

MARINE ACCIDENT INVESTIGATION BRANCH

Summary of Investigations No 1/93

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INTRODUCTION

This edition of the Summary of Investigations marks the start of our fourth year in the publication of the series. Although statistics are not included, it is interesting to note that in the last three years we have published eight editions of the Summary containing a total of 136 summaries. Of this total about two thirds relate to merchant vessels, a third to fishing vessels and a couple to pleasure craft. The terms "merchant vessel", "fishing vessel" and "pleasure craft" are used in the broadest sense. However, these figures are a bit misleading because some summaries cover more than one incident (there are two such examples in this edition), and in some incidents where two vessels are involved one might be a merchant vessel and the other a fishing vessel. The incidents covered have been very varied and deal not only with the more frequent type of accidents such as collisions, floodings, fires and accidents to persons, but also the less common such as danger from mines and a battery explosion. What they all have in common though is a lesson to be learnt, and in many instances the type of vessel or the person involved is not too important because the message contained in the summary is applicable to everybody, no matter what type or size of vessel they are sailing on. We hope to be able to continue in the same way in all future editions.

It should be well known by now that the fundamental purpose of our investigations is to determine the circumstances and the causes of accidents 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. Even so, there is still a fear in the minds of some people, not least those who have been involved in an accident which is under investigation by the Branch, that the investigation will lead to prosecution and that the declaration they have given to the Inspectors will be used in evidence against them. This Introduction is a good medium to make the position clear on this very important and sensitive matter.

Firstly, the Branch has no powers to take disciplinary action or proceed with a prosecution. We can only make recommendations to that effect and it is up to the regulatory body to take action if they consider it appropriate. We would only recommend prosecution under the Merchant Shipping Acts if our investigation determined there had been a flagrant or conscious contravention of the regulations.

Turning now to the question of declarations. Declarations are not released to a third party without the consent of the witness himself, however as in most things, there are a number of exceptions to this rule. Declarations may be produced at a Formal Investigation or a Section 52 Inquiry; they may in principle (though it is not normal practice) be used in a prosecution except when the declarant is being prosecuted; they may on request be given in confidence as background information to other authorities, for example Police or Coroners, to assist their separate inquiries; and they will have to be produced in any legal proceedings relating to the accident if the Court so requires but no answers given in declarations shall be admissible in evidence against the person giving the answers or his spouse, except in the case of a prosecution for a false declaration. It is hoped this clarifies the matter and we can only stress that the purpose of the declaration is to assist the investigation in determining the circumstances and the causes of the accident.

To conclude this slightly longer than usual Introduction, we would like to thank those people who write to us expressing their appreciation for this publication. From these letters we know that a number of shipping companies use it as part of their safety awareness programmes and maritime colleges worldwide use them as case studies for the students. This is extremely gratifying and it gives us considerable pleasure to know that our efforts to produce a publication that is both interesting and useful to the maritime world are worthwhile. There have been one or two letters which have questioned the details of specific incidents, but whether it be praise or complaint we welcome all correspondence concerning this publication.

Chief Inspector of Marine Accidents
April 1993.

1. LOSS OF DANGEROUS GOODS FROM RO-RO VESSEL

Narrative

A freight ro-ro vessel, operating in European waters, had loaded approximately 50 freight vehicles. These units were evenly distributed, between the main vehicle deck and the weather deck, several being 20 foot tank containers carrying dangerous goods. The order of loading, although under the control of the Chief Officer, was largely dependent on the availability of freight at the loading berth which led to several of the tank containers being stowed forward and outboard on the weather deck.

Shortly after departure the vessel encountered very poor weather conditions which caused her to roll heavily. After one such roll a number of the tanks containing dangerous goods broke free and fell overboard.

Observations

1. The IMDG Code advises that where tanks containing marine pollutants have to be carried on a weather deck they should be stowed inboard or in sheltered areas of the deck.
2. All the units were secured using the sizes and numbers of lashings as recommended in the "Code of Practice, Roll-on/Roll-off Ships Stowing and Securing of Vehicles".
3. The units were all properly documented and declared.

Comment

Although the units were secured as recommended in the 'Ro-Ro Code', no consideration was given to factors such as free play in vehicles suspension, free surface of liquid in tank containers and distance from roll axis of ship. All these are mentioned in the Code which strongly suggests that extra lashings, jacking up of vehicle trailers and frequent inspections were necessary, especially under the weather conditions encountered.

2. FLOODING OF TANKER'S ENGINE ROOM

Narrative

An oil tanker of 65,000 gross registered tonnage was regularly employed loading cargo at an offshore terminal. These operations required that the vessel maintained station relative to the terminal, with a Dynamic Positioning system controlling main engine and transverse thrusters. Because the sea water cooling system for the generators and main engine were becoming choked with eels, the duty engineer decided that the main sea water inlet filter required cleaning. This task involved closing the low sea water inlet valve and removing the top cover from the filter housing. This part of the operation was performed without mishap. However, in order to flush the remaining eels from the filter housing the engineer decided to crack open the low inlet valve for a few seconds. The open/close control for this pneumatically operated butterfly valve was thus put to the open position and then immediately to closed. Unfortunately the valve opened and remained open, defeating all attempts to close it using the normal controls. Water pressure prevented the refitting of the filter cover. Sea water entered the engine room, via the opened filter housing, rapidly flooded essential equipment and caused the engineers to abandon the lower levels of the engine room. As the vessel was lightly laden at the time, the flood water rose to a level only a few feet above the lower platform. There were no injuries, lives lost, pollution or any serious immediate danger to the vessel's safety.

Observations

1. Complete trust was placed on the ability of the ship's side valve to re-close after the attempted flushing operation. There must always exist the possibility that any ship's side valve may not reseal properly after being opened, due to debris etc. Where a closed ship's side valve is the only barrier between the sea and any opened up section of the sea water system, no attempt should be made to open this valve.
2. No proper attempt was made to employ the emergency bilge suction valve on one of the main sea water circulating pumps. This valve was opened but unfortunately, because the ship's side valve supplying this pump was still full open, no water was drawn from the engine room.

Comment

The proper use of the emergency bilge suction would not have prevented the ingress of water, but the flooding would have been controlled giving ship's staff time to properly assess the situation and possibly refit the filter cover. Valuable advice on the importance of ship's staff understanding the methods of operating emergency bilge suction is contained in Merchant Shipping Notice No M.788.

