MARINE ACCIDENT INVESTIGATION BRANCH

Summary of Investigations No 3/93

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With effect from the end of January 1994 our new telephone number will be:
0703 395500.

BUT THE ACCIDENT REPORTING NUMBER WILL NOT BE CHANGED.

Accident Reporting Line 071 276 6004 (24 hours)

This summary contains facts which have been determined up to the time of issue. This information is published to inform the shipping industry and the public of the general circumstances of accidents and must necessarily be regarded as tentative and subject to alteration or correction if additional evidence becomes available.

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INTRODUCTION

Investigations into accidents can serve three broad purposes: to find out what caused the accident; to determine who is to blame; to apportion liability. Occasionally the different aims of an investigation can overlap but each has its rightful place. The Branch is particularly concerned with trying to prevent the same type of accidents happening again, and to do this we need to know the causes. The way we go about trying to prevent recurrence is by making recommendations or making known as widely as possible the lessons learnt. Although accidents range from the most serious - with loss of life and major damage to vessels and property - to minor incidents where little or no harm is done, a common factor throughout is the likelihood that useful lessons are there to be learnt.

Clearly the Branch cannot investigate every single accident which occurs on UK registered vessels, and it might therefore be thought that some of the lessons to be learnt are being missed. Fortunately, however, many accidents are investigated by the Safety Officer on-board the vessel with the support of the Safety Representatives and the Safety Committee. Under the Merchant Shipping (Safety Officials and Reporting of Accidents and Dangerous Occurrences) Regulations 1982, certain vessels are required to appoint safety officials and to carry out on-board investigations. The value of these investigations ought not to be underrated; they serve an extremely useful purpose. First of all, such investigations can be carried out soon after the accident has occurred without waiting for the vessel to reach port. Secondly, all the information and the evidence is at hand. More importantly though, those on-board are in a position to take action to prevent a similar accident occurring again on the vessel. However, it is extremely difficult for those on-board to make known the lessons learnt on a far wider scale than just their own vessel. This is where the Branch comes into play.

When the details of investigations carried out on-board are sent to us, we are able to review them and include in this publication those which are of interest to a wider audience. There is no doubt that the quality of many of those investigations is of such a high standard that there is no need for the Branch to investigate further.

This introduction provides an ideal opportunity to express appreciation for the efforts of all those who carry out on-board investigations, whether they concern accidents or dangerous occurrences. By so doing you are helping to improve the safety of everyone at sea. Even if you are not required by the Regulations to have a safety officer on-board, such as on fishing vessels, please do ensure you investigate accidents and dangerous occurrences for, in many instances, you are the best placed to do that. And, of course, let us know about those investigations.

Chief Inspector of Marine Accidents

December 1993

1. ENGINE ROOM FIRE WHILST ALONGSIDE

Narrative

A 1,597 gross registered tonnage motor chemical tanker had left dry dock and moved alongside a loading berth where at 1500 hours, cargo loading commenced. The engine room was in the UMS mode when at 1915 hours the Second Mate on entering the accommodation from the bridge noticed smoke coming from the engine room. The Master and the Chief Engineer were informed and cargo loading operations were stopped. Immediately the Chief Engineer and the Second Engineer donned breathing apparatus and entered the engine room to tackle the fire using CO_2 extinguishers. The remainder of the crew went to their fire stations and prepared extra breathing apparatus sets together with fire hoses and other extinguishers. The shore authorities were informed and the local emergency plan put into operation. By 1933 hours, both the fire brigade and the port stand-by fire tug were in attendance. At 2015 hours, the fire was extinguished and at 2318 hours cargo loading recommenced.

Observations

1. The fire fighting actions taken by the crew on discovery of the fire were correct and showed the benefit of good organisation and proper training.

2. The seat of the fire was centred in the port main engine clutch and was the result of severe overheating of the clutch assembly. The cause of this overheating was thought to be either excessive wear down on the engaging ring or poor venting.

3. The discovery of the fire by the Second Mate was fortuitous as the automatic fire alarm did not sound. Subsequent investigation showed that whilst the fire alarm system was in working order, the system had been activated at some time in the recent past but had not been reset. This could have had serious consequences for both the vessel and crew if the fire had developed further before it was discovered.

4. A further observation was that the alarm panel's indicator lights were so small and faint that the crew failed to notice the status of the alarms when passing the fire alarm panel.

5. The Owner subsequently incorporated status checking of the fire alarm system in UMS procedures together with the fitting of easily seen alarm and system status indicator lights.

Comment

1. In this incident, there were no casualties to the crew and only minor damage to the vessel. It does however graphically illustrate the need for thorough testing and/or checking of <u>all</u> fire and safety systems.

2. It also emphasises the necessity of allowing for human error when producing UMS or any other operational procedures.

2. FATAL ACCIDENT TO AN ENGINEER ENTERING AN UNVENTILATED SPACE

Narrative

A foreign-registered split-hull hopper barge while at a repair berth in the UK was preparing for her Classification Survey. The ship's Engineer, a very experienced person, was required to open up the void spaces for ventilation before the surveyor attended. When this Engineer did not return for lunch the crew became concerned and mounted a search. He was seen through the open manhole of one of the buoyancy tanks. One of the crew took a deep breath and descended the ladder into the tank and confirmed that the Engineer was not moving. After this the crewman was instructed to leave the tank. The Master and crew assembled at the tank manhole with a breathing apparatus, but none of the crew was able use it. A shipyard painter with experience in the use of breathing apparatus entered the tank and tried to resuscitate the Engineer, but without success. The fire brigade recovered the Engineer from the tank and he was taken to hospital but found to be dead on arrival from asphyxiation.

