives in Felixstowe, Suffolk and is married with three adult children. Hobbies include sailing and golf.

CASE 1

Crew Prevents Disaster

Narrative

A tug boat crew had come on duty shortly before midnight to escort a container vessel to sea from her berth in a busy UK port. The master, mate and chief engineer didn't normally sail together and were providing cover over the summer leave period. While preparing the assigned tug, the chief engineer found a defect on the salt water system that could not be rectified quickly, so the crew decided to use a relief vessel instead. The tug escorted the container vessel safely and headed back to her berth with the mate at the helm.

Close to the berth, the fire alarm activated on the bridge, and the master and chief engineer went below to the damage control cabinet. The alarm panel indicated that a fire had been detected in the upper engine room. The engine room door was only slightly warmer than normal, so the master undid the upper dog and cracked the door open. Thick smoke began to escape, and the chief engineer shut the door tightly, while the master told the mate to get the boat alongside as quickly as possible.

Once alongside, the chief engineer shut the remote fuel valves and machinery space ventilation flaps while the master requested assistance via the local VTS station. The mate checked the ventilation flaps and closed other doors, while the master and chief engineer discussed operating the CO_2 drench system. With the engine room door getting hotter, both agreed that the CO_2 drench should be activated.

The crew evacuated to the jetty, where the fire brigade was arriving. Using fire plans taken from the tug, the master and chief engineer briefed the fire officer. Hoses were rigged, but were not required as the CO_2 took effect, and in the early hours of the morning fire officers re-entered the engine room wearing breathing apparatus. The fire was confirmed as being

Fuel injector spill return pipe and associated fittings

extinguished, but a main engine fuel spill return pipe was found to be broken, and fuel was seen to be draining back into the engine room from the service tanks above.

Further investigation identified that the fuel injector spill return pipe had not been fitted correctly. Several compression fittings had been used in a very short run of pipe to accommodate valves and changes to the pipe's diameter. The pipe was inadequately supported and exposed to vibrations from the engine. In an attempt to prevent earlier problems of fuel dilution of the main engine lubricating oil, a non return valve had been fitted in the spill line close to the engine, and the return pipework terminated in a gooseneck at the top of the service tank. Unfortunately, the failure occurred downstream of the non return valve, and with the base of the gooseneck immersed in the fuel tank, a siphon allowed fuel to drain back down to the seat of the fire, despite operation of the remote fuel shut off valves.

The Lessons

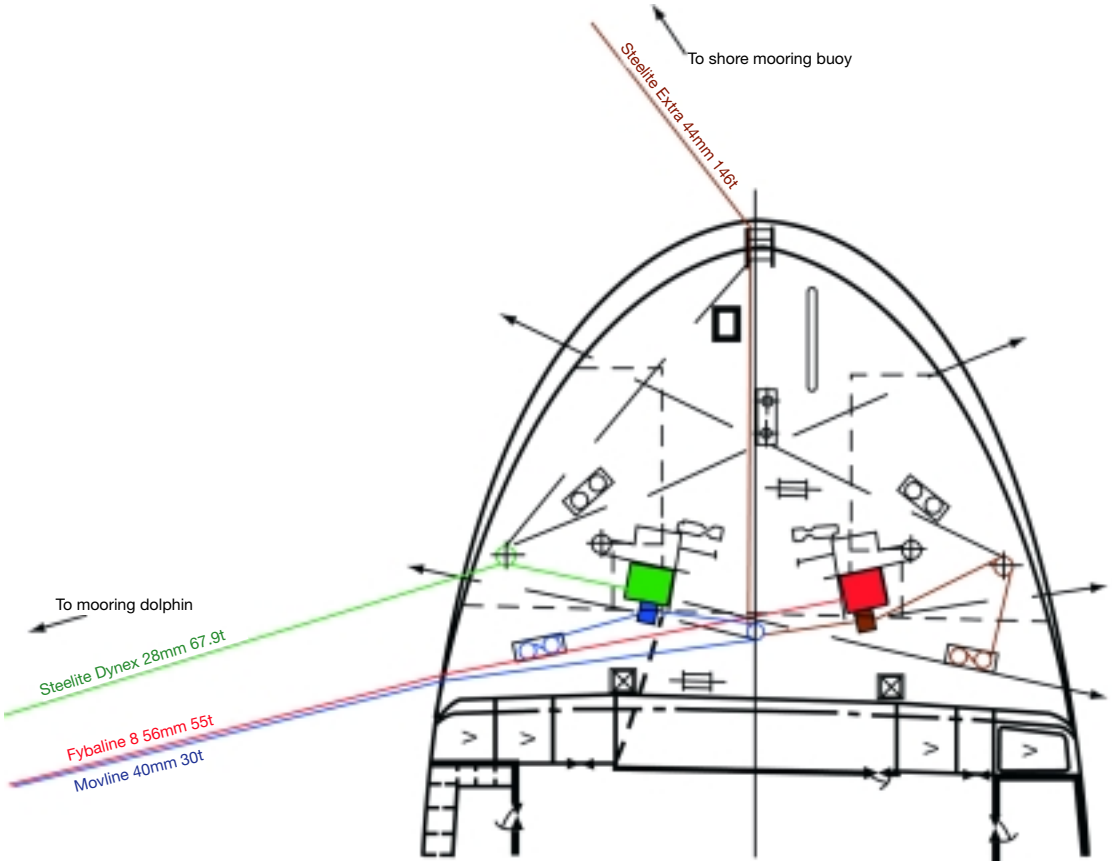
1. **The crew acted promptly and correctly, rightly earning a commendation from the senior fire officer on the scene for preventing a more serious fire and, indeed, probably saving the vessel.**

2. **The company's recognition that crews changed frequently and used differently configured vessels had prompted it to instigate a formal familiarisation programme. This ensured that the crew knew where all the necessary equipment was located and how to use it properly, despite not working together or using this particular vessel regularly.**

3. **Although the fuel injector spill return was a low pressure system, its failure allowed fuel to leak onto hot, main engine components, causing the fire. All fuel system pipework should be properly mounted and use appropriate fittings to minimise the risk of failure.**

4. **Once the pipework had broken, fuel could drain under gravity from the service tanks onto the fire below, despite operation of the emergency fuel shut off valves. All pipework to and from fuel tanks should be examined to ensure that, if the fuel shut off valve has to be operated, fuel can not drain out by other means.**

All Secure Alongside?



Mooring arrangement

Narrative

A ro-ro ferry approached port after an uneventful passage. The ship called port control, who gave the wind as 15-20 knots from the north-west, well within the limits for berthing safely. The ship entered the port and moored port side to, on a north-by-east heading. The ship was secured with four lines forward and four lines aft. Cargo discharging via the stern door commenced at 1830.

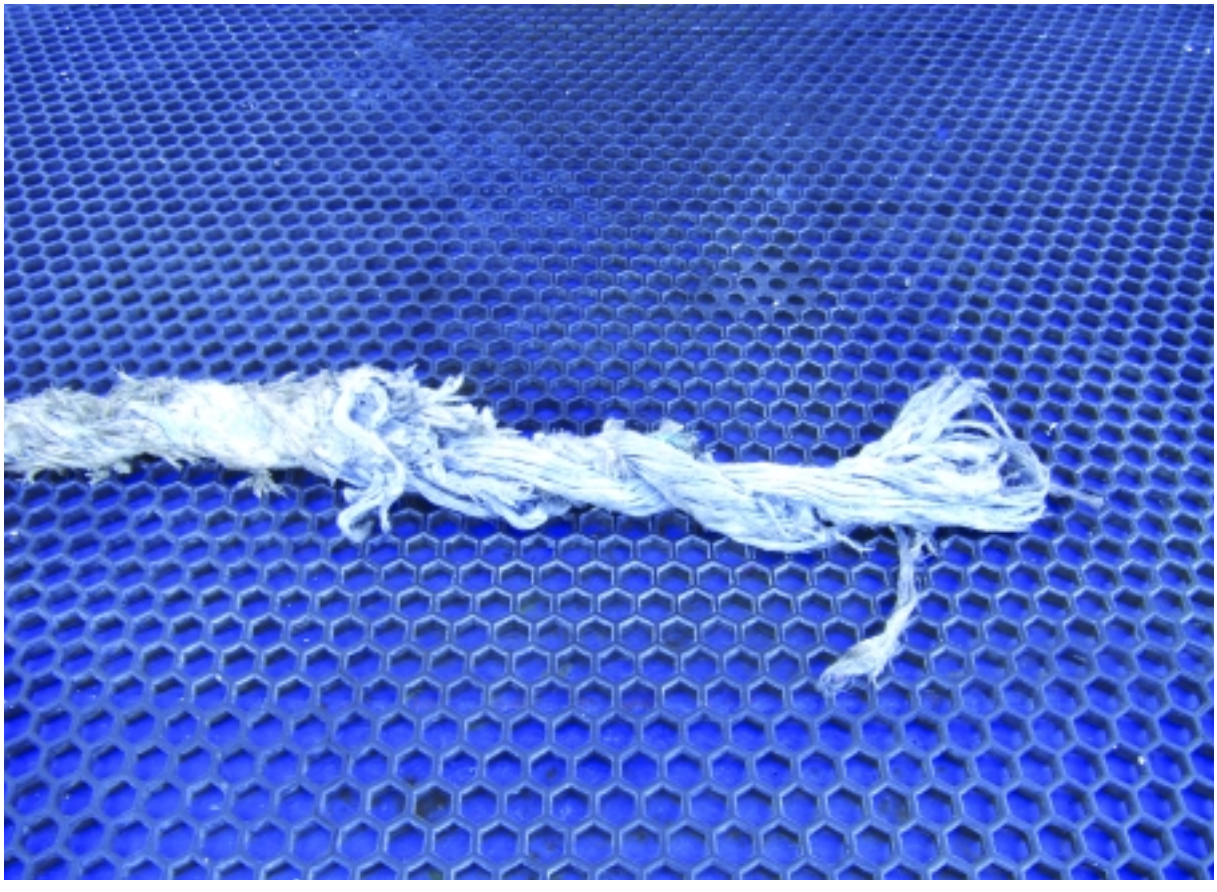
The vessel's mooring arrangement consisted of two mooring winches forward and two aft, with captive drums and drum ends. However, the types of lines employed for securing the vessel differed significantly. On the aft mooring deck, a 28mm wire rope on a captive drum was used as a spring; a 28mm HMPE[1] rope on the other captive winch drum was used as a breast line; a second breast and stern line were 56mm polyester mix rope and both were secured by round turns on the drum end, backed up on the bitts. On the forward mooring deck a 28mm HMPE rope on a captive winch drum was employed as a breast line; a 56mm polyester mix rope on a captive winch was also used as a breast line; a 40mm nylon rope, which normally acted as a forward spring, was used as an additional breast; and, finally, a 44mm HMPE rope was used as a head line. The two ropes were again secured by round turns on the drum end, backed up on the bitts.

The bridge was left unattended but the master and chief officer returned regularly to monitor the weather. At 2020 the master noticed the wind increase in strength to a steady 25 knots from the NW, with 35 knots gusts. This surprised the master slightly as the forecast had given a mean wind speed of 20 knots increasing to 22 knots by midnight. He ordered the main engines and bow thrusters to immediate notice, and he and the chief officer remained on the bridge.

[1] High Modulus Polyethylene

At 2105 there was a gust of 45 knots recorded by port control. This caused a mooring line to part on the foredeck and the captive winches started to pay out, slowly at first, then quickly. The master ordered the engines to be started and the port anchor to be let go. He also requested tug assistance from port control. Fortunately there was no traffic on the stern ramp, as the ship started to pivot around the stern and made contact with the linkspan and quay fendering. The second officer, who had been down aft, had run ashore when the lines parted, to try and raise the linkspan. The chief engineer tried to raise the stern ramp, but once it reached an angle of 45 degrees it was evident the hinges of the ramp were damaged. The ship steadied, with the starboard quarter resting on the corner of the adjacent quay, with only the lines from the two aft captive winch drums still intact. The brake shoe on one of the aft captive drums caught fire as the winch paid out, and it had to be tackled with a fire extinguisher.

Head line to mooring buoy



Parted line

The anchor and two remaining lines were recovered and the ship was manoeuvred to another berth and secured. The stern ramp was lowered, and temporary securing arrangements were made to allow the loaded cargo and passengers to disembark. The stern ramp was then raised and secured watertight for the passage to a repair yard.

Both halves of the head line, which was believed to have parted first, were recovered and tested. The line, fitted 11 months earlier, was a 12 strand, 44mm HMPE rope. It had a listed breaking strength of 1432kN (146 tonnes). After testing, it was found that the rope near to the failed area had a breaking load of 426kN, which represented a 30% residual strength. The rope was severely abraded in this area (see drawing) and was found to be significantly twisted with 3-4 turns per metre.

