Marine Accident Investigation Branch (MAIB) - Safety Digest 2/2002

Contents

Glossary of Terms and Abbreviations

AB - Able Seaman

ARPA - Automatic Radar Plotting Aid

CO2 - Carbon Dioxide

CPA - Closest Point of Approach

EPIRB - Emergency Position Indicating Radio Beacon

FRC - Fast Rescue Craft

GT - Gross tons

IFOS - International Festival of the Sea

IMO - International Maritime Organisation

Mayday - The international distress signal (spoken)

MCA - Maritime and Coastguard Agency

OOW - Officer of the Watch

Pan Pan - The international urgency signal (spoken)

RIB - Rigid Inflatable Boat

RNLI - Royal National Lifeboat Institution

RYA - Royal Yachting Association

SAR - Search and Rescue

TSS - Traffic Separation Scheme

UTC - Universal Co-ordinated Time

VHF - Very High Frequency

Introduction

Whenever one contemplates safety at sea, there is a tendency to think of it in terms of regulations, procedures, equipment and training. Important though these are there is, of course, far more to it than that. It not only embraces having to cope with an unforgiving environment but also living with management style and the attitude of colleagues. If the senior management ashore take a personal interest in safety, masters and chief engineers will do likewise. If they, in turn, set good examples, others will follow suit.

We are all, ultimately, responsible for safety but perhaps the most far reaching aspect is imbuing the next generation with a culture of good seamanship and safety. It is not something we should impose, but convey through example.

I learned much of my seafaring trade from hard won experience and am forever grateful to those many people who took the trouble to train me and show me how to do things properly. I am the first to admit I made many mistakes and frightened myself far too often in the process. I richly deserved some of the admonishments that came my way but, looking back on it all now, I realise that I learned most from those who were sympathetic to youth and who were prepared to say Well done, when I did something right. It is also true to say that the safest ships were the happiest ones where good humour and laughter prevailed. I, for one, noticed how constant criticism rapidly became counter-productive when trying to develop a safety culture.

After a working life in the maritime sector it is now time for me to go ashore for the last time. The moment provides me with an opportunity to look back on a wide range of experiences, including five years as the Chief Inspector of Marine Accidents. Investigating accidents is a curious profession; one where you see the frailties of man all too often. But it has its rewards. By finding out what went wrong and, more importantly why, inspectors find themselves in the same category as the conscientious trainer by being well placed to pass on to others the lessons learned. I believe the accident investigation profession plays a modest part in creating safe, and happy, ships.

It is almost impossible for me to judge whether the Safety Digests have done anything to improve safety, but it is very satisfying to discover how many read them. They are sent to people as far afield as Beijing, Murmansk, Cape Town and the Philippine Islands, and are known to reach mariners on board every type of vessel from cruise ships to harbour tugs. They are despatched to Fishermen's Missions and we know they are used as training aids in many nautical colleges and sailing schools. It gives us great pleasure to find articles and opinions reproduced in other publications, and many of you have been gracious enough to compliment us on our efforts. If, as a result, we have saved a life, or prevented a single accident, our efforts will have been worthwhile.

On this, my final introduction to a Safety Digest, I pay tribute to my staff for all their hard work in preparing each edition for publication. I thank my inspectors for producing the articles and the administrative staff who support them. I am particularly grateful to my editor, Jan Hawes, who collates the material and does so much to ensure that the highest standards are always met.

My final thought as I depart is that the safety culture, that the MAIB tries so hard to encourage, will become second nature to all those who are fortunate enough to be working afloat in what I believe to be one of the most rewarding and fulfilling of all professions, seafaring.

It only remains for me to wish my successor, Stephen Meyer, well in this fascinating appointment, to bid our readers Bon Voyage, and to give that traditional last command, Finished with Engines.

John Lang
Chief Inspector of Marine Accidents

Part 1 Merchant Vessels

Previous Safety Digests have drawn attention to the importance of maintaining a proper lookout. It is one of the most fundamental requirements of seafaring but, as we all know, it isn't the only one. It is essential that bridge watch keepers have a complete understanding of the Regulations for the Prevention of Collisions at Sea.

Despite this statement of the obvious, it is all too evident that there are a number of people in charge of vessels who, for one reason or another, are either unfamiliar with the Rules, or do not know how to apply them. It is a frightening revelation. Every one of us relies on the man on watch doing the right thing, at the right time, to prevent a collision.

There are those who maintain the Rules are flawed, lack clarity or do not cater for every situation. Such sentiments are not particularly helpful for the unfortunate watch keeper doing his best on a wild night in a traffic separation lane, with a flashing orange light on one bow, a survey vessel on the other, a fisherman dead-ahead, three ships astern overhauling him and a sandbank to starboard. He detects a vessel on his port bow showing a green light and on a steady bearing. As the range closes he finds it is doing nothing whatsoever to give way. He wonders if farming isn't an easier way of life, and mentally reminds himself that the Rules are the only ones there are, and that he is paid to interpret them correctly.

The problem facing many a watchkeeper in a potential collision situation is assessing what the other ship is going to do. This is especially true when you are in the stand -on vessel and are beginning to wonder if the other vessel has seen you. A few moments later you start to ask yourself if he is going to give way. As the distance closes further, and still nothing happens, your pulse begins to beat a little more rapidly and you have that sinking feeling that he is going to do something indescribably stupid.

It is at times like these that the watchkeepers in both vessels should remember Rule 2 of the Regulations. It reminds us of our responsibilities and the consequences of any neglect to comply with the Rules or of the neglect of any precaution which may be required by the **ordinary practice of seamen**

Translated, the ordinary practice of seamen involves making an early assessment as to whether risk of collision exists. If it does, and you are required by the Rules to do something about it, it requires the **appropriate action to be taken in good time and in such a way that your intentions are clear to the other vessel.** Put another way, it means observing good sea manners.

The MAIB finds that all too often collisions occur, or near misses arise, because the watchkeepers are not keeping a good lookout, make little or no assessment as to whether risk of collision exists and sometimes feel they are somehow exempt from doing anything about it. Many of those required by the Rules to take avoiding action compound the problem by doing so far too late.

We also find that a number of watchkeepers fail to anticipate the limitations, or likely intentions, of other vessels underway in heavy traffic or in confined waters. They give no thought to the fact that the other vessel may well be constrained by her draft, or poised to alter course before crossing a traffic lane, or is having to take avoiding action herself for someone else.

In sum, the watchkeeper in a modern merchant vessel has a formidable responsibility to ensure he is totally focussed on navigating his vessel safely and avoiding a collision. He cannot, must not, allow himself to be distracted by anything else.

To avoid a collision he needs to be 100% sure he knows how to interpret the Rules. He will have heard others say the same thing to him before.

Case 1
Grounding of a Cargo Vessel Blocks River

Narrative

The River Nene is a narrow, fast running, waterway draining into the Wash on the east coast of England. Port Sutton Bridge lies about 2½ miles from the mouth and is used by small cargo vessels carrying a range of goods. The river is insufficiently wide to turn vessels, and a swinging basin has been created to enable them to do so.

The 24 year old general cargo vessel Lagik, carrying a cargo of 2250.40 metric tonnes of steel products for discharge at Port Sutton Bridge, was preparing to berth. She was under pilotage on the last of a spring flood tide, and was entering the swinging basin to turn so she would berth bows to sea. There then followed conflicting evidence as to who had the conduct of the navigation. However, control was lost and her bow grounded. The tide quickly caught her stern and she grounded aft within a few seconds. With the distance between the points of grounding both fore and aft equating the vessels length, she was effectively wedged in position.

High water came and went. As the tide went out she found herself suspended between the two banks until such time that the combined effect of the steel cargo, and the falling tide, broke her back. She settled further into the river on each successive tide and was declared a constructive total loss. She was eventually cut up in situ after the owner effectively abandoned all rights to ownership.

She blocked the River Nene and closed the port of Wisbech for 44 days.

The cause of the grounding was found to be loss of control during the turning operation.

The investigation identified a number of factors which contributed to the grounding and the eventual loss:

- The master taking the helm from the pilot as the vessel was about to enter the swinging basin.
- Differing perceptions as to who had conduct of the navigation after the master took the helm.
- Inappropriate manoeuvring for the prevailing conditions.
- The master either ignoring the pilots advice, or failing to exercise his right to intervene when he became concerned about the pilots intended manoeuvre.
- No spring line being used.
- No tug standing by ready for immediate use.

Contributory factors to the ultimate loss of the vessel were found to be:

- The master not pumping out the ballast in the forepeak immediately after the vessel had grounded.
- The master stopping the propeller immediately after the vessel had grounded.
- The restricted width of the river and the effect of the flood tide.
- No formal written risk assessment having been made by the competent harbour authority for the turning operation at Port Sutton Bridge.

The Lessons

Being responsible for a vessel that is impaled on opposite banks of a narrow river, with the prospect of a falling tide, is among the more alarming nightmares to confront a master or pilot. It shouldn't happen and if something does go wrong, actions have to be taken very quickly indeed. A lesson for any harbour authority is to contemplate such an eventuality, and take whatever steps are necessary to minimise the risks involved. In the event of the unthinkable happening, contingency plans should be in place to deal with it.

1. The pilot has local knowledge, skills and experience and is, normally, the most suitable person to have conduct of the navigation during a difficult manoeuvre such as turning a vessel in a strong tidal stream or current, although a master may well have better knowledge of his vessels manoeuvring characteristics.

2. Language skills, where different nationalities are carried, should always be sufficient to ensure safety is not compromised.

3. The competent harbour authority had not made a formal written risk assessment for the turning operation. This would be likely to identify control measures which could include, for example, the use of a spring and/or a tug standing by when a vessel is turning using her bow thruster.

4. Detailed advanced planning will allow all issues to be discussed and a plan to be agreed upon.

5. Well-rehearsed written procedures and contingency plans will save time and ensure nothing is missed in the event of an unexpected incident.

Footnote

This incident was the subject of a full MAIB investigation. A comprehensive report, giving details of the causes, an analysis, and recommendations was published in December 2001.

Case 2
Melting Moments!

Narrative

Hoxa Lass, a 20.42mpassenger vessel, provides a scheduled boat service between Houton and Flotta oil terminal in the Orkney Islands. She is licensed to carry 97passengers with a crew of 2.

At 1815 one summer evening, *Hoxa Lass* left Houton for Flotta with 18 passengers and 2crew. At 1835, when she was about 2 miles north of Flotta, a passenger noticed fumes entering the aft passenger compartment from the starboard side bulkhead. The coxswain was notified immediately, and the starboard main engine stopped. After the crew carried out a brief investigation, the vessel continued on passage using the port engine. Once the vessel had arrived safely in port, the passengers disembarked and she was taken out of service for repair.

The investigation found that a drive belt, on the starboard engine cooling water pump, had broken and fouled the other drive belts. This had caused the remaining drive belts to slip and eventually force the pump to stop. Once the cooling water stopped, the engine over heated rapidly, with the result that the exhaust trunking started to melt. This allowed exhaust gases to percolate through the bulkhead into the passenger areas.

Temperature gauges were fitted on the engine and were found to be working correctly and accurately. High temperature alarms were also fitted, but failed to operate.

Subsequently, the temperature senders on both port and starboard engines were renewed, relays re-calibrated, and the operational and maintenance procedures reviewed.

The Lessons

1. Instruments are there to be looked at much the same as those on the dashboard of a car. They need to be of such a type that they can be easily read, and placed in such a position that they can be scanned regularly without difficulty.

2. Temperature gauges need to be checked regularly, together with alarm sensors. The failure to either read, or alarm, accurately can lead to very expensive main engine repair costs.

3. Regular checks of belt drives and their correct tension is also important. If a belt is in poor condition, change it do not wait until it breaks. If you do, it will undoubtedly break just when you need engine power the most!