Observations

From visual evidence it was thought that the Engineer went into the tank to retrieve his torch and pen which may have fallen in while he was opening the manhole. The tank oxygen level was checked about five hours later and found to be considerably below the minimum safe limit.

Comment

1. There have been many similar accidents which, on occasion, have led to multiple deaths when crew have tried in vain to recover colleagues from enclosed spaces. The guidance regarding safe entry is clearly set out in:

    1.1 The "Code of Safe Working Practices for Merchant Seamen" (1991 Edition), Chapter 10 - Entering Enclosed or Confined Spaces;

    1.2 A MARITIME SAFETY CARD published by the International Maritime Organization which sets out basic precautions on tank entry and provides a safety check list.

2. It is extremely disturbing that there are still vessels operating with crews who do not know how to use the breathing apparatus provided.

3. COLLISION CAUSED BY INADEQUATE LOOKOUT

Narrative

An offshore supply vessel had weighed her anchor and was proceeding towards a production platform. The Officer of the Watch (OOW) was alone on the Bridge while two crew members were securing the anchor forward. A trawler was towing her gear on a nearly reciprocal course, such that the vessels would pass port to port at close range. It was dark and both vessels were exhibiting appropriate navigation lights. The weather was fine and clear with a slight sea and a low swell.

The OOW of the supply vessel saw the red sidelight of the trawler fine on his port bow and interpreted her bearing to be opening. He then went to the aft manoeuvring console in order to communicate with the production platform by radio. In doing so, he temporarily lost sight of the trawler.

The sole watchkeeper aboard the trawler was attempting to navigate his vessel along a Decca lane by adjusting the autopilot heading as necessary. Unaware of the presence of the supply vessel on his port bow, he altered the course of his own vessel to port. He then saw the supply vessel rapidly approaching on his starboard side, but expected her to keep out of the way. When it became apparent that no avoiding action was being taken the watchkeeper called the Skipper, who went to the Bridge.

Upon his return to the forward part of the Bridge, the OOW of the supply vessel saw the green sidelight of the trawler on his port bow at close range and took avoiding action by altering the course of his own vessel to starboard. The Skipper of the trawler also took avoiding action by taking the propeller out of gear. However, these actions were too late to avoid a collision.

Substantial damage was caused to the forepart of the trawler but, fortunately, there were no serious injuries to personnel on either vessel. The supply vessel was only slightly damaged and both vessels safely returned to port.

Observations

1. The immediate cause of the collision was the failure of both vessels to maintain a proper lookout.

2. The duties of the OOW of the supply vessel prevented an all-round visual lookout from being maintained.

3. The watchkeeper of the trawler was primarily concerned with adjusting the heading of his vessel in order to maintain a planned track. He did not take account of the need to keep a proper lookout.

Comment

1. Rule 5 of the Collision Regulations requires every vessel to maintain a proper lookout at all times.

2. So as to maintain a proper lookout during the hours of darkness, The Merchant Shipping (Certification and Watchkeeping) Regulations 1982 require a lookout to be posted in addition to the OOW. Similarly, Merchant Shipping Notice No M.1190 recommends that two men should be on watch aboard fishing vessels at such times.

3. Additionally, The Merchant Shipping (Certification and Watchkeeping) Regulations 1982 require that the lookout must be able to give full attention to the keeping of a proper lookout and no other duties shall be undertaken or assigned which could interfere with that task.

4. It is evident that this collision could have been avoided if additional lookouts had been posted in both vessels in accordance with the above required and recommended practice.

4. PARTING OF A LIFEBOAT FALL WIRE

Narrative

While an offshore supply vessel was berthed alongside in port, it was decided to launch one of her lifeboats. The boat was lowered into the water, taken away and exercised satisfactorily for about 30 minutes. When it was re-stowed, the Chief Officer was not satisfied that the limit switches had operated correctly and decided to lower the boat again so as to test them. The crew disembarked and the lifeboat was then lowered a few feet. On inspection, the tripping arm of the aft limit switch was found to be missing. The forward limit switch was found to be inoperative.

The Chief Officer then instructed the Leading Hand to hoist the lifeboat to its stowed position using the winch motor. The aft davit arm reached its stowed position but the winch motor was kept running until the forward davit arm had also reached its stowed position.

The aft davit fall wire then parted which caused the aft end of the lifeboat to drop until its motion was arrested by a combination of the ship's structure and the forward davit arm.

Observations

1. The lifeboat sustained damage although there were no injuries to personnel.

2. The fall wires were less than 2 years old and had been end-for-ended 7 months prior to the incident.

3. Maintenance records indicated that the fall wires had last been greased 6 months previously and that the fall blocks had last been drifted, examined and greased 9 months prior to the incident.