The Lessons

It is very fortunate in this accident that the mooring lines did not part 30 seconds earlier when vehicles were crossing the stern ramp. Had it done so, the consequences would have been even more serious.

1. **Ensure your vessel's mooring arrangement is reviewed regularly and is suitable for the berth and likely weather conditions. In particular:**

   - **Mooring lines of the same size and type should be used for all leads but, if this is not possible, lines in the same service, i.e. breast lines, spring lines etc should be the same.**
   - **Ensure fairleads and the handling of ropes does not cause excessive abrasion.**
   - **Captive drum brake rendering loads should be proportional to the strength of lines fitted.**
   - **Develop a mooring plan that can be brought into action when bad weather is anticipated. Don't simply rely on the normal tie-up.**
   - **Make sure the types of line employed are suitable for their application.**

2. **Ensure lines are inspected in accordance with manufacturer's and industry guidelines (OCIMF, Cordage Institute). The head line in particular, although relatively new, was obviously abraded and in need of attention. The planned maintenance system had recorded the inspection of the head line 2 months previously, and found the rope in 'good condition', perhaps indicating an inability to be able to inspect the whole rope adequately.**

3. **Twisting ropes can weaken them as much as, or more than, abrasion. This is especially true for HMPE braided ropes, which have high strength but low extension properties. The compound effect of abrasion and twisting can cause significant loss of strength, as in this case, where an 11 month old HMPE rope had weakened by 70%.**

4. **Securing ropes, by taking turns on the drum end and backing up on the bitts, is bad practice and should be avoided. Generally, winch drum ends are not designed to take static mooring loads as, unlike captive drums, they have no brakes to secure them. Lines should be stoppered off and secured on the bitts.**

Obey the 5P Rule – Prior Planning Prevents Poor Performance

Narrative

A 14 month old Panamax size bulk carrier left port in Europe in ballast towards South America. Weather conditions were good and the visibility excellent. The pilot disembarked and the ship joined the Strait Traffic Separation Scheme (TSS). The chief officer was the 1600-2000 watch officer, and a bridge lookout was posted. All bridge equipment was functioning normally. Having disembarked the pilot, the master retired to the rear of the bridge to deal with the inevitable post-departure paperwork and took no further interest in proceedings.

While proceeding down the south west traffic lane, and intending to pass south of the bank situated in the middle of the lane, the chief officer became aware that the vessel was south of the planned track. He altered course 15 degrees to starboard and predicted that the vessel would regain track in the vicinity of the light float which marked the start of the bank. At 1715, before the vessel regained track, the third officer (3/O) relieved the chief officer to allow him to leave the bridge and take a meal.

The 3/O fixed the vessel's position at 1725, a single radar range and bearing from a buoy, which showed that the ship had regained the planned track coincident with a planned 5 degree alteration to port. However, he did not alter the vessel's heading either back to the original course, or to the new one.

Although the 3/O was aware of, and expecting to pass between, two cardinal buoys marking

the safe channel, he did not positively identify the marks that he saw and the vessel actually passed between the two cardinal marks positioned either side of the bank.

At 1745 the bulk carrier grounded at a speed of 15.5 knots on the southern end of the bank.

There were no injuries to personnel and no pollution.

The Lessons

Having cleared port, the vessel quickly adopted a deep sea passage routine without any consideration of the traffic density or the proximity of navigational hazards in the TSS. As a consequence, the quality of position fixing and track monitoring was inadequate, and bridge manning, especially the meal relief of the chief officer by the 3/O when the vessel was off-track, and approaching the bank and a turning point, was ill-considered. It is not clear why the 3/O missed the course alteration and failed to identify the two cardinal marks, but he had been woken only 15 minutes earlier to conduct the meal relief and it is possible he was still suffering from 'sleep inertia'.

This accident was a direct result of failing to plan adequately for a transit of the TSS. A passage plan should be berth to berth, and approved by the master. As the headline says, prior planning prevents poor performance.

Pyrotechnic Pandemonium

Narrative

In April 2002, MGN 216(M+F) was issued by the MCA. It was entitled "*Dangerous Incidents Involving the IKAROS MKII Smoke/Light Unit*", and gave details of a warning letter issued by the manufacturers of the unit as a result of a number of dangerous incidents with this pyrotechnic unit. In short, the unit could be activated without the canister's smoke efflux plug being displaced, causing a build up of internal pressure and the resultant explosion of the canister. The unit was withdrawn from sale and a MKIII model produced.

The units, however, had a 4-year shelf life, so the last of these units were due for exchange in late 2005. To prevent the inadvertent activation of the unit, a transport safety pin had to be inserted into the firing mechanism before the unit was moved from its mount. This would prevent the ignition of the unit, and would allow safe handling. Instructions for this procedure were written on the packing box and in the safety leaflet contained in the box.

Damage to a hatch lid, caused by the explosion of a unit during replacement of MOB marker

Four years is a long time, and as the units headed towards their expiry date, a number of incidents occurred as they were being replaced. Not replacing the transportation safety pin, and inadvertently moving the unit enough to activate it without displacing the plug, caused the canister to explode exactly as described in the MGN. Fortunately, in each case reported to the MAIB, there were no injuries.

The Lessons

1. **The safety issues associated with this pyrotechnic were well publicised, and the manufacturers had removed it from sale. However, the intervening years between the first dangerous incidents, with the subsequent issue of the MGN and withdrawal of the unit from sale, and the more recent incidents, have meant that the safety issues associated with this unit had been forgotten.**
2. **Pyrotechnics, of whatever type, are designed to explode. It is only through safe storage and operation in accordance with the manufacturers' instructions that the explosion occurs as designed. It is important to read these instructions before removing or replacing pyrotechnics to avoid inadvertent activation.**

Follow Procedures – Don't Rely on Your Memory!

Starboard console

Narrative

The master of a ferry on a domestic route was at the controls when the vessel sailed from one of its two regular ports of call.

The vessel was running a few minutes behind schedule and the passage, which normally took 55 minutes, would be made into a head wind and against the tide. Additionally, one of the vessel's two engines was being operated at reduced power.

When the vessel was clear of the fairway, the master took the vessel's two propulsion units out of synchronisation so that the vessel could make maximum speed on the passage. A display sign, indicating that the units were now out of synchronisation, was a requirement of the company's operating procedures. He failed to observe this requirement.

The propulsion units were driven independently by each engine and were routinely operated in synchronisation. The

master, who had served for many years on the vessel, had hardly ever previously operated the vessel with the propulsion units out of synchronisation.

The master handed the steering of the vessel to the AB, shortly after which a group of catering employees, who were on induction training, came to the bridge for a short visit during which the master informed them about the vessel's operation. At the midpoint of the passage, the chief officer took over the steering from the AB and took over the conduct of the vessel as it had been previously agreed that the chief officer would be undertaking the berthing operation for the vessel's arrival at the next port.

As the vessel approached the berth the chief officer, who had served on the vessel for 3 years but had never previously operated with the propulsion units out of synchronisation, began to reduce the vessel's speed. However, as the vessel drew close to the berth the chief officer, who was navigating by visual reference to marks on the adjacent quay side, could not understand why the vessel's speed was not reducing as he would have expected. The vessel was now very close to the berth and the master, who had remained on the bridge, suddenly realised why her speed was not reducing as normal. He remembered that he had taken the propulsion units out of synchronisation but had not told the chief officer.

The chief officer thought that he was reducing power on both propulsion units, thinking they were synchronised; in fact, one had remained at full speed ahead (see figure).

Although the master synchronised and stopped the propulsion units, it was too late to reduce the vessel's speed and prevent her from making heavy contact with the berth. This resulted in several passengers and crew members being injured, and caused material damage to the vessel.

The Lessons

1. **Human memory is fallible. In everyday life we are all susceptible to forgetting to perform intended actions. These everyday lapses are mainly annoying and sometimes embarrassing, but in the operational world such lapses can cause accidents. It is therefore important that procedures are in place for all aspects of an operation, and that these procedures are sufficiently robust to ensure that a memory lapse cannot lead to an accident.**

2. **The fact that the chief officer took over control of the vessel without any formal handover taking place reflects the dangers of complacency which may creep in on very routine passages. Ensure that all handovers are conducted formally and diligently, regardless of the fact that some of the information exchanged may be deeply procedural.**

3. **The use of effective signage provides a reliable indicator that a non routine procedure is in place. However, such signs must be displayed to be effective, and it is important that procedures requiring the display of signage cannot be bypassed by someone's lapse of memory.**

4. **The approach to the berth was made without an adequate abort contingency being in place. It is essential to ensure that all systems are fully operational and the vessel is under control and at a safe speed before commencing an approach to a berth, especially where there are no abort options.**

Corrosion – The Hidden Enemy

Figure 1

Narrative

After completing the weekly planned maintenance routine on a rescue boat and its crane, it was usual for the crew to lower the boat to the water for training purposes while alongside. The boat was lowered and manoeuvred in the water for a short time and then brought back to be hoisted on board. As the boat was being hoisted, the wire rope parted and the boat fell into the sea.

Fortunately, the company had already identified this as a high risk operation and had stopped the practice of having the crew in the boat while hoisting or lowering during training exercises. There were no injuries, and the boat was not damaged.

On investigation, it was found that a new wire rope had been fitted 14 months previously, and it had passed a thorough examination about 5 months before the incident. It was also inspected/greased on a weekly basis as part of the ship's planned maintenance programme. Despite the checks, the incipient corrosion had not been discovered and the wire eventually failed at the top of the steel ball counter weight (see Figures 1 and 2).

The accelerated corrosion was partly due to the harsh environment in which the rescue boat and its crane were located, at the aft end of the vessel. The ball weight had a crevice at the top where the wire passed through, and this formed an ideal trap for sea water, salt and sulphur deposits from nearby exhaust outlets to accumulate and obstruct regular inspection.

The investigation discovered that unsuitable grease had been applied, and this had not been effective in lubricating the wire core and served to obscure the underlying corrosion (see photograph of wire and crane ball indicating the point of failure).

Figure 2

The failed segments of the wire rope were sent to a laboratory for testing, and the subsequent report confirmed that the wire rope had failed through ductile tensile fractures of wires wasted by corrosion. The laboratory was also able to confirm that a contributory cause of the failure was inadequate maintenance greasing over a significant period of time.

The Lessons

1. The inspection of all wire ropes should be thorough, and should include the removal of old grease to assess the condition of the wire rope before re-coating with fresh wire lubricant.
2. Senior staff should regularly monitor planned maintenance procedures which are carried out by crew.
3. Consideration should be given to the use of a thinner self penetrating lubricant on seldom used wire ropes, especially where they are used or stored in a harsh corrosive environment.

A Question of Control

Figure 1

Narrative

The master of a single screw, 1850 tons cement carrier (Figure 1) had prepared his ship to enter port. The engines, steering gear and navigation equipment had been thoroughly tested as required by his ISM documentation. All proved satisfactory, and he settled back to await the imminent arrival of the pilot.

Out on the bridge wing, the master noted that the wind had come up slightly to force 4 from the north-east, but this was nothing to worry about even though the river passage was known to be rather awkward. In any case, he had regularly practised steering gear failure routines, and that was the worst that could happen – wasn't it? Furthermore, he had full confidence in his crew of 6 who, unusually, had been together for 6 years.

Mooring stations had been called. The chief officer and an AB were on the forecastle, two ABs were aft, and the engineer was in the engine room in preparation for entering harbour. After the master briefed the pilot, the routine passage upriver, on a fast flowing flood tide began. As planned, the vessel was turned in mid-river to stem the tide, and to take the standard approach to the lock the pilot ordered the engine to be put from "stop" to "dead slow ahead".

What happened next was definitely unexpected.

The master put the bridge pneumatic control lever (Figure 2) for engine and gearbox control to the "dead slow ahead" position; there was no response. The wind was on the port beam and the stern was swinging quickly towards the stone reinforced riverbank. The master immediately contacted the engineer to check the control system, but he could find nothing untoward, except that the gearbox selector was still in the "stop" position. The stress levels on the bridge rapidly increased as the bank drew ever closer. Unfortunately there was

Figure 2

no attempt to transfer propulsion control from the bridge to the engine room.

The inevitable happened and the stern came fast onto the stone bank. Hull integrity checks were immediately ordered. While the hull was found to be intact, the Becker rudder was found to be seized and the rudder stock bent by about 20° from the vertical.

Tugs eventually towed the vessel into port. Luckily, the diver's inspections revealed that the propeller had escaped damage; internal checks also confirmed that the engine, gearbox and main shaft were unaffected.