It is interesting to note that the exhaust trunking failed before the main engine showed any signs of seizure. It does raise the question as to what might have happened had passengers not raised the alarm at such an early stage.

Case 3
Checklist Fallibility!

Narrative

The fast catamaran *Rapide*, which operates a regular ro-ro passenger service between Douglas, Isle of Man, and Liverpool, remained in Douglas overnight while the nightshift carried out normal maintenance duties. At 0600 on the morning of 31 March2001, pre-departure checks were carried out prior to loading. At 0700, with 445 people on board, the vessel sailed in moderate conditions with good visibility and a south-west force 6 to 7wind.

At 0715, when about 7 miles south-south-east of Douglas, and travelling at 34 knots, the main engine alarm system showed abnormal exhaust temperatures. Main engine speed was reduced, followed shortly afterwards by the realisation that the fuel header tanks were showing a near empty situation, as the fuel lift pumps had not been started before departure. Although the fuel lift pumps were started immediately, three of her four main engines slowed down and eventually stopped. The fourth main engine "coughed", but by then sufficient fuel had been transferred to the header tank to keep both it and the three electrical generators running.

The vessel maintained position on reduced power, while the ship's engineers attempted to bleed air out of the other three main engines to restore the fuel supply. Both shore management, and passengers, were kept fully informed of the situation at regular intervals. By 1040, about 3½hours after losing power, a second main engine was started and run up to normal power. With two engines now operating, one on each side, *Rapide* returned to Douglas where she docked at1215 that day.

There were no injuries to either passengers or crew, although one passenger, who was on medication, suffered severe vomiting caused by the vessel's motion. On arrival alongside, he was taken to hospital in Douglas for treatment.

The company's subsequent investigation revealed the following combination of circumstances had led to the failure to re-start the fuel transfer pumps during the pre-departure checks:

1. A low-level alarm fitted to the fuel header tank had sounded during the night, but was not heard by the night shift maintenance crew.

2. The design of the alarm system was such that the alarm condition remained until cancelled by the operator. It was indicated both visually and audibly. The audible alarm would have remained until accepted. If numerous alarm conditions had been active, the page with all the alarm conditions might not have been visible and would have rolled over on the screen. On accepting the alarm(s), the operator would have cancelled the audible port, and the conditions would have remained on screen or on rolled over page until individually cancelled.

3. The pre-start checklist only asked for confirmation that the fuel system was primed. There was no requirement to check the operation of the fuel system, or that the lift pumps were operating.

Although one main engine was available, the master considered it unsafe to attempt to re-enter Douglas Harbour in the prevailing weather conditions until he had at least two main engines operating.

The Lessons

This incident illustrates the importance of closely examining the logic of checklists provided to sea staff under a fail-safe condition. In any area of operation where regular and standardised operations are involved, repetitive cycles are likely to reduce awareness levels.

1. Always check the logical sequence of a checklist and adopt a what if view when following it through.

2. Checklists are not infallible as an experienced mariner or engineer you have a responsibility to confirm that the necessary systems are both operational and functional.

3. If an alarm system is fitted, ensure that any fault condition identified continues to be shown until it is either manually accepted, or the condition is corrected automatically.

This incident demonstrated yet again, the importance of keeping passengers informed about what was happening. An analysis of marine accidents and incidents around the world has demonstrated over and over again that people will respond favourably, providing they are told what is happening. During this incident, they were.

Case 4
A Small Slip, A Big Fall

Narrative

On 1 December 2000, the ro-ro passenger/cargo ferry *European Highway*, engaged in the Dover to Zeebrugge route, was berthed in Zeebrugge. She was port side alongside a berth with piles, across which was fitted a mooring access walkway.

The vessels carpenter, and two others, had swung out the port lifeboat to progress some maintenance to the on/off load suspension hooks. All three were in the lifeboat and intended to hang it from the hanging off pendants. However, they were inadvertently connected to the recovery pendants, which were permanently shackled to the lower block lifting plates, instead of the hanging off lugs of the lifeboat.

Once the winch had paid out sufficiently for the falls to go slack with the weight being taken on the pendants, the operating lever of the on/offload suspension hooks was operated. This required one of the men to override the hydrostatic interlock.

The suspension hooks opened as intended but, because they still bore the lifeboats weight, it fell. The boat first struck a pile of the walkway, then tipped over and plunged into the water. Two men were trapped beneath the inverted lifeboat; the third was thrown into the water. All were injured to some degree.

The Lessons

1. The vessels carpenter, a very experienced man, well versed in the workings of the lifeboats equipment, was in charge of the operation. Despite his extensive training and experience, he made an error when connecting the hanging off pendants.

2. Apart from the carpenter, one of the others was also experienced. However, because he was unaware of the carpenters intentions, the value of his knowledge was lost. A short briefing or planning discussion between them might have allowed each to check the actions of the other.

3. The risks associated with overriding the hydrostatic interlock, a fundamental safety system, were not fully recognised and no special control measures were put in place to counteract them.

4. If at all possible, avoid operating hook release mechanisms while a lifeboat is hung off. If this is not possible, experienced staff should make double checks of hanging off arrangements before the hydrostatic interlocks are overridden.

A valuable modification made by the managers of European Highway was to fit special connections to the pendant, making an incorrect connection impossible.

Footnote

This incident was the subject of a full MAIB investigation. A comprehensive report, giving details of the causes, an analysis, and recommendations was published in January 2002.

Case 5
Man Overboard in Rough Weather the Nightmare Scenario

Narrative

Koningin Beatrix, a passenger ro-ro ferry, departed from Rosslare at 1040UTC on the day of the incident, bound for Fishguard. She had 1092 passengers embarked and 105crew. The weather was south-westerly force 7 to 8 with significant wave heights of around 4 metres. It was rough.

At 1145 the bridge was informed that someone had gone overboard; passengers had seen a man in the water. Reacting immediately, the vessel was turned to retrace her tracks and, together with another vessel in the vicinity, initiated a search and rescue operation.

The man was sighted several times, but the master judged it was too rough to lower a rescue boat safely. He manoeuvred the ferry to get as close to the victim as possible and, for about 8minutes between 1230 and 1238, had him very close to the vessels starboard side. A member of the crew claimed to have had a brief conversation with him.

At 1238 the victim passed around the ferry's bow but, by that time, was seen to be floating face down. At around 1300 he was picked up by an Irish coastguard helicopter and taken to Wexford hospital. He was identified as one of the passengers and was later declared dead.

Nobody saw the man fall overboard, so there is no means of knowing how it happened.

The Lessons

Despite every precaution, people still occasionally fall overboard. It doesn't matter how or why they fall, the sole aim must be to recover the victim as soon as possible.

The victim in such situations faces three problems: maintaining buoyancy, not swallowing seawater and preventing the onset of hypothermia. It is unlikely they will be too fussed about the priorities, but will be doing everything possible to survive against the odds. For the vessel concerned, speed of rescue is paramount.

As in many Safety Digest articles, the lessons to be learned embrace features which did not necessarily arise in this accident.

1. Anybody who ventures on deck in adverse weather must take care. Ships rails are designed to provide very adequate protection providing you don't start to climb them. If the vessel is pitching and rolling, be conscious of the forces involved. It is all too easy for the unwary to be propelled rapidly to one side if a proper grip is not maintained.

2. Although an unusual event, a man overboard can occur at any time. When it happens, you have just a few minutes to get it right. The enemy is time. The difficulties are twofold: keeping an eye on the victim and then recovering him. If you take too long, the chances of recovering him alive are not good. The advantage of a high-sided ferry is that you have the benefit of height when looking for the victim. The disadvantage is that deploying a rescue boat from such vessels is far from easy.

3. If you have thought about how to recover a man overboard in advance, you are much more likely to achieve success. While written procedures, basic seamanship and common sense will all play a part in effecting a successful rescue, a measure of contingency planning will make all the difference.

4. When someone is in the water without any form of buoyancy, his or her survival time will be limited. It is imperative they be given every form of assistance. A life buoy can be thrown, or even an inflated liferaft floated down. Even if the person cannot be pulled from the water immediately, some form of buoyancy aid will enable them to preserve their strength and increase their survival time.

5. In this case, the decision not to deploy a rescue boat in the prevailing conditions is supported by the MAIB. Each of the two rescue boats had a capacity of 60 persons, and was similar to conventional ships' liferafts, with twin falls and on-load releases. It is all too easy to put others at risk in a potentially dangerous environment, but nobody will be thanked if members of the rescue boat lose their lives in the process.

Footnote

This incident was the subject of a full MAIB investigation. A comprehensive report, giving details of the causes, an analysis, and recommendations was published in December2001.

Case 6
Collision in Thick Fog Container Feeder Vessel/Class V Passenger Vessel

Narrative

The 2,579gt feeder container vessel *Nordsee* was underway in the Clyde, and inward-bound for the port of Greenock. When approaching the pilot boarding area, the visibility was less than a cable. The master was on watch with the deck trainee. One of two radars was in use and set to the 0.75 mile range. Apart from the cross-river ferry there was no other traffic in the area.

At approximately the same time, the class V passenger vessel *Poole Scene*, which was berthed at the nearby Princess Pier, began embarking 41passengers for a day's cruise round the Kyles of Bute. As soon as they were all aboard, the skipper prepared to get underway. Owing to the late arrival of the passengers, they were 30minutes behind schedule.

In the meantime, the pilot had boarded *Nordsee*. As soon as he was on the bridge, he called Estuary Control and obtained clearance for the Ocean Terminal. The deck trainee then left the bridge to prepare for berthing. No sound signals were being made. Having completed the transfer, the pilot boat increased speed to return to harbour.

Alongside at Princess Pier meanwhile, *Poole Scenes* skipper was preparing to depart. He made a brief safety announcement and then contacted Estuary Control to inform them he was ready to leave the berth. The Estuary Control watchkeeper told him that an inbound vessel, *Nordsee*, was in the inward approach channel, and asked if he would prefer to wait alongside until she was past and clear. The skipper replied that he would still sail, but would keep well clear to the south.

Soon afterwards, *Poole Scene* let go. The skipper was alone in the wheelhouse and, with no improvement in the visibility, was navigating by radar set to the 1.5 mile range. No sound signals were being made. He decided not to use the outward-bound channel, but chose to remain to the south, and clear of the inward-bound channel.

On board *Nordsee*, both the pilot and the master, aware of *Poole Scene*s departure, detected her on radar approaching on a reciprocal course, and assumed she would pass clear to starboard. Both the pilot and the master thought it unnecessary to carry out a radar plot. They were content with a CPA of 0.1 mile.

Poole Scenes skipper had detected a contact on his radar, which he assumed was *Nordsee* and was mentally plotting her on radar. Soon afterwards, he felt the wake of the pilot cutter as it passed close by to starboard. The motion distracted the skipper momentarily, and the next time he looked at the radar, *Nordsee'*s echo appeared to have merged with one of the channel buoys.

As *Nordsee* passed the buoy at about 5-6 knots, the pilot could no longer detect the echo of *Poole Scene*; it had merged with the sunspot at the centre of the radar screen. The main engine was then stopped to reduce speed further.

On board *Poole Scene*, the skipper also decided to reduce speed from the 2-3 knots he was making. Just as he was doing so, he became aware of another vessels bow looming out of the fog. He immediately came full astern, but was too late to prevent his bow hitting *Nordsee'*s starboard side.

As a result of the collision, 17 passengers were injured. They were taken to a nearby hospital when the vessel docked. Sixteen were released after treatment for minor injuries, and one was admitted.

Poole Scene suffered substantial bow damage, while *Nordsee* sustained slight shell plate damage.

The Lessons

As in many Safety Digest articles, the lessons to be learned embrace features which did not necessarily arise in this accident.