4. Subsequent inspection of the fall blocks revealed that none of the sheaves could be turned by hand although they appeared to be well greased.

Comment

1. The aft fall wire parted as a result of overloading caused by the action of the winch motor when the aft davit arm reached its stowed position.

2. Although relatively new, the fall wire may have been progressively weakened by frictional loadings due to the inability of the fall block sheaves to rotate freely.

3. This incident highlights the need to ensure that all davit safety devices, including limit switches, are working correctly before the recovery and stowage of a lifeboat under power.

4. In practice, during the period between overhauls, the free movement of fall block sheaves can normally only be checked when a lifeboat is either launched or recovered and every opportunity should be taken, at these times, to confirm whether or not the sheaves are rotating correctly.

5. DANGER FROM ESCAPING LIQUID GAS

Narrative

In preparation for the task of repairing the expansion valve on a main refrigeration system, a member of the ship's engineering staff pumped down the gas system and isolated the section which contained the expansion valve. However, due to problems with the vessel's electrical supply, the pumping down operation could not be completed. Other operational difficulties, not directly connected with the refrigeration system, prevented the repair from being delayed until power became available to complete the pumping down operation. The ship's Engineer therefore proceeded with the repair by slackening the expansion valve retaining nuts. On freeing the joint liquid Freon escaped from the system and sprayed onto his chest, arm and leg causing cold burns.

Observations

In order to save time the Engineer neglected to obtain and wear any extra protective clothing or equipment, even though the risk of escaping liquid gas was recognised.

Comment

Although there may well have been compelling reasons why this job was progressed before the relevant part of the gas system was properly pumped down, pressure to complete a task should never be allowed to relegate safety to a subordinate position.

6. TRACKWAY HOIST INCIDENTS

Narrative

Two recent incidents involved the unsafe operation of a trackway hoist.

Case 1

A load was being transported across the engine room by manually moving a trolley hoist in its trackway. The intended path of the trolley was via a trackway turntable. However, the turntable was incorrectly aligned which caused the trolley to take an alternative route. The trolley ran off the end of the trackway resulting in injury to the operator.

Case 2

Following a period of maintenance during which the trackway end stops of a trolley hoist had been removed, the hoist was used to transport a load across the engine room. The trolley ran off the end of the trackway narrowly missing a crew member working below.

Observations

Case 1

1. The turntable had not been properly aligned and locked into position prior to operating the trolley hoist.

2. Trackway end stops were not fitted. The management company now intends to fit stop pins at the end of each fixed trackway.

Case 2

1. Ship's staff failed to identify that the trackway end stops had not been replaced prior to operating the trolley hoist.

2. The management company has since issued instructions for trackway end stops to be painted a conspicuous colour and for ship's staff to check that they are in position before the lifting plant is operated.

Comment

1. The Merchant Shipping (Hatches and Lifting Plant) Regulations 1988 require that any lifting plant is not to be used other than in a safe and proper manner.

2. With respect to the above requirement, these incidents highlight the need to ensure that trackway end stops are in position and that any turntables are properly aligned and locked prior to use.

9. LOSS OF A BEAM TRAWLER WITH LOSS OF LIFE

Narrative

A 21 metre beam trawler was dredging for scallops when the crew suspected her gear had snagged, and set about recovering it. There was a slight sea and swell and light breeze with good visibility. The port side dredges were brought up successfully and secured, but difficulty was experienced in turning the beam once the starboard gear had been brought nearly to the surface. Whilst the beam was being turned the derrick was partly lowered and at this time the vessel listed to starboard so that water came on deck and capsize quickly followed. Of the crew of five, three were on deck and although they were initially trapped under the vessel they were able to swim clear. One man was in the cabin below and escaped through the emergency hatch. These four managed to climb on to the upturned hull; the Skipper of another beamer saw them and rescued them before the vessel finally sank.

There was no sign of the Skipper despite a full scale search and rescue operation, and he must be presumed to have been trapped in the wheelhouse.

Observations

1. The heavy load on the starboard gear at the derrick head, together with the water on deck and not having the port gear out to counterbalance the starboard load, all contributed to the capsize.

2. The liferaft did not operate, therefore the crew who were not wearing life-jackets would have had no means of support once the vessel sank; and as the EPIRB did not operate the rescue services would have been unaware of the accident if the survivors had not been seen.

Comment

1. Once it was known that there was an extra heavy load on the one side, the gear should have been lowered to the bottom, and the quick release gear operated bringing the lifting point closer to the centre line of the vessel. This would reduce the possible heeling effect when lifting the gear.

2. During the dangerous operation of freeing snagged fishing gear the vessel should be completely closed down, eg all weather and watertight hatches and doors should be closed throughout the vessel; and all crew should be up on deck and should don a working buoyant vest or life-jacket.

3. The prompt action taken by the Skipper and crew of the other fishing vessel is to be commended. It undoubtedly saved the lives of the four crew members.

4. When fitting liferafts and hydrostatic release units the manufacturers' instructions should be strictly adhered to. If in doubt seek the assistance of the local service liferaft company or Marine Office surveyor.

5. The local Marine Office surveyor will advise on the location and fitting of EPIRBs.

Further information on the fitting of EPIRBs was printed in the last publication "Summaries of Investigation 2/93", item 18.

