Fishing 2009 Safety Digest

MAIB

MARINE ACCIDENT INVESTIGATION BRANCH

Front cover photograph courtesy of the Irish Coastguard

The Marine Accident Investigation Branch is an independent part of the Department for Transport, (DfT) and is completely separate from the Maritime and Coastguard Agency (MCA). The Chief Inspector of Marine Accidents is responsible to the Secretary of State for Transport. The offices of the Branch are presently located at Carlton House, Carlton Place, Southampton, SO15 2DZ. We will relocate to Mountbatten House, Grosvenor Square, Southampton SO15 2JU in August 2009.

This *Safety Digest* draws the attention of the marine community to some of the lessons arising from investigations into recent accidents.

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

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The *Safety Digest* and other publications are available **free of charge** to **anyone** by contacting the MAIB. Contact details are provided below.

MAIB

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

Extract from

The Merchant Shipping (Accident Reporting and Investigation) Regulations 2005

The fundamental purpose of investigating an accident under these regulations is to determine its circumstances and the cause with the aim of improving the safety of life at sea and the avoidance of accidents in the future. It is not the purpose to apportion liability, nor, except so far as is necessary to achieve the fundamental purpose, to apportion blame.

Contents

Chief Inspector's

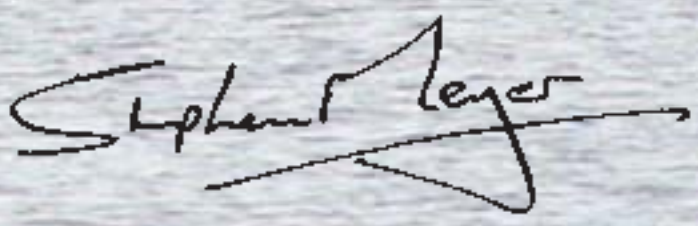
20 Fishing vessels were lost and 8 Fishermen died in onboard accidents in 2008

Foreword

You don't need me to tell you how dangerous fishing can be. However, the usual justification – "it is a dangerous industry, and the sea is an unforgiving environment" – is no longer valid. Almost none of the recent deaths and fishing vessel losses were unavoidable; few were as a result of vessels being overwhelmed by the sea. Awareness of the risks, safe practices, good maintenance, sensible safety equipment and trained crews would have prevented nearly all recent accidents.

It is telling that accidents often happen to the most experienced fishermen. When you are new to a job, you are very aware of the risks, and you are cautious in everything that you do. When you have done something for a thousand times without problems, you have lost that sense of danger, and no longer take the same precautions. When we talk to fishermen after accidents, particularly when a fellow fisherman has died, they nearly always have identified what they could have done more safely, and berate themselves for not having some simple safety measures. If you take 10 minutes or so every week just to think through how you do your work – and to discuss it with your crew – you could save yourselves the dreadful self-recriminations that always come after accidents.

The tragic loss of 3 crew in a fire onboard *Vision II* last August, brought into focus a new hazard developing in the fishing industry. With the advent of more fishermen from overseas, more crew are sleeping onboard their vessel in their home port. Many vessels are not suited to this, lacking even the most basic safety requirements. Alarms are normally fitted to sound in the wheelhouse, with the result that fishermen sleeping below cannot hear them. More worrying still, many alarms are disabled when alongside due to limitations in shore power. Emergency escape routes are often locked when alongside for security reasons. Access to the vessel is often dangerous, particularly at night, and perhaps when returning from having a few drinks. If you are going to have crew members living onboard, please think through the dangers and put in place appropriate safety measures.



Brief Visit to Deck Costs Life

Narrative

A man was lost overboard from an 18m fish farming vessel while returning to port, following a day's harvesting.

During the return passage, most of the crew were in the wheelhouse and were unaware that one of their colleagues had gone on deck and fallen overboard, until they moored up alongside. There, they searched the boat and surrounding area, but were unable to find him. A fast mussel farming boat searched the area where the man was last known to be on board, and during a second sweep of the area he was found in the chilly water. His lifeless body was brought back ashore, where extensive CPR failed to revive him.

It was customary for the casualty to wear a lifejacket while working on deck, but unfortunately at the time of the accident he was wearing no lifejacket or any other form of thermal flotation suit.

Subsequent examination of the vessel highlighted two large gaps in its side guardrails (placed there for ease of access to the salmon cages) which had no means of closure when not in use. Also, large fish pumping hoses created a serious trip hazard in way of these gaps. Directly inboard of one such gap a damaged salmon, which had been kept aside by the deceased, was discovered away from where the crew had seen him place it earlier. It is highly probable that the crewman left the wheelhouse and fell overboard through the gap in the adjacent guardrail while recovering the fish from where he had left it.

The Lessons

1 The deceased crewman was recognised as being very safety conscious, and regularly wore an inflatable lifejacket when working on deck. On this occasion, however, he had gone on deck for only a brief period, while the vessel returned to port, and had not put on his lifejacket.

No matter how brief the trip to deck, the short time taken to slip on a lifejacket may prevent an unfortunate accident from becoming fatal.

2 The vessel had been operating with unguarded openings for several years. These openings were accepted by the crew and unrecognised by the company managers. Crewmen should not accept unnecessary hazards which, if ignored, can very soon become the norm – until an accident occurs. If you suspect something is dangerous, bring it to the attention of crewmates and the vessel operators. It is possible that others have simply not noticed the potential danger, and if alerted would be more than happy to carry out improvements or change the way of working.

3 This vessel had missed two annual Load Line Exemption surveys. It is the owner's obligation to present vessels for survey at the appropriate time. Had the required surveys been carried out on this vessel, the unprotected gaps in the guard rails would likely have been identified, and the necessary actions carried out to make them safe.

4 Aquaculture is not just a "close to shore" farming business; it is a marine industry which uses vessels for various activities. Just because these vessels are operating "close to shore" does not make the risks any lower than on vessels going further out to sea. This particular company owned many vessels, of various sizes, yet had no proper marine superintendent to monitor their vessels' condition and operation. Any vessel operator should ensure that a suitably trained and qualified person is either employed or available to them, to ensure their vessels comply with all the required safety standards and regulatory requirements, at all times.

Look Out or Lose Out

Narrative

On a dark winter's evening, with good visibility and calm seas, two vessels underway off the south coast of England were in collision, even though each had seen the other 30 minutes earlier. As a result of the accident, the fishermen lost over 2 weeks' income at a time when the catches had been excellent.

The two vessels involved were a small commercial vessel and a fishing vessel. The commercial vessel observed the fishing vessel on its starboard bow, and was thus the give way vessel. However, after only a cursory glance the assumption was made that the fishing vessel would in fact pass clear to starboard. The vessel was equipped with a combined track plotter/radar set and a young, inexperienced deckhand had just taken the wheel and was steering by reference to the track plotter. Thus, the radar was not in use and no distance off the fishing vessel was obtained. The skipper initially remained in the vicinity of the wheelhouse to supervise the deckhand. However, assuming everything to be in order he then decided to go below to make a drink. Due to the layout of the wheelhouse, the skipper was unable to see out of the forward windows once he had left the wheel position, and he therefore had not rechecked the position of the fishing vessel before going below.

While the skipper was below, the deckhand saw the fishing vessel coming very close on the starboard side, and he called out for assistance. The skipper returned to the wheelhouse, but only had time to stop the engines before a collision occurred.

On the fishing vessel, during the time leading up to the collision, the crew of three were preparing to haul the trawl; everyone was on deck for this task. The vessel's floodlights were all switched on. At the start of the operation the skipper, who was on the foredeck, glanced around and saw the navigation lights of the other vessel: a green sidelight and single white masthead light on the port bow. He assumed, incorrectly, that this was another fishing vessel returning to its home port, and he did not look for the vessel again. During recovery and stowage of the trawl net the fishing vessel maintained a relatively steady course and speed which, unrecognised by either vessel, meant that they were on a collision course. With the net safely stowed, the skipper returned to the wheelhouse and increased to full speed on the engine. Unfortunately, he did this without looking out, and thus failed to see the other vessel very close on the port bow. The collision occurred within a minute of the skipper returning to the wheelhouse.

As a result of the collision, the fishing boat suffered extensive damage to its bow area and the repairs took more than 2 weeks; this represented a significant loss of income for the skipper and crew at a time when the catches had been particularly good. The commercial vessel was also damaged by the collision, and was off charter for a day, with a consequential loss of revenue.

Damage to the vessel's bow

The Lessons

1 Both vessels failed to keep a proper lookout. On the commercial vessel the one person who could have seen the approaching vessel was inexperienced and was unable to appreciate the developing situation.

2 Both vessels saw each other at a sufficiently early stage to have taken appropriate action in ample time to avoid a collision. However, both had assumed, at a glance, that no risk of collision existed, and neither vessel then continued to monitor the situation.

3 Neither vessel made use of all the means available to them to determine if a risk of collision existed; both made assumptions based on scanty information.

4 When training new recruits, ensure that they are never left unsupervised.

Sea Survival Training – Payback Time

Narrative

After 4 days of poor catches, the skipper of a 9.8 metre fishing vessel decided that the time was right to return to his home port, a passage that would take about 2 days.

On board the vessel was the skipper, who had about 30 years fishing experience, and two young deckhands, each with 3 years fishing experience. The skipper held a Fishing Class 2 certificate of competency, and both he and the two deckhands had undertaken the mandatory safety training courses: sea survival, fire-fighting, first-aid and safety awareness. Four months before the accident, the skipper had purchased a new liferaft for the vessel, fitted it with a hydrostatic release unit (HRU) and, thankfully, decided that the crew would benefit from attending another sea survival course, which they subsequently did.

When the vessel sailed from the fishing grounds the weather was forecast as south-westerly force 3 to 4. About 4 hours into the passage, the alarm on the automatic bilge pump alerted the skipper to unexpected water in the bilge. Investigation showed that water was entering through the stern gland, which had been re-packed the previous day. It was estimated that about 2.5 gallons of sea water were entering the bilge every 15 minutes. Unfortunately, the situation was made worse by the electric bilge pump operating well below maximum capacity. The crew examined the pump but could find nothing untoward, and commenced bailing by hand. The engine room hatch had been opened, and it remained open while bailing continued.

About 2 hours later, the skipper heard an update to the weather forecast, which predicted south-westerly winds force 5 to 7, gale 8 later. With an ineffective pump, water ingress, and a forecast gale, he chose to divert to the nearest port to effect repairs and take shelter.

These were not the skipper's local fishing grounds, and he did not have paper or electronic charts of the area. Consequently, when he chose to divert he was navigating using a basic track plotter, echo sounder and GPS. He was unaware that his diversion would take his vessel through two areas of renowned confused and steep seas, made worse by the onset of bad weather against the tide.

