

## Summary of Investigations No 1/95

April 1995

## INDEX

	Page No
Introduction	
1. Engine Room Fire whilst Alongside	1
2. Fundamental Errors cause Stranding of Small Cargo Vessel	3
3. Attempted Removal of Access Covers causes Injury to Crew Members	5
4. Chlorine Gas Escape from Swimming Pool of Passenger Vessel	6
5. Potential Danger of Water Based Mud	7
6. How <u>Not</u> to Plan and Conduct a Passage	8
7. New Seaman Injured during Cargo Operations	10
8. Injury due to Incorrect Wiring of Dough Roller Safety Guard	11
9. Occupants of an Angling Vessel thrown into the Water without Life-jackets	12
10. Unsafe System of Work causes Serious Injury to Fisherman	14
11. Two Crew are Injured during Winch Operations	16
12. Flooding of An Elderly Wooden Fishing Vessel	18
13. Unsafe Practice during Hauling	19
14. Fishing Vessel Backfloods through its Bilge Pumping System	21
15. Incorrect Operation of Bilge Pump leads to Loss of Fishing Vessel	22
16. Watertight Bulkhead Saves Fishing Vessel	23
17. Accident to Deckhand when Shooting Pots	24
18. Fatalities due to Cordage not Fit for Use	25
19. Failure of Bilge Alarm leads to Loss of a Fishing Vessel	26

Appendix A - Investigations Commenced in the Period 01/12/94 - 31/03/95

Appendix B - MAIB Priced Publications available from HMSO

Appendix C - HMSO Stockists and Distributors Overseas

## INTRODUCTION

This edition of the Summary of Investigations marks the start of the sixth year of this publication. Including this latest edition we have now published 15 editions which contain over 260 case studies. Some readers might have copies of every edition, while others possibly will only have the later ones. However, looking back over the past editions one of the things which is immediately obvious is that little has changed over five years. A very large proportion of the accidents are still due to failures to observe the basic principles of seamanship, and in many cases a lack of commonsense. It would be wrong to think that all accidents could be prevented but a very great number would not have occurred if only people had given some thought to the job in hand and the likely consequences of what could go wrong. There is a lot of truth in the maxim "To fail to plan is to plan to fail".

All of us make mistakes some time or another and I regret to say we did so when publishing the last summary of investigations - No 3/94. Case study number 5 - "Obstruction at Tidal Berth Causes Pollution" - was included by mistake. The investigation into the accident in question has not been finalised and the "comments" are not strictly valid. When the investigation has been completed we will include a revised summary in a future edition of Summary of Investigations. We apologise for any problems this may have caused readers.

Chief Inspector of Marine Accidents

April 1995

# **1. ENGINE ROOM FIRE WHILST ALONGSIDE**

## **Narrative**

This 6,009 gross registered tonnage refrigerated cargo vessel was undergoing various voyage and damage repairs whilst in drydock. Amongst those repairs was the requirement to remove a number of damaged shell bottom plates and floors underneath the engine room.

At approximately midnight, the night shift were removing a shell plate by burning along a shell seam from the underside of the vessel. This shell plate formed part of a double bottom tank, several plates of which had already been removed. As the burner was working on the seam, a loud bang was heard from within the tank right above where he was working. The chargehand, who was observing the burning operation from the dock bottom, immediately stopped the burning. Seeing flames within the vessel he tried to put out the fire with an extinguisher which was at hand. However thick black smoke rapidly built up and he decided to leave the dock bottom.

Having told one of his men to ring for the Fire Brigade, the chargehand together with another man, rushed on board, each carrying a fire extinguisher. On reaching the engine room the smoke was so thick that entry was impossible through the engine room door. The ship's staff managed to enter the engine room via the tunnel escape trunk and attacked the fire initially with fire extinguishers, then with a fire hose.

Once the fire was out and the engine room had been cleared of smoke, the seat of the fire was found to be centred around two access manholes to the tank being repaired. Two burnt out plastic containers plus rags were found in the area as well as a quantity of oil and water.