10. LOSS OF FISHING VESSEL AFTER COLLISION WITH AN OFFSHORE SUPPLY VESSEL

Narrative

A 16.4 metre registered length wooden hulled fishing vessel was returning to port after fishing in the North Sea. On board were three crew: Skipper, Mate and cook. At the time of the incident the Skipper and cook were turned in and the Mate was on watch.

The Mate had taken over the watch at just after midnight with the vessel on a south westerly course on auto-pilot. The weather was a freshening south westerly wind force 3 with some drizzle but generally good visibility. The Mate was using the radar on the six mile range; it was working well but there was reported to be sea clutter on the screen out to one and a half miles.

The vessel was approaching an oil rig on her port bow and the Mate altered course to starboard to pass one and a half miles clear of it. Once the oil rig was on the fishing vessel's port quarter the Mate adjusted the auto-pilot to resume the original course. The Mate stated that he looked at the radar and seeing nothing ahead went into the engine room to pump out that space and the fish room. He was involved in this task for about 15 minutes. He returned to the wheelhouse, sat down in the chair and was instantly jolted as the fishing vessel ran into the stern of an anchored oil rig supply vessel.

The fishing vessel was holed and subsequently sank. Fortunately the three crew were able to use the liferaft to transfer to the supply boat without injury.

The supply vessel had anchored about three miles away from the oil rig five hours before the incident. She was showing anchor lights and bright deck lights. Her crew had used VHF and the Aldis lamp in attempts to attract the attention of the fishing vessel to the impending collision.

Observations

1. The Mate had only glanced through the forward window and relied on the radar for information about other vessels before he left the wheelhouse. He was not familiar with the clutter control of the radar.

2. He thought that leaving the wheelhouse unattended was usual because the normal practice was to pump the bilges before calling his relief.

Comment

1. This accident happened because the wheelhouse of the fishing vessel was left unattended for about 15 minutes. The presence of the supply vessel might not have been detected on radar because of the sea clutter. However, the visibility was good and the supply vessel well lit.

2. Rule 5 of the Collision Regulations requires the keeping of a proper look-out at all times.

3. In Merchant Shipping Notice No M.1020 titled "Keeping a Safe Navigational Watch on board Fishing Vessels" Annex 4.1.2.1 specifically states that **"at no time should the wheelhouse be left unattended"**.

4. Merchant Shipping Notice No M.1190 titled "Bridge Manning, Watchkeeping and the Command of Fishing Vessels" draws attention to the need for proper instruction of watchkeepers, even if they are not required to be Certificated Officers, in the use of navigational aids and knowledge of the Collision Regulations.

11. NAVIGATIONAL ERROR RESULTING IN GROUNDING AND DAMAGE

Narrative

In the very early morning a steel hulled purse seine vessel, registered length 36.85 metres, was returning to Lerwick from a fishing trip to the west of the Shetlands. She was proceeding southwards towards the northern entrance to Lerwick Harbour. On board were a duly qualified Skipper and Mate plus eight other crew members. The Mate was the lone watchkeeper. The weather was a light south westerly wind with slight sea, low swell and good visibility.

From a position off Aiplin Island, 3.7 nautical miles to the north of Lerwick, it was intended to keep the Brethren buoy fine on the port bow so as to pass clear and to the east of the Unicorn shoal. (See extract from British Admiralty Chart 3282). However, the buoy was not sighted as expected because of large fish factory vessels ("klondykers") anchored to the north of Brethren Island. The vessel continued on course, though at reduced speed, until eventually the buoy was seen. An alteration of course was made towards it but immediately afterwards the vessel ran on to Unicorn Shoal.

The vessel took on a large list and was moving to sea and swell. The crew abandoned the vessel and took to a liferaft, from which they were quickly recovered by a local ferry. The vessel floated off the shoal shortly afterwards on the rising tide and was re-boarded by the Mate and two crew members. She was taken into Lerwick under her own power escorted by the RNLI lifeboat.

There were no injuries and no pollution. The vessel suffered damage to her starboard bilge keel and bottom plating with penetration of the forward freshwater and fore peak tanks, the estimated cost of repairs being £80,000.