Shortly after the skipper altered course toward land, he reduced speed because of reduced soundings and, at the same time, the vessel entered an area of turbulent seas. A large wave struck the port quarter, causing the vessel to roll heavily and lay flat on her starboard side. Water flooded along the deck and entered the open hatch of the engine compartment. Both deckhands, one of whom was in the engine compartment, managed to escape by moving aft under the shelter, and they abandoned the vessel over the port side. The skipper remained in the wheelhouse.

It was estimated that the vessel foundered within 2 minutes of the wave striking, only 0.5 mile from the nearest land. It was dark, cold, and both deckhands were dressed in no more than jeans and tee-shirts. After 10 to 15 minutes in the water, they spotted the white canister of the liferaft with the inflated liferaft attached, albeit upside down. They managed to right the raft, board it, bale it out, administer sea sickness tablets and release one red hand-held flare, which was immediately spotted by a member of the public who contacted the coastguard. A deckhand released a second flare when they spotted the blue flashing lights of emergency service vehicles on the shore, and a third flare on hearing the approach of the local lifeboat.

Both deckhands were successfully rescued and later airlifted to hospital. Regrettably, despite an extensive search, the skipper was not found.

Figure 1: Vessel before alterations

Figure 2: Vessel after alterations (right)

The Lessons

1 The vessel had been significantly modified by the current skipper. The structural modifications included a considerable amount of additional top weight, which probably had the effect of reducing the vessel's intact stability and her ability to return to the upright condition. Before making alterations, or adding additional weight, seek guidance from a qualified naval architect and, if necessary, have the vessel inclined to confirm the condition of the stability.

2 The open engine room hatch allowed immediate downflooding into the engine compartment. Had a second bilge pump been available, the crew could have pumped out the water without keeping the engine room hatch open.

3 Insufficient charts led the skipper to stray into dangerous waters. Make sure that before setting sail, full chart coverage and associated publications for the intended passage are held on board.

4 New lifejackets were available on board, but were not being worn, nor were they in a location where they were readily available for escape. Look around your vessel; identify a readily accessible place for stowing lifejackets and label it; and, if appropriate, place a 'grab bag' containing other emergency equipment close by. If you do not wear lifejackets the whole time, which is the safest option, at least put them on as soon as things start going wrong.

On the positive side:

5 The new liferaft had been fitted using an HRU, which undoubtedly saved two young lives. And importantly, the training undertaken only months before, ensured that ALL the correct actions were taken by the crew, from the time they saw the raft until they were rescued by the lifeboat. If a liferaft is carried, make sure that it is properly fitted with an appropriate HRU, and that it is carried in a position where it can float free without interference from obstructions. Finally, ensure that everyone on board is properly trained in sea survival.

The Flames Were Supposed to Stay Inside the Heater

Narrative

A fishing vessel was hauling a catch of scallops when her watchkeeper noticed that the radar had stopped working. He called the skipper, who realised that the battery voltage was lower than normal. The skipper went to the engine room to have a look at the batteries and noticed a loose terminal connection. As he tightened the connection, he heard an alarm coming from the accommodation area smoke detector.

The skipper opened the engine room door, with the intention of entering the accommodation area to investigate. Flames, at ankle level, came through the open door, so the skipper closed it again rapidly. Despite the flames, the skipper opened the door again and ran across the accommodation area to the emergency escape hatch in the opposite corner, where the other two crew members were able to help him climb out.

It was apparent that the seat of the fire was around a diesel-fired heater fitted to a bulkhead in the accommodation area. The weather was cold, and the heater had been running to keep the boat warm. A cheap, domestic smoke detector fastened to the deckhead had activated and this had alerted the crew to the emergency.

The coastguard was informed by VHF radio and the two crew members prepared a fire hose. The skipper took an extinguisher from the wheelhouse and operated it through the emergency escape hatch. Foam from the extinguisher put the fire out and, as the smoke cleared, the skipper was able to turn off the heater's fuel supply.

Once the vessel was safely alongside, the crew and local surveyors started to look for the cause of the fire. The diesel heater was relatively new and had been fitted only 8 months before.

Fuel for the heater was supplied from a tank in the engine room, this came through the bulkhead to a shut off valve and a thermostatically controlled flow valve, to maintain a set temperature in the accommodation. The flow rate of fuel could be checked as it passed through a sight glass.

The exact cause of the fire was not determined, but it was thought most likely that the thermostatically controlled valve had failed, possibly because of the high levels of vibration on the boat when the catch was hauled. Too much fuel had been able to flow and spill from the glass part of the sight glass and down the outside of the pipe, until it was ignited by the flame in the furnace. The fire had then spread as the fuel leaked down the bulkhead and onto the carpet.

Damage around the diesel-fired heater

The Lessons

1 This was a “good news” incident, where the forethought of the skipper and crew, and their actions on board, saved the day. A cheap smoke detector, effective fire-fighting and early alerting of the coastguard proved invaluable.

2 Early detection and response to fires are vital. This incident was dealt with extremely quickly; less than 5 minutes from the alarm sounding to the fire being extinguished. This undoubtedly limited the damage caused by the fire, and once the heater was removed, the boat was back fishing the following day.

3 Although this vessel was fitted with a fixed fire detection system, there was no sensor in the accommodation area, so the owner had purchased a cheap, domestic smoke detector which the crew had stuck to the deckhead in the accommodation area. It was this detector which alerted them to the fire. Engine room fumes and deodorant sprays had caused a number of false alarms, but with hindsight, the crew were very glad that they had not removed the batteries.

4 Quick responses rely on everyone knowing what to do, and working together. The best way to achieve this is for crew to practice realistic fire drills regularly.

5 Some vibration is inevitable on all boats, but high levels put a greater strain on people and equipment. Where this cannot be avoided, crew should be vigilant of not only the effect on themselves, but also on electrical equipment, pipework and heating systems.

Eyes Available But Not Used

Narrative

An angling boat was on a pleasure trip, heading north. It was dark with clear visibility, and she was following close behind another boat. Both were on passage and intent on a good day's fishing. The owner was alone on watch, steering and keeping a lookout by sight. The boat was displaying a masthead light, port and starboard sidelights and a stern light.

Meanwhile, a fishing vessel was steaming east-north-east on passage towards fishing grounds. She was exhibiting a masthead light, port and starboard sidelights and a stern light. A radar was operational and a junior crew member was alone on watch.

The fishing vessel watchkeeper did not detect the two angling boats on radar, but saw the lights of the leading boat to starboard and altered course to pass around her stern. However, he did not see the lights of the second angling boat, and the alteration of heading put his vessel on a collision course with her.

The angling boat watchkeeper did not see the lights of the approaching fishing vessel, with the result that his boat then ran into the side of the fishing vessel, damaging the angling boat's port side but, fortunately, insufficiently seriously to cause the intended day's fishing to be cancelled.

No damage was sustained to the fishing vessel, but the watchkeepers of both vessels were later left to reflect on what the consequences of such a collision might have been.

The Lessons

1 Action can't be taken to avoid collision if a risk of collision hasn't been determined. Likewise, a risk of collision can't be determined if an approaching vessel hasn't been detected. Vessels are required to display lights at night so that they *can* be detected. All that is then required is a pair of eyes to do the detecting. A pair of eyes was available on both the angling boat and the fishing vessel – the problem was that they weren't used!

2 Why weren't they used? Because neither watchkeeper recognized the extent to which they needed to maintain an all round lookout by sight. On board the angling boat, the owner was steering, eyes ahead and focused on the boat he was following, and thinking about his intended day's fishing. In his mind, anything astern was either going the other way or, if overtaking, had the obligation of keeping out of the way. The fishing vessel watchkeeper, on the other hand, had sighted the lights of the leading angling boat but his attention was then focused on avoiding her in the knowledge that the radar was indicating no vessels in the immediate vicinity.

3 Navigation and collision avoidance aids are there to do just that – aid. They are not there to replace conventional methods; they are there to enhance them. Consequently, Rule 5 of the Collision Regulations still requires every vessel to – *at all times* – maintain a proper lookout by *sight* and hearing, as well as by all available means appropriate in the prevailing circumstances and conditions so as to make a full appraisal of the situation and of the risk of collision. In this case, the radar gain control was set too low for the angling boats to be displayed on the screen.

Unguarded Machinery is a Riddle

Narrative

The skipper of a 14m purpose-built, shell fishing vessel (**Figure 1**) took on a 17 year school leaver to assist with the busy cockle dredging season. The young man joined on a trial basis to see if he would like the job. The skipper told the new crewman what his job entailed, and issued him with wet weather gear and gloves.

The vessel, with its three man crew, left harbour for the cockle beds in the early evening. The cockle dredging went as expected. The skipper manoeuvred the vessel from the wheelhouse, turning her in tight circles over the cockle bed, directing the dredge pipe to the cockle 'hot spots'. The cockles were suction dredged from the seabed and then sorted from the water and mud by a riddle, a hydraulically powered rotating perforated drum, before being transferred via a chute into bags stowed in the hold or on deck (**Figure 2**).

Later that evening, loaded with the bagged cockles, the fishing vessel anchored, to wait for the next rising tide to enable her to return

Figure 1

Figure 2

to harbour. The skipper and senior crewman slept in the bunks in the forward cabin and the new crewman slept in the wheelhouse chair. Early the following morning, after a short passage, they arrived alongside to land the catch.

Usually the cockle dredger remained alongside for a tide unless, due to the changing tide times, an additional trip to the cockle beds was possible. This was such a day, and so, on this morning, the cockle dredger returned to sea.

The boat arrived back at the cockle beds mid-morning and fishing started; it was a partly cloudy day, with light winds.

As the senior crewman directed the cockles from the end of the chute into the hold bags, the new crewman ensured the cockles ran freely from the end of the riddle by scraping the chute clear by hand. This was a right-handed job and the young crewman knew that, if necessary, he could safely rest his left hand on the hydraulic motor that drove the riddle (**Figure 2**).

After an hour of hectic work the new crewman was still scraping the cockles from the chute. He then moved his left hand to the structural cross member of the riddle to give himself a change of position, believing there was enough space for his hand to grip the support and be clear of the rotating inner drum. There was not (**Figure 3**). The riddle's rotating drum caught his thumb, fractured his wrist and pulled his arm into the riddle when his left elbow fractured and the skin was removed from his inner arm.

The skipper heard a shout from deck and, seeing the injured crewman, he quickly stopped the hydraulic power from the wheelhouse.

The injured youth was quickly released from the riddle and the skipper contacted the local coastguard for medical assistance. The injured crewman was transferred ashore by the local lifeboat and on to hospital by ambulance.