The rudder was removed while the vessel remained afloat, but repairs were delayed during the time that materials were being sourced and this resulted in the vessel being out of service for almost 3 weeks. Investigations identified that the control fault was due to a seized pneumatic shuttle which controlled the oil supply which activated the gearbox clutches.

Figure 3

The Lessons

In this case, engine speed and gearbox control can be achieved using the bridge pneumatic control lever and from the local positions in the engine room.

Unfortunately, the local engine and gearbox controls, telegraph switches and bridge communication equipment are separated by some distance, making it very difficult for one person to take local control (Figure 3). Had control failure drills been conducted, this limitation would have been identified and could have been addressed. Despite the well managed training regime, this important safety drill had been overlooked.

The following lessons can be drawn from this accident:

1. It is important that the ship's team is fully conversant and practised with the routines to assume local control of propulsion systems.

2. Do consider the need to supplement the engineering staff if the disposition of equipment makes it difficult for a person working alone to assume local control.

3. Consider the "what ifs" no matter how unlikely they may appear to be. For example, consider how to maintain propulsion control and steering should both fail during a tight navigational situation.

A Bridge Too Low

View of the radar from the pot hauling position

Narrative

A 1900grt single hold general cargo vessel was on passage, following the recommended route through the Little Minch off the west coast of Scotland, carrying a full cargo of grain bound for Northern Ireland. The vessel's bridge could be lowered to pass under river bridges, and on this passage the bridge was in the lowered position. At the same time, a local 10 metre fishing vessel was close to the recommended route, hauling a fleet of prawn pots.

Visibility was poor, no more than 1 to 2 cables. On the cargo vessel, the master and a lookout were on the bridge but, despite the poor visibility, the helm remained in automatic, the vessel was travelling at her maximum speed of 9 knots, and the fog signal was only sounded intermittently. Unknown to the master, the starboard radar was not tuned correctly.

The fishing vessel was manned by the skipper and one crewman, both of whom were engaged in recovering a fleet of pots. Although it was possible for the skipper to see the radar display from the winch position, he had not identified the cargo vessel and neither he, nor his crew were keeping a dedicated lookout. No fog signals were sounded and the vessel was not fitted with a radar reflector.

The first time the master of the cargo vessel became aware of the fishing boat was when he saw her stern appear through the fog fine on his starboard bow, at a range of about 1 to 2 cables. He immediately changed from automatic to hand steering, switched on the second steering motor, and put the helm to port. As the vessel started to turn, the master realised that his stern would swing outward and collide with the fishing vessel. He therefore stopped the turn, but seconds later the fishing vessel disappeared from view under the starboard bow. The master did not feel any impact, but moved to the starboard bridge wing to observe, and saw the fishing vessel passing 5 metres off, along the starboard side.

CASE 8

On board the fishing vessel, the crew was heaving in a fleet of pots and totally unaware of the cargo vessel's presence. The cargo vessel's bow wave heeled the fishing vessel hard over to starboard, and as she rolled back the other way the port shoulder of the fishing vessel collided with the starboard bow of the cargo vessel.

The fishing vessel's crew was badly shocked by the collision, but recovered quickly, and while the skipper checked for water ingress, the crewman identified the name of the cargo vessel and reported the accident to the coastguard on VHF channel 16. Hearing the report, the cargo vessel turned and stood by the fishing vessel to provide assistance if required. Fortunately, no-one was injured and neither vessel suffered serious damage.

The Lessons

RADAR

1. Neither vessel detected the other on radar in time to avoid the collision. On board the cargo vessel, the radar in use had earlier been adjusted to allow for the effects of rain and sea, but as conditions changed it was not re-adjusted. On board the fishing vessel, although the skipper could see the radar display from his position at the winch, his attention was focused on hauling his pots.

2. Had the fishing vessel been fitted with a good radar reflector, her larger radar return might have been visible to the cargo vessel's master, despite the poor tuning of his display. Fitting of radar reflectors where practicable, is a safety of life at sea (SOLAS) requirement applicable to all vessels.

In restricted visibility, all vessels have the responsibility to 'see, and avoid'. Help others to see you by fitting a good radar reflector, and keep a proper lookout on radar yourself.

LOOKOUT

3. The cargo vessel was designed with a hydraulic wheelhouse which could be lowered to allow the vessel to pass under low bridges in European inland waterways. In the raised position, wheelhouse access was by external ladder, but in the lowered position the crew could transit to and from the wheelhouse using an internal stairwell. Possibly because of this, it had become normal to use the wheelhouse in the lowered position, as it was at the time of the accident. However, the lowered position seriously increased the forward visual blind sector to a point beyond that allowed by regulations. Had the wheelhouse been operated, as intended at sea, in the raised position, the master would have had a much better field of vision and therefore longer to avoid the fishing vessel before he lost sight of it in the blind sector.

4. The fishing vessel's crew was on the working deck recovering a fleet of pots where large side screens, fitted to protect them from the elements, severely restricted their ability to keep a proper and effective lookout.

5. Given the speeds of the two vessels involved, even the 2-3 cable visibility would have given the vessels time to avoid the collision had both taken proper and effective action. However, on both vessels, their ability to keep a good visual lookout had been artificially and unnecessarily constrained.

The Mark I Eyeball is still the most effective system for detecting the presence of other vessels – give it a chance.

FOG SIGNALS

6. Neither vessel was sounding the correct fog signal at the appropriate interval. Had they done so, it is almost certain that the fishing vessel's crew would have heard the cargo vessel approaching, even if the cargo vessel's crew, inside their bridge, had not heard the fishing boat's signal.

The purpose of a fog signal is to provide a warning – no signal, no warning!

Shore Worker Dies in Onboard 'Base Oil' Fire

Figure 1

Narrative

An offshore supply vessel was in port for tank cleaning of its mud and base oil tanks prior to taking on board a fresh cargo. The base oil was a combustible liquid with a flash point of 75°C.

A specialist tank cleaning team had been organised, and arrived with the tank cleaning, vacuum and storage equipment required for the work. Prior to commencing, a cargo surveyor outlined the work required and one of the team arranged a work permit with the authorising ship's officer.

Tank entry for the tank cleaners and the suction hose was through a manhole located in the engine room at an upper level (Figure 1).

After oxygen levels had been checked, three members of the team entered the base oil tank with the suction hose, while other members operated the vacuum equipment ashore.

When all of the base oil had been sucked out of the tank, one of the tank team climbed out and the three started to remove the hose from the tank. One of the hose connections became jammed and a second member climbed out of the tank to assist. He subsequently went ashore to the storage tanker. To facilitate the hose removal, the hose end section in the engine room was removed.

The team members who were ashore with the vacuum and storage equipment stopped the pumping operation ashore and closed the storage tanker valves. A misunderstanding about the correct sequence of operations apparently occurred, and this allowed the residual vacuum in the suction hose to be lost.

With the hose partially disconnected in the engine room, the base oil remaining in the hose flowed out under gravity and splashed over the running engine. The base oil ignited and a sheet of flame and dense smoke enveloped the area.

The tank cleaner who had disconnected the hose in the engine room, and a ship's crew member, escaped out to deck and raised the alarm. The fire brigade found the body of the remaining tank cleaner, who had still been in the base oil tank when the fire started, at the bottom of the engine room stairs.

An investigation of the accident concluded that the parties involved failed to have a safe system of work in place. A poor appreciation, by all involved, of the risks of transferring base oil was also apparent. The Permit to Work system was not fully understood and the permit issued was inadequate for the planned activity.

The Lessons

1. **Whenever shore contractors are on board your vessel, assure yourself that they are working safely, are aware of on board hazards in their vicinity, and have suitable measures in place should an incident occur. Deploy a member of the ship's crew to assist or standby while work is in progress and who can halt the work if safety is being undermined.**

2. **As with any visitors on board, contractors should be instructed on emergency procedures, what to do in the event of an alarm, and where escape routes are in relation to where they are working. They don't want to be trying to read the escape notices when surrounded by thick noxious smoke.**

3. **When transferring flammable liquids by hose, such as fuel oil, lubricating oil, hydraulic or base oil, be aware of the hazards. A simple risk assessment is a good idea. Before disconnecting hoses, ensure that the liquid transfer system is properly isolated and the lines fully drained – trying to stem the flow of a noxious liquid from an open hose while it splashes over you and surrounding machinery is an unforgettable experience!**

4. **Ensure that Permits to Work are:**

   - **Explicit in their description of the exact nature, identity and extent of the job, the names of those detailed for the task, the hazards involved and any limitations on the extent of the work and time constraints;**

   - **Specific in the precautions to be taken, including a risk assessment, isolation of potential risks such as running machinery or hazardous substances and using correct equipment and clothing;**

   - **Checked by an authorising officer who has ensured that the measures specified have been complied with and who retains responsibility until the permit has been formally cancelled or responsibility has been transferred to another responsible person;**

   - **Countersigned by the person undertaking the task to indicate their understanding of the safety precautions involved.**

Keep Your Eye on the Passage

Narrative

A container feeder vessel was on passage, partially loaded with 370 containers. The voyage had begun uneventfully. The day after leaving port, the 2/O completed a normal day, standing his 0000-0400 and 1200-1600 watches. Just before midnight he and a lookout reported to the bridge for duty again. The sea and weather conditions were good, and there was little other traffic to cause concern.

Half an hour after coming on watch, the 2/O sent the lookout down below to 'stand-by' in the crew mess. The lookout understood this to mean he could rest, so having eaten some food, he went to his cabin to sleep.

After the lookout left the bridge, the 2/O became distracted, initially by the VHF and subsequently by sending text messages using his mobile telephone. During this period, he cursorily checked the ship's position once as he walked by the electronic chart display, noting the ship still had some distance to run until the next planned alteration of course.

The 2/O was so engrossed in his text messaging that he missed the planned course alteration, due to occur at 0115, and the ship continued on to run aground half an hour later. The 2/O was alerted to the imminent grounding by vibration of the ship, and rushed to the central controls. There, he noticed the ship's log indicated the vessel had stopped, so he reduced the pitch on the Controllable Pitch Propeller to zero, and called the master.

After pumping out sufficient ballast, at 0245 the master was able to refloat the vessel using main engines and the bow thruster. A diver survey, conducted in a nearby port, revealed that two breaches of the hull into water ballast tanks had occurred, and the ship was allowed to continue passage to her planned destination to discharge her containers and conduct repairs.

The Lessons

1. The 2/O was distracted for over 40 minutes prior to the grounding, so he missed the alteration of course required by the navigational plan. By concentrating on text messaging using his mobile telephone, he had no capacity to monitor his vessel's passage, and he was oblivious to her progress. The OOW's principal responsibility is to ensure the safety of the ship – and *nothing* should distract him from this.

2. The master was fully aware that his crew regularly used mobile telephones on board, but had no policy about their use on the bridge. Ensure your company or ship has a policy on mobile phone use while on watch, to prevent unnecessary distractions.

3. Although fully aware of the requirement for a lookout to be present on the bridge, especially at night, the 2/O stood the lookout down. Had a lookout been present on the bridge, it is unlikely the 2/O would have become so distracted as to miss the alteration of course. The lookout rules are clear, for good reason – ignore them at your peril.

4. In this case, the watchkeeper placed too much reliance on the Electronic Charting System (ECS) to monitor the ship's position, yet did not employ the full functionality of the system. With no depth or no-go areas, cross track error or waypoint alarms set on the ECS, the system was passive and so provided much less support to the OOW. Make sure, if your ship has an ECS, you can use it effectively.

Break Out

Narrative

A small general cargo vessel, ship 1, had arrived at a river berth on the east coast of the UK to discharge. It was usual at this berth to take two shore ropes forward and two aft to act as head/stern and breast lines, and to use the ship's lines as springs. The ship had arrived shortly after local high water, and took the usual two shore lines forward to act as head line and breast line, and used a ship's line as her spring. Aft, because of the lead of the available shore lines and the fact that the ship's ropes appeared to be in better condition, ship's lines were used as stern, breast and spring lines. Once secured starboard side to the jetty, the agent arrived on board and presented the master with a standard letter from the wharf operator, which included the instruction not to adjust the moorings, especially when the tide was flooding or ebbing strongly. Since the ship had been to this berth on a number of occasions, the crew were aware of this warning.

A little over 30 minutes after arrival, cargo discharge commenced, and this continued for an hour until the stevedores stopped for lunch. The ship's crew also took this opportunity to break for lunch, and they went to the mess room. This left one man on deck as watchman.