3. FIRE IN ACCOMMODATION OF STANDBY VESSEL

Narrative

The owners of an offshore supply vessel had converted her for safety standby duties by adding suitable and approved survivor accommodation for 250 persons. This accommodation was constructed from six cargo containers, suitably insulated and fitted out, connected together and mounted on stilts on the working deck of the vessel. Internally this module was equipped with the necessary furnishings eg blankets, seats, beds and was heated by electric space heaters. Whilst the vessel was on station these heaters were kept switched on to prevent condensation and maintain the module ready for immediate use.

Some three weeks after arriving on station to take up standby duties, smoke was discovered issuing from an air vent on the module; this was little more than an hour after a routine inspection of its interior. After isolating the electrical supply to the module, initial attempts were made to fight the fire using hoses via the access doors and air vents. Large quantities of smoke and heat rendered these attempts unsuccessful. After closing all external doors and flaps on the unit the crew maintained boundary cooling of all outside surfaces of the module until, after being relieved, the vessel arrived in port some 24 hours later. On opening the module's doors the shore Fire Brigade doused the remains of the fire. The interior of the module was very seriously damaged, although all external surfaces were unmarked.

Observations

The accommodation module was not equipped with a fire detection system; this was not a requirement at the time of the incident. The cause of the fire could not be established with certainty, but balance of opinion is that one of the electric space heaters had overheated and ignited adjacent bedding.

Comment

1. The action of the crew in ensuring that all doors and air vents to the module were closed and concentrating the fire-fighting effort on boundary cooling was correct. This action reduced the risk of injury to the fire-fighting team and probably prevented the fire spreading.
2. The nature of the module's construction allowed access to all external surfaces for the purposes of boundary cooling. Although it is recognised that such ease of access, and means of clearing surface water may not be available for many ship fires, this incident does reinforce the value of the boundary cooling technique in controlling the spread of a fire.

4. RELEASE OF BITUMEN INTO THE PUMPROOM OF A TANKER

Narrative

During a routine discharge of bitumen from a tanker, it became apparent that the filter of the port cargo pump, which was the only one in use, had become choked. In order to clean the filter, the pump was stopped and shore personnel informed; the latter then closed their manifold valve.

The Mate remained on deck to complete setting the deck lines in order to drain them back to an empty cargo tank. Meanwhile, the Second Mate and the Bosun went down to the pump room to clean the filter, which required removal of the cover. However, after about five minutes, the shore personnel decided to blow the discharge line back into the vessel, without waiting for permission from the tanker. They opened their air valve, which caused a plug of bitumen to blow back down the line.

The Second Mate and the Bosun noticed the back flow and they quickly left the pump room but the Second Mate was sprayed with bitumen before he could reach the exit ladder.

Observations

1. Bitumen is required to be heated to a high temperature to keep it fluid. When cargo pumping stops it is necessary to drain the lines before it can cool.
2. There was a failure to ensure a safe working system, in that:
 - liaison between ship and shore was inadequate,
 - there was no work planning or defined procedure for the cleaning of filters,
 - there was no proper isolation of the cargo system,
 - there was no "permit-to-work" system for this operation.

Comment

Since this accident, the tanker has reviewed the onboard permit procedures, which have now become part of the safety induction process for all Officers and Petty Officers when they join the vessel. Also a formalised procedure for the safe isolation and overhaul of the filters has been established. This includes, as a minimum, two valve segregation from any cargo system, prior to commencement of any work.

Furthermore, a series of training sessions on permits, in addition to current training schedules, has been introduced for all Officers and Petty Officers in the company.

There are two publications which are relevant to this case:

1. The "International Safety Guide for Oil Tankers & Terminals" gives details of the precautions that should be taken for the clearing of pipe and hose procedures.
2. The "Code of Safe Working Practices For Merchant Seamen", chapter 7 gives details on permit-to-work systems.

5. FIRE IN ENGINE ROOM

Narrative

A 471 gross registered tonnage submersible support vessel was at sea in rough weather under an unmanned machinery space condition when at 2340 hours, the engine room fire alarm sounded. An initial inspection showed heavy smoke in the vicinity of No 4 main engine; a closer inspection revealed that the spill line from the fuel injector on No 1 unit had fractured allowing fuel to leak onto the engine top. Movement of the vessel due to rough weather subsequently caused the oil to drop onto the exhaust trunking where ignition took place shortly afterwards.

The General Alarm was sounded, fire parties mustered and preparations made to tackle the fire using carbon dioxide and dry powder extinguishers. Because of the weather, two main engines were required for propulsion so, prior to No 4 being shut down, to enable the fire to be tackled, No 3 main engine was started, paralleled and placed on load. As a precautionary measure, a PAN message was broadcast at 0003 hours. Over the next 30 minutes, seven dry powder and five carbon dioxide extinguishers were used both to fight the fire and to cool the exhaust trunking. This trunking was covered by a protective shroud which made direct access to it difficult.

With the fire out and cooling in progress the PAN message was cancelled. It was then discovered that fuel was still being fed to the area from the broken spill pipe connection. This was brought about by the heavy rolling of the vessel causing fuel in the service tank to be forced back down the spill line. To prevent this, the spill pipe was broken further upstream and the fuel overflow diverted. Cooling of the trunking continued until the trunking thermometer recorded approximately 200°C. At this point a light water spray was played over the trunking to further reduce the temperature. A fire hose had been rigged as a backup system, but was kept in reserve due to the close proximity of electrical equipment and was only to be used as a last resort.

Subsequent investigation of the fuel system revealed that a non-return valve was fitted in the fuel supply but there was no isolating arrangement in the fuel spill line.

Observations

The well-considered actions of the crew in the circumstances illustrate the value of both crisis management and fire-fighting training. Had they taken precipitate action concentrated entirely on the fire, and failed to take account of navigational requirements, a situation might have been created whereby fire-fighting could have become considerably more dangerous and could have ended in the evacuation of the engine room.

Comment

1. Subsequent to this engine room fire, non-return valves were fitted in each spill line thus preventing fuel from "returning" back down the line.
2. Spill pipe connections are now checked for defects on a regular basis in line with the normal routine 1000 hour inspection procedures.