1. A significant factor in this accident was the decision by *Poole Scenes* skipper to sail in such restricted visibility. He did so despite being asked by Estuary Control whether he would prefer to wait alongside until *Nordsee* was past and clear. Had he done so, the collision would have been avoided. Pressures, commercial or perceived, are a common feature in the causes of accidents. Although there is no evidence to indicate that any of these applied in this instance, it is very likely that had the skipper delayed sailing, and informed his passengers what was happening, they would have accepted his decision. Never let pressures obscure your professional judgement. Anyone taking decisions such as this, has to weigh up the risks involved. Perception of risk, and evaluating the consequences of something going wrong, is a function of good seamanship.

2. When *Poole Scene* sailed, the skipper decided to remain outside but close to the inward-bound channel. The choice placed her in a vulnerable position with another vessel navigating inbound in conditions of severely restricted visibility. Close and continuous monitoring on both vessels could have provided advanced warning of the impending danger, and a further reduction in speed would have provided more time to assess the situation and take effective avoiding action.

3. Neither vessel was sounding fog signals, despite the mandatory requirement to do so. It can, and does, provide an additional means of warning other vessels and contributes to ensuring safety.

4. The need for an additional lookout in fog is paramount and, in all but the smallest vessels, it is sensible to have one forward when in confined waters. Providing the lookout is in direct contact with the bridge, he can give those extra few seconds of warning, which may well prevent a collision.

5. Any defective navigational equipment should be repaired or replaced at the first available opportunity. You never know when you will need to depend on it.

6. In reduced visibility, radar remains the key anti collision device available to the mariner. To provide the information necessary to ensure a safe passage, it must be correctly set up to the most appropriate scale and settings. But even the best radar becomes ineffective if there is no systematic observation of the contacts or plotting. This can be effectively achieved if the radar incorporates an integrated plotting facility and the operator is fully trained in its use.

Footnote

This incident was the subject of a full MAIB investigation. A comprehensive report, giving details of the causes, an analysis, and recommendations was published in December 2001.

Case 7
Near Miss in Dover Strait TSS

Narrative

The 6,391gt reefer vessel, *Saratau*, was proceeding in the south-west bound lane of the Dover Strait TSS on a course of 227°.

Another reefer vessel, the 4,574gt *Polestar*, was in the opposite lane and heading north-east, but bound for the pilot station off Dover. To achieve this she made her heading 350° to cross the TSS. It was not an uncommon situation.

Saratau first detected *Polestar* at a distance of 6miles, and determined that a risk of collision existed. As the stand-on vessel in accordance with Rule 17 she maintained her course and speed. She was watching *Polestar* carefully and expected *her to* take avoiding action.

By the time the distance between the vessels had reduced to approximately 1 mile, the bridge team onboard *Saratau* had become very concerned that the other vessel appeared to be doing nothing to give way. She tried, first, to attract the other vessels attention by using sound signals in accordance with Rule 34(d), and then by VHF radio, channel 16.

As the distance between the vessels continued to close, *Saratau* altered course to port. *Polestar*, the give-way vessel, eventually reduced speed and then stopped her engines.

The vessels passed each other at a distance of 1cable. *Polestar* passed ahead of *Saratau*.

The Lessons

The situation described above is all too familiar. Two vessels are approaching one another in such a manner that risk of collision exists. The watchkeepers on the stand-on vessel are watching the other one carefully, and start to become anxious when the other one appears to be doing nothing to give way. Too many of us have vivid recollections of such occasions. CPAs of about a cable tend to expedite old age.

1. In this instance, *Polestar* was the give-way vessel in accordance with Rule 15 and should have taken *effective* avoiding action. She didn't. The Rules are quite clear: with *Saratau* on her starboard side, and a risk of collision existing, she was required to keep out of the way. She could have altered to starboard in good time, or even slowed down. She did reduce speed eventually, but it was far too late. And to add insult to injury, she passed ahead of the stand-on vessel.

2. Vessels obliged to keep out of the way must always consider what the watchkeeper in the stand-on vessel is thinking. Common courtesy and good seamanship demand that you make your intentions clear at an early stage. Rule 16is, in the meantime, uncompromising in its bluntness. As the fourth-shortest Rule in the book, even the most inexperienced watchkeeper should know it off by heart: "*Every vessel which is directed to keep out of the way of another vessel shall, so far as possible, take early and substantial action to keep well clear*."

3. The Dover Strait is one of the world's busiest waterways, and the watchkeeper of any vessel crossing the lanes must have their wits about them. One of the most important priorities is to determine whether risk of collision exists. Needless to say, this requires a good lookout as the most basic of all watchkeeping duties.

4. *Sarataus* watch keeper was obviously becoming very anxious as the two vessels closed, but even he left it very late before taking action to avoid a collision. He had several options open to him and, with one exception, the Rules leave the choice to the watchkeeper. The exception is the directive not, so far as the circumstances of the case admit, alter course to port for a vessel on her own port side. It is not known why *Saratau* altered course to port but it only served to aggravate the situation.

5. There is always a temptation to look for some acceptable explanation for the actions taken in such situations, or to blame the other vessel. There might well have been some unknown reason for the actions taken on this occasion, but the point is made that we all have a responsibility to avoid collisions. We must learn from incidents such as this, and realise that this close quarters situation was very nearly an expensive accident. Had there been one, there would have been no excuses.

Case 8
Hatch Cover Control

Narrative

Celtic Carrier, a1,892gt general cargo vessel was moored alongside in Bromborough, Merseyside preparing to load cargo. Part of this work involved shifting portable bulkheads within the holds. The second officer was standing on the main deck port side by the two metres high hatch coaming, while the chief officer was at the hatch cover hydraulic control station on the starboard side. An AB was in the hold, while the second engineer and the cook were standing by the chief officer.

Before the accident, the second mate was inspecting the underside of the hatch cover on the port side to ensure that the bulkhead was attached correctly, and that the trackway was clear for the hatch covers to move freely. The second mate was standing with one foot on some pipes running alongside the hatch coaming, and the other on the ships outboard rails. With both hands holding firmly on to the hatch cover trackway he could easily look down into the hold to check the clearances. His right hand was about 30 centimetres from the first hatch cover wheel.

Suddenly, the hatch covers started to move. Normally, a verbal warning was given before any movement was made. In this case it appears that either no warning was given, or it was lost in the high level of background noise. The operation of the hydraulic pumps for the deck machinery, together with the sound of traffic on the adjacent quayside, made this area a particularly noisy one. Although the second mate realised that the hatch covers were moving, he had insufficient time to move his right hand, with the result that it became trapped between the hatch wheel and the trackway. Although he shouted out, the hatch cover continued to move for another 2 metres. He wasn't able to pull his badly injured hand free until it had stopped. He was taken to hospital where the little and annular fingers, and part of his right hand, were amputated.

The Lessons

1. The ships trim can cause stowed hatches to move so, before undertaking any work close to, or on open hatch trackways, always CHECK that the hatch covers are secured and LOCKED in the stowed position.

2. If close supervision or an inspection is to be carried out on the covers, or their wheels, while the hatch covers are in motion, ENSURE that everybody involved is aware of what is happening, where everybody is, and that the person at the controls CHECKS that everybody is clear before operating them.

3. Hatch covers under motion are heavy dangerous items, and cannot be stopped easily. If you are not involved in the opening or closing operation, STAY CLEAR!

Case 9
Poor Contacts Generate Heat and Fire

Narrative

On the afternoon of 22 June 2001, the ro-ro passenger ferry, *P&O Stena Line Provence*, had just left Dover for passage to Calais when a warning indicated on the bridge fire alarm panel. A watchman investigated and, three minutes later, reported smoke coming from a ventilation fan control room on the upper vehicle deck.

Power supply to the fan control room was shutoff and, shortly after, the chief officer located a small fire in the space. It was put out using aCO_2 extinguisher.

The chief engineer and electrical officer examined all the electrical panels in the control room and identified the source of the fire as a mechanical failure to one contactor. No other heat source was found.

The vessels passage continued with the watchman monitoring the space.

The complete incident lasted less than 10 minutes.

The Lessons

1. Mechanical problems with electrical contacts, connections etc will often result in an increased electrical resistance. These, in turn, generate heat if the circuit is under load and can lead to localised smouldering and ignition.

2. Regular maintenance and inspections of connections can help to prevent such incidents but vibration can lead to the deterioration of electrical connections between even the most careful and conscientious inspections.

3. Early detection of unusual heating is often difficult using the normal senses of touch, smell, hearing and sight. This means that by the time it is detected it could be serious, or even critical, as in this case.

Following this incident, the staff suggested the possibility of using heat-seeking equipment to locate unusual heating of electrical systems. It uses infrared emissions, undetectable to the human eye, to identify temperature differences and, by using it sensibly and intelligently, it can do much to prevent such incidents. By detecting problems before they become serious it can assist in planning rectification work without unwanted downtime.

Case 10
Creep!

Narrative

On 12 January 2001, No 1 lifeboat of the cruise ship *Ocean Princess* was launched for testing with an officer and two seamen as crew. Prior to its recovery, the on/off load suspension hooks were reset, and the lower blocks attached. Following further checks of the release gear, the lifeboat was hoisted to the embarkation deck where the three crew disembarked.

It was left at the embarkation deck while the other lifeboats were lowered and recovered. Except for pressure-washing the cab roof, it was left untouched until the time came to stow it. As it was being hoisted, and just before the lower blocks contacted the davit head, the forward end detached from the falls and fell. The transfer of weight to the aft hook tore it from the boats structure, and the entire lifeboat fell to the water inverted.

Nobody was in the boat and there were no injuries.

No defects were found in the suspension hook system that would cause them to open spontaneously, although the locking latch was found to be distorted. These latches are intended to prevent the lifting rings from inadvertently slipping from the hooks in the event of the falls swinging, or going slack during recovery of the boat. However, from observations made by a senior officer during earlier lifeboat operations, and from the nature of the latch deformation, it was suggested that the forward lifting ring had not been fully engaged in the hook.

It was found that the lifting rings could be placed diagonally on the beak of the hooks, so that only one side of the latch prevented the ring from slipping off.

This theory was further investigated and, with the help of the hooks manufacturers, a test rig was constructed. This revealed that it was possible to partly engage the lifting ring and apply a weight equal to the normal load of 3.3tonnes without causing immediate failure. It was found that after maintaining this load for about 3 hours, the ring slipped from the hook. Deformation of one side of the latch exactly matched that found on the latch of the forward suspension hook of No 1 lifeboat.

The Lessons

1. Although some uncertainty remains concerning the precise mechanism of this failure, the tests indicate that care must betaken to ensure that the lower block's lifting rings engage with the hooks properly before attempting to lift the boat. Merely checking that the hooks have taken the full weight, is not a sufficient test that all is well. It is also necessary to make a careful visual check that the lifting rings are properly and fully engaged in the hooks, and that the latches are fully closed.

2. Delayed failure of the latch on application of load was a feature of the tests. This suggests that the failure was caused by a creep type mechanism. This is not caused by any material defect commonly associated with high stress and high temperatures, but emerges only after a sustained period(s) of stress. Clearly, temperature was not an issue here, but the test application of a load in an oblique fashion was sufficient to generate the required stress to cause the failure in a relatively brief period.

Case 11
Eighty Two People Fall Down Ladders or Stairways

Narrative

This article differs slightly from those normally published. It summarises a number of accidents involving death or injury caused by falls from ladders and stairways. They were all reported to the MAIB between May 1999 and May 2001.Although these areas are potentially dangerous in any environment, they can be particularly hazardous on ships, and require certain precautions and care to be taken. All the accidents reported were preventable.

The Lessons

1. Ladders and stairways must always be well lit, fitted with non-slip treads and, where possible, equipped with a handrail on both sides.

2. Wet stairs and ladders are dangerous. Proceed with caution.

3. Appropriate footwear must be worn. Flip-flops are great for the shower, but can be a death trap when moving around a ship.

4. Don't carry heavy loads on stairways or ladders, and always try to hold on to a handrail with at least one hand. If you need to move a heavy load between decks, don't try and do it yourself get somebody to help.