Figure 3

The Lessons

1 Dangerous machinery like this must have protective guards in place to stop operators unintentionally getting caught in the moving parts. This is particularly important at sea, where the movement of the vessel may unbalance the crewman and cause him to fall into the machinery.

2 The construction and location of the riddle created a significant “shear trap” risk to the crew working adjacent to this unguarded machinery. The usual crew accommodated the risk of personal injury when working close to the riddle in their normal operations, but they had not identified that the shear trap posed a significant danger to an inexperienced crewman on board. While the dangers associated with fishing may be blatantly obvious to experienced hands, they might not be recognised by new crewmen. A risk assessment would have identified the hazard from the riddle earlier, and the machine could have been guarded properly, thus protecting all the crew from the shear trap risk.

3 The new crewman was, by legal definition, a “young person”, and there are specific regulations in place to ensure that his working environment is safe. Owners and skippers should take into account the inexperience, immaturity and age of young employees, and also their possible lack of awareness of the possible dangers, in deciding whether their allocated jobs are suitable. In particular, they should be aware that new, young crew might not have completed all the Seafish training courses, and so ensure that briefings and familiarisation, especially on safety equipment, is thorough.

Small Hole – Costs a Life

Narrative

The skipper of a 9 metre steel hulled fishing vessel lost his life when his vessel sank while trawling off the east coast of Scotland.

While in port after the previous trip the skipper, who fished single-handed, had told some other fishermen that a significant amount of water had entered the vessel's under deck area, and that he had experienced some problems with a bilge pump.

The vessel had a single undivided space under deck from the wheelhouse to the transom, and had a low freeboard, resulting in water coming onto deck through the freeing ports when the vessel was underway.

The skipper had also previously reported having problems with his engine exhaust. The exhaust system was a dry exhaust, which vented to atmosphere via an outlet at the top of the stern gallows. The exhaust gases flowed through the steel box section of the gallows, with no internal flue liner fitted.

One of the major components of engine exhaust gas is sulphur oxide which, when in contact with water, combines to produce sulphuric acid. In this case, the location of the exhaust trunking created ideal conditions for corrosion to take place, which would have led to water entering the below deck space.

Analysis of previous accidents to similar vessels shows that water can flow through relatively small holes at a surprisingly high rate, and that a relatively small amount of water entering the hull area can adversely affect the stability to such an extent that very rapid downflooding can occur. For example: 0.5 tonne of water per hour will flow through a hole of just 18mm in diameter assuming a constant head of 25mm.

The Lessons

1 This tragic case illustrates the vital importance of having – and maintaining – an adequate freeboard and keeping your vessel watertight.

2 While there are no statutory requirements for fishing vessels of less than 15 metres in length to undertake stability tests, it is prudent for all skippers to be aware of the stability condition of their vessel at all times.

3 Never underestimate how much water can flow though relatively small holes, and make sure you have an operational bilge alarm and bilge pump system.

Complacency Kills

Narrative

A small fishing vessel and her skipper had been chartered for the day to catch small fish for display purposes. To achieve this, the boat had a fine mesh trawl net, a small rectangular tank for sorting the catch and two circular tanks for storing the fish. On board were the skipper, the charterer's representative and a passenger who was along for the ride.

Shortly after clearing the harbour entrance, the net was shot over the stern and the skipper set an easterly course for a tow across the bay. The two circular tanks were positioned just aft of the engine casing on deck, and once the nets were shot these tanks were filled with water using two electric 'bilge' pumps immersed in the sea at the stern. Each pump had a discharge hose passing through the port side freeing port leading to one of the tanks. The pumps discharged continuously into these tanks, which then overflowed through holes about 60cm from the bottom of them into buckets and then onto the deck.

The first tow lasted 45 minutes, after which about 40 minutes were spent sorting the catch into the tanks before the net was shot again. The second tow was uneventful, until several centimetres of standing water were noticed on the starboard side of the deck, with water coming on deck through the starboard freeing port in the stern. The skipper's attention was drawn to this water, but he gave no sign of being concerned and told the others not to worry. The tow continued as intended until the skipper began to haul in the gear.

Hauling continued for about 5 minutes until the trawl doors were hanging from their chains on the stern gantry. By this time, the amount of water on deck had become substantial and the skipper released the clutches on the winch, allowing the fishing gear to return to the seabed.

The skipper checked below deck and found water in the aft void and the engine space. He then took one of the electric pumps being used to top up the tanks, and used it as a bilge pump. However, the depth of water on deck was increasing, so while the passengers started bailing, the skipper went to the wheelhouse to call for help. Using VHF Channel 16, he called the coastguard, stating his vessel was taking in water and requesting a lifeboat. He gave a local position, but did not include a latitude and longitude. The coastguard responded by broadcasting a "Pan Pan" message and alerting air and surface search and rescue units.

Bailing appeared to be achieving little, and the level of water had reached the top of the bulwark at the stern. One person went to the wheelhouse to join the skipper who, having raised the alarm, was collecting lifejackets from the cabin. One lifejacket was passed out on deck, by which time the stern was completely submerged.

Before any more lifejackets could be gathered, the vessel rolled to starboard and her stern completely submerged, leaving only the bows above the surface. The skipper appeared to be still in the wheelhouse or cabin, but the other two managed to swim clear. The vessel sank shortly afterwards. The skipper was not seen again.

The two people in the water held onto the single lifejacket for about 45 minutes before being rescued, as the search for them had commenced in the wrong position. Fortunately, they were found as the search area expanded, were winched from the sea and transferred to hospital, where they were treated for mild hypothermia. Divers later recovered the skipper's body from the vessel.

The vessel was raised so that the cause of sinking could be established. It was found that her starboard quarter was damaged such that water could enter the hull under conditions of limited freeboard or poor weather. At the time of her loss, she had additional weight on deck in the form of water tanks which held live catch. This weight reduced the freeboard sufficiently to allow flooding through the damaged area of the hull. To complicate matters further, the skipper had removed the electrical bilge pump to use it to provide a flow of sea water to the holding tanks, and there was no bilge alarm.

It is not certain when the hull damage occurred. Because protective rubber matting largely covered the area of damage, it was obscured to the casual observer and might have been present for some time, becoming critical only when the freeboard was reduced by extra weight.

Vessel after recovery

The Lessons

1 The skipper was unaware that the hull of his vessel was breached above the waterline and would let in water in a moderate sea or when heavily loaded. Check your hull regularly, especially the areas that are not easy to see, such as under matting or fenders.

2 During this trip, the vessel was unsafe. Although the skipper was unaware of the hull damage, he further compromised the safety of his vessel by heavily loading the deck with tanks, removing the only working bilge pump to fill those tanks, and not having a working bilge alarm. Individually, these deficiencies could have been coped with; put together they proved fatal. Sometimes compromises are necessary, but always keep an eye on their cumulative effect: complacency kills.

3 The two survivors were lucky, they had only one lifejacket between them, and the position given to the rescuers was inaccurate. Think through what you would do in an emergency: how you would pass a “Mayday” message; where your lifejackets are stowed; whether your flares are accessible, and so on; and talk the drill through with your crew.

Even a Short Time in the Sea Can be Fatal

Narrative

A crewman died after being dragged overboard by a trawl net during routine hauling operations.

The crewman had assumed that the cod ends were ready to be lifted on board, and had lain across the net while clearing the dog rope (which had become twisted around the bag). The net drum operator was usually informed when it became necessary to clear twists from the dog rope; unfortunately, on this occasion he was not. The net drum operator's view was restricted by the physical size of the net drum, and he was unaware that the crewman was working with the dog rope when he veered the net back into the sea to enable fish in the bag to drop into the cod end. As the net was veered, it also carried the casualty overboard.

The alarm was raised immediately. However, because the stern trawler was being hampered by her nets, it was impossible for the skipper to come astern to the casualty without fouling the propeller, which would have disabled the vessel and prevented further endeavours at rescue.

After several attempts, a life ring was thrown, and was grabbed by the crewman, allowing the other crew to haul him alongside a ladder. The crewman was rapidly losing consciousness, so two of his colleagues went down the ladder, into the sea, to assist and support his head out of the water. A crane was then used to lift him from the sea onto the deck, where cardio pulmonary resuscitation (CPR) was attempted. He could not be revived.

The crewman regularly wore a flotation jacket on deck, but unfortunately he was not wearing one on this occasion. It was estimated that he was back alongside the boat within 10 minutes of going overboard, and was immersed in the 14° C sea water for probably fewer than 15 minutes in total before being recovered to the deck.

Operator's view towards net drums (casualty obscured behind drum)

Position of the casualty before going overboard

The Lessons

1 Ideally, deck machinery controls should be placed where the operator has an unrestricted view of the surrounding area. However, if the view is restricted, communication between parties is essential before controls are operated. Communication is a two way thing: it should be given, and should then be acknowledged by the recipient to prevent any misunderstanding.

2 Beware the dangers of routine. It can foster complacency due to the repetitive nature of the work, and will sometimes cause lapses in vigilance.

3 Always assess the possible dangers involved in any tasks, no matter how routine, and ask yourself, “is this really safe, or is there a safer way to do it?”

4 Carrying out tasks on board a fishing vessel will sometimes necessitate leaning overboard. The simple precaution of wearing some sort of flotation aid will help mitigate the obvious risks and will increase your chances of survival if you fall overboard. The casualty involved in this case had been a fit and healthy man, yet after just a few minutes of being immersed in the cold water, the debilitating effect of cold shock rendered him unconscious.

5 In this case, it was possible to lift the casualty from the sea using a deck crane. In the process, crewmates were required to go into the sea to assist. Not every vessel has the benefit of a convenient crane; serious thought should be given by all seamen on how a man can be recovered from the sea on their particular boat. Bear in mind, the medically safest way to recover someone from the water is to keep their body horizontal rather than attempting to lift it vertically.

6 If it is absolutely necessary to send anyone into the water to assist during a recovery, ensure they are properly dressed in thermal clothing and wearing a flotation device.

7 Life rings are cumbersome to throw at any great distance, but they do give a swimmer support. There are various line throwing devices available (not necessarily mechanical) which could be used to good effect in recovery situations.

Mystery Fire Sinks Potter

Narrative

During the early morning, a skipper and his single crewman took out their Cygnus 26 potter to recover and shoot their lobster and langoustine pots. As the weather deteriorated, they decided to return to their mooring which was about 40 metres from the shore.

The skipper was acutely aware of the risks of fire and flood, so he shut the gas supply valve from the gas bottle to the stove, and isolated the electrical supplies at the main battery isolating switches just before leaving the boat at about 1300. As usual, the bilge pump control was switched to the “auto” position to cope with any unexpected water ingress sensed by the high bilge level float switch. The power for the pump and float switch was derived from the battery side of the battery isolating switch.