6. TWO INCIDENTS OF HEAVY WEATHER DAMAGE

Narrative

These heavy weather damage incidents caused damage to bridge windows, a compass binnacle and the electrical equipment.

Case 1 A 55 metre standby safety vessel with a crew of 12, was on duty to the east of Shetland, attending a platform at the time of the accident. A south-westerly force 12 wind was blowing, the vessel was at minimum speed and hove-to, with wind and sea slightly on the starboard bow. When she met a wave with an estimated height of 25 metres, she nearly climbed the wave successfully, but just before the top she slipped away to port down the wave. The wave then broke and crashed down on top of her along the full length of her starboard side. The forward bridge windows were all protected with portable steel storm shutters (with a slot to see through), but the weight of water broke some of the side bridge windows and flooded the bridge.

This had the effect of wiping out most of the bridge electrics and flooded down into the accommodation. Temporary repairs were made and the vessel returned to port safely under her own power when the weather abated.

Case 2 This incident concerned a similar size standby vessel also with a crew of 12. Whilst operating in force 10/11 conditions, and in the same area about two weeks before the above case, the vessel suffered heavy weather damage to the binnacle on the top bridge and to the starboard bridge window. The damaged binnacle led to flooding of the wheelhouse which resulted in control systems failing. The vessel was then steered from the aft steering position with command from the bridge. The window damage was caused a little later when a wave hit the side storm shutter, pushing it in until it shattered the 19 millimetre toughened glass window. Temporary repairs were made and the vessel returned to port safely under her own power when the weather abated.

Observations

Case 1 There was no other weather damage apart from the broken bridge windows. The vessel has had permanent repairs which included reducing the size of the side windows and providing them with storm shutters.

Case 2 The steel plate storm shutter was later reinforced with 75mm x 75mm angle bars to prevent the plate from distorting in the future.

Comment

Such incidents are not uncommon in vessels which, like these, are required to operate in the North Sea throughout the year in all conditions. Fortunately in these two cases, unlike some others which have occurred, there was no injury to the crew. The measures taken by the operators during repair, with checking the toughened glass thickness and the structural attachments, are all sound practices to safeguard the operation of these vessels.

It is noteworthy that portable bolt-on storm shutters are preferred to the hinged type, because of problems with the latter caused by corrosion.

7. INJURY TO CREWMAN WHILST RECOVERING A FAST RESCUE CRAFT

Narrative

A team of four crewmen were recovering an inflatable Fast Rescue Craft following an exercise when the power lifting system for the single arm derrick being used to lift the craft failed. Three of the four crewmen moved to the main starter box of the derrick in order to assess the problem. Meanwhile the fourth crewman acquired the emergency operating handle and slid it onto the gearbox operating shaft with a view to raising the boat manually. While the fourth crewman was operating this handle, one of the other three crewmen closed a contactor within the starter box. This caused the derrick motor to start, resulting in injury to the fourth crewman from the wildly spinning emergency handle.

Observations

The main starter box for the derrick motor was out of sight of the operating station for the derrick controls and so the group of three crewmen were not aware of the actions of the fourth, and vice versa. Engaging the emergency operating handle with the gearbox shaft operated a safety cut-out switch which was designed to prevent this type of accident. Closing the contactor manually at the starter box clearly bypassed the safety cut-out.

Comment

Quite clearly safety devices, in this case the safety interlock, are of little value if personnel set out, albeit inadvertently, to override their operation. Clearer communication between the members of the crew concerning their proposed actions would have helped to prevent this incident.

8. FLOODING AND FOUNDERING OF A SMALL TANKER

Narrative

A 480 gross tonnage motor tanker employed in bunkering operations within the smooth water limits of a tidal port area, was moored alongside, well trimmed by the stern with the bow approximately 10 feet from a dock wall sill at the end of the quay. The mooring ropes, consisting of a head rope (slack), forward spring (taut), aft spring (slack) and stern rope (slack), were adjusted for the night with the crew then leaving the vessel as was the port custom. The vessel was moored heading about south-south-west.

Later that evening the crew moved another vessel across the basin and secured her alongside the motor tanker. She was moored outboard with forward and aft spring ropes made fast to the tanker, stern and head ropes made fast to bollards on the quay. During the night the wind was north-easterly force 3. Low water was at 0119 hours, high water having been at about 1900 hours.

In the early hours of the following morning, the Dock Master received a report that oil pollution had occurred in the vicinity of the basin. Further investigation showed that the inboard tanker was listing to starboard with the aft end submerged and the bow above water with the knuckle of the bow resting firmly on the dock sill. The outboard tanker was afloat with her forward and aft spring ropes still attached to the inboard tanker.

The Port Authority was informed, pollution control measures were put in place and a clean up operation started. The tanker was successfully salvaged a few days later and although the engine room was thoroughly examined for the cause of the flooding, none was found.

Observations

1. From the evidence available there was no clear cause for the sinking. Flooding of the engine room by the fracture of a sea chest or similar cause was discounted after a thorough examination after salvage.
2. The tanker had been secured alongside three hours after the afternoon low tide. The Mate, in making the final adjustments to the mooring ropes had, on the one hand, to gauge how much slack to leave in the ropes in order for the vessel to cope with a 6.8 metre tidal range, and, on the other hand, gauge the forward spring tension such that the vessel would not drift onto the dock sill at high tide.

With a rising tide, and with a north-easterly wind force 3, it is likely that there would be a tendency for the tanker to drift forward towards the sill. At high tide later that evening, there would have been 1.55 metres of water over the dock wall sill. The forward draught of the tanker, known to be well trimmed by the stern, has been calculated to be 1.56 metres which means that the bow knuckle of the vessel would be capable of coming to rest on the concrete sill.

As the tide ebbed, more weight transferred to the knuckle. This theory was supported by a deep V-shaped indentation which was found at the knuckle of the bow. The stern would have descended with the tide until a point was reached when water would have flooded over the aft deck. Once this stage had been reached it was only a matter of time before the engine room and cofferdam flooded, and the vessel sank.