Observations

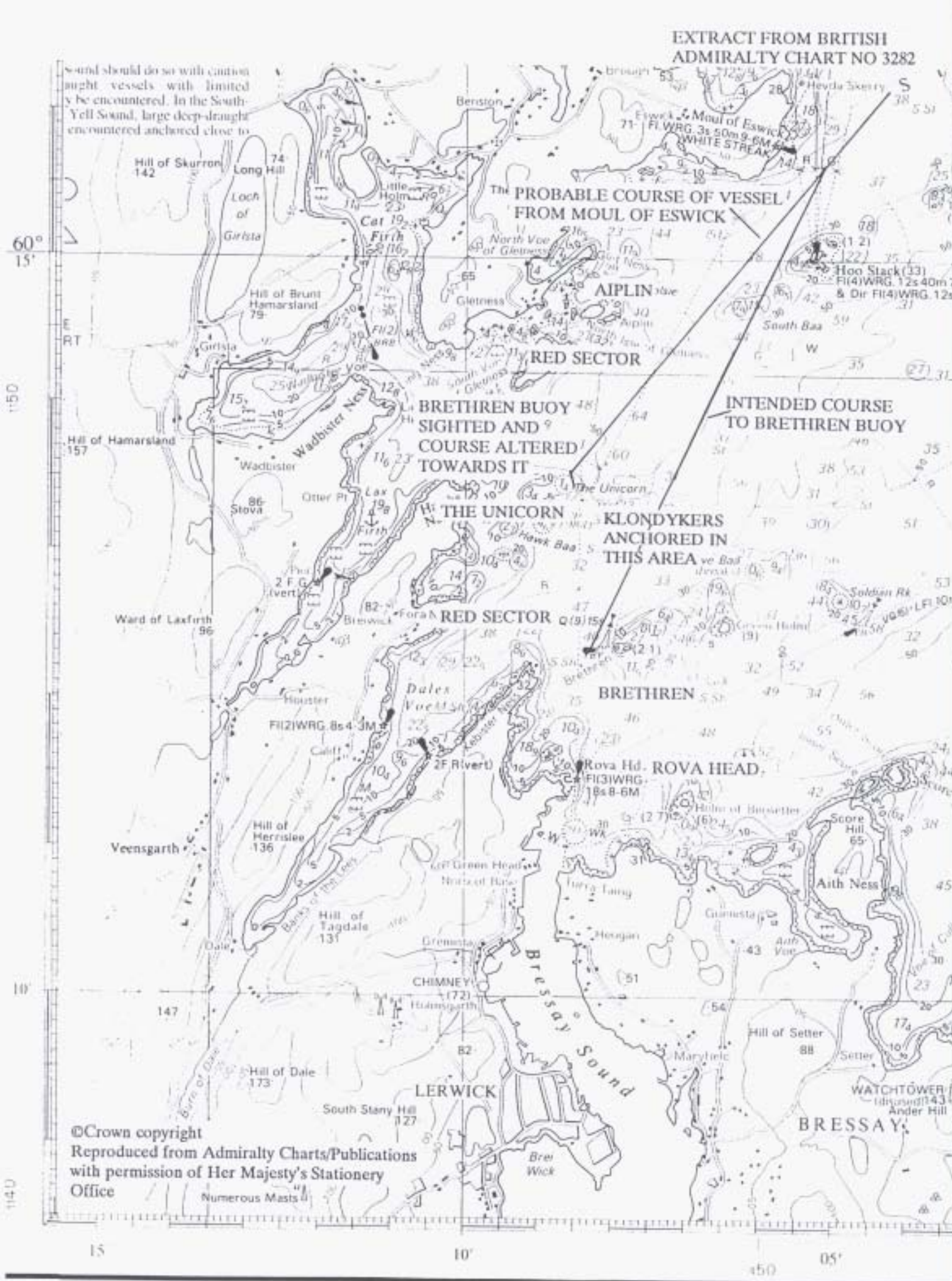
1. The fishing vessel was fitted with two operational radars and both terrestrial and satellite navigation systems.

2. The Mate was very familiar with the local area.

3. Unicorn Shoal has a least depth of 1.4 metres over it and is covered by the red sectors of two lighthouses, Rova Head and Moul of Eswick.

Comment

1. The cause of the grounding was reliance on eventually sighting the Brethren buoy and failure to use other navigation marks that could actually be seen. The red sector of Moul of Eswick light covered the Unicorn Shoal but concentrating on trying to locate the buoy the Mate failed to see that the vessel, which was proceeding at reduced speed, was being set into this sector.



2. The Mate's familiarity with the area led him to use less caution than might have been used by a navigator not so practised in making Lerwick Harbour.

3. Where the buoy and other lights were obscured, use could have been made of the radars, either for radar bearings or parallel indexing. Merchant Shipping Notice No M.1158 provides information on the use of parallel indexing techniques as an aid to navigation.

4. The Mate should not have been on watch alone. It is recommended in Merchant Shipping Notice No M.1190 that casualties could be avoided if a two-man watch system is employed when the vessel is close to land. Attention is also drawn to Merchant Shipping Notice No M.1020, which sets out the IMO "Basic Principles to be Observed in Keeping a Navigational Watch on board Fishing Vessels" including making full use of all navigational aids and keeping a continual check on position. These principles had not been followed on this occasion.

12. LOSS OF A FISHING VESSEL DUE TO FIRE

Narrative

A 48 gross registered tonnage "crabber" left port late one evening with four strings of crab pots, some 360 - 370 pots in all, stowed on deck forward of the wheelhouse and aft, both under and on the podium deck. The vessel had a crew of four including the Skipper. The weather was good, the sea calm with a number of other vessels in the vicinity. The usual watchkeeping routine was followed with nothing unusual noticed until at about 0730 hours, when the smell of "burning rubber" was noticed. The vessel at this time had been steaming for about 10 hours, and was about 20 miles from the fishing area.

The Watchkeeper looked aft, saw black smoke and immediately called the Skipper. The port side of the wheelhouse adjacent to the main engine exhaust pipe was on fire together with at least two crab pots. The Watchkeeper and Skipper used dry powder and water extinguishers but could not get to the seat of the fire because of the flames.