At about 1730, the skipper saw the boat riding easily at its mooring, with no signs of the impending disaster.

Just after midnight, a friend of the skipper was walking along a road high above the small harbour when he noticed that the boat was fiercely ablaze, but still at its mooring. He immediately roused the skipper, who lived nearby. They both went to the foreshore to see the boat drifting away towards a headland as the fire burnt through the mooring lines. The skipper notified the coastguard, and the local inshore RIB lifeboat arrived a short time later. Unfortunately, they were unable to get close to the boat because of the ferocity of the fire. It was then decided to allow the boat to drift, and a couple of hours later it was headed towards rocks in an isolated inlet, still burning.

In the morning, the skipper and his crew tried to locate the boat, but were unable to do so. They believed that it was probably dragged out to sea by the tides and had sunk. However, they continued to search the inlets and eventually found it at low tide resting on rocks. The wheelhouse, deck and most of the hull had been consumed by the fire.

Figure 1

Figure 2

The Lessons

Discussions with the local authorities confirmed that the boat was well maintained, and that the skipper took good care of it and of his fishing gear. There was no suggestion of arson or foul play. All the indications suggest that the fire was probably caused by an electrical fault on the bilge pump or high bilge level float switch circuit which were the only circuits that were live while the boat was at the mooring.

It is not possible to identify specific lessons associated with this case because the exact cause can only be a matter of speculation. Although they would not have helped this safety-conscious skipper, it is timely to highlight the following areas of good electrical practice:

1 Make sure that electrical circuits are maintained in good condition, that connections are tight and corrosion free, and that insulation is in good order.

2 Attend to electrical defects promptly. The constantly flickering light or intermittent power supplies are sure indications of potential problems.

3 Do not install additional electrical equipment until you are certain that the cable carrying capacity and fuse ratings are adequate.

4 Isolate as many electrical circuits as you can before you leave your boat.

5 Always properly isolate and use correct terminations for redundant circuits.

6 Makeshift plugs, sockets and fuses should not be used.

7 When in doubt, seek professional advice/assistance from a qualified electrician.

General advice on electrical safety can be found in MCA's Code of Safe Working Practices for Merchant Seamen, which is available on the MCA's website at www.mcga.gov.uk.

Insecure Fiddle Leaves Crewman in Hot Water

Narrative

A small fishing boat was rolling easily while trawling in a moderate beam sea. The skipper and crewman were in the wheelhouse together and decided to have a hot drink.

A kettle of water was placed in the fiddle on the stove which was located in the wheelhouse. The crewman sat down beside the stove, waiting for the water to boil, while the skipper remained at the wheel.

As the water began to boil the boat took a heavy roll. The kettle came free of the fiddle and fell from the stove, tipping hot water onto the crewman and scalding him. The skipper reacted quickly by drenching his colleague with cold sea water from the deck wash hose before calling the coastguard to ask for assistance.

The crewman was transferred by lifeboat to a local hospital where he was treated for his injuries. Fortunately, thanks to the prompt action taken by the skipper, his injuries were not too severe and he was able to leave hospital after a short stay.

The skipper later inspected the fiddle to establish why the kettle had been able to fall from the stove. He found that the fiddle had not been properly adjusted to suit the kettle which had been recently supplied to replace an older and different sized model.

The skipper ensured that the fiddle was properly adjusted to fit the kettle before the stove was used again.

11

Cooker with old fiddle and kettle

New fiddle

The Lessons

1 The supply of hot drinks is one of the key requirements on any vessel. However, as with any other items of equipment, it is essential that the kettle can be used safely in all weather conditions.

2 Fishing boats can be expected to roll, especially when trawling in a beam sea. The skipper had taken the precaution of securing various items of working gear but had not foreseen the hazard caused by a defective fiddle.

3 Galley equipment should not be overlooked when securing for adverse weather, especially on a small boat.

Double Tragedy

Narrative

After the last haul of the trip, the skipper of a 20m trawler set the autopilot to return to port at a speed of about 7 knots. During the 18 mile passage, he assisted the boat's two deckhands in the shelter deck to help prepare the catch for market, but returned to the wheelhouse periodically to check the boat's position and adjust the autopilot. Several minutes after the skipper's last visit to the wheelhouse, when he had estimated by eye that the boat was about 1nm from the port entrance, the boat struck the rocky shore further south.

The skipper ran straight to the wheelhouse and put the engine full astern. Once clear of the rocks, he put the engine ahead and turned towards the port, which was only 3 cables away. By now, the low-level bilge alarm was sounding, so the skipper told one of the deckhands to steer while he went below to the engine room to start the auxiliary engine and the secondary bilge pump. This took only a few seconds, during which time the skipper saw water entering the engine room bilge through gaps around pipework penetrating its forward bulkhead.

When the skipper returned to the wheelhouse, the high-level bilge alarm was also sounding, and the boat had stopped answering the helm. The skipper was then informed that the forepeak was almost full of water and the fish room was half full. The deckhands were instructed to take off their oilskins and prepare the liferaft on the galley roof while the skipper fetched the lifejackets from the accommodation. However, he was unable to get into the accommodation because its access was flooded and the accommodation lighting had gone out, so he joined the deckhands on the galley roof. The boat was now trimmed considerably by her head, and as soon as the skipper released the slip holding the liferaft in its cradle, she sank.

The three men initially clung on to the liferaft canister until the skipper managed to inflate the liferaft by pulling on its painter. Unfortunately, it inflated upside down, and by the time the skipper managed to right it, the deckhands had disappeared. The local lifeboat was activated after the coastguard had been alerted by the boat's EPIRB, and spotted the liferaft about 5 cables from the port entrance. The skipper was rescued about 1½ hours after the boat sank. The body of one of the deckhands was later recovered from the seabed close to the wreck, but the body of the second deckhand was not found.

An underwater survey of the wreck showed that the vessel was badly holed below the waterline on her bow.

The Lessons

1 Leaving a wheelhouse unattended is risky at the best of times. To do so when approaching the shore at night, and not keeping any form of lookout, is asking for trouble. Balancing the various demands of a fishing vessel crew can be difficult, and keeping the wheelhouse manned when there's plenty to do on deck is not always popular. However, whereas such unpopularity will usually be short-lived, the grief following a fatal accident will potentially last a lifetime.

2 Deciding on the right course of action to take following a grounding is not always easy, and requires a skipper to think on his feet to quickly consider a number of factors. Although moving into safe water as quickly as possible is an instinctive response, it might not be the best action to take without first obtaining a quick assessment of the damage sustained. In any event, driving ahead when holed below the waterline forward not only increases the rate of flooding, but it also increases the chances of making the damage worse.

3 Watertight bulkheads save boats and save lives. Where penetrations in these bulkheads cannot be avoided, they can still be kept reasonably watertight providing the gaps around pipes and conduits are adequately packed.

4 In an emergency, it takes seconds to press the DSC button or to send a "Mayday" call. Not only does this alert the coastguard, but it also alerts all other vessels in the area, including nearby vessels alongside if their equipment is switched on. The sooner this action is taken, the sooner help will be at hand.

5 There are two main types of EPIRB, both of which are extremely useful in alerting the coastguard. However, the first transmits a vessel's GPS position when activated; the second relies on Doppler techniques to establish the beacon's location, which takes time and is not as accurate. Although the GPS version might be a little more expensive, it is potentially a sound investment.

6 Many older vessels pre-date the requirements for generators, batteries and switchboards to be protected against water ingress and a separate, emergency power source. Where this occurs, the provision of additional torches and portable VHF radios, which would be of benefit in an emergency situation, should be considered.

7 Storing lifejackets and other equipment such as flares, in the accommodation, when alongside, keeps them secure. Keeping them there at sea might result in them being inaccessible when they are needed.

8 Ideally a liferaft will have been inflated either manually before an evacuation, or automatically as a vessel sinks. However, if a liferaft has to be inflated by persons already in the water, great care needs to be exercised as the forces generated during inflation are potentially hazardous to those near its canister.

Water in Fuel – A Recipe for Expensive Problems

Narrative

A skipper and his five crew sailed from a south coast port to deliver his recently purchased 23 metre trawler to its new Scottish home port. Before sailing, 13000 litres of marine gas oil were bunkered. As the weather was fine the skipper decided to familiarise himself with the trawling equipment, so he spent a couple of days fishing before resuming his passage to Scotland.

The wind was west-south-west force 4. The trawler handled well in the seaway and the skipper was satisfied with the boat. The fishing was successful and life seemed, on the whole, to be pretty good.

Over the next 30 hours the weather and the sea state slowly deteriorated and the boat started to regularly ship heavy green seas. At about 2300, the engineer reported to the skipper that he had transferred fuel from the port and starboard service tanks to the day tank from which both the main engine and the two generators took their fuel supplies. About 10 minutes afterwards, the main engine revolutions dropped from 1400 rpm to about 1100 rpm. After a short period of stability the revolutions continued to fall. At the same time, the skipper noticed white smoke coming from the main engine exhaust, and soon afterwards the engine stopped. Because the electrical power was being generated from the “on engine” alternator, all electrical power was also lost.

Unable to restart the engine the skipper instructed that the electrical generators be started. Almost immediately after starting, these also stopped and could not be restarted. The engineer was unable to identify the cause of the failures so the skipper had no option but to notify the coastguard of his problems. They, in turn, arranged for the vessel to be towed into port by the local RNLI lifeboat. The tow was connected at about 0230 but parted twice before final arrival at 1125.