Comment

1. The probable cause of the sinking of this vessel was an error in adjusting the mooring ropes to take into account the high rise and fall of the tide and the close proximity of the vessel's bow to the dock sill.
2. The presence of submerged obstructions in harbour areas, such as the dock sill in this incident, should be clearly marked and suitable warning notices prominently displayed.
3. Where vessels are employed in the carriage of dangerous substances within harbour areas, owners should either ensure that at all times there are sufficient crew onboard to maintain a proper watch or that there should be adequate supervision available to maintain the safety of vessels and their cargoes.

9. FIRE IN INCINERATOR ROOM

Narrative

A passenger cruise ship was alongside in port when the heat and smoke detectors for areas, which included the garbage incinerator room, were activated. The Second Engineer was the first person to reach the incinerator room and on seeing a fire he activated the manual alarm and also telephoned the bridge to report the fire. He then returned to the fire and assisted the Storekeeper, who by now was effectively using a water fire extinguisher. A fire hose was run out and the fire extinguished.

Observations

1. The fire was caused by burning rubbish which had been blown back out of the chute to the incinerator and which ignited other waste, which had been allowed to accumulate around the chute.
2. The blow back of burning rubbish had occurred because the top lid of the chute to the incinerator and the bottom hatch were both open at the same time.
3. Although the operators had been instructed in the safe operation of the equipment, they had, for the sake of expediency, bypassed the safety interlock which prevented the lid and the hatch both being open at the same time.
4. One of the operators sustained minor burns and singed eyelashes.
5. Further instructions were given to the two operators, even though they conceded that they understood the safe and correct operations of the incinerator and the associated chute.

The two operators were disciplined to make the point that the safety interlocks should not be bypassed for the sake of expediency.

Comment

1. Any form of safety interlock is provided to ensure both safety of personnel and equipment. They should only be overridden in exceptional circumstances and when proper precautions have been taken.
2. Whenever new operators of the equipment are appointed, they are given a demonstration and instructions on how each piece of equipment is to be used, what safety precautions are necessary and how to use the extinguishing system for the space. Also included in the instructions are operating, cleaning procedures, and the protective clothing to be worn.
3. Following the incident, supervision of the area has been increased to ensure that the procedures have been understood and are in force.

10. IMPROPER LOOKOUT AND FAILURE TO OFFER ASSISTANCE

Narrative

A 10 metre fishing vessel was proceeding on a generally south-easterly course towards fishing grounds. Her Skipper was on watch. The weather was fine with good visibility. The Master of an approaching 1,600 gross registered tonnage cargo vessel, who was in charge of the navigational watch, saw the fishing vessel on his port bow. He concluded that a risk of collision existed and expected the fishing vessel to keep out of the way. The cargo vessel was on an easterly course.

When it became apparent to the Master of the cargo vessel that the fishing vessel was not taking appropriate action to keep out of the way, he altered the course of his vessel to starboard, by approximately 5°.

The cargo vessel then maintained her course and speed until the vessels collided. Fortunately, it was only a glancing contact, and although the fishing vessel sustained some damage, she was able to return to port unescorted. There were no injuries on either vessel.

Observations

1. The Skipper of the fishing vessel had failed to observe the cargo vessel until moments before the collision.
2. On first noticing the cargo vessel, immediately prior to the collision, the Skipper of the fishing vessel applied port helm and increased speed. However, this action was ineffective. In fact, the fishing vessel swung to starboard at that time.
3. Although her Master was aware of the collision, the cargo vessel continued on passage without positively determining whether or not the fishing vessel required any assistance.

Comment

1. The Skipper of the fishing vessel failed to keep a proper lookout, as required by Rule 5 of the Collision Regulations.
2. The Master of the cargo vessel, having concluded that his was the stand-on vessel, failed to take action that would best aid the avoidance of a collision, as required by Rule 17(b) when it was apparent to him that the fishing vessel was not taking action. An alteration of course of 5° was grossly inadequate. He also failed to make the sound signals required by Rule 34 of the Collision Regulations, to indicate his doubt to the fishing vessel.

3. The sudden starboard alteration of the heading of the fishing vessel immediately prior to the collision was probably due to the effects of hydrodynamic interaction between the vessels, which overrode the effects of the port helm action and increase of speed.
4. The Merchant Shipping Act 1894 requires the Master or person in charge of a British vessel involved in a collision to stand by the other vessel until he has ascertained that the other vessel has no need of assistance. For non-UK vessels, there is a similar obligation in the International Convention on Collisions of 1910.

11. UNATTENDED WINCH CONTROLS

Narrative

A fishing vessel was landing her catch of fish using her own derrick and winch. The winch drum had been set to rotate at constant speed throughout the landing operation. The Skipper was handling the rope fall on the winch. One of the two deckhands was deployed in the hold; the other on the quay.

In order to hoist a fish box from the hold to the quay, the Skipper was applying two turns of the rope fall around the winch drum. On landing the box, he removed the turns which allowed the rope to be guided back into the hold, ready for securing to the next box.

During one of the hoists, the Skipper decided to remove one of the two rope turns so that he could surge the rope on the winch drum more readily. However, he was concerned that, whilst removing a turn from the winch drum, there was a risk of the fish box dropping and striking the deckhand who was working in the hold. In order to avoid such a risk, while removing the turn he held onto that part of the rope which was leading onto the winch drum from the heel block of the derrick.

The remaining turn was still tight on the drum and the Skipper failed to remove his hand before the rope turned onto the winch drum. His hand became trapped between the rope and the winch drum and was severed above the wrist.

Observations

1. After his hand became trapped, the Skipper was unable to reach the local winch control lever with his other hand.
2. A remote winch control lever was located in the wheelhouse. However, the wheelhouse was unmanned at the time of the accident.

Comment

1. The accident would have been avoided had the Skipper stopped the winch prior to removing the turn of rope from the winch drum.
2. The winch could have been immediately stopped if either of the two control positions had been independently manned.
3. The way the landing operation was being conducted would have been acceptable had the Skipper been standing in a position from which he could quickly stop the winch by the local control. In this particular case he was not, so one of the winch control positions should have been manned as advised in "Fishermen and Safety". This booklet also advises against standing too near a winch when using a rope on a warping drum.

4. The "Fishermen and Safety" booklet is published by the Department of Transport and is available, free of charge, from Marine Offices and Fishing Vessel Survey Offices.