5. Slipping, tripping, and losing ones footing increases with alcohol consumption. On a ladder or stairway, however, the consequences can be more severe than just a hangover!

6. Other than in emergencies, never run up or down ladders or stairways.

7. Don't get distracted when negotiating a ladder or stairway, and always watch where you are treading. How many of us have thought we were past the last step, but were not, and ended up stumbling at the bottom?

8. Consideration should be given to closing off the upper accesses to ladders and stairways when not in use or in rough weather.

9. When using vertical ladders, always face the ladder and make sure only one person is on it at a time. Footprints across fingers can be irritating!

10. Many passengers are elderly, disabled, or just unfamiliar with a ships movement. You might be able to manage the stairways OK, but can they?

11. Remember that old saying, One hand for the ship, one for yourself. Nothing changes.

Part 2 Fishing Vessels

Safety at sea has many dimensions. It includes having vessels that are seaworthy, equipment that is robust and reliable, crews that are well trained, and procedures in place to prevent accidents. It also means identifying risks in advance and doing something about them.

We do not, however, live in a perfect world, and even the best prepared among us may, one day, have to face the consequences of something going wrong.

Whenever an accident occurs, we rely heavily on the safety equipment working. We therefore have a responsibility to ensure that liferafts, lifejackets, EPIRBs, fire extinguishers, and other items are properly looked after, are stowed correctly, and are in date for service. If, after the event, we discover that something didn't work, we need to find out what went wrong and why, with a view to putting it right.

Things don't always work as intended. There have been a number of occasions when liferafts couldn't be used because they were incorrectly stowed, or lifejackets that were unavailable because they were inaccessible, or a fire extinguisher failed to function because it was empty when most needed.

Assessing the effectiveness of safety equipment is one thing, analysing the actions of the crew is another, because we can all learn from how people handle events such as a fire at sea or flooding. Someone else's hard won experience may well save another life or prevent a vessel from being lost.

The more serious accidents include fires, collisions, groundings and founderings. In each event it falls to those on board to deal with the situation, and both their lives and the fate of the vessel may well depend on them taking the right action.

When the serious accident occurs, notify the coastguard, taking care to give your position. It is surprising how often this basic step is not taken, often because those on board think they can handle the situation themselves, or because it is forgotten in the heat of the moment. The coastguard would far prefer to be told of any misfortune very early, even if it is seemingly containable, rather than too late when matters are out of control.

What happens next depends entirely on the reaction of those on board. The outcome is far more likely to be successful if they prepared for, and have trained in handling the predicament. The crew that has practised fire drills, thought about how to contain flooding, tried out the mechanical pumps, or rehearsed the recovery of a man overboard, is far better prepared to cope with whatever the predicament is. And individuals who have recently undergone survival training are well placed to survive, if abandoning ship becomes the last resort.

The better prepared the crew, the more likely they are to survive and be in a position to bring their vessel back to harbour. If preparation results in someone checking that the liferafts are in date for servicing, or refilling the empty fire extinguisher, or making sure a weathertight door can be shut properly, lives and fishing vessels may well be saved.

If it also means crews carrying out fire drills regularly, or giving thought to how they would handle a flooding incident, better still. Far too many vessels founder once flooding takes hold, but if people know how to contain it, they have every chance of saving the vessel rather than watch her slide below the waves.

Case 12
Collision in the Dover Strait

Narrative

At 0413 UTC, CNIS Dover detected a radar contact crossing the south-west lane of the Dover Strait TSS on a heading of 010°.As the axis of the lane was 230°/050°,she was not crossing at right angles as required by Rule 10cof the Collision Regulations. Consequently, a preliminary broadcast was made on VHF channel 16, followed by a further broadcast on VHF channel 11 at 0416, warning all vessels of the contravening vessels position.

The vessel was later identified as *Saint-Jacques II*, a French stern trawler which was on passage from Boulogne-Sur-Mer to the fishing grounds in the vicinity of the South Falls Bank. A 17-year-olddeckhand was alone in the wheelhouse, and had been instructed to follow the planned track of010° across the Dover Strait at a speed of 11knots. The vessel was in autopilot and the watch alarm was set to a 10-minute interval. Both the skipper and the deckhand were aware that the intended track contravened Rule 10c of the Collision Regulations, but the skipper was keen to get to the fishing grounds before his rivals.

CNIS Dover had previously reported *Saint Jacques II* five times since 1998 to the French administration for contravening Rule 10 of the Collision Regulations.

Shortly after crossing into the south-west traffic lane, the deckhand in *Saint Jacques II* saw a radar contact about 3 miles on the starboard bow. He initially saw a vessels port and starboard sidelights, but soon after, *Saint Jacques II* crossed ahead of this other vessel, and only her starboard sidelight remained visible. Based on this information, and by monitoring two small radar displays, the deckhand assessed that the vessel would pass no closer than 1 mile to starboard. He was then either distracted, or fell asleep, and paid no further attention to the situation until he saw *Gudermes* at very close range ahead.

Gudermes, a product tanker on passage to Conakry, West Africa, was following the south-west lane of the Dover Strait TSS at a speed of about 11 knots with three other vessels close astern. Between 0413 and 0423 UTC, the OOW fixed the ships position and annotated the deck log. Although the bridge VHF radios were set to channels 11 and 16, he did not hear the broadcasts made by CNIS. The OOW was accompanied by a lookout, who remained at the helm for much of this period.

After finishing his work at the chart table, the OOW checked the radar display and saw a contact 2 miles on the port bow with a CPA of 1cable to port. He visually identified the contact as a fishing vessel, and continued to monitor it for several minutes until it became apparent that the vessel was on a steady bearing and was not taking any action to avoid a collision. At this point, the OOW applied 10° of starboard helm and sounded 5 short blasts on the ships whistle. On hearing the sound signal the master, who had been working

in his cabin, came to the bridge and saw the fishing vessel about 1 cable on the port bow. He immediately ordered the helm to be increased and repeated the 5 short blasts.

At about the same time, the deckhand in *Saint Jacques II* attempted to avoid a collision by turning to starboard but, as automatic steering was selected, there was no response.

Saint Jacques II collided with *Gudermes*s port bow at about 0429 causing a 6m gash in the No1(port) tank, followed by lesser impacts amidships and in the vicinity of the accommodation. About 110 tonnes of oil leaked from the ruptured tank into the sea, before the contents of the tank were transferred.

The Lessons

A feature of this incident is how late each watchkeeper detected the other vessel. Once again it reminds people how important it is to keep a very good lookout, especially at night.

1. A fundamental purpose of a TSS is to improve safety by requiring vessels to behave in a predictable manner. Vessels following a traffic lane should be either overtaking or being overtaken, and the status of crossing vessels should be unambiguous. When vessels disregard the requirements of Rule 10, the benefits of a TSS, including those of the precautions of radar coverage and reporting schemes, are jeopardised. Familiarity, or regular use of waters, does not carry any particular rights or exceptions from complying with the Rules at all times. They are there for all ships to follow.

2. Maintaining an effective lookout in are as such as the Dover Strait, which are navigationally demanding, and have a high traffic density, is not easy and requires efficient time and bridge resource management. Remember, that with a closing speed of 20 knots, it only takes 3minutes for vessels to close 1 mile, and an OOW cannot afford to take his eye off the ball for long periods. An OOW quickly checking the radar display, and looking out of the window between plotting a fix and writing up the deck log, can be the difference between detecting a rapidly developing close quarters situation in good time, and panic stations. When an OOW cannot maintain a lookout himself, it is good practice to make the lookout aware of what he is doing and, in any event, must ensure the lookout keeps a good watch, particularly ahead.

3. Dedicated lookouts are required at night. Keeping a lookout from the helm is not the way to meet the requirement.

4. When there are several vessels of different sizes in close proximity, it can be difficult to correctly associate radar echoes with the vessels sighted, particularly when there is no compass repeater available to take bearings. In such situations it is essential that all vessels are continuously monitored, both visually and by radar. Be aware of remaining in the same position on the bridge or in the wheelhouse for too long, as a vessel on a steady bearing can remain hidden behind a window mullion from the horizon until just before it hits you.

5. Bridge watchkeepers are frequently tired, but precautions can be taken to keep them alert. These include drinking fresh water; ensuring they are well rested before taking over; that two people are always on the bridge or in the wheelhouse; that the frequency set on the watch alarm is appropriate to the situation and that watchkeepers are discouraged from remaining seated for long periods.

6. The MAIB is aware that recreational equipment, such as CD players, feature as aids to relieve boredom in some vessels. If a master or skipper sanctions their use, so be it, but they are a major distraction in confined waters, and can prevent the OOW monitoring VHF transmissions. Switch them off, especially in the Dover Strait TSS.

7. A warning broadcast via VHF radio is worthless if it is not heard or understood. Always ensure that a proper listening watch is maintained on the VHF radio.

8. A competent master would prefer to be called to arrive on the bridge to find a vessel at a distance of 2 miles and closing, rather than a vessel at 1 cable with collision imminent.

9. Vessels transitting the Dover TSS should be aware that the fishing vessel they see crossing the lane in front of them might well be in the charge of a 17 year old who may be well trained, but is unlikely to have much experience.

10. Whether or not the belief that fishing vessels often wait until the last possible moment before taking action to avoid a collision is true, this should not influence the application of Rule 17 of the Collision Regulations. This rule allows a stand-on vessel to manoeuvre as soon as it becomes apparent that the give-way vessel is not taking appropriate action to avoid a collision. It is better to use this rule to good effect, and remain clear of give-way vessels bent on maintaining their course and speed, rather than get involved in what could be a risky game of chicken. It is dangerous to assume another vessel is aware of your presence we might be right, but we don't want to be dead right!

11. When appropriate, use the wake up signal as soon as possible and as frequently as needed. The use of the ships whistle, and any associated light, costs nothing and, if another vessel is not aware of your presence, the sooner it is used, the more time the other vessel may have to take appropriate action.

12. When at close quarters, and taking avoiding action, don't nibble. By the time it is realised that more helm is needed to avoid a collision, it is often too late to be effective. The helm can always be eased once the risk of collision has passed.

Footnote

The BEAmer also investigated the accident and co-operated with the MAIB with good effect.

This incident was the subject of a full MAIB investigation. A comprehensive report, giving details of the causes, an analysis, and recommendations was published in February 2002.

Case 13
EPIRB Saves Two Lives

Narrative

Crimond II, a 15.73mlongwooden vessel was trawling about 35miles east-north-east of Scarborough one night in April, when she became fast. A crew of two was onboard. The wind was from the south-east force 3 and the sea was slight.

While trying to release the trawl by heaving with the winch, a hydraulic pipe burst. An attempt to repair it failed, but shortly afterwards they came free. Because the winch was not working, the trawl could not be recovered. Not wanting to lose their gear, the crew decided to leave the gear out and make towards Scarborough at slow speed.

After they had been steaming for a while, the skipper told the deckhand to go below and get some rest. When the deckhand opened the hatch to the cabin he discovered flooding. The skipper turned on the electric bilge pumps, but didn't think it necessary to contact the coastguard. After about half an hour the floodwater disabled the electrical supply which, in turn, stopped the electric bilge pumps. Realising the situation was becoming critical, the skipper tried to contact the coastguard using the fixed radios, but there was no electricity supply, so was unable to do so. The skipper did not think to use the portable VHF radio carried on board.

Soon afterwards, *Crimond II* capsized and foundered. The crew found themselves in the water where the temperature was between 8°Cand 9°C. The liferaft went down with the sinking vessel, but two lifebuoys, a gas bottle and three or four pound boards floated to the surface. The survivors managed to grab the lifebuoys.

One further item had also broken free, the EPIRB. It started to transmit once on the surface and alerted the SAR authorities. The crew were in the sea for over an hour before a rescue helicopter arrived, having homed in on the EPIRB signal.