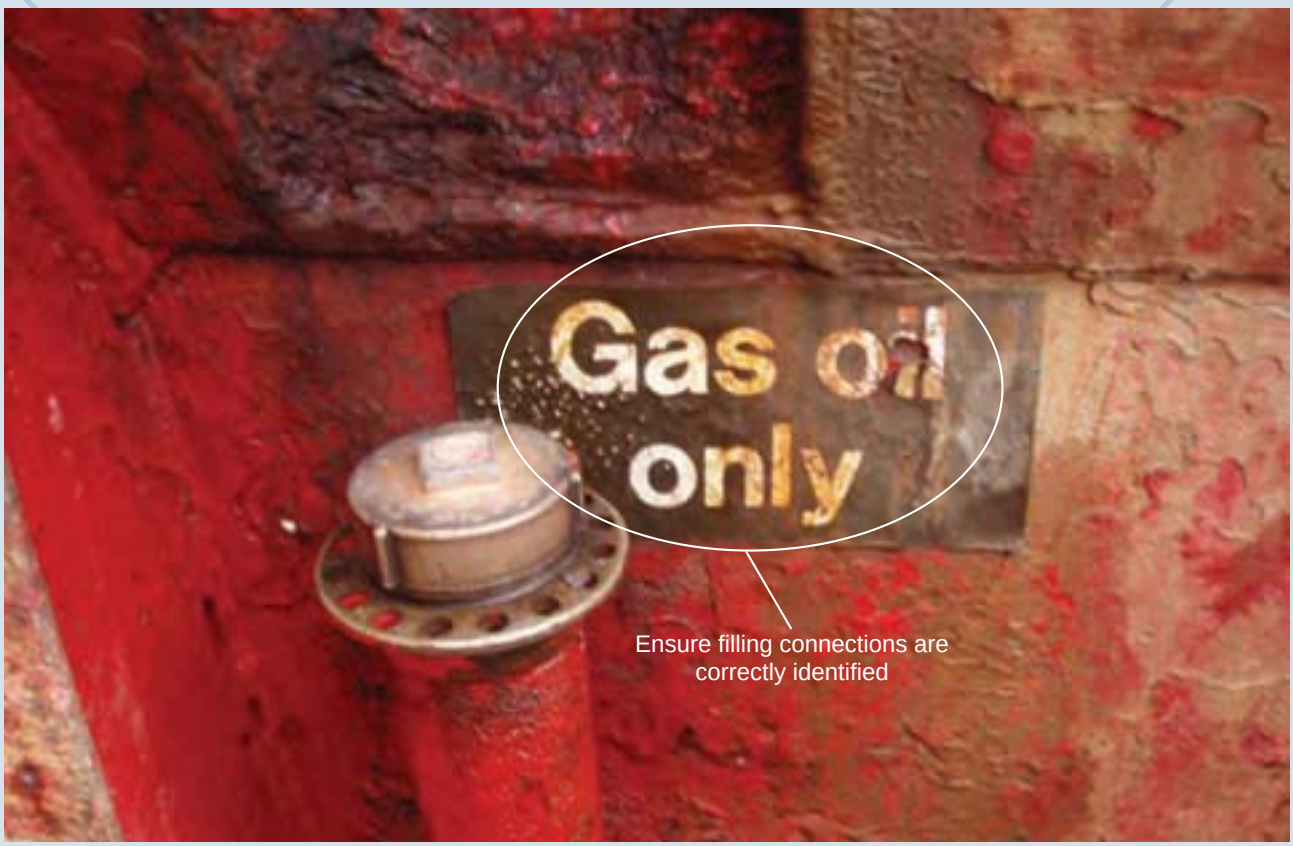


Figure 1

Figure 2

The Lessons

On investigation, it was found that after bunkering the vessel, the fuel deck filling caps had not been properly tightened. This allowed water to pass into the fuel service tanks during the rough weather. The water was subsequently transferred to the day tank from which both the engine and generators took their fuel supplies. The water-contaminated fuel caused the engine and generator failures.

The failure to observe the most basic of procedures – the tightening of the filling caps to prevent the ingress of water – led to the contamination of the complete fuel system. This resulted in considerable expense for cleaning/changing of fuel tanks, pipe work, pumps, strainers and filters.

1 Ensure that deck fuel filling connections are properly marked (Figure 1) to prevent inexperienced crew putting water or other fluids into the system – it has happened!

2 Threads and caps should be in good condition, and cap seals intact. If leather seals are used, they can become brittle, and should be regularly inspected and changed if damaged or if they become hardened.

3 Make sure that fuel deck cap tightening keys match the cap recess or stub and are in good condition so that the cap can be fully tightened.

4 Some types of filling caps are arranged so that a lock can be fitted to prevent intentional contamination. A lock or other device, a plastic cable tie in the case of Figure 2, can be fitted to prevent the cap from rotating through vibration which can easily lead to potential sea water contamination of the fuel system.

5 It is good practice, where possible, to check fuel quality before transferring between tanks so that contaminated fuel is not passed around the system.

6 Where fitted, always use fuel purifying systems to “polish” the fuel to remove impurities, including water.

7 Remember – fuel hygiene discipline is part and parcel of good engineering practice; look after your fuel and it shouldn’t let you down.

Between a Rock and a Hard Place

Narrative

A deep sea fishing vessel's main engine stopped at a critical moment after she had been sheltering from severe weather for almost 2 days in the lee of an island. Initial close proximity to the shore, tidal effects, and violent unpredictable changes in wind direction caused the vessel to drift towards rocks after losing power. Repeated attempts to restart the engine failed, and the vessel grounded.

The skipper transmitted a distress call on VHF radio, which was answered by other vessels also sheltering in the bay. Unfortunately, due to shallow water and over 6m swell, these other vessels were unable to get close enough to pass tow lines.

DSC alerts transmitted by the stricken vessel before she lost electrical power were picked up by the coastguard, who immediately put in place a full scale search and rescue mission involving helicopters and a lifeboat.

Due to the weather conditions and distance from the rescue facilities, the crew sheltered for over 2 ½ hours in the vessel's wheelhouse as she lay crashing against a cliff face in darkness. During this time, waves stove open a wheelhouse door, soaking the occupants, who were wearing little more than normal clothing and lifejackets. The skipper realised any attempt to abandon by liferaft or scale the nearby cliffs would be futile, so motivated his crew and ensured they remained in the relative safety of the wheelhouse until help arrived.

The rescue helicopter had to abort an early attempt at rescue due to the darkness and extreme weather conditions. However, on a subsequent attempt, a winchman was successfully lowered to the vessel and all the crew were airlifted to safety.

On arrival ashore, several survivors were suffering from the effects of hypothermia and required treatment in hospital.

The Lessons

1 It is not known why the vessel's engine stopped. However, it had been idling for a prolonged period, which could have led to poor combustion and inefficient running. It is not unusual in such conditions for an engine to stop when load, such as engaging gear, is applied. Diesel engines need to be "worked" to maintain optimum performance and reduce coking. Even occasional revving up out of gear during periods of prolonged idling will help "clear" an engine and reduce the chances of it stalling.

2 Anchoring was not attempted to slow the vessel's drift; had it been, it might not have been effective in the sharp, steep swell anyway. Nevertheless, in close to shore situations anchors should always be prepared and be ready for use; if nothing else this can buy time.

3 The vessel was not equipped with immersion suits, and there is no statutory obligation for vessels of less than 45m in length to do so. The absence of regulation should not prevent responsible owners from ensuring some means of thermal protective clothing is available to crew members. If all else fails, oilskins secured around cuffs, waist and ankles can reduce heat loss in immersion situations, and reduce the early onset of hypothermia.

4 The skipper recognised the dangers of abandoning by liferaft on the wave-battered rocks, and also the dangers of attempting to scale the cliff face. The vessel was not breaking up beneath them and he knew that remaining on board provided their best means of survival. This reinforces the old adage, "Don't leave the ship until the ship leaves you!" The skipper motivated his crew and kept morale high for several hours while awaiting rescue, emphasising the benefit of strong leadership in such arduous circumstances.

When Making a Cup of Tea Wrecks a Crabber

Narrative

During the evening, a 15m crabber sailed for her fishing grounds. At about 0200, one of the deckhands was woken to take over the navigational watch. At this time the vessel was dodging inside a wide and deep sea loch, waiting for the weather to abate.

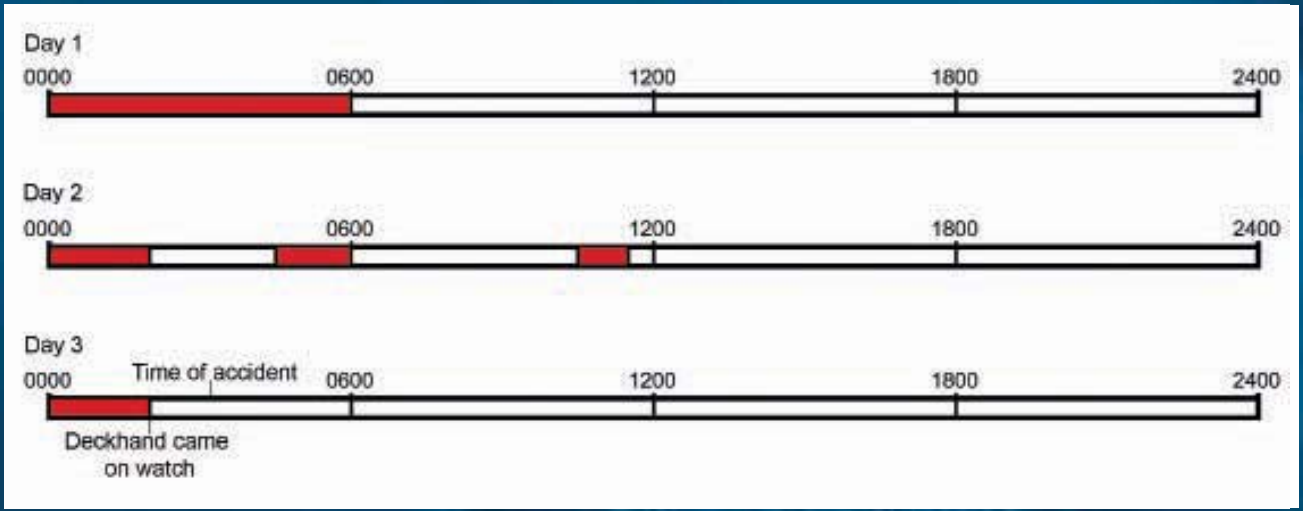
The deckhand had transferred from a sister vessel that evening and had only had sporadic and short periods of sleep over the previous 48 hours (**see diagram below**).

The engine was ticking over, giving a speed of about 4 knots, and the vessel was dodging north/south in a box that the skipper had drawn on the electronic chart. The watch alarm was in operation. As the vessel reached the southern end of the box, the deckhand selected a new course from the electronic chart and is reported to have dialled it into the automatic helm, expecting the vessel to turn onto a northerly heading. He then left the wheelhouse unattended and went to the galley to make a cup of tea and a sandwich, returning briefly to cancel the watch alarm.

During his absence, the vessel ran aground in a deep cove to the south of the box drawn on the electronic chart. The skipper awoke, and broadcast a “Mayday”, which was received by the coastguard. Two lifeboats and a rescue helicopter were then tasked to the scene.

The crew prepared the liferaft, but before launching it they threw a lifebuoy into the water to see where it drifted. The swell drove the lifebuoy further into the cove, so the skipper decided it would be safer to remain on board the vessel. When the lifeboats arrived, they were unable to approach the stricken vessel to evacuate the crew because of rocks located astern and the swell waves breaking over them.

When the rescue helicopter arrived, the winchman was lowered down by the side of the cliff and onto the vessel. The 7-man crew were then airlifted to hospital and treated for hypothermia and shock.