12. LOSS OF A FISHING VESSEL DUE TO FLOODING

Narrative

A 40 year old wooden hulled trawler was operating, with a crew of three, some 30 miles from land in good weather conditions. As was the Skipper's practice in fine weather, the engine room hatch was left open to improve ventilation. On passing this open hatch one of the crew noticed excessive water in the engine room. Although equipped with an immersible automatic electric bilge pump and an alarm, these had both failed to operate. Fortunately another fishing vessel in the area was able to stand by and indeed towed the flooded boat for a short while. Portable pumps transported by helicopter, and another pump from a survey vessel, failed to control the flooding and the vessel sank. There was no loss of life.

Observations

1. The cause of the flooding proved impossible to establish with any certainty, mainly because the extent of the flooding prevented proper inspection of the engine room by the crew. However, the suspected cause of failure of the bilge pump and bilge alarm was the poor siting of their electrical junction boxes, allowing water to enter. Unfortunately neither of these junction boxes was watertight. Because of the limited lengths of the cables supplied with these units it had proved convenient to fix these boxes very low in the bilges.
2. The problem of engine room flooding was also aggravated by the lack of any watertight bulkheads on the vessel, so that flooding extended over the full length of the vessel very quickly.

Comment

The standard lengths of cables supplied with any electrical equipment cannot possibly suit all of the installation configurations that are likely to be encountered. When, as a result, it is not possible to site junction boxes or any other connection in the circuit well above the bilges, it is essential that such fittings are watertight.

13. ACCIDENT TO DECKHAND IN BEAM TRAWLER

Narrative

A 35 metre beam trawler working in the North Sea was hauling her gear. It was observed that the gear on the starboard side was fouled by a small anchor and some rope caught round one of the chain bridles by which the warp is joined to the beam. To clear this, the derrick was topped, the beam was brought alongside, and some weight was put on the warp so that it would be kept taut while the work was being carried out. The warp was rove through the lower sheaves of a 10 tonne double-purchase block which in turn was secured to the derrick by the quick-release tackle; this was rove through the upper sheaves and a block at the derrick head, with one end of the wire led to a winch and the other shackled to the derrick. The hard eye at the shackle was spliced with an aluminium ferrule, (see diagram and photograph).

As the warp was being tensioned under winch power, the quick release wire parted and the double-purchase block fell to the deck, striking a member of the crew. Fortunately it did not fall directly on him; nonetheless he suffered injuries which required him to be evacuated by helicopter and to receive several days treatment in hospital followed by a long convalescence.

Observations

1. The vessel's Skipper and crew acted correctly when the accident occurred in seeking medical advice by radio and, as internal injury was suspected, restricting treatment to keeping the man as comfortable as possible until the helicopter arrived with a doctor on board.
2. Inspection of the wire showed that it had broken near the ferrule splice at the eye by which it was shackled to the derrick. In the region of the break there was severe local corrosion and a number of broken wire strands.
3. The probable causes of the corrosion and damage to the wire are, firstly that when fishing is in progress and the derrick in the operating position, the quick-release gear is in the "splash zone" and therefore very susceptible to accelerated corrosion; secondly, in the course of operation the blocks can come close up to one another. In this situation, the aluminium ferrule securing the thimble eye may cause the wire to be bent rather than led into the sheave, which can result in kinking and possibly lead to strand fracture.

Comment

1. The combined effects of corrosion and damage to the wire seriously reduced its tensile strength, so that an applied load normally within its capability caused overloading and fracture.

2. The particularly severe environment to which beam trawling gear is subject indicates that frequent examination and regular maintenance is especially necessary. A record of such work is helpful in ensuring that **no** items are overlooked.
3. In such a rig **as** described here, a "traditional" splice has the advantage of greater flexibility when compared with one finished with a ferrule.



View of double purchase block in normal position with new quick release wire fitted. Note: the ferrule has been replaced by a "traditional" splice.