Twenty minutes later, the crew heard a sound similar to a rope rendering around bitts. The master went to investigate and was halted by shouts from on deck saying that they were breaking adrift from their moorings. He ran to the bridge, shouting for the chief engineer to start the engines and for the mate to go forward and let the anchors go. Arriving on the bridge, he was in time to see the after spring part just as the mate was reaching the forecastle. The forward spring parted shortly afterwards as the ship's stern swung out into the river. The head line and breast line began to run out around the bitts, and the starboard anchor was let go.

At the next berth downriver, a larger general cargo vessel, ship 2, was also discharging her cargo. The master was on deck discussing the discharge with the mate when, from the corner of his eye, he noticed ship 1 moving. By that time, it was perpendicular to the jetty and swinging towards his ship. He shouted for the mate to go forward and let go the anchors, and for the poop to be cleared. The mate managed to let go both anchors just as the two vessels collided.

The port shoulder of ship 1 struck the port side of the transom of ship 2. Ship 1 was still swinging fast, and to arrest the swing the master gave a kick ahead on the engines with hard port rudder. This slowed the rate of swing and his vessel came to rest with her stern pointing into the river, at an angle of about 20° to the other vessel. Further damage had been caused by her forward crane striking the upper works of ship 2.

The weight of both vessels was now on the moorings of ship 2, and this caused one of her two forward springs to part. However, with the added effect of the anchors, the moorings held and the two vessels remained in position. To prevent further movement, the number of lines ashore was increased, and lines passed between the two ships to prevent further movement.

The port VTS service was contacted and the situation reported. A pilot was assigned to the vessels, and preparations made to move ship 1 at high water later that evening.

Two tugs arrived with the flood tide and, once all the traffic had passed for that tide, ship 1 was lifted clear of ship 2 and returned to her berth. There, she was moored using two shore lines at each end and her own lines as springs.

The Lessons

1. **There were no witnesses to the ropes breaking, since the stevedores were taking their lunch break and the crew of ship 1 were in the mess room on board.**

2. **The use of ship's lines aft was not expected by ship 1, and was at odds with the routine experienced at this berth during previous visits. Shore lines were supplied at these berths because the wharf operator did not always trust that the strength of the visiting ship's mooring lines would be sufficient to cope with the very strong tidal stream along the berth. Yet in this case it was thought that the ship's ropes would be of sufficient strength. They were not.**

3. **A letter of instructions is given to the masters of visiting ships by the wharf operators. This advises against adjusting the moorings during times when the tide is flooding or ebbing strongly. Experience has shown the wharf operators that this is the most likely cause of a ship breaking its moorings at these jetties. The ship followed these instructions.**

4. **The actions by the crews of both vessels were enough to prevent the moorings of ship 2 parting, and probably prevented any further damage.**

Ferry Comes to a Grinding Halt

Narrative

Moments after leaving one of the two harbours between which a ro-ro passenger ferry plied, her bridge team felt her shudder and lose speed when transiting the approach channel. The sea bed in the channel consisted of fine clear sand. For the first time that year, the sailing times were close to the time of very low spring tides.

On the return passage from the other harbour, the bridge team discussed the event further, and decided to restrict the amount of cargo they would load in order to produce a shallower draught. They also agreed to leave ahead of schedule to allow more time before low water.

Discharging and loading of passengers, trailers and vehicles was rapid, and they managed to sail with a draught 0.2m below that of the previous night. There were 1½ hours left before low water. After looking at the latest hydrographic chart, and taking into consideration the height and time of low water, the master thought he would have 0.5m under keel clearance over the shallow patch in the channel.

The ferry made her usual exit through the breakwaters and turned into the channel. To prevent squat, the master kept the propeller pitch down to 50%, which gave a speed of about 7 knots. The heading was set to make a course along the starboard side of the channel. While the bridge team were discussing where the ship had sniffed the bottom the previous night, the ship's speed began to slowly decrease and the echo sounder readings became spurious. Over several minutes, the speed gradually dropped – until the ship came to a halt. The vessel had grounded. The master tried astern and ahead movements, but the ship remained stationary. The weather was good, with calm seas, and there were no tugs in the area to call for assistance.

While waiting for the tide to rise, tanks were sounded, and passengers, company representatives, and appropriate authorities were informed. About 2 hours after grounding, the ship began to move astern and she refloated with the incoming tide. The propeller pitch was placed ahead, the ship made headway, and she resumed her passage without further incident.

During the 100 years of the harbour's existence, the approach channel had not been dredged. However, an offshoot of a nearby river had developed about 4 years before this incident, and this had caused the course of the channel to shift. Navigational buoys had to be moved accordingly. Several months before the incident, a regular hydrographic survey had detected the shallow patch on which the ship had grounded, so the harbour authority had issued copies of the hydrographic chart to all the port's users. A dredging licence had been granted to the harbour authority.

Dredging began a week after the ferry grounded.

The Lessons

1. The master had sole responsibility for making decisions about the ship's sailing minimum under keel clearance and, in this case, underestimated the rate of the falling tide. It would have been wise for the company to have issued guidelines about acceptable minimum under keel clearance. Furthermore, when sailing and arrival times coincided with very low water springs, it should have revised the ship's schedule to meet these guidelines. Circumstances can sometimes make it necessary to deviate from laid down schedules.

2. Between the discovery of the shoaling, and the dredging taking place, the harbour authority should have considered the impact caused by the reduced depths on vessels using the port and taken proactive action such as issuing appropriate guidance to pilots and pilot exemption certificate holders. This would have facilitated more informed passage planning.

3. When a ship grounds, a natural initial reaction is to attempt to refloat her by using the engines. This can damage the main engine gearbox torque and transmission block, and the controllable pitch propeller actuating system. Having established that there was no danger to his ship, the master should have exercised caution in using the engines and, ideally, have left the vessel where she was and waited for the rising tide.

CASE 13

Overloaded Gangway

Figure 1

Narrative

As a gang of 16 cleaning contractors boarded a container ship via the vessel's gangway in single file, the outboard end of the gangway moved off the quay edge and dropped about 1 metre until its weight was taken up by the lowering wires. Of the last three contractors to step onto the gangway, two lost their balance when the gangway dropped, and fell into the water. The third managed to hold onto the safety net. Despite an immediate recovery attempt, one of the contractors, who fell into the water, drowned.

Figure 2

Figure 3

The roller at the bottom of the gangway had not been placed fully on the quay due to the proximity of a shore gantry. This resulted in the bottom roller projecting over the water below (Figure 1). As the contractors climbed the gangway, their combined weight was sufficient to cause a harmonic motion that moved the bottom roller off the quay (Figure 2).

The gangway then dropped because the lowering wires had been slackened to allow for the movement of the vessel during cargo operations. The ship's duty officer and gangway watchmen were positioned at the top of the gangway, where a sign indicating that the maximum number of persons allowed on the gangway was 10, was sited (Figure 3).

The Lessons

1. **Although a gangway watch has traditionally been kept at the inboard side of the gangway, this is not always the best position. On occasions such as this, where a large shore gang was embarking, the number of contractors using the gangway would have been easier to control from the quay.**

2. **The maximum capacity or loading of any equipment has been determined for everyone's safety. However, these restrictions cannot work unless they are monitored and enforced.**

3. **Warning signs will not do their job if they cannot be seen. Warnings relevant to the safe use of gangways should therefore be sited at both their inboard and outboard ends.**

4. **For a variety of practical reasons, gangways cannot always be rigged or used as designed. However, they can frequently still be safely used in such situations providing the risks involved are carefully considered, and additional precautions, such as the reduction of its maximum loading, and increased vigilance, are implemented.**

CASE 14

Look Before .....!

Figure 1

Figure 2

Narrative

While alongside, the chief engineer and AB were engaged in painting the forward pump room of a dredger. This required the chief engineer applying paint with a spray gun from a 3 metre scaffold tower, with the AB assisting as required. Both were wearing the correct PPE, with the exception of safety helmets because the respirators they had on rendered this impractical.

No formal risk assessment or permit to work had been completed.

They completed one section and began repositioning the scaffolding. The AB was handing the platform boards back to the chief engineer from a permanent access landing (2.1M) which, although fenced off, had a staircase leading down to the main deck (see Figures 1 and 2). Just as the AB was about to hand the last board up to the chief engineer, the chief engineer told him to *'hold on'* so that he could reposition himself. This probably disrupted the work rhythm of the AB, who stepped backwards onto the staircase, missed her footing and fell backwards down eight steps.

This fall rendered the AB briefly unconscious, and the impact caused a gash to the back of her head with severe bruising to her back. She required hospitalization, but was lucky to have escaped with minor injuries as a fall of this nature could have had serious consequences.

The Lessons

1. **Although a safety discussion took place, no formal risk assessment or permit to work was completed. Either process might have prompted a more detailed review of the risks involved.**

2. **When working in difficult conditions, one should be constantly aware of the surroundings, and concentrate on the task at hand. It is very easy to become distracted or disoriented, especially when wearing respirators which limit visibility.**

3. **Working areas should be risk assessed for the task to be undertaken, and should be made safe before starting the job. Where it is not possible to make it entirely safe, work should not proceed until satisfactory safeguards have been established.**

Under Tuition

Narrative

The chief officer of a ferry was taking the ship to sea from a south coast port, under instruction from the experienced master. Using helm, engines and bow thrust, he successfully manoeuvred the ship from the berth and set off across the harbour. To exit the harbour required a sharp turn to port to pass between the breakwaters on an easterly heading. The usual routine was to start the turn with the bridge abeam a particular lamppost on the jetty, and experience showed that this would turn the ship onto a track through the harbour entrance.

On this occasion, the wind was blowing strongly from the south-south west, and the tidal stream was almost at slack water.

The standard exit plan required a heading of 215°(T) across the harbour but, once clear of the jetty, the chief officer steadied the ship on a heading of 196°(T). This had two effects: firstly, the wheel over position was not in the planned position and would require a sharper turn. Secondly, the ship would be nearer the entrance when making the turn, so would have less time to make any adjustments to the track before passing through the breakwater.

The chief officer began to make the turn onto the easterly heading when the correct lamppost came abeam, and the ship started to swing. About 30 seconds later, the chief officer noted that the ship was approaching the northern breakwater arm at the entrance, and put the helm amidships to slow the rate of turn. This had little effect and the master took over, increasing speed on both engines, putting the helm to port and the bow thrust full to starboard. This slowed the ship's approach to the breakwater, but not sufficiently to stop her from touching.

Damage was slight, with no water ingress and no pollution. The ship was cleared to continue her cross-channel service.

The Lessons

1. **The chief officer had planned his exit, and had briefed the rest of the bridge team of his plan. However, he did not follow this plan, and the master did not intervene to correct this omission. The chief officer ended up turning the ship in the wrong position.**

2. **By turning in this position, the ship was much closer to the entrance than originally intended, and once it became apparent that the ship was closing the north side of the entrance, there was little time for the master to take over and avoid striking the breakwater.**

3. **Since this accident, the ferry company, in conjunction with the harbour authority, has amended the passage plan to allow for a wider approach to the entrance. This will give more time to line up with the centreline of the entrance, and will allow the master more time to intervene if necessary.**

CASE 16

Slippery When Wet

Narrative

The duty AB had just come on duty in port when he was assigned to lashing/unlashing operations. This involved using a portable aluminium ladder to climb on top of containers to carry out the required task. The AB was alone and unassisted during this task.

The weather was overcast; in fact it had rained recently, leaving the decks wet and slippery.

The AB propped the portable ladder against the container and, without securing it, climbed up to lash the container. The ladder slipped from underneath him. The AB fell from the top of the container and landed on his feet, which resulted in a compound fracture to his left leg.

As he was working alone, there was nobody to assist him immediately. However, he was fortunate that his personal radio survived the fall and this enabled him to call for assistance. Being in port, he was also lucky to have immediate access to medical attention.

The Lessons

1. **The Code of Safe Working Practices for Merchant Seamen stipulates that portable ladders should be properly secured against slipping or shifting, yet this was not practised.**
2. **If working at a height of more than 2 metres, a safety harness with a life line should be worn. However, as in this case, where this was not possible due to the nature of work involved, consideration should be given so that at least two people are involved in this kind of operation.**

A Turn for the Worse

Narrative

A 5000grt dry cargo ship grounded when entering a port via a 120m wide channel. On the bridge were a local pilot, the master, chief officer and an AB helmsman. Visibility was about 2 cables, so a lookout, who was also available to drop the anchors if required, was also posted on the forecastle.

The ship was following a course of 110° in hand steering, at a speed of 11 knots when the pointer of a rudder angle indicator sited on the steering console suddenly moved to the hard to starboard position. The helmsman responded by applying port helm until the pointer indicated 10° to starboard. The main rudder angle indicator mounted on the deck head was not checked.