The crew of *Crimond II* were successfully rescued, and owe their lives to the coastguard, the helicopter crew, many others in support and, above all, the EPIRB.

The Lessons

1. This is a classic example of how the EPIRB can save lives! Fishing vessel owners often complain about the cost of safety equipment, but this demonstrates how valuable an investment the EPIRB can be.

2. If flooding is discovered, always call the coastguard. You will not be disturbing them unnecessarily. They much prefer to be informed at an early stage, than later when things get desperate.

3. Fishing vessels of *Crimond II*'s size are required to have a portable VHF radio. If the crew abandon to the liferaft, they should take the portable VHF radio with them; this is its primary purpose. The portable VHF radio can also be used if all other radios have failed.

4. There is little point in speculating why *Crimond II*'s liferaft didn't float free, but the next time you walk along the jetty looking at your fellow fishing vessels, count the number of times you see liferafts so firmly secured that they will never break free. Then go away and think about it.

Footnote

This incident was the subject of a full MAIB investigation. A comprehensive report, giving details of the causes, an analysis, and recommendations was published in February 2002.

Case 14
The Thinking Man!

Narrative (1)

Fertile, a 251gt fishing vessel had recently undergone routine maintenance, during which time the turbo charger on the main engine had been overhauled and refitted. Once the maintenance was complete, the vessel prepared to return to the fishing grounds. She sailed, and had been on passage for only a short time when the turbo charger bearings seized, and a small fire broke out in the area of the exhaust manifold. The fire was quickly put out and arrangements made to tow the vessel back to port.

On investigation, it was found that the turbocharger failed because of a basic error during re-assembly:

a. The bearing oil supply pipe had been connected to the casing cooling water inlet;

b. The cooling water supply had been connected to the bearing oil inlet.

Narrative (2)

The ro-ro ferry *Pride of Bilbao* was on passage from Bilbao to Portsmouth, and the opportunity was taken to install a new security box in the emergency generator room for the Halon release lever and alarm. The release wire had been disconnected while the work was being carried out to give easy access. With the job nearing completion, it was decided to re-connect the release wire before the final electrical connections were made. In doing so, the crewman moved the operating lever to one side, causing the release lever of the 60kg halon bottle to activate, discharging the gas into the emergency generator room.

The crewman left immediately, the space was ventilated, and the work was completed once the area was safe to enter. There were no injuries to either passengers or crew.

Narrative (3)

The cruise ship *Royal Princess* was at Sparrows Point dry-dock, Baltimore, USA when her crew were alerted to the presence of heavy smoke in the vicinity of the frozen meat room. The alert was sounded, with contractors and non-essential crew being told to muster ashore. Preparations were made for boundary cooling, while the deck fire party entered the storeroom wearing breathing apparatus. After reporting that they had found smouldering wiring on the deckhead, they withdrew, leaving the second fire party from the engine room to investigate the surrounding area. This party entered the void space outside the storeroom, and found no evidence of the fire having spread to, or having originated in, an adjacent space.

The local fire brigade was now in attendance, and entered the storeroom. A Class A fire was put out. Smouldering and fire-damaged goods were removed, and the fire confirmed as being out shortly afterwards.

The cause of the fire was put down to boxes of meat being stowed in contact with hot unprotected compressor pipework. This resulted in the cardboard containers drying out, heating up and smouldering to start a chain reaction. Nobody was injured.

The Lessons

A common theme links these three events. They happened in very different circumstances, and on differing types of vessel, but they each demonstrated what can happen when a course of action is not thought through to its logical conclusion. If you don't think things through YOU will probably be the one who suffers.

1. After any machinery overhaul, CHECK that all connections are both made and tightened. Ideally, water and oil connections should be either different colours, type of connections or marked in some way. ALWAYS check the work of contractors. If something is set up incorrectly, it is highly likely that YOU will be the one who eventually has to sort it out.

2. When undertaking work on a gas release mechanism, ALWAYS fit safety devices to prevent accidental release. But remember to remove and CONFIRM that it has been removed once the work has been completed.

3. When loading stores, look at the space first so that you know what access difficulties there are in the space allocated, and what problems could be encountered. If there are areas such as exposed and unprotected hot pipes, get them insulated and protected.

No matter what vessel you are on, spend time checking out the pitfalls that you or your fellow seafarers are likely to meet during the course of your job. RISK ASSESSMENT, as it is now called, can save you a lot of time and worry.

Case 15
I Will if you Wont!

Narrative

A fishing vessel was trawling north-west at 2.2knots. A coaster was steaming north-east at 10knots. It was daylight and the fishing vessel was displaying an appropriate shape for a vessel engaged in fishing. The weather was calm and the visibility was good.

The fishing vessels sole watchkeeper sighted the coaster when she was 4 miles away, and determined that a close quarter's situation was developing. When the coaster's range had closed to half a mile, and she hadn't taken any action, the watchkeeper altered course hard to port and increased to full speed.

The report is based solely on evidence provided by the fishing vessel, since the coasters evidence is that no such incident occurred.

The Lessons

There can be few fishing vessel skippers or short sea traders who do not recognise incidents such as this. There is often a tendency to blame the other vessel for not doing more to keep out of the way.

1. In the fishing vessel skippers experience, approaching vessels tend not to alter course until the last minute. This has led fishermen to delay taking action themselves until it becomes apparent that the give-way vessel has no intention of doing so. The reluctance of fishermen to take action themselves is compounded by the restrictions imposed by their trawl gear. Although a stand-on vessel is not required to take action until collision cannot be avoided by the action of the give-way vessel alone, it may do so as soon as it becomes apparent that the other vessel is not giving way. In view of their restricted nature, and the reduced margin of safety in taking late action, vessels engaged in trawling should be prepared to act much earlier than they would do otherwise.

2. It was the coasters masters experience that fishing vessels tend to display a fishing shape when they are not engaged in fishing. The assumption is justified, as anyone who has seen a fishing vessel in harbour can testify. The practice of having shapes permanently displayed does undermine the value of being recognised as a burdened vessel, and can lead to dangerous assumptions being made by other, give-way, vessel's. Having said that, it is totally wrong to assume a fishing vessel showing shapes is not engaged in fishing. In this particular incident, the coaster was still the give-way vessel because she apparently had the fishing vessel on her own starboard side and was crossing. As a give-way vessel, she was required to take early and substantial avoiding action.

3. We have here a skipper and a master who, fundamentally, do not entirely trust the other because of their past experiences. It is a sad reflection of how the traditional manners of the sea have declined. Shipping must keep an eye open for fishermen, and must take early avoiding action so that trawlers and others are not forced to manoeuvre with their gear still out. Fishermen, for their part, must realise that flouting the regulations, and having their daytime shapes permanently rigged, undermines the trust that other seafarers have in their actions.

4. There are a couple of other points. The Collision Regulations require a vessel which fails to understand the intentions or actions of another, or is in doubt as to whether sufficient action is being taken by the other, to sound a warning signal of at least five short and rapid blasts. Had the fisherman done so in this instance, it might have alerted the coaster. Although the minimum audible range required for a vessel the size of the fishing vessel is 0.5mile, the distance at which the watchkeeper decided to take action himself, making a sound signal might, just might, be the difference between a collision and a near miss.

5. This article has focussed, in part, on shipping's interpretation of fishing vessel's shapes. It is an old debate, wit h every prospect of continuing. The fact remains that any experienced mariner in reasonable

visibility can tell by looking at a fishing vessel, using binoculars if necessary, whether it is actually engaged in fishing. The watchkeeper glued to the radar cannot. The moral of the story: look out of the window. Please.

Case 16
He Who Hesitates

Narrative

At 1524 (UTC +1)on 30 July 2001, the French fishing vessel *Celtit* collided with the UK aggregates dredger *Sand Heron* in the north-east traffic lane of the Dover TSS. *Celtit* was not fishing and had been the give-way vessel under the Collision Regulations. Both vessels suffered minor damage.

Celtit had been crossing the north-east traffic lane on a southerly heading making 9 knots. *Sand Heron* was steering 050° in the traffic lane and making a speed of 11.7 knots (**see trackplot**). She had been overhauling two vessels which were close ahead of her. The headings and speeds of both *Celtit* and *Sand Heron* had been steady for 10 to 12 minutes before the collision.

The second officer was on watch on *Sand Heron*. He was aware that *Celtit* was approaching on a collision course. Experience had taught him to expect fishing vessels to leave it until the last minute before altering course. He continued to monitor the situation, but did nothing at that stage to attract the attention of *Celtit*'s watchkeeper.

The skipper was on watch on *Celtit*. He had seen *Sand Heron*, but did not think that there was a risk of collision.

In the event, *Sand Heron* did not alter to starboard to avoid the collision until about a minute before the collision, when *Celtit* was at a range of a quarter of a mile or less. At about the same time, *Celtit*'s skipper put her engine full astern. These actions proved too little, too late.

The Lessons

Anyone reading this brief narrative will be asking what new lessons can possibly be learned in this oldest of all situations. Two vessels are approaching one another in such away that the risk of collision exists. The one thinks he knows that the other will delay giving way until the last minute, while the other doesn't think a risk of collision exists. Ancient mariners the world over will bethinking *Here we go again*. Most will instinctively say they would never, ever, leave things so late. These lessons are not, therefore, for them but for that watchkeeper in a million who might, just might, get it wrong. The problem is that it keeps happening, so perhaps we should never stop learning.

1. If a risk of collision exists, and you are the officer of the watch in the stand-on vessel, never assume that the give-way vessel has seen you. Until she shows, by positive action, that she has the situation under control, it is safer to assume she has not.

2. Rule 17 permits the stand-on vessel to act as soon as it becomes "*apparent to her that the vessel required to keep out of the way is not taking appropriate action in compliance with these rules"*. In this case it was apparent, when the range between the two vessels was about 1 mile, that *Celtit* was not taking "*early and substantial action to keep well clear"* as she was obliged to do under Rule 16. At this time *Sand Heron* should have used her signalling light and whistle to alert *Celtit*. If this did not prompt immediate action from *Celtit, Sand Heron* should have made a broad alteration to starboard to avoid the collision. She was permitted to do this under Rule 17 a (ii) and, it could be argued, required to do it under Rule 2.

3. If *Celtit*s skipper really thought there was no risk of collision, he was demonstrably wrong. It doesn't matter who you are, or in what type of vessel, the person in charge has a fundamental responsibility to determine whether a risk of collision exists and do something about it when it does. Radar, the compass, common sense, seaman's eye, and knowledge of the Rules are the tools available to achieve this. The oldest guidance of all is still the best. If the compass bearing of the approaching vessel does not appreciably change, then risk of collision exists.

Footnote

This incident was the subject of a full MAIB investigation. A comprehensive report, giving details of the causes, an analysis, and recommendations was published in April 2002.

Case 17
Ideas for Tackling Flooding

Narrative

The 21.9m wooden vessel *Constant Faith* was heading north north-east from her home port of Peterhead to pair trawl with *Conquest*. The wind was south, force 4 and the visibility was moderate to good. A crew of six was onboard.

While on passage, the main engine temperature was seen to be rising. An investigation revealed the problem to be a blocked sea water inlet. The mate closed the seacock as best he could before taking the cover plate off the adjacent strum box. On looking inside, he saw a black plastic bag jammed in the valve. He opened it and pulled the bag out but, no sooner had he done so, when water started to pour through. The mate did his best to shut the seacock, but the linkage came off. Despite frantic efforts to contain the flooding, all attempts failed. Bilge pumps were used to pump out the floodwater, but couldn't keep pace. The hand pump was hardly effective.

The only power-driven bilge pump used, was the one fitted to the auxiliary engine. A second one, driven by the main engine, was available but not used. The main engine drew its cooling water from the open seacock, and both skipper and mate assumed they could not start the main engine because there was no cooling available. There was a pipe from the bilge system capable of feeding sea water direct to the main engine for cooling. The mate was aware of this but, because he had never used it before, thought it should not be used as it would damage the engine. The nature of the emergency left little scope for lateral thinking.