Deckhand’s sleep patterns prior to the accident

The Lessons

1 The vessel did not turn as expected. This might have been as a result of environmental influences and the vessel's slow speed. Alternatively, it is likely that the deckhand's performance was affected by fatigue, and he might have either not altered course at all, or dialled an incorrect course into the automatic helm.

2 Never leave the wheelhouse unattended, and always monitor alterations of course to ensure the vessel turns as expected. Sensible advice on keeping a safe navigational watch can be found in the Maritime and Coastguard Agency's Marine Guidance Note MGN 313(F).

3 It is essential that skippers take full account of a deckhand's work and rest pattern before allocating him to a navigational watch. This will ensure that he can perform his duties safely.

4 The skipper was wise to use a lifebuoy to test where the liferaft would drift before launching it. It is often safer to stay on board a vessel than to rashly abandon it at the first opportunity.

Wooden You Know

Narrative

After a couple of weeks' layover during the Christmas period, a 20m fishing vessel sailed to the next port along the coast to pick up ice and to have a minor repair carried out to the fish-finder display in the wheelhouse. She sailed at 2035. As she was leaving the port, she made contact with the breakwater. However, she continued the voyage with no attempt having been made to check for damage to the vessel.

Overnight the passage progressed without further incident, but at about 0330 the watchkeeper called the skipper, having noticed that the engine revolutions were dropping and that the engine was making a strange noise. The skipper decided this needed further investigation, so turned back to port.

At about 0700, the fish hold bilge alarm sounded. This was set to sound once the well was full. Again the skipper was called, and he started the main bilge pump which was driven by the auxiliary engine. The suction for this pump ran along the port side of the keel into the well, and was fitted with a coarse strainer in the well, and a finer strainer at the valve chest in the engine room.

After about 10 minutes, the skipper checked to see that the pump was still discharging; it was not. He therefore went to the engine room and dismantled the valve and strainer. Removing a small amount of debris, he reassembled the valve, but could still not gain suction. He then started the bilge pump driven from the main engine. This suction ran up the starboard side of the keel, and was fitted with similar strainers to the port side suction. Again this ran for about 10 minutes before the discharge stopped. It was at this

Images courtesy of RAF rescue helicopter footage

point that the skipper went to the fish hold. The water was now about 10cm above the level of the well, and could be seen running from forward through a redundant cable gland opening in the forward bulkhead.

Checking the forecastle space, the skipper noticed that the water level there was higher than that in the fish hold, but he could not see the source of the water ingress. He returned to the wheelhouse and called the rest of the crew, telling them the boat was filling with water and that they should don lifejackets, prepare the liferaft, and retrieve the emergency pump from the cabin and rig it to pump out the fish hold. He tried to raise the alarm, firstly by VHF radio channel 16, then on MF 2182 kHz, and finally by pressing the DSC alert button on his radio. The coastguard replied, and started to organise a rescue attempt. By this time, the crew had used the power block to lift the liferaft from the roof of the wheelhouse and put it on the poop, and had put on their lifejackets. However, they had failed to start the emergency pump because the engine was found to be seized. It was at about this time that one of the crew members, who was making his way forward, slipped and fell against the fish hatch coaming, breaking his ribs.

An RAF helicopter was launched to assist, and a number of oil rig supply vessels responded to the "Mayday Relay" broadcast by the coastguard. Approximately 40 minutes later, the first oil rig

supply vessel was on scene, and the master gave orders for the FRC to be launched. In discussion with the fishing boat skipper, he decided to take three of the crew off, including the injured man, and take them on board his own vessel, which remained close to the sinking fishing boat as the RAF rescue helicopter arrived. Two salvage pumps were lowered onto the fishing boat, and one was started without problem. The second initially failed to prime, and was moved to a position on the main deck, where it operated effectively.

By now, the water level in the fish hold was such that a number of holes in the bulkhead between the fish hold and the engine room used for cable runs were submerged, and the engine room had also started to fill. The pumps were not keeping pace with the water ingress, so it was decided to take them back on board the aircraft and have the FRC take the remaining two crew members off.

The fishing boat sank at 1108. The injured crew member was transferred to the helicopter, and then on to hospital, and the remaining crew members returned to port on board the oil rig supply vessel. Before leaving the scene, the FRC was launched again to pick up floating debris and the fishing boat's EPIRB.

It is not possible to be certain about where the water was entering the hull. There were three possible sources: the first – and most likely – source was as a result of damage sustained when the boat contacted the breakwater when she left the port, and possibly holing her. The second was as a result of a fractured pipe supplying water to the freezer plant condenser in the forecastle. However, the pipes were fairly high in the space, and it is likely that the skipper would have seen water being pumped into the space through a pipe fracture. The third possible source was from a redundant skin fitting which had not been maintained.

The Lessons

1 MGN 165(F) Fishing Vessels: the Risk of Flooding, provides guidance on bilge systems and their construction and operation, as well as recommending the consideration of additional pumping arrangements to reduce the risk of catastrophic flooding.

In particular, it includes advice on the need to keep bilge suction strainers and the fish hold bilge free of rubbish, and to position bilge alarms low enough to provide early warning of flooding. Further advice is given concerning the need to maintain bulkhead watertight integrity, the carriage of portable pumps and their regular testing, and ensuring that crew members are familiar with the bilge system.

Much of this advice was not followed.

2 Only the skipper was familiar with the bilge pumping arrangements. None of the rest of the crew was able to assist him during this emergency.

3 The bilge alarm was set to sound when the fish hold bilge well was full. This meant that the end of the suction pipe was under approximately 80cm of water when it first activated. Had the bilge alarm been adjusted to sound at a lower level (as recommended by the MGN), it would have given an earlier warning of the problem, and allowed ready access to the strainer at that time.

4 It was not until the second pump suction strainer had become choked that the skipper entered the fish hold. By then, the water level rendered the strainer difficult to access. No attempt was made to stop water flowing into the fish hold from the forecastle through the redundant cable gland opening. Doing so, might have allowed the skipper enough time to clear the strainer and start to pump out the hold.

5 Although the owners had followed the advice in the MGN concerning the provision of emergency pumps, they had not ensured that the pump was ready for use. No routine had been established to start and maintain the engine, and when it was required in an emergency it could not be started. Make emergency pump testing part of your pre-sailing checks.

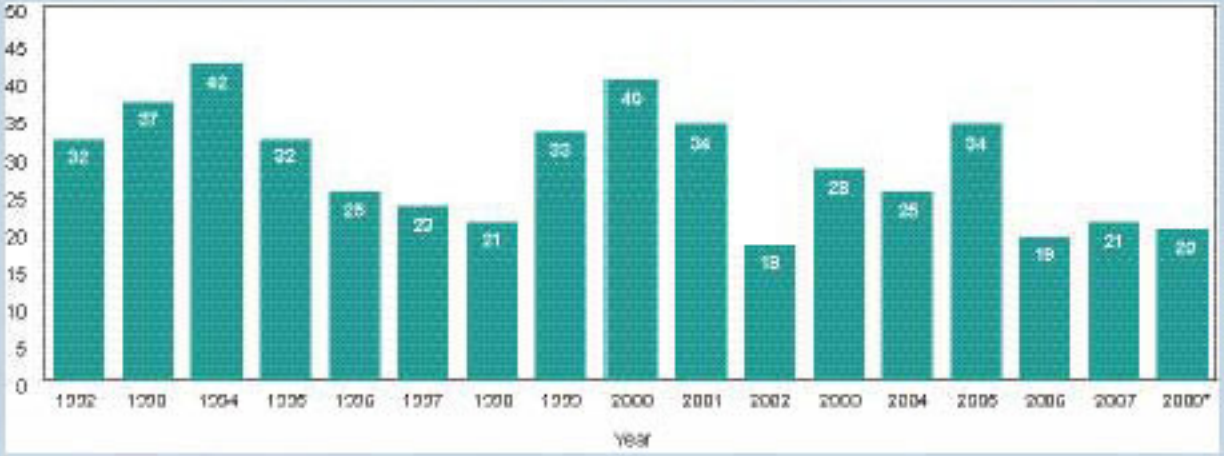
6 Following contact with the breakwater, no check was carried out to see if any damage had been caused to the vessel. While it is unlikely that the water ingress would have been immediately apparent, since it was almost 11 hours until the bilge alarm sounded, any damage with the potential to cause flooding would have been noted, and the vessel returned to port for repairs.

7 The hull fittings in the forecastle included a redundant sea water suction valve, and a disused echo-sounder transducer. Both of these were situated underneath the water tank, which filled the lower part of the forecastle. It was not possible to see these fittings from inside the boat, and they were not maintained when the boat was slipped. The condition of these fittings was therefore unknown.

8 Attempts to raise the alarm by VHF and MF radio were initially unsuccessful because the frequencies used are no longer allocated for distress alerting. It was only when the correct procedure was followed, by using the DSC alert button, that a response was obtained. Are your emergency calling procedures up to date?

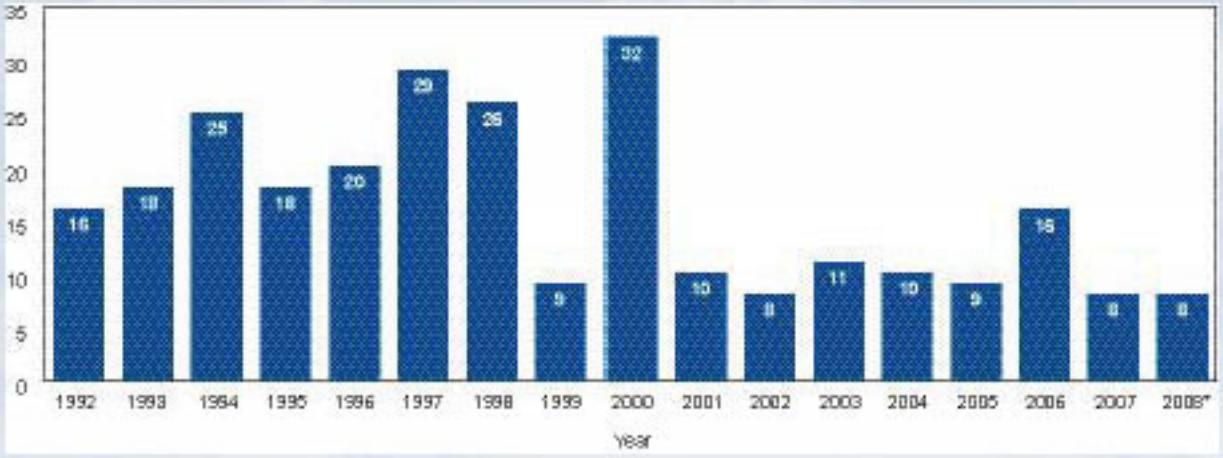
Fishing vessel accid

Fishing Vessel Losses 1992 – 2008



*Figures for 2008 are provisional at time of publication. (May 2009)