The master saw from the gyro repeater that the vessel was altering course to port, and quickly moved to the steering console and applied starboard helm. The indicator on the console did not move, and the helmsman then reported that there was a problem with the steering. The master immediately changed to auxiliary steering and put the lever hard to starboard. The application of starboard helm was confirmed by movement of the main rudder angle indicator. Although the master also put the propeller pitch control to half astern, the vessel grounded. The grounding occurred about 40 seconds after port helm had first been applied and with the ship on a heading of 055°. The ship was refloated about 12 hours later with the assistance of 3 tugs.

The Lessons

1. **When navigating in restricted waters, the consequences of a steering equipment failure can be catastrophic. Therefore, it is important that any such failure is detected, reported, and corrective action taken as quickly as possible. This relies on a bridge team being familiar with and practiced in: the steering system in use, the types of failure possible, how to report a malfunction, and the action that needs to be taken. It also relies on the course being steered being carefully monitored at all times. Don't be caught out, be prepared and practice for the unexpected.**

2. **When inadvertently approaching shoal water, if it is necessary to put the engine astern to prevent grounding, such action will inevitably be more successful if full power astern is used. Although anchors are seldom used for this purpose, they can also be very effective as a brake.**

Part 2 – Fishing Vessels

"Oh no! …. It's the bloke from the MCA!"

In 2001 the Maritime and Coastguard Agency took the bold decision to open an office in Newlyn dedicated to Fishing Vessel surveying. The idea of having an office actually on the quay was viewed by many with some scepticism. In the early days it was indeed a lonely existence, but very gradually industry came to accept that I hadn't been put in place to beat them with a big stick and make life difficult. I consider my role to be a privilege and know that certainly in the South West the relationship between 'them' and 'us' has improved. I'm now able to show that all regulations aren't necessarily as onerous as they may first appear and do have a purpose in making their lives at sea safer. One thing that has had most impact has been the phrase; "The Fishing Vessel MOT man". It's a concept to which fishermen can relate. Their cars are looked at every year, why not the boat? If they keep things up to scratch the costs are minimal and we don't charge for inspections on the smaller vessels, a pleasant surprise to many! I'm also able to work closely with the local producer's organisation and the fisheries resource centre to point fishermen towards the various grants that are available.

One of the major problems that the fishing industry has is image. "Old, scruffy, poorly maintained vessels manned by untrained drunken layabouts". Not my words but a member of the general public on the quay in Newlyn! Nothing could be further from the truth. Fishing has a totally different culture. It's not a down market version of the Merchant Navy. Fishing is a very dangerous business and carried out by professional seamen who are also the last of the hunter-gatherers. Fishing vessels are largely maintained within the requirements of the various regulations. Paint doesn't catch fish! It's true that the nicely painted boat may look more efficient than the unkempt one alongside it, but it may not be any better in terms of compliance.

I'm not sure that we in our various former guises have always served industry very well, but at least some of our hierarchy are more aware of the problems faced on both sides, and recent changes in legislation have shown a more pragmatic approach.

Sadly we still get too many incidents involving fishing vessels and their crews as the following articles will testify. The Marine Accident Investigation Branch work tirelessly to ensure that incidents are systematically examined. They then produce objective reports. They do not point the finger or apportion blame. Any one of us reading these reports, be they owner, skipper, crew, surveyor or even my interested member of the public, will probably be able to see instantly what went wrong, will shake their head and deny it would, or could happen to them. But these incidents are real. Alcohol and the sea have always been uneasy bed fellows and every year accidents to which drink can be attributed are still too prevalent, and in two of these reports alcohol was a contributory factor. In two other reports the first principle of being at sea is ignored. Failure to keep a good lookout is I suspect in part due to the increased reliance on electronic aids and also the diminishing number of crews aboard. Lessons can be learnt from these and other incidents, but they mainly boil down to a lack of good seamanship.

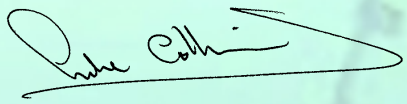
Being situated as we are, close to the main shipping lanes in and out of Europe, I am constantly being apprised of close quarters situations involving merchant and fishing vessels. I would remind all factions of the International Rules for the Prevention of Collision at Sea. A collision is never attributable to just one vessel. A full understanding of the Rules and good seamanship dictates the need to avoid close quarter situations. Hopefully the advent of AIS will improve matters further.

Whilst on the subject of Rule of the Road, it may be timely to remind skippers that the fishing signal defined in Rule 26 signifies "A vessel engaged in fishing", not as some seem to think, a fishing vessel, whatever it's doing, and whether at sea or in port. Please take the signal down when you're not actively fishing.

I commend these reports to you. Let us ensure that we read and discuss them. We can, and maybe should be openly critical of each other, but ultimately we must remember that what we are all trying to achieve is a much safer Fishing Industry.

There is still much to be done, but I am confident that we are on the right track. Try and think Safety and act safely all the time.

Good Fishing!



Mike Collier, MBE

Mike Collier was educated at HMS Conway MN Cadet School and joined Ellerman's Hall Line in 1964 for a career at sea involving world wide trade. Following a spell on the Coast with Stevenson-Clarks, he joined Hudson Steamship Company. He moved to the North Sea as Mate with Offshore Marine in 1974. The lure of the dollar then took him to Zapata Marine Service as Master, and he later became Shorebase Manager South East European Operations based in Sicily.

He joined HM Coastguard in 1984 serving at Belfast, Falmouth and latterly the Isles of Scilly. In 1999 he was part of a pilot scheme to bring Fishing Vessel surveyors closer to Industry, and he opened the Newlyn office in 2001. He was awarded an MBE in the 2007 New Years Honours list for Services to the Fishing Industry.

CASE 18

Crush Stop!

Narrative

A 30m beam trawler left her berth after being given all the necessary clearances from the harbour authorities. Fifteen minutes later, in poor visibility, she ran "head on" into an oil tanker jetty, at almost full speed.

There were no injuries to the crew, and the damage to both vessel and jetty was relatively minor. Fortunately there was no oil tanker alongside the jetty at the time, otherwise the outcome could have been much worse.

After her impact with the jetty, the trawler headed seawards, passing very close to other inward bound vessels, before the port authorities were able to establish contact and persuade the skipper to return to port.

Once back in the port, the vessel's skipper was breathalysed for alcohol and was found to be over the legally prescribed limit. The skipper was arrested and imprisoned, then released on bail pending the results of a blood sample analysis to confirm alcohol levels. Following the results of the blood tests, the skipper was prosecuted and found guilty under section 78 of the Railways and Transport Safety Act – *Navigating a vessel under the influence of drink.*

At the time of the accident, the port authorities' VTS staff were distracted from their primary function (monitoring and controlling marine traffic) by a routine telephone call and administrative duties, and failed to notice the trawler deviating from her expected route until it was too late. As a result, no intervention took place that might have averted the accident, although any such intervention might have been ineffectual. Following the collision, the VTS centre did not inform other traffic that a "rogue" vessel was at large, and the port's routine carried on as normal.

The resulting investigation concluded that the accident was caused by impaired judgment of the trawler skipper, probably brought about by

alcohol consumption. Although the harbour authorities' VTS centre played no part in causing the accident, they could have taken action to intervene in an attempt to prevent it.

The Lessons

1. Don't drink and drive! The dangers are no fewer in a boat than they are in a car. Alcohol dulls the senses, interferes with judgment and slows reactions. This in turn endangers the lives of all those in the vicinity.

2. The skipper was alone in the wheelhouse. Regardless of the alcohol issue, a second person in the wheelhouse, to act as lookout, is sensible when navigating close to shore. We are all human, if the man at the wheel loses control due to ill health, or any other reason, then the vessel is inevitably going to end up on the beach, or even worse.

3. The vessel was travelling at an unsafe speed in relation to the circumstances and prevailing conditions. When travelling in confined waters close to the shore, a reduced speed gives time to weigh up the situation, make a balanced judgment and react appropriately and, in the worst event, an accident at slow speed will do far less damage than one at high speed.

4. Harbour authorities play a major role in safe navigation within their jurisdiction. On this occasion, the VTS team were distracted from their main purpose and, although an attempt to intervene might have proved futile, it would have at least alerted other harbour users that a serious situation was developing. Alerting other vessels to the presence of a "rogue vessel" could prevent other potentially dangerous situations occurring.

Better to be Safe Than Sorry

Narrative

First incident:

On a Tuesday morning, a 28m, wooden-hulled, 60-year old beamer sailed from her home port to her fishing grounds. The weather was good but was forecast to become south-westerly force 6 to 8 for the weekend. By the Saturday, the wind had increased to near gale force.

While gutting the fish, under the whaleback, the deckhand/engineer noticed small globules of oil in the crab tank, which were coming out of one of two deck wash hoses. He went to the engine room and tried a number of valves in the deck wash/bilge systems, but the amount of oil being discharged out of the systems increased further. Soon afterwards, the bilge alarm alerted the crew to an increased water level in the engine room. The crew could not discharge the water from the space and, deciding it was better to be safe than sorry the skipper called the coastguard to tell them of the situation.

The coastguard sent a rescue helicopter, carrying a portable pump, to the vessel, and this was used to discharge the water from the engine room. By that time, the fishing vessel had hauled her nets and was making her way back to her home port, where she arrived safely the following morning.

The next day, a shore engineer found that the overboard discharge non-return valve for the engine room bilge pump was closed, and the crossover valve to the deck wash line was cracked open. The flooding was therefore attributed to the engineer not having opened the overboard discharge valve to the engine room bilge pump.

Second incident:

The following Tuesday, the fishing vessel sailed again towards her fishing grounds, this time with a different crew on board. The weather was good and the winds were light.

Two days later, the electric submersible pump in the forward net store failed. Using the emergency pump, which was driven by the auxiliary engine, the deckhand/engineer tried to pump out the store. However, the auxiliary engine failed because of an oil leak, which could not be repaired at sea.

Unhappy that the net store could not be pumped out, the skipper elected to haul in the nets and set a course to return to the home port. At about midnight on Friday, the engine room bilge alarm sounded because the bilge pump could not discharge the water that had accumulated in the space. Once again, feeling it was better to be safe than sorry, the skipper called the coastguard to inform them of the situation.

The local lifeboat was launched, carrying a portable pump, and it rendezvoused with the fishing vessel. They made for the nearest port, where the fire brigade pumped out the flooded spaces. The engineer found that two wires had become detached from the electric submersible pump, so he reattached them and the pump worked satisfactorily. Later that morning, the fishing vessel returned safely to her home port, under the watch of the coastguard.

The following actions were taken to prevent another serious incident:

- To improve the hull's watertight integrity, areas of the hull were recaulked.
- Crew members who were designated as engineers received improved training.
- The auxiliary engine and the engine bilge pump were renewed.
- Large sections of bilge pipe system were renewed, and improved routing was introduced.
- The overboard discharge valves for the emergency and bilge pumps were raised from beneath water level to lead over the top of the deck.
- A diesel-driven, portable salvage pump was placed on board.
- A working sea trial was carried out in moderate sea conditions to test the new improvements; all were found to be satisfactory.

The Lessons

1. **It is not good practice to rely on bilge alarms and/or operate bilge pumps continuously while at sea, no matter how reliable you think they are. It is important that crew members regularly check compartments for any ingress of water. The Marine Guidance Note 165(F) provides very useful advice on the risk of flooding to fishing vessels, and is well worth a read.**

2. **Skippers and owners should ensure that crew members are familiar with sea water side valves and bilge systems on board their fishing vessels. A displayed bilge system diagram is a good reminder when identifying the layout of pipe lines, pumps and valves.**

3. **The skippers were concerned about the free surface effect of bilge water on the stability of the vessel, and that major spaces could not be pumped out. Both skippers wisely called the coastguard early, before the situations had gone beyond the point where the vessel's survival could have been in doubt. Such decisions save lives.**

A Rude Awakening

Narrative

A 23m fishing boat was engaged in pair trawling with another vessel of a similar size. The boats were owned by brothers, and were fishing their normal fishing grounds in the North Sea. As is common practice, one of the skippers was always on watch while fishing, and on this occasion the tow had started at about 0200 with the skipper of the starboard boat on watch. The watch on the port boat was being taken by the engineer. He was new to the boat and this was his first towing watch on board. It was a calm night, with a low southerly swell, and the visibility had started to reduce at about midnight. By 0500 visibility was about 0.5 mile. Both vessels were fitted with two radars: one was kept on the 0.25 mile range to keep position on the other vessel; the other was kept on the 3 or 6 mile range for look ahead. No fog signals were being sounded.

CASE 20

At about 0509, a vessel was noted at about 5 miles on the starboard side. The skipper of the starboard boat confirmed with the port boat's watchkeeper that he also held it on radar; both began to plot the approach on radar. It soon became apparent that the approaching vessel would pass close ahead of the starboard boat, but was on a collision course with the port boat.