A coastguard helicopter flew out to *Constant Faith* with two portable salvage pumps, but before these could be put into action, the position onboard deteriorated to the extent that the decision to abandon ship was taken. The crew evacuated to *Conquest*, leaving *Constant Faith* to sink about three hours later.

The Lessons

An incident like this demonstrates that flooding can occur at any time, in any place and is no respecter of a vessels age. The lessons focus on two aspects: preventing the flooding in the first place, and containing it to prevent the vessel sinking.

It is also sobering to think that the origin of this loss was a plastic bag.

1. Opening up a seacock when afloat is not advisable. Unless there is some way of isolating an inlet safely at sea, remedial work should only be attempted in harbour. Apart from the obvious solution of slipping the vessel to ensure there is no way for flooding to take place, it is possible to open up a seacock by berthing in a tidal harbour and waiting for the tide to go out. Once it is safe to do so, the

seacock can be opened up and the blockage cleared. Should there then be a problem restoring the system to normal, there should be sufficient time to deal with the situation.

2. The US coastguard trains repair teams so that ships can be kept operational after limited damage. A large softwood wedge is driven into an open pipe. Those doing so will confront an even greater quantity of spurting water initially, but smaller softwood wedges are then driven in between the main wedge and the pipe until the flow is choked off. The tops of the wedges are trimmed with a saw, before a wood shore is placed between the tops of the wedges and the nearest part of the ships structure. The US coastguard encourages fishing vessel skippers to carry softwood wedges and shores for this purpose. Why not do the same?

3. In extremes, it might just be possible to contain the flooding by resorting to the traditional option of fitting an emergency tingle. By lowering a weighted canvas or plastic sheet over the side in the vicinity of the inlet, it is possible it will cover the hole and substantially reduce the rate of flooding. This in turn might provide additional time for other actions to be more effective. It might sound far-fetched, but in days gone by was tried with conspicuous success.

4. The main engine could have been started once the flooding had developed. The cooling water was available and plenty of it; the floodwater inside the vessel. This would have helped to pump the vessel out since the cooling water was discharged overboard once it had been cycled through the heat exchanger. Starting the main engine would also have meant that the second bilge pump could be used.

5. The sea water pipe from the bilge system could also have been used for main engine cooling. Seawater fed directly to an engine, rather than through a heat exchanger, can cause damage by blocking passages with salt deposits. However, in situations such as this, the risk of any problems is minimal. In an emergency, it is a perfectly acceptable step to take.

6. Had a portable salvage pump been carried onboard, it could have helped save *Constant Faith*. Consider it.

Footnote

The MAIB receives a number of reports of flooding incidents to fishing vessels. The reasons are not always identified, but what does become evident, is how often it seems that more could have been done to prevent the vessel from sinking had damage control actions been better handled. The instinctive reaction is, invariably, to request additional pumps. This is right and proper, but far more needs to be done to contain, or even stop, the flooding using alternative means.

This article is largely directed at stimulating discussion on how this might be achieved.

One final thought. Next time you allow inadvertently of course a plastic bag to drop overboard in harbour, don't. It could be the one to jam someone's seacock. The really sobering thought is it might be yours!

This incident was the subject of a full MAIB investigation. A comprehensive report, giving details of the causes, an analysis, and recommendations was published in June 2002.

Case 18
Engine Room Flooding causes Another Fishing Vessel Loss

Narrative

The 23.99m twin-rig steel trawler *Christine Nielsen* was fishing120 miles north-east of the Tyne when her nets became fast on the seabed.

While trying to haul back the starboard net, a hydraulic pipe, from the winch to the hydraulic motor burst. All three crew then spent the next several hours on deck replacing the burst section of pipe.

While they were on deck, the vessel suffered substantial flooding to the engine room. The flooding was not discovered until one of the crewmen went down the engine room for a section of hydraulic hose. Because the wheelhouse was left unattended, the bilge alarm went unnoticed.

By the time the flooding was discovered, the level of floodwater was well above the engine room floor plates. With the engine room in virtual darkness, because of the failure of the 24Velectrical system, it was not possible to locate and open the valve chest to operate the engine driven bilge pumps.

After unsuccessful attempts were made to regain power to the 24V electrical system, and to transmit a Mayday, the crew abandoned the vessel in the liferaft. The vessel capsized soon after.

Shortly after boarding the liferaft, the crew managed to activate the EPIRB, which they had taken with them. Three hours later they were rescued by a coastguard helicopter.

The Lessons

1. The investigation of this accident revealed that *Christine Nielsen*'s loss was one, or a combination of, the following factors:

- **a breach in the hull plating,**
- **failure of a non-return valve in an overboard discharge resulting in backflooding, or**
- **engine room seawater piping failure caused by erosion or corrosion.**

2. The condition of the hull plating should be checked on a regular basis, in addition to the 4-yearly ultrasonic testing required under survey. This is especially important if the vessel has suffered any kind of impact damage, no matter how slight.

3. Non-return valves should also be checked regularly, to ensure they are functioning correctly.

4. The failure of engine room seawater piping is a common occurrence on fishing vessels, and has accounted for many flooding incidents. This has, in some cases, led to the actual loss of the vessel. In light of this, it is wise to carry out simple regular checks on all pipework, especially in the engine room and in places which may at first appear to be inaccessible. A simple check for signs of corrosion or weeping pipework, culminating in the repair or replacement of the piping, may well prevent the vessel from being lost.

5. While at sea, the wheelhouse should never be left unattended. Had it been manned, the bilge alarm would have been heard, and would have given the crew sufficient time to deal with the problem and contain the flooding. In all probability, it would have been possible to prevent the vessel from foundering.

The ingredients of this incident are not untypical. There have been a number of recent founderings in which the circumstances have been very similar. There is a late discovery of flooding, and the crew have insufficient time to contain it. The vessel then fills with water and sinks. The saving grace in many of the more recent incidents is that the crew has usually been rescued, thanks to the skill and dedication of the search and rescue organisations.

Yet the fact remains that in all probability, the loss was caused by a relatively small hole, perhaps measuring no more than 5 to 10cm across, through which the flooding was taking place. If it is possible to stop the water coming in at the point where the pipe penetrates the hull, it is very likely the vessel, and perhaps its crew, can be saved. The fact remains, that with forethought and the sharing of experiences, it is possible to reduce or even stop the flooding by a number of ways, providing you know how to do it.

Even by adopting the oldest technique in the book, by lowering a weighted canvas sheet over the position of the engine room inlets on the affected side, can the rate of flooding be substantially reduced.

Footnote

This incident was the subject of a full MAIB investigation. A comprehensive report, giving details of the causes, an analysis, and recommendations was published in November 2001.

Part 3 Leisure Craft

Statistics are wonderful. You can prove almost anything.

The MAIB's database reveals that serious accidents involving leisure craft are relatively rare and that fatalities are, mercifully, far and few between. One can justifiably conclude from such statistics that there are few problems in the sector.

If, on the other hand, you start to count the number of times the rescue services are having to respond to calls for help from both sailing craft and powerboats, a slightly different picture begins to emerge. There are many such calls every year and someone could, understandably, deduce that all was not well and argue that safety was an issue.

The true picture lies somewhere between the two. But regardless of how one interprets the information, and accepting that the search and rescue authorities would far rather become involved in preventing a tragedy than having to recover dead bodies, an analysis of the reasons why there are so many call outs reveals some disturbing trends.

A high percentage of RNLI services and rescue helicopter launches each year are in response to pleas for help by sail or power-driven pleasure craft, many because of engine failure. Users in this sector have come to rely, justifiably, on a thoroughly professional and very willing service when things go wrong. The fact that it exists should not, however, tempt skippers into thinking they can rely on luck and a helping hand once they have cleared the harbour entrance.

Nothing should replace careful preparation forgoing to sea, no matter how long or short the intended voyage. It doesn't need the MAIB to remind skippers that the most vulnerable times are (a) when a boat has just emerged from being fitted out, (b) has not been used for a while,(c) if caught in bad weather and (d) if they are sailing with an untried or novice crew.

The skipper himself must work within the limits of his knowledge and experience, the capability of his craft and the prevailing conditions. Problems can arise from any number of reasons, and the sea has an uncanny knack of exposing weaknesses. If you find yourself stranded on a well-charted rock, or you have run out of fuel, or the forestay has parted, or the crew is seasick, it could be too late to start thinking about what you should have done to prevent the problem happening in the first place.

Every time the rescue services are called out for something that could, and should, have been prevented it is worth remembering that someone, somewhere, will be analysing the origins of the incident and, perhaps, drawing the conclusion that leisure craft users are not safety conscious.

The skipper and crew who thoroughly prepare for sea before setting out, who ensure everything is stowed properly, who double-check that equipment carried is in good condition, that the passage has been properly prepared and are familiar with the safety arrangements on board, are far more likely to enjoy themselves. Of greater importance, they are far less likely to have an accident or call for help.

Case 19
Be Prepared!

Narrative

In May 2001, a Morayshire club was running a number of activities including sailing and a two-day RYA powerboat course. The club had insufficient resources of its own for all the activities, and was using lent boats and equipment to meet the requirement.

The powerboat course had nine trainees. Following classroom sessions on the first day, practical on-water sessions, using rigid hulled inflatable boats (RIBs), was scheduled for the second day.

Having nearly completed the initial practical sessions by late morning, the decision was taken to carry out further training in more open water. The weather was good, there was no noticeable sea state and little wind.

At about midday, two of the three RIBs, complete with instructor and three trainees, were offshore waiting for the remaining boat to join them.

The instructors took the opportunity to demonstrate medium speed pacing techniques, and were holding their respective positions while moving at about 15 knots. Part of the demonstration was the breakout, where one of the RIBs peels away from its companion when at speed. The first try was aborted as the designated RIB failed to break away. On the second try, just as separation began, one of the RIBs suffered a power-drive failure.

The disabled RIB slowed immediately, and found herself rolling violently in the wake of the other boat to such an extent that one of the trainees was thrown overboard. Another trainee, meanwhile, was thrown against the centre line driving rack, and was injured.

The trainee thrown overboard was then hit by the trailing propeller of the disabled RIB and injured his left hand.

The other RIB turned and rescued the injured trainee from the sea and attempted to provide first-aid. It was only then that the occupants discovered that the first-aid box did not contain any dressings. The first-aid box in the disabled RIB was not much better equipped, but did have some limited dressings. The instructor on board the disabled RIB was also the course director. He transferred to this RIB, and instructed the third RIB which had, by that time, arrived on scene to take the disabled RIB back to base. Attempts were then made to make a Pan Pan call on channel 16 using the hand-held VHF radio, but when this failed, the decision was taken to return direct to base.

On arrival, the emergency services were called using a mobile telephone, while the two injured crew members were brought ashore. At that point, another instructor collapsed and needed treatment for a diabetic coma. This was possibly brought on by heat exhaustion. Both he and the student were subsequently taken to hospital by ambulance.

The cause of the power-drive failure was the fracture of the coupling between the selector lever and the gear selector cable. With the gear train spring-loaded to neutral, the drive immediately shifted into neutral, and propulsion was lost.

The Lessons

1. As a member of a powerboat crew, ALWAYS make sure that you are firmly anchored to the boat using either foot or hand-holds. Vibration and violent movements of the boat are constant companions, and should be expected at all times it is the UNEXPECTED that will catch you out.

2. For all training courses organised by a club, each boat whether club owned or on loan MUST not only carry a recognised first-aid kit at all times, but must also ensure that the kit is both adequate and in date.

3. Good radio communication is essential at all times. Check for black spots and if found, provide a radio capable of making immediate and reliable contact either with the emergency services, or the club base.