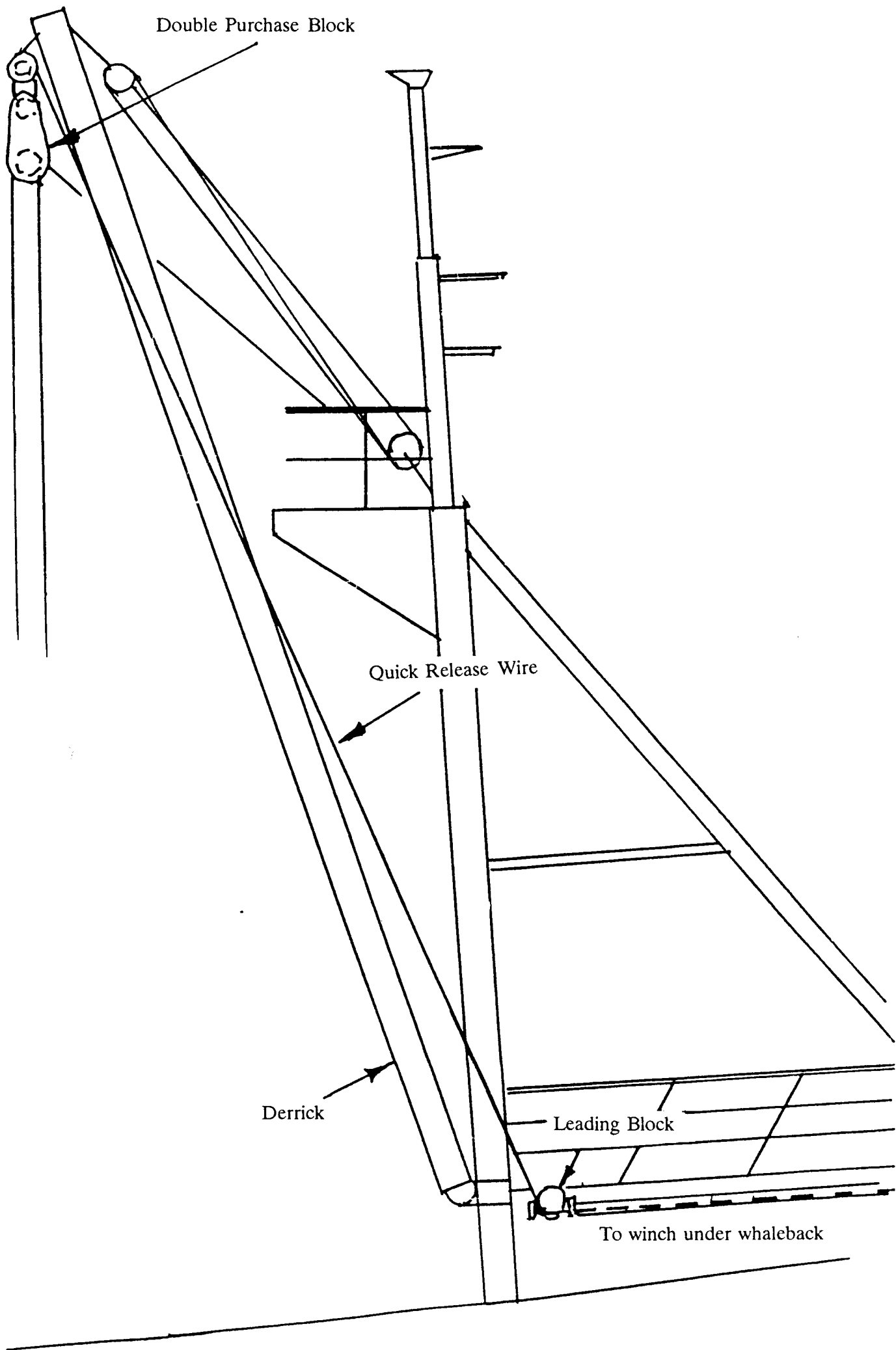


DIAGRAM OF STARBOARD DERRICK

14. LOSS OF FISHING VESSEL DUE TO ENGINE ROOM FIRE

Narrative

This 1972 built, UK registered fishing vessel was propelled by the main engine driving a variable pitch propeller through a fixed reduction gearbox with a generator driving from the forward power take off point. An auxiliary engine drove a generator and fire pump from the aft end and a generator, bilge pump and hydraulic pumps for the trawl gear from the forward end. A five gallon fuel service tank, supplied from port and starboard bunker tanks was fitted between the two engines and below the auxiliary engine.

After shooting the gear and starting to trawl, the Engineer, on a routine inspection of the engine room, discovered smoke and flames forward in the vicinity of the hydraulic pumps and noticed a ruptured hydraulic hose adjacent to the auxiliary engine exhaust. He was unable to shut down the auxiliary engine, but he managed to release the contents of one dry powder extinguisher in the general direction of the fire before leaving the engine room.

Although electrical power was still generally available, the supply to the radio equipment failed. Attempts to fight the fire using the electric fire pump also failed as by this time the main engine had been stopped and with it, the generator. No attempt was made to operate the emergency fuel tank trips at this time.

Approximately 15 minutes after the discovery of the fire all six crewmen retreated to the deck and after closing the vents, Halon gas was released into the engine room. The emergency fuel tank "shut down" controls had been fitted under a seat in the galley and as this space was by now full of smoke, attempts to operate the controls were abandoned.

About 15 minutes after the Halon had been released into the engine room, the crew abandoned the vessel and boarded two liferafts carrying with them the emergency portable radio.

Visibility was poor. It was cold. There was heavy rain and the crew had very little warm clothing. The portable radio was operated continuously but without response and it was two hours before the distress flares were seen by another fishing vessel and the crew rescued.

A multi-purpose supply vessel arrived and fought the fire on the vessel which by now had been burning for approximately eight hours, finally bringing it under control some three hours later. The vessel was taken in tow but again fire broke out and despite further attempts at fire fighting by the supply vessel, the fishing vessel eventually sank.

Observations

1. The cause of the fire was the failure of an unshielded hydraulic hose in close proximity to the auxiliary engine exhaust.
2. The siting of the emergency fuel stops in a rather inaccessible position within the confines of the superstructure and in an area susceptible to smoke from an engine room fire effectively prevented their operation and in all probability provided a fuel source for the fire. Early action in isolating all sources of fuel supply which could feed the fire was not taken and, indeed, did not seem to occur to the crew until some 15 minutes after the fire had started.
3. The emergency batteries for the radio equipment were sited in the engine room and the early failure of the electrical supply to the radio prevented an immediate call for assistance and could be considered as the major reason for the loss of the vessel.
4. The fixed Halon fire extinguishing system might have been more effective if used as soon as the initial attempt to fight the fire failed. Smoke was reported to be entering the galley continuously even though the fire vent flaps had been shut. Leaks of this magnitude suggest that effective sealing of the engine room to enable the Halon gas to operate successfully did not, and could not, take place.
5. The failure of the emergency portable radio to successfully transmit calls to the local Coastguard and vessels in the immediate vicinity resulted in a two hour delay in the rescue operation; in other circumstances this failure could well have proved fatal.

Comment

1. The installation of hydraulic hoses in close proximity to a hot surface, in this case the auxiliary engine exhaust, without the provision of shielding in the event of hose failure is an aspect which is specifically identified in the Merchant Shipping Notice No M.1456.
2. The fitting of flexible hoses carrying high pressure oil is covered in the same 'M' notice which also highlights the importance of the Manufacturer's recommendations on shelf and service life of hoses.
3. The remote emergency closing valves on the fuel tanks should be located outside the deckhouse of fishing vessels not provided with internal structural fire protection and in a readily accessible position which should be clearly marked.
4. The radio batteries should be sited outside the engine room to reduce the possibility of damage caused by fire or water.

5. Emergency portable radios should be regularly tested and maintained - a point specifically made in the Merchant Shipping Notice No M.917.
6. The case further illustrates the need for effective fire fighting training and underlines the requirement that all new entrants to the industry and candidates for Certificates of Competency undergo an approved training course on fire fighting.

15. FLOODING OF A FISHING VESSEL'S ENGINE ROOM

Narrative

During fishing operations, the engine room bilge alarm of a 23 metre fishing vessel operated. Inspection of the engine room revealed that the main sea inlet pipe to bilge pumps had failed due to corrosion. The sea cock to this line was shut off but, as the line was used to prime the bilge pumps, difficulty was then experienced in bringing the bilge pumps into operation to pump out the engine room. As a precautionary measure, a portable pump was requested from the Coastguard. The vessel subsequently reached port with no further problems.

Observations

The bilge alarm operated properly giving the crew sufficient time to identify the cause of the flooding and allowing them access to close the corresponding sea cock in order to control the flooding; the sea cock was not yet below floodwater level.