The approaching vessel was a supply boat on its regular run to a number of oil rigs. The OOW and a lookout should have been on the bridge, as required by the master. However, the OOW was alone. VDR records show that the two fishing boats appeared on the radar screen at about 9 miles. They were not plotted with the ARPA, and it does not appear that the OOW noticed them at all. Although the visibility was reduced, no fog signals were being sounded and the sound reception equipment on the Monkey Island was not in use.

About 30 seconds before the collision, the starboard boat's skipper tried to call the supply vessel. But he received no reply. The watchkeeper of the port boat attempted to alter to starboard, but only managed to alter through 15 – 20 degrees before the collision occurred. Moments before, the OOW on the standby vessel had looked up and seen the fishing boat appear in front of him at about 50 metres. He reacted by turning the main thrusters athwartships, the quickest way to stop the vessel.

The impact rolled the port boat onto her port side, throwing the remaining crew out of their bunks. A split had been made in the hull, allowing water into the fish hold, and the bulkhead between the fish hold and engine room had been ruptured, allowing water to flow freely between the two spaces. Pumps were started, and although they were coping with the water in the engine room, it was clear that the fish hold was filling fast.

The liferafts were launched and the crew put on their immersion suits; they didn't all don their lifejackets.

On board the supply ship, the master arrived on the bridge fewer than 30 seconds after the impact. Noting that the fishing boat was alongside, and that the towing wire was leading under his vessel, he de-clutched the thrusters so that they did not become

entangled in the wire. As the tension eased in the wire, it cleared from under his vessel, and he decided to move his vessel clear and standby to offer assistance. Meanwhile, other members of the crew were preparing the FRC and checking their own ship for damage. Apart from some denting and scrapes to the ship's side, damage was limited to a hole above the waterline in the forepeak tank.

As the fishing boat began to sink, the crew got into the liferaft and were subsequently rescued by the other pair trawler without having to enter the water.

The Lessons

1. **The OOW on the supply vessel was on watch alone. It was dark and visibility was reduced by fog; both factors requiring the presence of an additional lookout on the bridge. Had the lookout been on the bridge, it is likely that the fishing boats would have been seen in sufficient time for effective collision avoidance action to have been taken.**

2. **In fog or other conditions of reduced visibility, vessels involved in a close quarters situation have an obligation, under Rule 19, to keep clear of each other.**

3. **Neither vessel was sounding fog signals. Had the sound reception equipment on the supply vessel been operational, and the fishing vessels been sounding fog signals, the supply vessel might have been alerted to the presence of the fishing vessels early enough to take action to avoid a collision.**

4. **The immersion suits in use had integral buoyancy and would certainly have assisted in keeping the crew members afloat if they had been required to enter the water. However, an immersion suit will not turn an unconscious person onto their back, so it is essential that a lifejacket is also worn.**

Poor Beam Trawler Practice Costs Three Lives

Image courtesy of MCA

Narrative

On a late winter's afternoon, in calm sea conditions, a beam trawler caught her port trawl gear on a fastener. During the ensuing attempts to free the gear the vessel listed rapidly and capsized. There was only one survivor from the four crewmen on board.

After the trawler became fast, the starboard trawl gear was hauled to the surface, the derrick was raised and the net and beam brought clear of the water. The port gear, with its derrick in the normal horizontal towing position, was hauled until the warp was tight, causing the vessel to list to port. The three crewmen, who were on deck, moved to the starboard side of the vessel as water came through the freeing ports and then over the port bulwark.

The skipper, who was in the wheelhouse, shouted to the crewmen through an open window, saying that he was unable to do anything more. He did not operate the emergency winch release system which was fitted to his, and similar, beam trawlers. The starboard derrick, with the trawl gear suspended from it, probably then swung inboard and the trawler rapidly capsized to port. The crew found themselves in the water. None of them were wearing a lifejacket.

The youngest member of the crew swam to the upturned hull and managed to climb on to it. He saw the other two deck crew float past, face up, but was unable to pull them on board the hull, and they floated away. It soon got dark, and the survivor saw a number of ships pass by, but he was unable to signal to them. Neither the vessel's liferaft nor her EPIRB came to the surface.

The following morning, a passing ship saw the upturned hull and the survivor, and raised the alarm. An intensive search and rescue operation began immediately, coordinated by the Coastguard. The survivor was rescued by a Coastguard helicopter, and a search by military and civilian vessels located and recovered the bodies of the two crewmen. The skipper's body was also located a short distance away by other search units. However, it sank before it could be recovered, and he has not been seen since.

The upturned trawler began to drift, and she sank 2 days later.

The Lessons

1. The trawler met all the applicable stability conditions. However, in the situation where her port derrick was horizontal, its gear anchored to the seabed, and her starboard derrick raised to a large angle, she was extremely vulnerable, and capable of capsizing with less than 5 tons of winch force on the port side. Hauling the gear on one side, and lifting the derrick before trying to free the snagged gear on the other, is contrary to good beam trawler practice. Leaving the derrick on the opposite side horizontal will help balance the forces, and would have been a safer way of maintaining stability in this case.

2. The investigation found that the skipper and crew had worked long hours before and during the voyage. Long hours and hard physical work are common in the industry, making a fishing vessel a dangerous work place. Fatigue can affect us all – even the experienced, and its effects can be difficult to recognise. It can be dangerously long before you actually fall asleep, and can adversely affect: concentration; memory; response times; and the attitude to safety and risk taking. Improving the quality of rest, and taking regular rest periods will reduce fatigue levels and could prevent that ultimate mistake being made.

3. The emergency winch release system was misunderstood and not trusted. However, it was an effective system to lower the derricks and beams under control. Had it been used in time, it might have prevented the capsize. Ensure that all your vessel's safety systems are maintained, tested and understood by those on board – you never know when they might be needed.

4. When deciding on the best location for liferafts and EPIRBs, the possibility that they may become trapped in rigging, or on other fitments if the vessel rapidly capsizes should be considered.

CASE 22

In Drink and in the Drink

Narrative

Does this scenario sound familiar to you?

You've been fishing for a week and not had much sleep because the weather has been foul. In the early morning, your boat enters port to land the catch. During the day alongside, you help discharge the fish hold, load ice and fuel and carry out repairs on the fishing gear. The skipper decides to stay in harbour for the night and, once cleaned up, and having had something to eat, you go ashore to the pub with the crew.

After having a good amount to drink in the pub to celebrate the good earnings from the catch, it is closing time and you leave to return to the boat. On the way back, you decide to call into the local takeaway, while the others go on ahead. You buy your takeaway meal and continue on back towards the boat. When you arrive, you try to board, by reaching out for a stay to steady yourself and stepping from the quay onto the top of the gunwale before jumping on to the deck. You have done this many times before, and had no difficulties. However, on this occasion, as you try to step from the quay to the top of the gunwale, you miss your footing and say to yourself, *"Oops, missed!"* This is the last thought you will ever have, because your head hits the gunwale and your body continues to fall between the boat and the quay, into the water.

Sometime later on board the boat, someone asks where you are and, after searching, the crew realise that you are missing. The skipper then notifies the coastguard that you are missing and a search is started. Later that morning, after the dock has been searched by divers, without result, the boat is moved away from the quay and your body floats to the surface. It is in the early stages of rigor mortis and beginning to bloat. Not a pretty sight. With some difficulty, your body is heaved onto the quay so that it can be taken to the local mortuary.

Not only has the incident involved coastguard search units, the ambulance service, paramedics and divers, but also the police, the MAIB, MCA, HSE and the coroner (procurator fiscal in Scotland). The coroner has to order a postmortem examination on your body to establish the cause of death, and sometime later he holds an inquest in the local court. More tragically, someone has the terrible task of telling your wife and four kids that you have had a fatal accident, and has to explain how it happened.

The Lessons

1. You may think that it is rare for someone to fall between a vessel and the quay while boarding a fishing vessel, and perhaps even more so for a fisherman to lose his life in the process. During the last 10 years, 13 fishermen have lost their lives when returning from the pub; the circumstances in which all these fatalities occurred reflect closely the scenario given above. Alcohol and fatigue can be a fatal combination.

2. The Marine Guidance Note MGN 268 (M+F) reminds vessel owners and others of the need to ensure that safe means of access are provided to fishing vessels and other small vessels. It also identifies some of the hazards that may be encountered and advises on protective measures that can be taken to minimise the risk.

So if you are responsible for providing a safe means of access, it is important that you carry out a risk assessment to identify the hazards and then try to remove them, or at least minimise them.

Part 3 – Leisure Craft

This issue of Safety Digest features a flyer to the leisure industry from the most publicised yachting accident in recent times, the loss last August of the yacht *Ouzo*, and her three crew, after an incident with the P&O ferry, the *Pride of Bilbao* 6 miles south of the Isle of Wight.

As editor of Britain's biggest-selling boating magazine I am very aware of the impact the *Ouzo* disaster has had on boat owners who sail in the vicinity of shipping routes. There's a new air of caution, even among seasoned yachtsmen. The fact that the ship's watch did not see the *Ouzo* by eye, or on their radar, blows away the general assumption by many yachtsmen that ships will see them and that a radar reflector guarantees you will be seen.

The advice to yachtsmen in the 'leisure' flyer is about making your yacht as visible as you can, and ensuring you have the equipment necessary to call for help and to survive in the water. Until the *Ouzo* disaster, many boat owners did not think of an expensive EPIRB, or liferaft, or lifejackets with all the 'extras', as necessary for coastal cruising. Yet *Ouzo* was lost just 6 miles off the coast, and any of those items could have improved the crew's chances of survival.

Ouzo was not an isolated case. The yacht *Tuila*, lost in the North Sea with all crew, was most likely to have been run down by a ship. Only 4 years ago, the *Wahkuna* was sunk by a P&O container ship in the English Channel, the crew miraculously survived. With these incidents still fresh in our readers' minds, the MAIB's advice to yachtsmen is being taken very seriously.

To its great credit, as a result of its *Ouzo* investigation, the MAIB commissioned a test of yacht radar reflectors. Shockingly, the performance of most was, as Practical Boat Owner reported, 'frighteningly poor'. This knowledge puts an even greater onus on yacht skippers to not assume they can be seen, and for manufacturers to produce better radar reflectors.

Thanks to the MAIB's investigation and report into an incident involving a yacht and a High Speed Craft in this issue of Safety Digest, ship operators are warned again that, 'Even HSCs must obey the COLREGs!' I was once told by a fast-cat ferry skipper that 'yachts are stationary objects' to them. That may be so, but we are stationary objects with the ability to be injured when tossed around in wash, and to feel fear when fast ferries unexpectedly change course.

A day on the waterways turned into tragedy in the blink of an eye, and a child was injured by a piece of cabin furniture. These two accidents in the remaining two reports this month both remind us that we can be a danger to ourselves and our crew, even if no other vessels are involved. Anyone who reads these reports will step aboard a narrow boat, and secure a locker lid, with more thought in future.

The MAIB reports are very much welcomed by the 48,600 buyers and 219,000 readers of Practical Boat Owner. The knowledge gained from the misfortunes and tragedies of others may result in they themselves sailing more safely.

Sarah Norbury

Sarah Norbury

Sarah Norbury is editor of Practical Boat Owner, Britain's biggest-selling yachting magazine. Matters of seamanship, navigation and safety are given high priority within the editorial pages and boat owners rely on PBO for the latest news and navigation updates.

Sarah has been Editor of Yachting Monthly, Practicals Editor of Motor Boat and Yachting and a journalist on Classic Boat, Yachts & Yachting, and Boat International.

She is a keen keelboat racer and also enjoys cruising.

Fatal Injuries From Propeller

Narrative

A family were enjoying their first narrow boat holiday together on a hired boat. The hire company had provided buoyancy aids and shown the family how to manoeuvre the boat and operate the locks on the canal before they set off.

Two days into their holiday, the family approached a lock which was obscured from their view by a bend in the canal and a bridge immediately ahead of the lock gates. Their boat came level with another hire boat moored in the lock waiting area, and the family realised that they needed to move astern to moor and wait their turn for the lock. With the wind blowing down the canal, from bow to stern, the helmsman put the propeller into reverse, but was unable to prevent the bow being skewed at an angle across the canal. The boat then made contact with the stern of the moored narrow boat and a family member jumped from the stern to the bank using the stern mooring line to help secure the boat safely.