4. Some medical conditions are aggravated by sea going activities. If you think yours could be so affected, seek medical advice BEFORE starting. It is your responsibility to ensure that you are both fit and capable of meeting the requirements of the activities.

It is important to realise that any organisation, whether voluntary or not, is required to comply with health and safety regulations; particularly when under-age persons are involved. Nothing should be taken for granted; if the regulations say it is required, check that it is both there, in date and functional.

Case 20
The Cost of Cannon Firing

Narrative

Grand Turk is a UK flagged wooden replica of a three masted, three decked, eighteenth century square-rigged sailing vessel. She represents a British frigate designed in about 1791. On 20August 2001, *Grand Turk* arrived at Gosport, Hampshire, to take part in the International Festival of the Sea (IFOS).

In addition to being open to the public during the festival, she had a role as a platform for using her cannon for, among other functions, firing gun salutes to welcome other vessels. After arrival, she carried out several practice firings, with the gun crew comprising the mate, third mate, the acting bosun, and a senior top man.

On Thursday 23 August, the third mate was asked to take over as gun captain for the demonstration to be given the next day in front of an invited audience. Following discussions with the master and mate, the new gun team consisted of the third mate, two experienced members and a young lad of 17 who was keen but relatively inexperienced. During the day, the new gun crew carried out various practice routines, culminating in both loading and firing.

The following day, *Grand Turk*, which by then had berthed alongside the north wall of HM Dockyard, Portsmouth, had No 4 cannon prepared as the noon day gun. It was loaded but not primed. The demonstration gun team was in position and the guests grouped on the forward starboard side of the main deck. The master was positioned port side forward, to warn off any boats approaching from forward, while the mate carried out similar duties aft. Immediately after the noon cannon was fired, the reloading demonstration started.

After the recoil, the acting bosun concentrated on securing the cannon carriage and serving the vent. The young lad pushed the swabber down the muzzle, bottomed it, and pulled it out. As he turned to pick up the rammer, another crewmember used the wormer on the debris. Once the wormer had been withdrawn, a new charge was placed just inside the muzzle. The young lad then began to push it down the barrel with the rammer. As he tapped the charge down against the breech, there was a loud bang followed by the customary cloud of smoke. As the smoke cleared, the young lad was heard shouting for help, and seen standing in front of the muzzle clasping his hands, which were covered in powder burns and blood.

He was taken immediately to hospital for treatment, and subsequently transferred to Haslar Naval Hospital for surgery. He suffered the loss of his little finger down to the knuckle, as well as serious damage to the adjacent two fingers on his left hand. He suffered powder burns to his left arm and shoulder.

In the excitement of the occasion, the reloading procedure had become confused, with the swabber being used before the wormer. When the wormer was used, debris from the previous firing was disturbed which, when the new charge was inserted, caused the black powder charge to ignite prematurely.

The Lessons

It is probably a safe bet that firing cannon is not the lot of the average merchant seaman. Despite the references to such items as the wormer, swabber and rammer, and the paucity of cannon in British merchant ships, we have included this article because a number of significant lessons emerge from this unfortunate accident.

1. The vessels Training and Safety Manual contained detailed instruction and guidance on the correct procedures for loading and firing the cannon. The investigation revealed, however, that only one member of the gun crew knew of its existence, and had read it.

Before undertaking any new venture, ask if any written instructions are available and, if so, study carefully the requirements and instructions. If you do not understand anything, ASK !

2. If you are asked to take control of any unfamiliar operation, make sure that you are fully aware of what is required and what the safety implications are. If you are in charge, you are responsible for the safety of others and must satisfy yourself that everyone knows exactly what to do.

If that operation involves explosives of any sort, make DOUBLY SURE you know what the procedure is, and what responsibility you have.

3. If you are learning to be in control of the operation but feel you cannot safely oversee everything, ask for a safety officer to be appointed. He, or she, would be required to monitor the operation until you were fully satisfied that YOU were fully in control and everyone else involved was competent.

Footnote

This incident was the subject of a full MAIB investigation. A comprehensive report, giving details of the causes, an analysis, and recommendations was published in April 2002.

A Pause for Thought
Whither the weather

The marine accident investigator has two roles: to investigate accidents to determine what happened and why, and to identify trends. The aim of both is identical, to prevent them happening again.

Readers of our investigation reports and Safety Digests will have noticed that certain elements keep cropping up again and again. Perhaps the most obvious is the frequency with which reference is made to the human factor as an underlying cause of so many accidents.

It isn't the only one. Weather and sea conditions not only provide the backdrop to practically everything we do at sea, but are often crucial factors when things go wrong.

You only have to reflect how the weather has played its part in maritime history. The storm of14 October 1881, when 300 fishermen from Eyemouth in Scotland lost their lives, is still remembered. A glass calm sea, freezing temperatures, and an iceberg played a significant part in the loss of the *Titanic*. A ferocious storm in the Irish Sea lay at the heart of how the ferry *Princess Victoria* sank on 31 January 1953, while fog featured as the crucial factor in the collision between *Stockholm* and *Andrea Doria* in July1956.

The 1979 Fastnet race is still recalled with horror by the ocean racing community, as is the Sydney-Hobart race of 1998. And large ships are not immune when reflecting on the 400 or so containers that were lost overboard from the container ship *APL China* while on passage off California in the same year. Bad weather played apart in the break-up of *Erika* in December 1999.

Study, and knowledge of the weather is a core subject for seafarers, and they are introduced to it early in their careers. For those working in machinery spaces, the galley or the accommodation, it might not be quite such a formal agenda item, but it only takes a day or two for the first time voyager to discover that ships roll, pitch, heave, lurch and corkscrew. They soon learn the importance of stowing things away properly, and the art of maintaining a balance and sure foothold at sea. Choice of suitable footwear is crucial. The old adage of one hand for the ship and one for you is as true today as ever.

Sailors the world over live with the effects of the weather. Some become quite boring about it, and revel in how thick the fog was on their last voyage, or describe in vivid detail how they survived Typhoon X in the South China Sea. The marine accident investigator, meanwhile, is forever being told how a freak wave was responsible for some disaster. Weather is a factor we cannot ignore.

While every investigation tends to throw up some new lesson, it is instructive to read old reports to see whether we can still learn from the experiences of the past. The answer is we can, and this article draws together a number of lessons that will come as no surprise to the average mariner, but will serve as ready reminders for those among us who might have become slightly blasé about matters meteorological.

Despite satellite surveillance systems and computer-based predictions to help forecasters, and modern communications that enable mariners to access the latest information in detail, the weather is still a fickle commodity, with the ability to surprise. There have been a number of accidents to both small craft and large merchant vessels where those on board have failed to heed the available weather forecasts. There have, for example, been some incidents where it appears the sole source was the local TV channel or radio station. As mariners know only too well, the weather offshore is likely to be very different to that inland.

Those intending to put to sea in charge of a vessel have a duty to all on board, and as part of the safe passage plan, to gather as much information about the predicted weather as possible, and apply their own judgement on the conditions to be expected. At its most basic, this not only means examining the general synopsis and monitoring area forecasts, but also looking at the sky, interpreting the barometer and, where feasible, looking beyond the harbour wall. And there is everything to be said for contacting the local harbourmaster, coastguard, or local weather station to establish the current conditions and what is forecast. Local knowledge can be invaluable.

Once at sea it pays to read every available forecast. Conditions can change, and sometimes rapidly. Once again, the mariner must not only pay heed to the forecasts, but must also use these to complement his own observations. An understanding of what is happening when, for instance, high winds are predicted, is invaluable. Such knowledge may also enable him to predict the formation of a secondary depression in advance of it featuring in an externally produced forecast.

And when the bad weather arrives, the good seafarer should be well prepared.

Take fog. It doesn't take a genius to realise that the risk of collision increases many times over when underway in fog or other conditions of reduced visibility. Snow, very heavy rain, and sandstorms have even greater powers of degrading the navigation and anti collision aids at your disposal. Those of us who are unaccustomed to navigating in falling snow may well be surprised at how deceptive the imagined visibility can be. What seems to be a good mile or two, may in fact be no more than a couple of cables.

Despite radar and ARPA, many of us are guilty of failing to adjust to the Rule 19 mentality when operating in conditions of reduced visibility.

One of the most common factors to emerge in any analysis of a collision in fog, or something similar, is the tendency for watchkeepers to make unjustifiable assumptions about another vessels heading when her range is close. Time and time again watchkeepers react with total disbelief when the other vessel looms out of the murk to reveal a starboard bow instead of the expected port, and vice versa. The lesson is that if you cannot see the other vessel at close range, and you find yourself making an assumption about her heading, you may well be wrong. Act accordingly.

This may be an opportune moment to remind ourselves of a technique successfully adopted by our forefathers in certain conditions of abnormal visibility: the placing of a lookout low down and well forward. A lookout in the bows, as opposed to high up in the heated comfort of a carpeted bridge, is often well placed to see something a few precious seconds before the officer of the watch. To maximise his effectiveness he must, however, have very good communications with the bridge.

But while fog is an unwelcome bedfellow for mariners, it is the bad weather that does the damage.

Despite the lessons of the past, and hard won experience, some vessels still proceed to sea with gear and cargo insufficiently secured. No matter how benign the conditions seem beyond the breakwater, it is still possible to get caught out. By the time the pilot has been dropped, and you encounter the first heavy sea or swell, it may already be too late to put someone safely on to the upper deck to lash things down. Good seamanship starts in port. Check and double-check that cargo-securing arrangements are in place before putting to sea, and that any loose gear has been properly secured. Particular attention should be paid to securing containers. Transverse forces acting at the top of a stack, when rolling in a beam sea, can be immense.

One of the primary causes of Braer suffering an engine failure before going aground at Garthnesson the Shetland Islands, in 1993, was the failure to properly secure some spare pipes on deck. As the tanker laboured in heavy weather, they broke loose and damaged some vent pipes, which allowed seawater to drain into the oil fuel tanks.

Apart from anything else, there are dangers inputting seafarers on deck in rough weather. More than one person has been killed or seriously injured by green seas while working in an exposed position. Analysis often reveals that had things been properly attended to in the first place, it would never have been necessary to put someone out to secure loose gear or shut a weathertight opening.

Another factor for people working in exposed conditions is that they are never as efficient as they would be in fair weather or in harbour. Little allowance is ever given to reduced performance in bad weather, so expectations of normal responses, and attention to detail, are likely to be misplaced.

For the watchkeeper working in a totally enclosed bridge there is a danger that he or she might become detached from the elements outside, and will no longer have that instinctive feel for the actual conditions. There is no reason why someone so protected shouldn't be aware of the sea conditions, providing a conscious effort is made to watch what is happening and analyse its effect.

An awareness of how bad weather can damage vessels comes with experience. Nobody will thank you if you push a vessel too hard. More than one ro-ro ferry has damaged its bow visor in rough seas, and the prudent mariner may well choose to reduce speed before the damage is done.

And it is worth remembering the topography of the seabed. Smaller vessels, including leisure craft, can be very vulnerable when approaching the edge of a continental shelf in foul weather.

And many a mariner has been surprised by how vicious the seas can be when underway in a gale in the relatively shallow waters of, say, the North Sea or the Baltic.

As conditions deteriorate, the small boat sailor should take care to shorten sail in ample time and be prepared to ride out the conditions if necessary. Anticipating how one might react in bad weather, before setting out, helps. As the barometer drops, the wind rises, the seas build, and the visibility clamps, it is a bit late to wonder where the try sail might be stowed, or realise you have never used the new parachute anchor before. Sea room is the small boat sailors greatest asset. He should not squander this advantage, unless he is very confident of his position and his ability to take his craft safely to shelter. Many a yachtsman has foundered at the harbour bar, having been perfectly safe offshore.

The two most frequently ignored factors among small boat users in bad weather are the need to keep warm, dry and well nourished, and for the skipper to get his head down so he can rest. It is interesting to note the number of mistakes fatigued skippers make.