Comment

This case clearly demonstrates the value of an operational bilge alarm. However, regular inspections of the engine room piping system might have revealed symptoms of corrosion, or other defects, in the sea water line before failure occurred.

16. FISHING VESSEL COLLISION CAUSED BY POOR LOOKOUT

Narrative

A trawler was towing on a north-westerly course at a speed of 2 knots. The wind was south-south-westerly force 3 and the visibility was 2 miles. The sun was rising to the south-east. A second fishing vessel was heading towards fishing grounds on an east-north-easterly course at a speed of 9 knots. The two vessels were approaching each other so as to involve a risk of collision.

The Skipper of the trawler observed the other vessel both visually and by radar and determined that his was the stand-on vessel. He became concerned that the other vessel was not taking appropriate action to keep out of the way and unsuccessfully attempted to communicate with her by VHF radio. He then summoned his crew by sounding the general alarm and applied full starboard helm in an attempt to avoid a collision.

The bow of the other vessel struck the port quarter of the trawler. The colliding vessel then started to make water forward and a MAYDAY was transmitted. Rescue services landed salvage pumps on the vessel to reduce the rate of flooding. A liferaft was successfully inflated and secured alongside the holed vessel as a precautionary measure. She was subsequently towed to port. The trawler sustained some damage to her deck but was able to proceed to port unescorted.

Observations

1. The watchkeeper on board the colliding vessel failed to detect the trawler, either visually or by radar, prior to the collision although her wheelhouse windows were clear, her radar was operating satisfactorily and the trawler was exhibiting the appropriate navigation lights for a vessel engaged in trawling.
2. The watchkeeper on the colliding vessel was listening to a commercial radio station at a sound level above that of the main engine.
3. The colliding vessel was exhibiting the appropriate navigation lights for a power-driven vessel under way, but she was also displaying a daytime signal for a vessel engaged in fishing.

Comment

1. A proper lookout was not maintained aboard the colliding vessel. Rule 5 of the Collision Regulations states:

"Every vessel shall 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."

2. The watchkeeper on the colliding vessel did not hold a Certificate of Competency and had not attended any training courses in navigation. Although this was not a mandatory requirement on this particular vessel, Merchant Shipping Notice No M.1190 draws attention to the fact that fishing vessel casualties still occur where the man in charge of the watch is seriously deficient in his knowledge of navigation and of the Collision Regulations. The Notice recommends that advantage should be taken of voluntary courses covering those subject areas which are offered by nautical colleges.
3. The colliding vessel was wrongly displaying a daytime signal for a vessel engaged in fishing when proceeding as a power-driven vessel. This contravened Rule 26(e) of the Collision Regulations.
4. The Skipper of the trawler failed to indicate, by sound signals, his doubt as to whether any action was being taken by the other vessel to avoid a collision. However, the watchkeeper on the colliding vessel would probably not have heard such signals above the sound of the radio to which he was listening.
5. The Skipper of the trawler took appropriate action when he concluded that a collision could not be avoided by the action of the give-way vessel alone. However, he could have taken earlier action in compliance with Rule 17(a)(ii) of the Collision Regulations.
6. Although the altitude and direction of the sun are not considered, in this incident, to have been contributory factors to the collision, there may be other situations in which they might impair the keeping of a proper visual lookout. The availability of window shades or sunglasses would be a useful aid at such times.

17. SINKING OF TWO SMALL BEAM TRAWLERS WITH LOSS OF LIFE

Narrative

Two small beam trawlers were lost in separate tragic accidents whilst fishing.

Case 1 A steel hulled beam trawler of 11.28 metres registered length with a crew of three was fishing about seven miles from the coast. She trawled two different grounds in the company of a larger beamer. At about 0230 hours the last communication between the two vessels was made; there was no reference to any problems. At that time there was a long swell.

It was reported that at about 0500 hours the wind had increased to force 8/9, producing a rough sea and heavy swell. The larger trawler tried to make contact with the smaller one by VHF at 0800 hours, but without success. Assuming the latter had returned to port, no further attempt was made to contact her. When she was reported overdue, a major search was initiated but only some flotsam including lifebuoys and a liferaft were found. No bodies were recovered.

Case 2 A new steel hulled beam trawler of 9.75 metres registered length with a crew of three was on her third fishing trip. At about 0100 hours while lifting the cod end of the nets, the vessel capsized and later sank. Two of the crew managed to swim to the surface after capsize and climb onto the hull for a while. When the hull sank they held onto boards and a lifebuoy until a passing yacht picked them up, some two and a half hours later. The third crew member lost his life; his body was later recovered from the wheelhouse of the wreck by a diver. The vessel was subsequently raised, and an analysis of stability carried out.

Observations

Case 1 This hard chine hulled vessel had undergone extensive conversions. The for'd wheelhouse had been removed and a new wheelhouse built and fitted aft. The fishing gear and winch, plus the main engine were all renewed. From reports, this vessel was well converted and maintained. However, as with many vessels of under 12 metres there was no knowledge of her stability and she was not surveyed by a qualified surveyor on completion of the extensive conversion.

The weather forecast had been accurate in predicting the poor weather.

Case 2 The vessel was originally designed as a stern trawler but was built and fitted out for beam trawling. Salvage of the wreck showed that the cod ends contained sea weed, sand and mud. After the vessel had been salvaged she underwent an Inclining Test and her stability was measured. From this it was clear she had insufficient reserve of stability to lift the loaded cod ends.

The crew were not experienced in the operation of twin beam trawling.

In neither case was the vessel provided with an Emergency Position-Indicating Radio Beacon (EPIRB) and in Case 2 no liferaft was carried. While such equipment is not mandatory for vessels of less than 12 metres length at present, its provision is strongly recommended.

Comment

Case 1

1. When severe weather is forecast, vessels of this size should head for shelter.
2. When vessels undergo extensive conversions a stability check should be made before going to sea.
3. If this vessel had been fitted with an EPIRB, the Coastguard would have initiated a rescue operation on receiving the alarm .