It was realised that the flames would shortly reach two gas bottles secured abaft the wheelhouse, and although a crew member tried to get to the bottles, the heat was too intense. The liferaft container, stowed on the wheelhouse top, was also now on fire. Due to the heat, the securing slip could not be reached so eventually the webbing securing strap was cut and the liferaft container lifted over the side. The raft inflated, but unfortunately the fire had burnt away the securing end of the painter and it broke away from the vessel. With the fire beyond control, three crew members jumped into the sea and managed to reach the raft.

Meanwhile, the Skipper attempted to send a Mayday but owing to the rapid spread of fire the message could not be completed. He was forced to abandon the vessel; the raft was now some 500 metres away but the men who had reached it were able to paddle the raft towards him and eventually succeeded in bringing him on board, where he was covered with a thermal blanket. Two vessels were in sight and flares from the emergency kit were used to attract their attention. All four crew were successfully rescued.

Observations

1. As the main engine exhaust line passed up the port side, and to the rear of the wheelhouse, terminating approximately one metre above the roof of the wheelhouse, crab pots were reported normally to be kept well clear of the area. On this voyage that precaution was not taken, and it is probable that the fire was initiated by one of the pots coming into contact with the exhaust. The pots are combustible and the fire spread rapidly among them.

2. The actions of the crew on the outbreak of the fire were correct in that all crew members were immediately called and attempts made to fight the fire. However in fires of this nature on the open deck, water in copious amounts is the answer. (Dry powder extinguishers are more suitable for under deck usage and other types of fires.) The nearest fire hydrant, also used for the deck wash system, was on the main deck, centre, immediately forward of the wheelhouse. The hose for this hydrant was stowed in the same location. As the main deck was over-stowed with crab pots and fishing lines, this hydrant was not readily available.

3. The actions of the crew member who took control of the liferaft well illustrate the advantages of attendance at a sea survival course. His organisation of the crew and sensible use of the liferaft equipment ensured that the rescue was safely carried out.

Comment

1. It is important that any exhaust or silencer pipe is fully insulated in any area that is, or is likely to be, used for the stowage of fishing gear or any other combustible material. In addition, the pipe should be provided with suitably ventilated guards to prevent mechanical damage and close contact with the insulation.

2. Deck fire hydrants and hoses should be easily accessible at all times and not obstructed by fishing gear or other equipment.

3. The crew were not wearing life-jackets when they abandoned the vessel. For security, the life-jackets were stowed in the aft cabin whilst in port and tended to remain there. The time interval between the discovery of the fire and the launch of the liferaft did not apparently allow for the issue of the life-jackets.

   Whilst accepting that security of equipment is a commercial reality, it must be emphasised that safety equipment must be readily available for immediate use. It was fortunate in this case that all the crew members were good swimmers and that the conditions were good. In bad weather or in winter it is doubtful if all the crew would have reached the liferaft without a life-jacket to keep them afloat.

13. FAULTY OPERATION OF BILGE SYSTEM

Narrative

A fishing vessel, of under 12 metres length, was operating with a crew of two. The Skipper pumped out the engine room bilges using the engine driven bilge/deck wash pump. When these bilges were empty he closed the bilge suction valve and opened the sea suction to restore the pump to its normal deck wash mode of operation. At this point several other urgent jobs took his attention and he was unable to immediately check the overboard discharge from the deck wash pump. Having completed those jobs the Skipper noticed that there was no discharge overboard and went to the engine room to investigate where he found serious flooding.

The vessel carried a second, portable, bilge pump which was used to lower the level of floodwater. Although the Coastguard was called, and another fishing vessel together with an RNLI lifeboat attended, the vessel was able make port under her own power.

Investigation later established that the bilge suction valve had not been closed properly after the bilge pumping operation, allowing water to flow into the bilges via the engine room bilge valve and line, from the sea inlet.

Observations

1. The vessel's bulkheads proved to be watertight and effectively limited the extent of the flooding; a very desirable feature not always encountered in small fishing vessels.

2. There was no non-return valve fitted to the engine room bilge suction line.

3. The provision on board of a second large capacity bilge pump very effectively controlled the flooding.

Comment

1. The owner has decided to fit a non-return valve on the engine room bilge suction line.

2. The Skipper now recognises the importance of checking for the proper functioning of equipment, in this case the deck wash system, after altering its mode of operation.

16. DANGERS OF DIRTY BILGES AND POOR MAINTENANCE

Narrative

A 9.2 metre vessel, with a crew of two, was steaming about 2 miles off land in good weather, winds force 2 - 3, when the main engine faltered and stopped. On investigating, the Skipper found that the engine room had flooded to half the height of the engine. Since the engine had stopped, only the manual bilge pumps were available, but these became choked with debris.

The Coastguard were notified and a helicopter was despatched to lift a portable pump out to the vessel: the lifeboat was also launched to tow her in to port.

Observations

1. When the vessel was being repaired it was discovered that the original source of the flooding was a large hole in the cast iron end cap of the heat exchanger.

2. The flooding was exacerbated by the parting of the cooling water inlet pipe. A loose rag, which was floating in the rising bilge water, had became wrapped around the pipe and the rotating propeller shaft resulting in the pipe parting.

3. No bilge alarm was fitted. This allowed the flooding to pass undetected until it had reached such a level that it caused the engine to stop.