Deaths 1992 – 2008



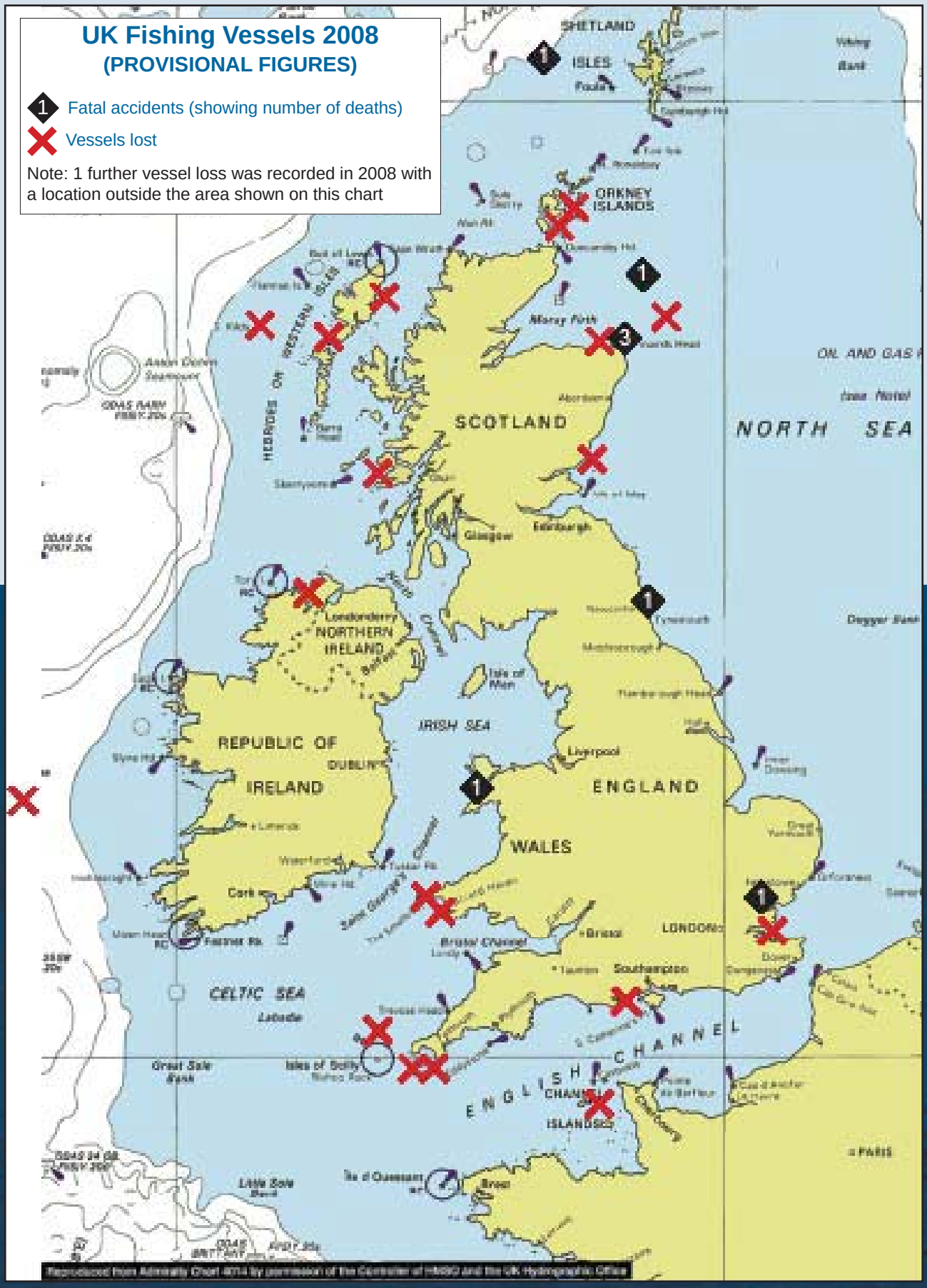
ent statistics

Fishing Vessel Accident statistics 1999 – 2008

YEAR	LOSS OF LIFE					PERSONAL ACCIDENTS	VESSELS LOST
	Lost with vessel	Fell overboard	Involved Machinery	Onboard Accidents	Total		
1999	3	4	0	2	9	72	33
2000	21	6	2	3	32	73	40
2001	1	6	0	3	10	77	34
2002	4	4	0	0	8	47	18
2003	4	5	1	1	11	59	28
2004	7	3	0	0	10	60	25
2005	1	6	0	2	9	53	34
2006	10	4	1	1	16	53	19
2007	3	5	0	0	8	56	21
2008*	4	4	0	0	8	53	20
Total	**58**	**47**	**4**	**12**	**121**	**603**	**272**

*Figures for 2008 are provisional at time of publication. (May 2009)

Major accident locations



MAIB published reports

List of fishing vessel accident reports published since 1999

Alma C – report on the death of Michael John Beedie, a fisherman from the fishing vessel *Alma C*, on Turbot Bank about 55 miles west-by-south of Thyboron in Denmark on 25 January 2001.

Amber – loss of a fishing vessel in the Firth of Forth on 6 January 2003.

Amber Rose – foundering of a fishing vessel with the loss of one life off the Isle of Man on 15 October 1998.

Angela – capsize and foundering of a fishing vessel in the North Sea on 6 February 2000.

Annandale – flooding and foundering of a fishing vessel 16 miles north-north-east of the Shetland Islands on 23 March 2000.

Arosa – grounding and total loss of UK fishing vessel on Doonguddle rock off the west coast of Ireland with the loss of 12 crew members on 3 October 2000.

Astra II – loss of two crewmen attempting to board the vessel while berthed at Carbost pier, Loch Harport, Isle of Skye on 2 April 2000.

Atlantic Princess – man overboard incident from vessel in the English Channel on 23 November 2000.

Aqua-boy – Report of the investigation of the grounding of *Aqua-boy*, Sound of Mull on 11 November 2006.

Auriga – loss of fishing vessel off Portavogie, Northern Ireland on 30 June 2005.

Aurelia – flooding and loss of fishing vessel *Aurelia*, 78 miles west of St Kilda on 13 August 2001.

Be Ready – fire on board the fishing vessel while fishing 30 miles north-west of the Orkney Islands on 22 January 2000.

Betty James – grounding and subsequent loss of a fishing vessel off Isle of Rhum on 10 July 2000.

fv ***Beverley Ann II/Cypress Pass*** – collision between vessels on 9 March 1999.

Blue Hooker – loss of a fishing vessel with two lives off Blackchurch Rock, North Devon on 12 November 1998.

Blue Sinata – foundering of fishing vessel in Weymouth Bay on 8 September 2005 with loss of one life.

Bounty – loss of fishing vessel off Portavogie, Northern Ireland on 30 June 2005.

Bro Axel/fv ***Noordhinder*** – near miss between *Bro Axel* and fv *Noordhinder* and the subsequent grounding of *Bro Axel* at Milford Haven 5 December 2002.

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

Catrina – capsize of a UK registered fishing vessel south of Newhaven on 13 October 1998.

Celtic King/De Bounty – collision between UK registered feeder container ship *Celtic King* and Belgian registered fv *De Bounty* to the south of The Smalls traffic separation scheme off the south-west coast of Wales on 19 March 2000.

Charisma – capsize of the fishing vessel *Charisma* (OB588) with the loss of one crew member in Carlingford Lough on 30 January 2002.

Chelaris J – capsize and sinking of the fishing vessel *Chelaris J* (GU323) and loss of all crew members Banc de la Schôle (near Alderney) 1 October 2003.

Chelaris J – le chavirement et le naufrage du bateau de pêche *Chelaris J* (GU323) avec la perte de tous les membres de l'équipage, Banc de la Schôle (près d'Alderney), 1er octobre 2003.

Christine Nielsen – flooding and foundering of a fishing vessel 120 miles north-east of the River Tyne on 18 March 2001.

Constancy – sinking of a fishing vessel on 30 July 1998 with the loss of one life.

Constant Faith – loss of a fishing vessel about 100 miles north-north-east of Peterhead on 30 June 2001.

Crimond II – loss of a fishing vessel 30 miles north-east of Scarborough on 24 April 2001.

Danielle – investigation of the major injuries sustained by a deckhand on board fv *Danielle* BM478 17 miles south-south-east of Falmouth on 6 June 2006.

De Kaper – fire on board a trawler off Hanstholm, Denmark on 12 February 1999.

Donna M – capsize of a fishing vessel off the Orkney Islands with the loss of two lives on 31 August 1999.

Dunan Star – fatal accident on board a fishing vessel 1.5 miles south-west of the Isle of Arran on 10 August 2000.

Elegance – investigation into 2 engine room fires, subsequent flooding and foundering of the fishing vessel *Elegance* 30 miles north-west of Shetland on 30 January 2004 and 8.5 miles west of Shapinsay on 5 March 2004.

Elhanan T – flooding and foundering of the fishing vessel *Elhanan T* on 14 August 2003.

mv ***Elm***/mfv ***Suzanne*** – near miss incident on 11 February 1999.

Emerald Dawn (one of trilogy) – capsize and foundering of fishing vessel off Kilkeel with the loss of one life on 10 November 2004.

Emerald Star – investigation of *Emerald Star* making contact with Chevron Texaco Number 6 berth at Milford Haven on the evening of 18 January 2006.

European Tideway and ***Vrouw Grietje*** – collision between vessels In the North Sea on 16 October 2000.

Fishing Vessel Safety Study 1/2002 – report on the analysis of fishing vessel accident data 1992 to 2000.

Fishing Vessel Safety Study 1992 – 2006 – Analysis of UK Fishing Vessel safety

Flamingo – capsize of a fishing vessel east of Harwich on 7 July 2002.

Fleur de Lys – explosion on board vessel which then foundered 18 miles south-east of Portland Bill on 16 April 2000.

Fraoch Ban – capsize of a fishing vessel off the coast of the Shetland Islands on 15 August 1999.

Geeske – death of one person while fishing off Beachy Head on 9 December 1998.

Gemma Fidelis – fatal accident on board *Gemma Fidelis* 9 miles east of the River Tees on 23 October 2001.

Girl Alice – loss of skipper from vessel 1.5 miles south-east of Burnmouth on 19 November 2000.

Gradeley – manoverboard fatality off the west coast of the Island of Mull on 28 October 1999.

Greenhill – grounding and subsequent foundering of fv *Greenhill* off Ardglass, Northern Ireland 19 January 2006.

Gudermes and ***Saint Jacques II*** – collision between vessels in the Dover Strait on 23 April 2001.