The boat then made contact with the canal bank, and the helmsman was seen to tip over the guard rail, which was at about knee height and fitted round the cruiser style stern. He managed to hold on briefly, with his legs hooked over the rail, before dropping into the water on the outboard side. The crewman with the stern line jumped back on board and stopped the engine, but could not see the helmsman in the water. Although buoyancy aids were available on the boat, the helmsman was not wearing one. A lifebuoy was thrown into the water, but with no sign of the helmsman, the crewman jumped into the canal to assist. The crewman quickly found the helmsman's leg, but could not pull him free. Another family member and the helmsman of another boat jumped into the waist deep water to assist, but the helmsman was entangled in the propeller.

The crewman climbed back on board and

removed the weed hatch in the engine compartment to gain access to the propeller. He could see the helmsman was trapped by torn clothing, with his head and arm caught in the propeller. Using scissors, he managed to free the helmsman, and with the assistance of the emergency services, who had quickly arrived at the scene, the helmsman was recovered to the canal bank. He had suffered severe injuries to the back of his shoulders and head, and his left arm was very nearly severed. He was pronounced dead at the scene.

The Lessons

1. **Although serious accidents are rare on the inland waterways, boaters, and particularly those new to boating, should be aware of the potential hazard posed by a rotating propeller.**

2. **All responsible people on board should be familiar with the actions to take in an emergency, and be able to stop the propeller quickly if needed.**

3. **Boaters should check canal maps for potential obstacles such as locks and bridges, and slow down if the view ahead is obscured to avoid having to make difficult manoeuvres at short notice.**

4. **Although hand rails are not required on narrow boats, where they are fitted, they should be of an appropriate height to prevent people from falling overboard near the propeller.**

Mind Your Fingers

Narrative

A 10.6m yacht was returning to its home port with its owner at the helm. The boat had been recently purchased by the owner. As the yacht neared the entrance to the harbour, the wife of the skipper was down below getting their 14 month old son ready for bed in the forward cabin. The infant was laid down on a bunk adjacent to a storage unit with a lid that was secured open by a rigid spring mechanism. As his mother turned her back for a moment, the boy rolled over and sat up and, in doing so, deflected the spring that was keeping the locker lid open. The lid came crashing down, trapping one of his fingers.

The owner called the emergency services and requested an ambulance on arrival in the home port. The harbourmaster came out in his launch to meet the yacht, and he took the injured boy and his mother to a waiting ambulance. Fortunately, the little boy did not lose any bone from his finger and was expected to make a full recovery.

The Lessons

1. **Make sure any heavy locker lids or chart tables can be secured open and do not pose a significant hazard.**
2. **Special care needs to be taken where children can easily reach securing mechanisms. If children travel on your vessel, it is worth considering your craft's arrangements from a child's perspective to avoid potentially nasty accidents such as this.**

A Change of Mind

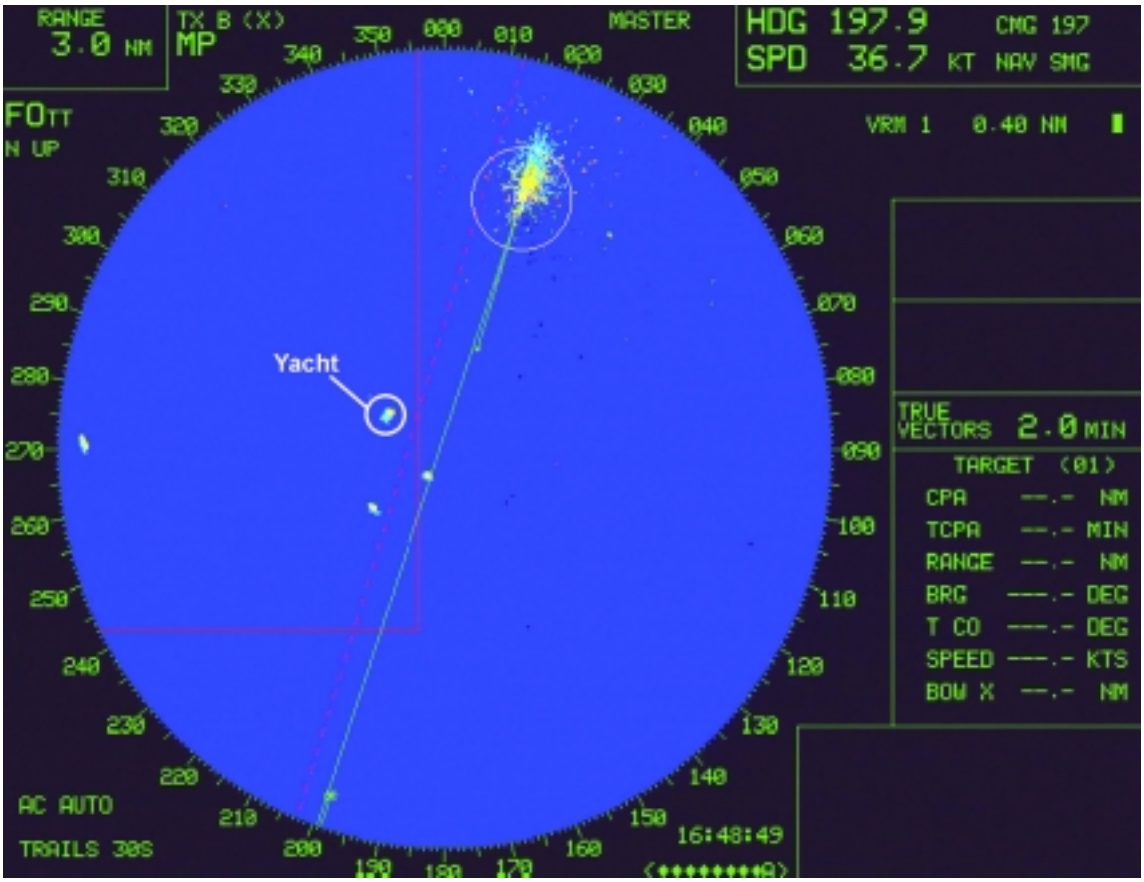


Figure 1: VDR extract of HSC

Narrative

What started out as a leisurely passage on the south coast turned into a frightful adventure for the skipper and crew of a motor yacht due to the failure of the master of a high speed craft (HSC) to appreciate the situation from the yacht's point of view.

On clearing the entrance of the estuary, the master of the HSC retained the con of the vessel and increased speed to about 34 knots. At this time, the chief officer was assisting the master in executing the passage plan.

Visibility was good, and although there was a force 5 wind blowing, the height of the sea was recorded as 0.5m. Both 'X' and 'S' band radars were working, but unfortunately no targets were acquired for plotting and the present traffic was being assessed by eye rather than by all the available means.

The motor yacht was first sighted at about 10 degrees on the starboard bow at a distance of about 3.5nm (Figure 1) and appeared to be crossing and on a collision course. The master of the HSC, being the give way vessel, decided to alter course 15 degrees to starboard which, by the time he had done so, put the motor yacht 1.6nm away and fine on his port bow (Figure 2).

For some unexplained reason, the master changed his mind at a distance of about 1nm and altered course to port by about 10 degrees (Figure 3). The astonished skipper of the motor yacht stopped his engines to increase the passing distance, and the HSC passed 2.5 cables ahead. The skipper and crew of the yacht had been frightened by the experience, which was made worse by having to brace themselves against the effects of the HSC's wash.

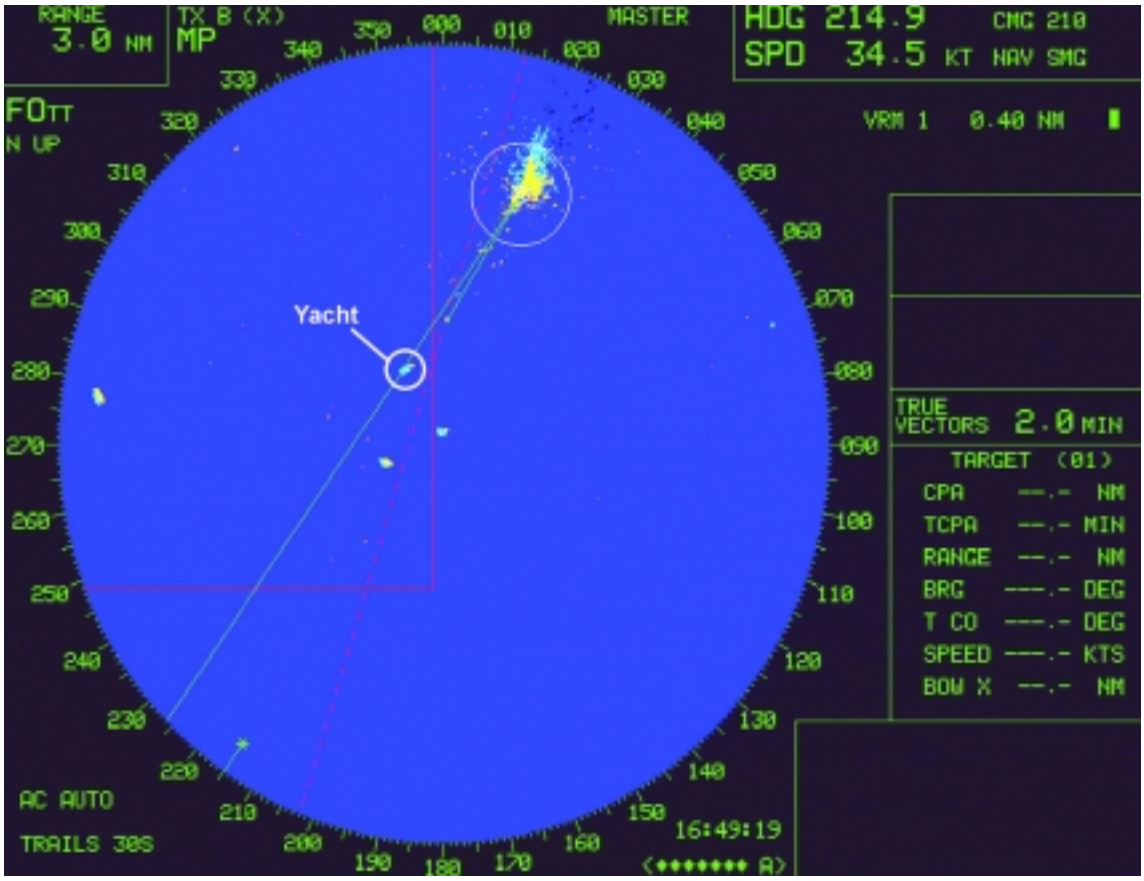


Figure 2: VDR extract of HSC

The master of the HSC was unaware that his last minute change of plan had caused so much upset on the yacht. He believed he had the situation under control. The yacht skipper reported the incident to the MAIB and, consequently, the Voyage Data Recorder (VDR) records were retrieved from the HSC. It was only through analysis of the VDR data that exactly what had occurred could be deduced. Several shortfalls in the bridge team performance were identified and measures were put in place to avoid a similar incident.

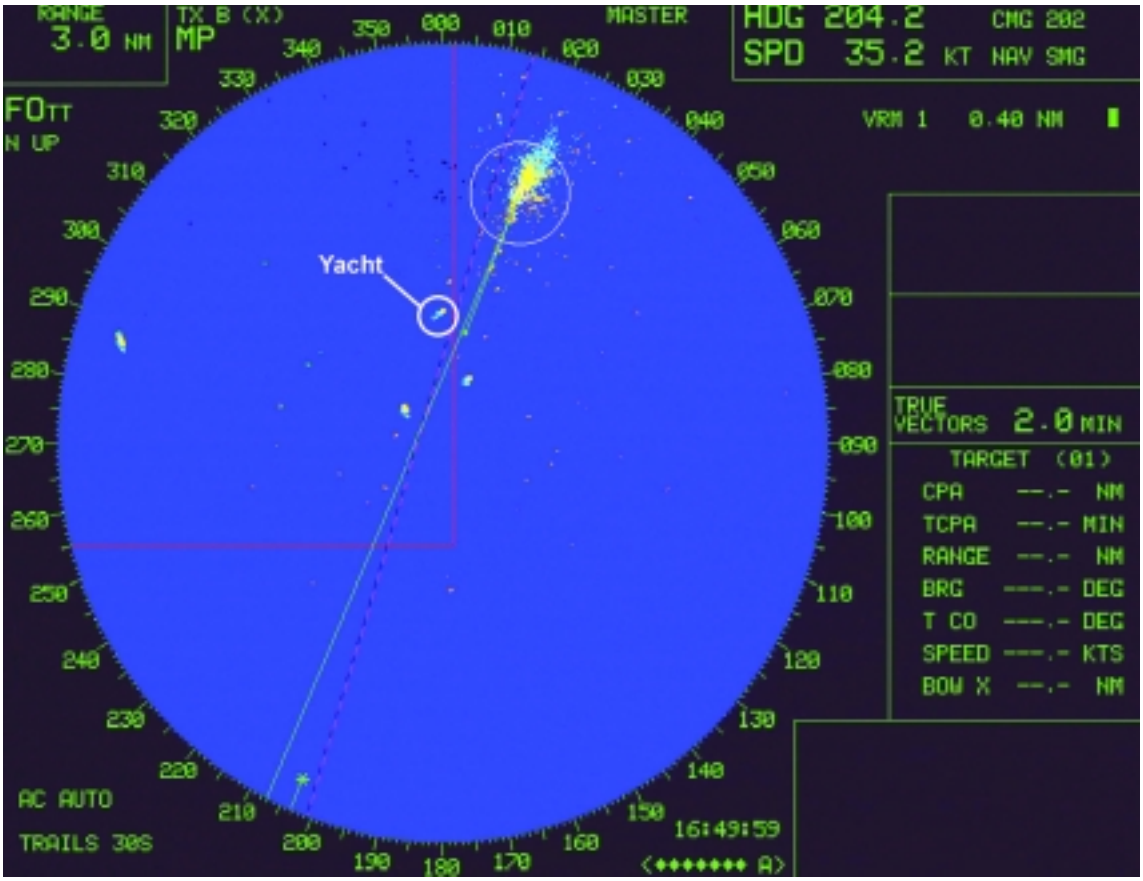


Figure 3: VDR extract of HSC

The Lessons

1. It is a good idea for ship managers to routinely download the data from the vessel's VDR every now and again to audit the bridge team performance.