Comment

1. This incident would not have developed to the point of endangering the vessel and the lives of the crew if the boat had been fitted with a bilge alarm. This would have alerted the crew to a potential flooding problem before it became serious. Merchant Shipping Notice No M.1327 recommends the fitting of bilge alarms to <u>all</u> fishing boats regardless of length.

2. The manual bilge pumps would have been unlikely to have blocked if the bilges had been kept clean and free from rubbish. This aspect of safety and good seamanship is also covered by Merchant Shipping Notice No M.1327.

3. It is probable that greater care in the maintenance of the machinery on the vessel would have prevented this incident altogether.

17. MAJOR INJURY DURING LANDING OF FISH

Narrative

A fishing vessel was engaged in landing fish by means of her derrick. The Skipper was standing near the deck winch drum which had been set to rotate at a constant speed. One of his deckhands was on the quay and the other was in the fish hold. In order to hoist a box of fish from the fish hold to the quay, the Skipper was putting two turns of the runner rope around the winch drum. However, he found that he was unable to control the rate of lift by surging and decided to remove one of the turns. In order to avoid the risk of the box dropping without warning and striking the deckhand in the hold while he removed the turn, the Skipper proceeded to hold onto that part of the rope which was leading onto the winch drum from the derrick. However, he failed to remove his hand before the rope turned onto the winch drum. The winch drum continued to rotate and his hand was caught under the rope and severed.

Observations

1. The weather conditions were calm and the working deck was unobstructed, dry and well illuminated.

2. The Skipper was very experienced. The method by which he used the deck winch for landing was a traditional practice in the port.

3. An emergency stop lever was located on top of the winch housing. With his hand trapped, the Skipper attempted to reach the stop lever but was forced away from it by the rotation of the winch drum.

Comment

1. The accident would have been prevented had the winch been stopped prior to removing the turn of rope from the winch drum.

2. Advice on safe practices with respect to winch operation is provided in the Department of Transport publications "Fishermen and Safety" and the "Recommended Code of Safety for Fishermen". It is specifically recommended that an operator should always leave plenty of room between himself and the winch drum.

3. The method by which the fish was being landed can be a safe one provided established and recommended practices are followed.

18. ACCIDENTS CAUSED BY FOOTWEAR

Unsatisfactory footwear has contributed to a number of accidents to crew members on board ship. The following two incidents occurred on fishing vessels but the lessons to be learnt apply equally to seafarers serving aboard merchant ships.

Narrative

Case 1

A trainee fisherman was engaged in moving net bins across the deck of a crabber while at sea. A screwdriver was located beneath one of the bins and on moving the bin, the screwdriver pierced one of the fisherman's toes. His injury required medical treatment ashore and the vessel had to abandon fishing operations and return to port. The fisherman was transferred immediately to hospital.

Case 2

A fisherman was walking along the deck of a seine netter while carrying a cup of tea. The deck was wet and the vessel was moving in a seaway. The fisherman slipped and fell to the deck, fracturing a limb as a result. He had to be evacuated by lifeboat and then transferred by ambulance to a hospital for treatment.

Observations

In **Case 1**, the fisherman was wearing training shoes. In **Case 2**, the fisherman's footwear was in poor condition.

Comment

1. In both cases, insufficient attention was given to personal safety in the prevailing circumstances and conditions.

2. Footwear should be in good condition and should be appropriate for the nature of the work being carried out. In this regard, it is recommended that fishermen should wear slip-resistant boots with protective toe caps.

3. Advice on footwear and protective clothing in general can be found in the Department of Transport publications "Fishermen and Safety", the "Recommended Code of Safety for Fishermen" and the "Code of Safe Working Practices for Merchant Seamen". By following the advice in these publications the chances of injury and, sometimes, permanent disablement can be reduced.

19. BATTERY EXPLOSION

Narrative

A 10.29 metre fishing vessel was at sea when the Skipper noticed that the main engine driven alternator was over-charging. In order to check the regulator, he stopped the main engine and entered the engine compartment. Finding nothing obviously wrong, he shouted up to his crew member to re-start the main engine. As the starter motor was energised, the battery exploded and released gaseous fumes into the immediate area. The Skipper was not injured in the explosion, but suffered from the effects of the fumes whilst getting out of the engine compartment. As a result, he was lifted off the vessel by helicopter and taken to hospital. The vessel was then towed into port by the local lifeboat.

Observations

1. The alternator regulator had failed on the previous fishing trip but a new one had been supplied and fitted. This had been tested for 4 hours prior to departure and appeared to be satisfactory.

   After the incident, the regulator was again tested and found to be a high powered type unsuited to the installed system. This resulted in over-charging of the two batteries and the generation of hydrogen and oxygen gases. As hydrogen is easily ignited in concentrations between 4% and 75% in air, either sparks generated by the action of using the electric starter motor or a short circuit in one of the battery cells was sufficient to cause an explosion and collapse of the batteries.

2. Apart from the complete loss of electrical power, the toxic fumes generated as a result of the over-charging caused the Skipper to have difficulty in breathing together with nausea, headache and dizziness. Although fortunately the effects were short lived, they did cause the remaining crew member to organise the evacuation of the Skipper ashore for treatment.