Harbour Lights – loss of a fishing vessel off Polperro, Cornwall on 8 January 2000 with the loss of one life.

Harvest Hope – capsize and foundering of the fv *Harvest Hope* 40 miles north-east of Peterhead on 28 August 2005.

Harvester/Strilmoy – collision between fv *Harvester* and mv *Strilmoy* in the North Sea on 4 November 2005.

Horizonte Claro – grounding of a fishing vessel on Soyea Island, Loch Inver, on 21 October 2000.

Jann Denise II (one of trilogy) – foundering of fishing vessel 5 miles SSE of the River Tyne 17 November 2004 with the loss of her two crew.

Jasper III – foundering of vessel 90 miles north-east of Fraserburgh on 10 September 1999.

Kathryn Jane (one of trilogy) – foundering of fishing vessel 4.6nm west of Skye on or about 28 July 2004 with the loss of the skipper and one possible crew member.

Kingfisher II – investigation of the fire on board the fishing vessel *Kingfisher II* whilst on passage to recover creels, 5 miles east of North Uist on 26 April 2004.

Kirsteen Anne – loss of a fishing vessel in the Firth of Lorn on 31 December 2002 with the loss of her two crew.

Lady Hamilton/Blithe Spirit – Report on the investigation of the collision between fishing vessels *Lady Hamilton of Helford* and *Blithe Spirit* in Falmouth Bay, Cornwall on 3 October 2007.

Lomur – grounding of a fishing vessel in the approaches to Scalloway, Shetland Islands on 14 June 2001.

Luc and ***Toisa Puffin*** – collision between two vessels 8.5 miles due east of the river Tyne on 13 June 1999.

Lysfoss – grounding of a fishing vessel in the Sound of Mull, Scotland on 7 May 2001

Marbella/Bravo Delta offshore platform – collision between UK registered fishing vessel and offshore platform in the Rough Gas Field about 25 miles south-east of Flamborough Head on 8 May 2002.

Mariama K – carbon monoxide poisoning on board a fishing vessel in Douarnenez, France on 10 June 2000 – one fatality.

Mathilda and fv ***Lady Hamilton of Helford*** – near miss incident between *Mathilda* and fv *Lady Hamilton of Helford*, 7 miles east-south-east of Lizard Point, Cornwall on 28 June 2001.

Meridian – Report on the investigation of the loss of the fishing vessel *Meridian* KY 147 with the loss of four crew 160 nm due east of Aberdeen on 26 October 2006.

Noordster – investigation of the capsize of the fishing vessel *Noordster* Z122 with the loss of three crew 11.5nm south of Beachy Head on 13 December 2005.

Ocean Star – failure of a warp block on board a UK registered fishing vessel north of the Shetland Islands resulting in one fatality on 26 November 2001.

Opportune – man overboard fatality from a fishing vessel 35 miles east of Wick on 23 February 2000.

Osprey – fatal accident to a man overboard from a fishing vessel in Lochinver Harbour on 20 April 2002.

Our Nicholas – grounding and loss of the crabber *Our Nicholas* near the entrance to Stornoway Harbour on 24 July 2001.

fv ***Our Sarah Jayne***/***Thelisis*** – collision between vessels in the Thames Estuary on 20 June 2001.

Pamela S – capsize and foundering of fv *Pamela S* IH308 in Carmarthen Bay on 17 June 2006 with the loss of one life.

Pescalanza – sinking of a fishing vessel with the loss of six lives on 2 November 1998.

Philomena – fatal accident on board vessel in the Moray Firth on 6 March 2001.

Primrose – grounding of vessel on the Island of Rhum on 15 June 2001.

Purbeck II – injury of crew member on board on 7 June 1999.

Purdy – man overboard fatality from angling boat at Shipwash Bank off Harwich, on 17 July 1999.

Rachel Harvey – grounding and loss of fishing vessel off Peninnis Head on 1 October 1999.

Radiant – capsize and foundering of a fishing vessel about 45 miles north-west of the Isle of Lewis with the loss of one life on 10 April 2002.

Radiant Star III – foundering of a fishing vessel 60 miles northeast of Fraserburgh on 6 August 1999.

Random Harvest – flooding of a fishing vessel south-west of Brighton on 3 July 1999.

Rebecca Kay – loss of a fishing vessel off Bideford Bar Buoy on 20 April 2001.

Reno and ***Ocean Rose*** – collision between *Reno* and *Ocean Rose* off Whitby, North Sea 6 March 2004.

Resplendent – grounding of a fishing vessel in Bluemull Sound Shetland Islands on 13 June 2001.

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

Sally Jane – capsize alongside in Shoreham Harbour on 27 July 1998.

mv ***Sand Heron*** and fv ***Celtit*** – collision between vessels NE Traffic Lane, Dover TSS on 30 July 2001.

***Shark & Royalist* dual investigation report** – Dual investigation report into the fire on board fv *Shark* on 19 January 2008 and the foundering of fv *Royalist* on 23 January 2008.

Sharona – flooding and foundering of a fishing vessel 80 miles north-east of Peterhead on 3 August 1999.

Sian Elizabeth – investigation of the injury to a member of the crew on board the fishing vessel *Sian Elizabeth* 3 miles north of Kings Lynn on 14 September 2006.

Silvery Sea/Merkur – collision between *Merkur*/*Silvery Sea* which then foundered about 35 miles west of Esbjerg, Denmark with the loss of five lives on 14 June 1998.

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

Solway Harvester – summary report on the investigation of the capsize and sinking of fv *Solway Harvester* 11 miles east of the Isle of Man on 11 January 2000 with the loss of 7 lives.

Solway Harvester – capsize and sinking of fishing vessel, 11 miles east of the Isle of Man on 11 January 2000 with the loss of seven lives.

Sundance – capsize and foundering of a fishing vessel off Gilkicker Point, East Solent with the loss of one life on 10 September 2001.

Suzanne – see *Elm*.

Tullaghmurry Lass – sinking of a fishing vessel with the loss of three lives in the Irish Sea on 14 February 2002.

Union Arbo/Philomena – collision between Bahamian cargo ship *Union Arbo* and UK fv *Philomena* about 10 miles south of Newlyn, Cornwall on 2 September 1999.

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

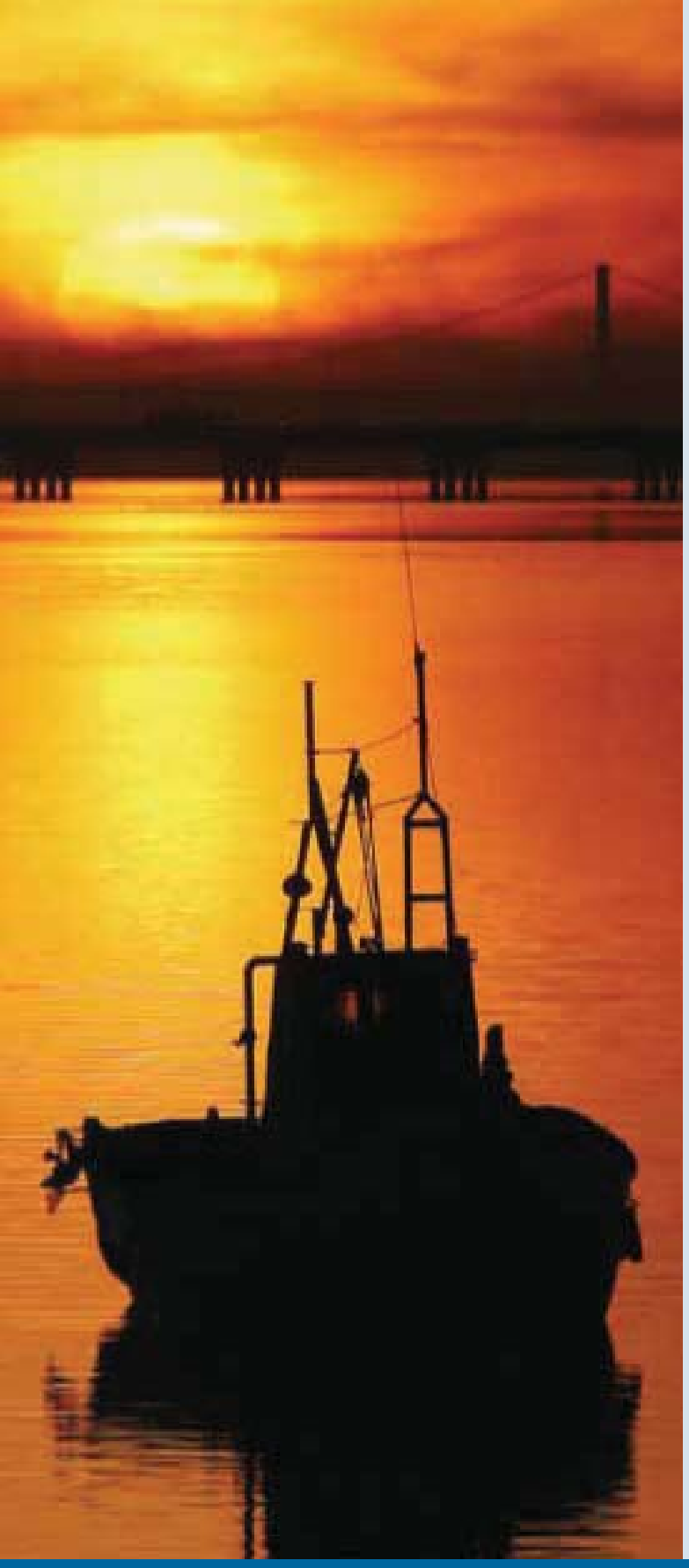
Vertrauen – investigation of the loss of *Vertrauen* about 75 miles north-east of Peterhead on 19 July 2001.

Vision II – Report on the investigation of the fire on board the fishing vessel *Vision II* alongside at Fraserburgh on 1 August 2008 resulting in three fatalities.

Wakil II – investigation of an accident to the skipper of a fishing vessel 3.5 miles south-west of St Bees Head on 10 April 2000.

GLOSSARY of abbreviations

CPR	Cardio Pulmonary Resuscitation
DSC	Digital Selective Calling
EPIRB	Emergency Position Indicating Radio Beacon
FRC	Fast Rescue Craft
GPS	Global Positioning System
HRU	Hydrostatic Release Unit
kHz	kilohertz
“Mayday”	The International distress signal (spoken)
MCA	Maritime and Coastguard Agency
MGN	Marine Guidance Note
Pan-Pan	The International urgency signal (spoken)
RAF	Royal Air Force
RIB	Rigid Inflatable Boat
RNLI	Royal National Lifeboat Institute
rpm	revolutions per minute
VHF	Very High Frequency



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