2. Masters and OOWs on fast merchant vessels, and especially those on HSC, should consider how their planned actions will be seen by smaller, slower craft, yachts and fishing vessels. Although the master was aware of the yacht, and in his mind had the situation totally under control, the yacht skipper had a very different opinion and desperately needed reassurance.

3. Even HSCs must obey the COLREGs! In this case, the master of the HSC should have taken early action to clearly indicate his intentions. He should then have maintained that course until past and clear and, most definitely, should not have changed his mind and altered at the last minute across the bow of the yacht. There was no navigational reason for him to have to pass closer than, say, a mile from any craft in the vicinity.

4. Good bridge teamwork practices require that actions by one person are cross-checked by another member of the team. In this case the chief officer should have questioned the master's intentions/actions.

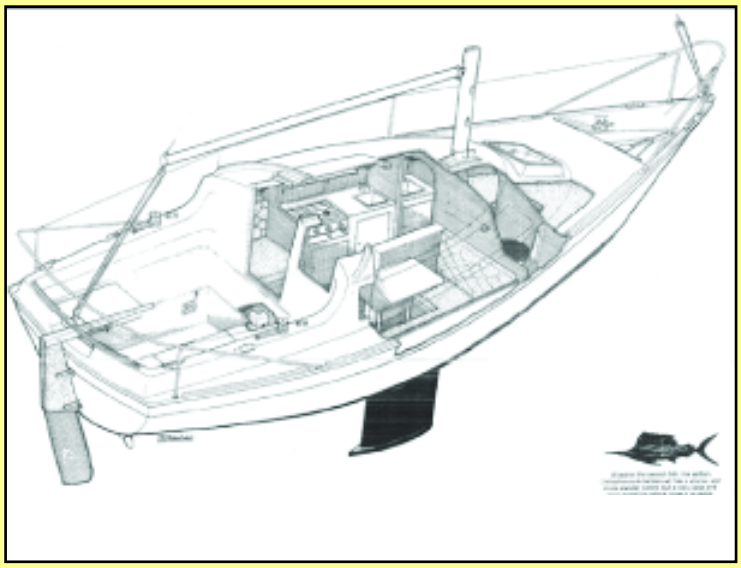
5. Wash from HSCs can be a serious problem to small craft, even at sea and in deep water. Bridge teams should be sensitive to this fact and should plan their actions accordingly.

MAIB

MARINE ACCIDENT INVESTIGATION BRANCH

FLYER TO THE LEISURE INDUSTRY

OUZO:
ACCIDENT WITH THREE FATALITIES 21 AUGUST 2006



Narrative

The yacht *Ouzo* sailed from Bembridge, Isle of Wight (IOW), bound for Dartmouth, Devon on the evening of 20 August 2006 with her three regular crew on board. The last record of the yacht was at 2230 when she went out of range of the Southampton/Portsmouth VTS radar system in Sandown Bay. At this time it is believed that the yacht was sailing close hauled in a south-south-westerly direction.

The body of one of the crew members was found in the sea just before midday on 22 August about 10 miles south of the Nab Tower. At about 1900 on the following day, the bodies of the other two crew were recovered from the sea. They had all been wearing inflated lifejackets and good quality yachting clothing. Despite extensive surface and sub-surface searches no trace of the yacht has been found.

Voyage data recorder (VDR) records from ships that had been in the area during the night of 20/21 August were recovered and analysed by MAIB inspectors and it was discovered that the ferry *Pride of Bilbao* had been involved in an incident with a yacht 6 miles south of the Isle of Wight in the early hours of 21 August. The investigation concluded that she had either collided with, or passed so close to *Ouzo* at that time, and that the yacht had been swamped or capsized by the vessel's wash.

Just before the incident, *Pride of Bilbao* had made an alteration of course for navigational purposes which might have inadvertently served to confuse the yacht's crew about the ferry's intentions. In any case, any attempts the yachtsmen might have made to attract the ferry's attention were ineffective as the ferry's watchkeeping officer and lookout only saw the yacht's lights at the last minute, by which time they were unable to keep well clear. The yacht had not shown up on the ferry's radars despite probably having a radar reflector hoisted.

Safety Issues for yachtsmen

1. Yachts cannot be seen easily from the bridges of ships, and yachtsmen need to be proactive in attracting the attention of the ship's watchkeepers. The crew of *Ouzo* kept a powerful torch at hand for just such an emergency but, in this case, were probably unaware of the real danger until it was too late. **Yachtsmen should not hesitate to attract the attention of ships' watchkeepers by whatever means are available.**

2. The lookout on the ferry had not seen the yacht until it was very close ahead. This gives rise to a number of possible factors including, from the yachtsmen's point of view:
   - i The lenses of navigation light units similar to the one fitted to *Ouzo* are prone to crazing which substantially reduces their efficiency. **(as shown on photo)**
   - ii. The lamps (bulbs) fitted to the navigation lights used on *Ouzo* can easily be inadvertently replaced with lamps of a lower rating.
   - iii. It is quite common for replacement lamps for yacht navigation lights to have damaged filaments, which cause an intermittent fault.
   - iv. If the yacht heels more than 5° the horizontal intensity of her navigation lights may be decreased.

Yacht owners should make every effort to ensure that their navigation lights are fully effective, and their characteristics understood.

3. *Ouzo*'s small radar cross section, coupled with the moderate sea conditions, made it unlikely that the radars on *Pride of Bilbao* could separate *Ouzo* from the sea clutter even if *Ouzo* had been displaying her octahedral radar reflector. A study of the capabilities of typical radar reflectors that may be fitted to yachts will be published on the MAIB website on 1 May 2007. **Yacht owners should be encouraged to fit the best radar reflector they can afford.**

4. One of the crew members survived in the water very much longer than the others probably due to the fact that he had fitted his lifejacket tightly. The simple addition of a crotch strap would have significantly increased the survival times of the yachtsmen. **Crotch straps should not be optional extras on lifejackets; they should be supplied, fitted and worn.**

5. After the incident, the alarm was not raised by the yacht's crew. The factors contributing to this include:
   - i. There was probably too little time before the yacht's crew found themselves in the sea. **A hand-held VHF set in a waterproof cover could have provided a means of sending a distress alert.**
   - ii. The boat did not carry an EPIRB and/or a liferaft rigged with a hydrostatic release unit. **An EPIRB and/or a liferaft would have dramatically increased the crew's chances of survival.**

A similar flyer has been produced for merchant vessels, identifying the safety issues pertinent to them.

Further details on the accident and the subsequent investigation can be found in the MAIB's investigation report, which is posted on its website: www.maib.gov.uk

Alternatively, a copy of the report will be sent on request, free of charge.

Marine Accident Investigation Branch
Carlton House
Carlton Place
Southampton, SO15 2DZ

Telephone 023 8039 5500

Email maib@dft.gsi.gov.uk

April 07

APPENDIX A

Preliminary examinations started in the period 01/03/07 – 30/06/07

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

Date of Accident	Name of Vessel	Type of Vessel	Flag	Size (gt)	Type of Accident
14/03/07	*Obsession* *Gas Pioneer*	Fishing vessel Liquid gas carrier	UK Isle of Man	9.92 1173	Collision
17/03/07	*Sant Yann II* *Velazquez*	Fishing vessel Container	France UK	Unknown 7519	Collision
19/03/07	*Conquest*	Workboat	Unknown	Unknown	Fatal acc to person
21/03/07	*Andrina F* *Zeldenrust*	Dry cargo Fishing vessel	Germany Belgium	1568 89	Collision
03/04/07	*Retainer*	Tug	UK	120	Fatal acc to person
19/04/07	*Audacity*	Oil tanker	UK	2965	Machinery failure
21/04/07	*Audacity* *Red Wolf*	Oil tanker Tug	UK Spain	2965 476	Collision
30/04/07	*Doris*	Pleasure craft	UK	Unknown	Capsize/listing (2 fatalities)
05/06/07	*CSO Wellservicer*	Dive support	UK	9158	Fire
20/06/07	*Tor Futura*	Dry cargo	Denmark	18725	Acc. to person
	Haven Hawk	Pilot boat	UK	Unknown	Fire
26/06/07	*Young Lady*	Crude oil tanker	Isle of Man	56204	Hazardous inc.

Investigations started in the period 01/03/07 – 30/06/07

Date of Accident	Name of Vessel	Type of Vessel	Flag	Size (gt)	Type of Accident
14/04/07	*Audacity* *Leonis*	Oil tanker General cargo	UK Panama	2965 4649	Collision
16/04/07	*Whispa* *Gas Monarch*	Pleasure craft Liquid Gas Carrier	UK Bahamas	Unknown 4402	Collision
04/05/07	Haitian Sloop	Small commercial	Haiti	Unknown	Capsize (at least 60 fatalities)

Reports issued in 2007

Aqua-boy – report on the investigation of the grounding, Sound of Mull on 11 November 2006
Published 4 July

Arctic Ocean and ***Maritime Lady*** – collision between *Arctic Ocean* and *Maritime Lady*, the capsize of *Maritime Lady*, and contact with wreck of *Maritime Lady* by *Sunny Blossom*, and its subsequent grounding in the Elbe River on 5 December 2005
Published 1 February

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

Calypso – report on the investigation of the engine room fire on board the passenger cruise vessel 16 miles south of Beachy Head on 6 May 2006
Published 19 April

Danielle – investigation of the major injuries sustained by a deckhand on board fishing vessel, 17 miles south-south-east of Falmouth on 6 June 2006
Published 29 March

Ennerdale – report on the investigation of a major LPG leak from the gas carrier while alongside Fawley Marine Terminal on 17 October 2006
Published 25 May

Harvest Caroline – report on the investigation of the grounding, Tanera More, north-west of Scotland on 31 October 2006
Published 22 June

Hilli – investigation of the starboard boiler explosion, resulting in one fatal and one serious injury on board the liquid natural gas tanker, Grand Bahama Shipyard, Freeport, Grand Bahama on 10 October 2003
Published 27 March

Maersk Doha – report on the investigation of the machinery breakdown and subsequent fire, Norfolk, Virginia, USA on 2 October 2006
Published 6 July

Maersk Dover/Apollonia/Maersk Vancouver – report on the investigation of the close-quarters situation between the ro-ro passenger ferry *Maersk Dover*, the tanker *Apollonia* and the container vessel *Maersk Vancouver* in the Dover Strait on 17 October 2006
Published 17 May

Ouzo – the investigation of the loss of the sailing yacht and her three crew, south of the Isle of Wight during the night of 20/21 August 2006.
Published 12 April

Sian Elizabeth – investigation of the injury to a member of the crew on board the fishing vessel, 3 miles north of Kings Lynn on 14 September 2006
Published 12 March

Skagern/Samskip Courier – investigation of the collision in the Humber Estuary on 7 June 2006
Published 4 April

Thomson Celebration – report on the investigation of the fatal accident to person on board vessel while at anchor in St Peter Port, Guernsey, Channel Islands on 26 September 2006
Published 4 June

Thunder – report of the investigation of the grounding at the approaches to the Dee Estuary on 10 August 2006
Published 12 June

Annual Report 2006 Published June 2007

Recommendations Annual Report 2006 Published July 2007

Safety Digest 1/2007 Published April 2007