Among the most frequently observed shortcomings of fishermen in similar conditions are the failure to make their vessels completely weathertight by shutting external doors and hatches properly, and not appreciating the dangers of free surface effect if water is sloshing around in the fish hold.

The big ship sailor faces a slightly different problem. There is no single reason that stands out as an area of concern, but there is perhaps the need to remind those in this category that big seas can still pack a very heavy punch. If the master decides that he should route his vessel well clear of stormy weather, then he should not hesitate to do so.

Ships can still drag their anchor if in an exposed anchorage, and if a master has any concerns about the scantlings in his ship, he would be well justified to slow down sooner rather than later on confronting bad weather.

Remember that one square metre of water approaching you on a steady bearing weighs one tonne. A breaking wave of, say only 3m high, will be travelling at about 12 knots, and the combination of its weight and approach speed could inflict heavy damage to a vessel that is not being well handled, or if there is a flaw in its structure. The implications make for sober reflection.

But that's seafaring. The good seafarer can cope with bad weather. The sea will expose those who are not so well prepared.

MAIB NOTICEBOARD

From the DfT press releases web page:

New Chief Inspector of Marine Accidents appointed

Rear Admiral John Lang, the Chief Inspector of Marine Accidents, retires on 31 July 2002. He will be succeeded by Mr Stephen Meyer who will take up his three-year appointment on1 August.

Thank You

The MAIB thanks those many readers who have contacted the Branch to comment on the value of the Safety Digest. We welcome any constructive comments and are always interested in hearing peoples views. We are also keen to send copies to anyone, or any organisation that might benefit from being placed on the distribution list. If any reader is in a position to recommend that we should send a copy to any deserving recipient, they are invited to let us know. We would also point out that each edition of the Safety Digest is published on our website, and if anyone no longer wishes to receive a hard copy it would be very helpful to know.

Accident Reporting

There is evidence to indicate that in certain categories there is under reporting of accidents, particularly in personal injury and near miss-incidents. The MAIB stresses that the reason behind the need to report accidents is to enable improvements to safety to be made. Without the evidence we can do little about it. We also encourage leisure craft users to report incidents to us. Although we tend to hear about them from many other sources, it is not unknown for us to learn about some quite serious incidents from the pages of the yachting press some months, if not a year or two, after the event.

Appendix A

Investigations started in the period 01/03/02 30/06/02

Date of Accident	Name of Vessel	Type of Vessel	Flag	Size	Type of Accident
02/04/02	*Stena Gothica*	Dry cargo (vehicle carrier)	Sweden	14406	Collision
10/04/02	*Radiant*	Fishing vessel	UK	621	Flooding/ Foundering
20/04/02	*Osprey*	Fishing vessel	UK	92	Accidents to personnel
08/05/02	*Marbella*	Fishing vessel	UK	2882	Collision
21/05/02	*Queen Elizabeth 2*	Cruise ship	UK	69053	Accidents to personnel
29/05/02	*Maria H*	Dry cargo (vehicle carrier)	Antigua & Barbuda	1297	Collision
23/06/02	*Queen Elizabeth 2*	Cruise ship	UK	69053	Machinery failure
24/06/02	*Devotion* *Fruitful Bough*	Fishing vessel Fishing vessel	UK UK	4688 62	Collision
28/06/02	*Pride of the Dart*	Passenger vessel	UK	4745	Accidents to personnel

Appendix B
Reports issued in 2001 (unpriced)

Alfa Britannia parting of a mooring line while Bahamian-registered tanker was berthing at Tranmere oil terminal near Birkenhead on 18November 1999, resulting in injuries to crewmembers on board a gig-boat.
Published 31 January 2001

Alma C death of a fisherman about 55 miles west-by-south of Thyboron in Denmark on 25January 2001.
Published 31 August 2001

Angela capsize and foundering of fishing vessel in the North Sea on 6 February 2000.
Published 26 April 2001

Annandale flooding and foundering of fishing vessel 16 miles NNE of the Shetland Islands on23 March 2000.
Published 7 March 2001

Atlantic Eagle capsize of vessel off St Justinians, Ramsey Sound, 28 September 2000.
Published 25 May 2001

Atlantic Princess man overboard incident from vessel in the English Channel on 23November 2000.
Published 31 August 2001

Baltiyskiy accident on the general cargo vessel, resulting in the death of a seaman on 10September 2000 while on passage from Riga, Latvia to Poole, UK
Published 11 May 2001

Brucestone/Loverval collision between vessels, River Thames, Purfleet Deepwater Berth, 21 December 2000.
Published 23 August 2001

Celtic King/De Bounty collision between UK registered feeder container ship *Celtic King* and Belgian-registered fishing vessel *De Bounty*, to the south of The Smalls traffic separation scheme off the south-west coast of Wales on 19 March2000.
Published 2 February 2001

Coastal Bay grounding of vessel in Church Bay, Anglesey on 21 July 2000.
Published 9 March 2001

Diamond Bulker incident on bulk carrier with the loss of two lives, when at anchor in Lough Foyle, Londonderry, Northern Ireland on 5 April2000.
Published 3 April 2001

Eastfern/Kinsale collision between Irish registered cargo ship *Eastfern* and Cyprus registered bulk carrier *Kinsale* 10.6 miles SW of Dover on 25 September 2000.
Published 3 May 2001

European Pioneer grounding off Fleetwood 1December 2000.
Published 27 April 2001

European Tideway and Vrouw Grietje collision between vessels in North Sea on 16October 2000.
Published 25 May 2001

Evangelos CH fatal accident to a crew member on board the bulk carrier at the Zulu Anchorage, River Thames Estuary on 20 November 2000.
Published 10 August 2001

Fivla death of an engineer on board vessel in the Bluemull Sound, Shetland on 16 July 2000.
Published 17 April 2001

Fleur de Lys explosion on board vessel, which then foundered 18 miles south-east of Portland Bill on 16 April 2000.
Published 12 October 2001

Girl Alice loss of skipper from vessel 1.5 miles south-east of Burnmouth on 19 November 2000.
Published 2 May 2001

Happy Lady grounding of vessel off Shoebury Ness, Thames Estuary, 21 January 2001.
Published 11 May 2001

Highland Pioneer collision between the offshore supply vessel and the DA jack-up rig of the Douglas offshore installation in Liverpool Bay 27 January 2000.
Published 27 April 2001

Horizonte Claro grounding of fishing vessel on Soyea Island, Loch Inver, 21 October 2000.
Published 18 May 2001

Inga death of a crewmember on motor tanker after falling down a pump room hatch at Pembroke on 7 July 2000.
Published 10 April 2001

Lifeboat Safety Study 1/2001 Review of Lifeboat and Launching Systems accidents.
Published 22 February 2001

Mariama K carbon monoxide poisoning on vessel in Douarnenez, France 10 June 2000 one fatality.
Published 20 April 2001

P&OSL Aquitaine impact with quay by passenger ro-ro ferry at Calais on 27 April 2000.
Published 19 July 2001

P&OSL Calais failure of No 5 lifeboat winch on 25 June 1999, and related investigation into self-lifting sprag clutch behaviour.
Published 20 April 2001

Philomena fatal accident on board vessel in the Moray Firth on 6 March 2001.
Published 31 August 2001

Portsmouth Dory capsize of school boat on Fountain Lake, Portsmouth with the loss of onelife on 16 September 1999.
Published 20 March 2001

Pride of Bilbao rescue boat falling from *Pride of Bilbao* into Cherbourg Harbour injuring two people on 1 July 2000.
Published 16 February 2001

Ross Alcedo fire on board vessel while underway about 32 miles north-west of the Isles of Scilly on 16 January 2000.
Published 15 February 2001

Solstice II investigation of a fatal accident to a crew member, 25 miles south-west of Rockall 13 May 2000.
Published 18 May 2001

Southampton Boatshow RIB three persons falling overboard from RIB in River Test on 22 September 2000, resulting in one fatality.
Published 3 August 2001

St Helena engine room fire on 25 August2000.
Published 4 May 2001

Van Dijck loss overboard of a fisherman from fishing vessel while fishing 30 miles south-west of Guernsey on 16 April 2001.
Published 5 October 2001

Wightstone/Rose Ryal collision between *Wightstone* and the moored yacht *Rose Ryal* in River Medina, Isle of Wight on 9 November2000.
Published 8 June 2001

Wintertide/MSC Sabrina collision between vessels off Texel Traffic Separation Scheme on 13June 2000.
Published 15 March 2001

Xuchanghai/Aberdeen collision between vessels at Immingham oil terminal on 12 December 2000.
Published 22 August 2001

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***Safety Digest 1/2001*: Published April 2001**

***Safety Digest 2/2001*: Published August 2001**

***Safety Digest 3/2001*: Published December 2001**

Safety Digest

Copies of the *Safety Digest* publication can be obtained, free of charge, on application to the Marine Accident Investigation Branch (Mrs J Blackbourn (023 8039 5509)).

Appendix C
Reports issued in 2002 (unpriced)

Beatrice propulsion failure and subsequent beaching of Class V amphibious passenger craft, opposite the River Thames fire station, Lambeth, on 31 March 2001
Published 1 February 2002

Bramble Bush Bay collision between chain ferry and four XOD class yachts at the entrance to Pool Harbour on 5 May 2001
Published June 2002

Commodore Clipper broaching of fast rescue boat while being launched from the vessel on 18February 2001
Published June 2002

Constant Faith loss of vessel about 100 miles north-north-east of Peterhead on 30 June 2001
Published June 2002

Crimond II loss of vessel 30 miles north-east of Scarborough on 24 April 2001
Published 18 February 2002

European Highway accident to lifeboat and fast rescue craft, Zeebrugge, on 1 December 2000
Published 23 January 2002

Finnreel grounding of UK ro-ro vessel off Rauma, Finland on 14 March 2001
Published 13 May 2002

Grand Turk injury sustained during the firing of cannon on vessel, while alongside at Portsmouth on 24 August 2001
Published 16 April 2002

Gudermes/Saint Jacques II collision between vessels in the Dover Strait on 23 April 2001
Published 8 February 2002

Hampoel and Atlantic Mermaid collision between vessels in the Dover Strait on 7 June2001
Published 19 March 2002

Lomur grounding in the approaches to Scalloway, Shetland Islands on 14 June 2001
Published 15 February 2002

Marine Explorer failure of lifeboat winch brake in Harwich on 14 March 2001
Published 25 January 2002

Mathilda and Lady Hamilton of Helford near miss incident between the two vessels, 7 miles east-south-east of Lizard Point, Cornwall on 28June 2001
Published 14 March 2002

Our Sarah Jayne/Thelisis collision between vessels in the Thames Estuary on 20 June 2001Published February 2002

P&O Nedlloyd Magellan grounding of Liberian-registered container ship, in the western approach channel to Southampton Water on 20February 2001
Published 17 May 2002

P&OSL Canterbury flooding of the forward machinery space, as she entered Dover Harbour on 17 May 2001
Published 16 April 2002

Pride of Cherbourg/Briarthorn near miss between vessels in the Eastern Solent on 7February 2001
Published 4 February 2002

Primrose grounding on the island of Rhum on15 June 2001
Published 12 April 2002

Randgrid parting of mooring line between the Tetney buoy and the North Sea shuttle tanker Randgrid, resulting in 12 tonnes of crude oil being discharged into the Humber Estuary on 20December 2000
Published 8 February 2002

Resplendent grounding of vessel in Bluemull Sound, Shetland Islands, 13 June 2001
Published 13 March 2002

Sand Heron and Celtit collision between vessels, north-east traffic lane, Dover TSS on 30July 2001
Published 12 April 2002

Sundance capsize and foundering off Gilkicker Point, East Solent, with the loss of one life on 10 September 2001
Published 4 July 2002

Safety Digest 1/2002**: Published April 2002**

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Appendix D
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