Comment

1. It is important from an operational and safety point of view, that replacement parts for any mechanical or electrical system are correctly identified, comply with the manufacturers design specification for that system and are correctly installed. Failure to follow this basic principle can result in death or injury to personnel and/or damage to both machinery and vessel.

2. It is important to remember that gases such as carbon dioxide, carbon monoxide, hydrogen and some refrigerant gases have no smell to warn of their presence. Many also require precautions to be taken against possible fire and explosion.

3. The "Code of Safe Working Practices for Merchant Seamen" is not required to be carried aboard fishing vessels but much of the advice is equally suited to all types of vessels. Chapter 24 of the code highlights the dangers associated with storage batteries and the charging process.

APPENDIX A

INVESTIGATIONS COMMENCED IN THE PERIOD 01/08/93 - 30/11/93

DATE OF ACCIDENT	NAME OF VESSEL	TYPE OF VESSEL	FLAG	SIZE	TYPE OF ACCIDENT
10.06.93	SHEROMHALIDH	Fishing Vessel	UK	9.95m	Grounding
12.07.93	KIRKELLA	Fishing Vessel	UK	58.78m	Accident to Person
21.07.93	PUTFORD ARTEMIS/ DB101	 Offshore Supply Derrick Barge	 UK Panama	 1,190 grt 32,508 grt	Collision
02.08.93	HEBRON	Fishing Vessel	UK	22.19m	Grounding
07.08.93	TERMINATOR	Pleasure Craft	UK	8m	Machinery
09.08.93	SINGAPORE BAY	Container	UK	50,235 grt	Accident to Person
17.08.93	BALAENA	Pleasure Craft	UK	8.99m	Grounding
19.08.93	LOUGH FOYLE	Research	UK	547 grt	Grounding
21.08.93	AMETHYST	Fishing Vessel	UK	13.99m	Grounding
22.08.93	CHEVENING/ WITHEYCOMBE	Passenger Passenger	UK UK	106.69 grt 54.64 grt	Collision
22.08.93	FORTH BRIDGE	Oil Tanker	UK	3,338 grt	Accident to Person
23.08.93	MATHRAKI	Oil Tanker	Greece	16,975 grt	Grounding
24.08.93	BARGE P5	Submersible Barge	Germany	2553.02 grt	Explosion
30.08.93	LORD OF THE ISLES	Ro-Ro Passenger	UK	3,504 grt	Machinery
30.08.93	UNION TOPAZ/ SUPERIORITY/ MOSA	General Cargo General Cargo General Cargo	UK UK Germany	1,543 grt 2,230 grt 1,289 grt	Collision
01.09.93	FALCON	Fishing Vessel	UK	21.69m	Accident to Person
02.09.93	FLEETWOOD MAC	Fishing Vessel	UK	9.91m	Grounding
12.09.93	STRATHGARRY	Fishing Vessel	UK	22.73m	Foundering
15.09.93	INSISTENCE	General Cargo	UK	475 grt	Machinery
17.09.93	BRUCE STONE	Oil Tanker	UK	357 grt	Contact
24.09.93	NORMANDIE BRIDGE/ EUROPEAN TIDEWAY	Container Ro-Ro Passenger	Liberia UK	48,235 grt 8,583 grt	Hazardous Incident
25.09.93	PRIDE OF WINCHESTER/ DUCHESSE ANNE	 Ro-Ro Passenger Ro-Ro Passenger	 UK France	 6,387 grt 6,812 grt	Collision
30.09.93	STENA BRITANNICA	Ro-Ro Passenger	Sweden	26,671 grt	Dangerous Occurrence
01.10.93	QUEEN ELIZABETH 2	Cruise	UK	69,053 grt	Heavy Weather Damage
08.10.93	SAVA STAR	General Cargo	Panama	2,026 grt	Hazardous Incident
17.10.93	GLEN STAR	Fishing Vessel	UK	8.30m	Foundering
20.10.93	FRAGRANT ROSE	Fishing Vessel	UK	21.03m	Flooding
23.10.93	FRAGRANT ROSE	Fishing Vessel	UK	21.03m	Accident to Person
29.10.93	IVORY ACE	Reefer	Vanuatu	10,394 grt	Dangerous Occurrence
02.11.93	HOO ROBIN/ BONNY	General Cargo Oil Tanker	UK Bahamas	794 grt 49,898 grt	Collision
02.11.93	GILSEA	Fishing Vessel	UK	9.86m	Foundering
03.11.93	GLENMORE	Fishing Vessel	UK	22.58m	Foundering

Continued **INVESTIGATIONS COMMENCED IN THE PERIOD 01/08/93 - 30/11/93**

DATE OF ACCIDENT	NAME OF VESSEL	TYPE OF VESSEL	FLAG	SIZE	TYPE OF ACCIDENT
08.11.93	OUR ZOE ANNE	Fishing Vessel	UK	28.65m	Fire
09.11.93	LUNOHODS-1	Fish Catching	Latvia	2,774 grt	Grounding
14.11.93	TERN	General Cargo	St Vincent	697 grt	Flooding
17.11.93	BORODINSKOYE POLYE	Fish Catching	Russia	3,147 grt	Grounding