Case 2

1. Had the vessel undergone an Inclining Test after being built and before going to sea, it could have been established that much more permanent ballast was required to be fitted. As she was under 12 metres in length there is no Departmental requirement for such a test. However, Merchant Shipping Notice No M.989 does provide guidance on safety aspects to Owners, Skippers, Boatbuilders, and Designers.
2. Twin beam trawling has particular hazards. When a Skipper intends to undertake fishing of this nature, it is wise for him to first gain experience with a crew who are well used to this type of fishing.
3. If this vessel had been fitted with an EPIRB and a liferaft, the Coastguard would have initiated a rescue operation on receiving the alarm . In addition, the crew would have had a liferaft to use. It is fortunate that this accident occurred during summer months as these men may not have survived in a cold sea in winter.

APPENDIX A

INVESTIGATIONS COMMENCED IN THE PERIOD 01.11.92 - 31.03.93

| DATE OF ACCIDENT | NAME OF VESSEL | TYPE OF VESSEL | FLAG | SIZE | TYPE OF ACCIDENT |
|------------------|--|-------------------------------------|-------------------|-----------------------|-------------------------|
| 11.07.92 | EBEN HAEZER/ KVITSJOEN | Fishing Vessel Fishing Vessel | UK Norway | 34.96m - | Collision and Contact |
| 18.09.92 | MY PARTNER/ ANKE EHLER | Fishing Vessel General Cargo | UK Germany | 9.30m 2,642 grt | Collision and Contact |
| 03.11.92 | RONA II/ WELSH VENTURE | Fishing Vessel Oil Tanker | UK Panama | 16.39m 151,127 grt | Fire and Explosion |
| 04.11.92 | DANRYAN | Fishing Vessel | UK | 10m | Foundering and Flooding |
| 05.11.92 | SIR WINSTON CHURCHILL | Other | UK | - | Accident to Person |
| 15.11.92 | PRIDE OF BATH | Pleasure Craft | UK | - | Accident to Person |
| 16.11.92 | RIVER SHANNON | Oil Tanker | Gibraltar | 1,566 grt | Fire and Explosion |
| 24.11.92 | DAVID ANDREWS | Tug | UK | 54 grt | Listing/Capsizing |
| 29.11.92 | PAGANINA | Fishing Vessel | UK | 9.02m | Foundering and Flooding |
| 06.12.92 | BENAIHA | Fishing Vessel | UK | 22.64m | Foundering and Flooding |
| 23.12.92 - | PUTFORD SNIPE/ GAS PLATFORM AMOCO 49/27C | Offshore Supply Platform | UK Unknown | 762 grt - | Collision and Contact |
| 05.01.93 | BRAER | Oil Tanker | Liberia | 44,989 grt | Machinery |
| 06.01.93 | TRONDENES/ UNKNOWN | Ro-Ro Other Cargo Pleasure Craft | Norway Unknown | 223 grt - | Machinery |
| 06.01.93 | STEPHANIE JANE/ OSA VOYAGER | Fishing Vessel Offshore Supply | UK UK | 19.05m 1,057 grt | Collision and Contact |
| 10.01.93 | SNIPE | General Cargo | St Vincent | 699 grt | Stranding and Grounding |
| 17.01.93 | STENA HIBERNIA | Ro-Ro Passenger | UK | 7,836 grt | Heavy Weather Damage |
| 23.01.93 | HAVKONG | Liquid Gas Carrier | Bermuda | 34,577 grt | Hazardous Incident |
| 24.01.93 | LOCHEARN | Fishing Vessel | UK | 18.90m | Foundering and Flooding |
| 27.01.93 | PUTFORD SKUA | Offshore Supply | UK | 807 grt | Fire and Explosion |
| 06.02.93 | AFON LAS | Tug | UK | 43 grt | Accident to Person |
| 09.02.93 | HOO PRIDE/ BRITANNIA HARVESTER | General Cargo Standby Vessel | UK UK | 794 grt 433 grt | Collisions and Contacts |
| 11.02.93 | LOCH DUNVEGAN/ GLENFYNE | Ro-Ro Passenger General Cargo | UK Isle of Man | 549 grt 299 grt | Collision and Contact |
| 16.02.93 | RESEDA/ HMS CORNWALL | Fishing Vessel Naval Craft | UK UK | 10.67m - | Collision and Contact |
| 16.02.93 | CONNAUGHT III | Fishing Vessel | UK | 21.40m | Foundering and Flooding |
| 16.02.93 | LIA-G | Fishing Vessel | UK | 14.37m | Listing\Capsizing |
| 18.02.93 | PREVAIL | Fishing Vessel | UK | 20.30m | Foundering and Flooding |

Cont.

INVESTIGATIONS COMMENCED IN THE PERIOD 01.11.92 - 31.03.93

| DATE OF ACCIDENT | NAME OF VESSEL | TYPE OF VESSEL | FLAG | SIZE | TYPE OF ACCIDENT |
|-----------------------------|---------------------------|-------------------------------------|---------------|---------------------|-----------------------------|
| 19.02.93 | OLIVE ANN | Fishing Vessel | UK | 21.31m | Foundering and Flooding |
| 20.02.93 | MORAY ENDURANCE | Fishing Vessel | UK | 21.50m | Heavy Weather Damage |
| 21.02.93 | NORQUEEN/ ST PETER | Ro-Ro Other Cargo Fishing Vessel | Finland UK | 6,850 grt 32.79m | Collision and Contact |
| 27.02.93 | BREAKSEA/ TOURMALET | Oil Tanker Fishing Vessel | UK France | 992 grt - | Collision and Contacts |
| 28.02.93 | FREJA SVEA | Oil Tanker | Bahamas | 52,500 grt | Stranding and Grounding |
| 02.03.93 | CHARLYNNE II | Fishing Vessel | UK | 15.10m | Foundering and Flooding |
| 08.03.93 | HESPERIAN | Fishing Vessel | UK | 11.75m | Foundering and Flooding |
| 25.03.93 | HERITAGE | Fishing Vessel | UK | 9.90m | Foundering and Flooding |
| 25.03.93 | KINGFISHER | Fishing Vessel | UK | 6.10m | Listing and Capsizing |
| 28.03.93 | CAM SENTINEL/ THAROS | Standby Vessel Semi-Sub Vessel | UK UK | 499 grt - | Machinery |
| 29.03.93 | ST ROGNVALD | Ro-Ro Other Cargo | UK | 2,645 grt | Heavy Weather Damage |

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