## **Observations**

1. Prior to the start of the work on this double bottom tank, the tank had been gas freed and a "Safe for Hot Work" certificate issued. A fire watch was operative externally but did not extend to the engine room space immediately above the hot work site.
2. On investigation, the fire was found to have started forward of the aft engine room bulkhead in the immediate tank top area above the lub oil tank under repair. No damage was found to either the tank or the internal pipes and no internal debris was found.
3. The two plastic containers with their tops cut off had most probably contained slops from the tank cleaning that had been carried out prior to the burning operation. Rags drenched in oil and water together with a variety of charred tins were found in the immediate vicinity of the tank access manhole.

4. Most probably the fire was ignited by sparks from the burning operation shooting through the manhole and dropping onto either oil soaked rags or the fluid in the open top containers.

*Comment*

1. It is important that a fire watch and fire patrols cover not only the immediate area where hot work is taking place, but also those areas adjacent.
2. The cause of the fire was bad housekeeping on the part of the persons employed to carry out the tank cleaning. All waste material and fluids should have been removed from the area and all fluids placed in sealed containers on completion of the shift. These and other precautions are identified in Chapters 2 and 13 of the "Code of Safe Working Practices for Merchant Seamen". Similar guidance will be found in the HSE Approved Code of Practice relating to Safety in Docks and the Docks Regulations 1988.

## **2. FUNDAMENTAL ERRORS CAUSE STRANDING OF SMALL CARGO VESSEL**

### **Narrative**

A general/bulk cargo ship of 794 gross registered tons left Whitstable shortly after midnight bound for Le Havre. She was in ballast with a maximum draught of 2.45 metres. Her speed in this condition was 8 knots. On clearing the harbour the Master took the first watch. After about two hours the Mate took over the watch, at which time the vessel was about to alter course off North Foreland Lighthouse. The new course to make good was 151°(T) which would take the ship between Gull and Goodwin buoys and clear 0.5 nm NE of the Goodwin Knoll Bank (see chart extract). The wind at the time of the alteration of course was NE'y 5 and the spring tide was ebbing giving a predicted set of 035°(T) x 1.5 knots.

It was the Mate's intention to navigate by pilotage techniques, steering gyro courses between visual sightings and radar detections of the buoys en route. The radar was set on the 6 mile range. The vessel was also equipped with a Phillips AP Navigator which worked from the Decca system. Visibility from the wheelhouse was restricted due to spray and the vessel was rolling heavily.

The Mate allowed a total of -6° on the course of 151°(T) for the resultant effects of wind and tide. The course steered was not noted in the ship's deck log. The first buoy should have been sighted within 20 minutes after the alteration of course. However, the Mate did not see this buoy or any of the other buoys expected visually or on the radar, neither did he attempt to use any other method to establish the ship's position. The Mate allowed this situation to continue for an hour until eventually he felt the ship run aground.

The vessel had stranded on the Goodwin Sands and was "high and dry" by the following low tide. The vessel was eventually refloated on the next rising tide. There was no damage to the ship, no injury to personnel and no pollution resulted from the accident.

### **Observations**

1. The Mate had a 1st Mate's (FG) Certificate, 20 years experience in the Limited European Trade and, in all likelihood, had been using visual estimated positions from buoys and lights as the main or sole basis for navigation for many of those years. He qualified in 1966 and had not undertaken any formal training or updating since that time.
2. The choice of course to pass within 0.5 mile to the North of the Goodwin Knoll Bank in strong NE'y winds was imprudent especially when considering the restricted visibility from the wheelhouse under those conditions.
3. The Master left no written or verbal "night orders" before he left the bridge. Although this may not have contributed directly to the incident it is considered indicative of the general relaxed approach to formal bridge and navigational procedures.

4. The Master decided that, due to a heavy workload on the previous day, no watch rating would be required on the bridge.
5. In the 24 hours prior to the stranding the Mate had been able to sleep for an aggregate of about 7 hours over three different periods.

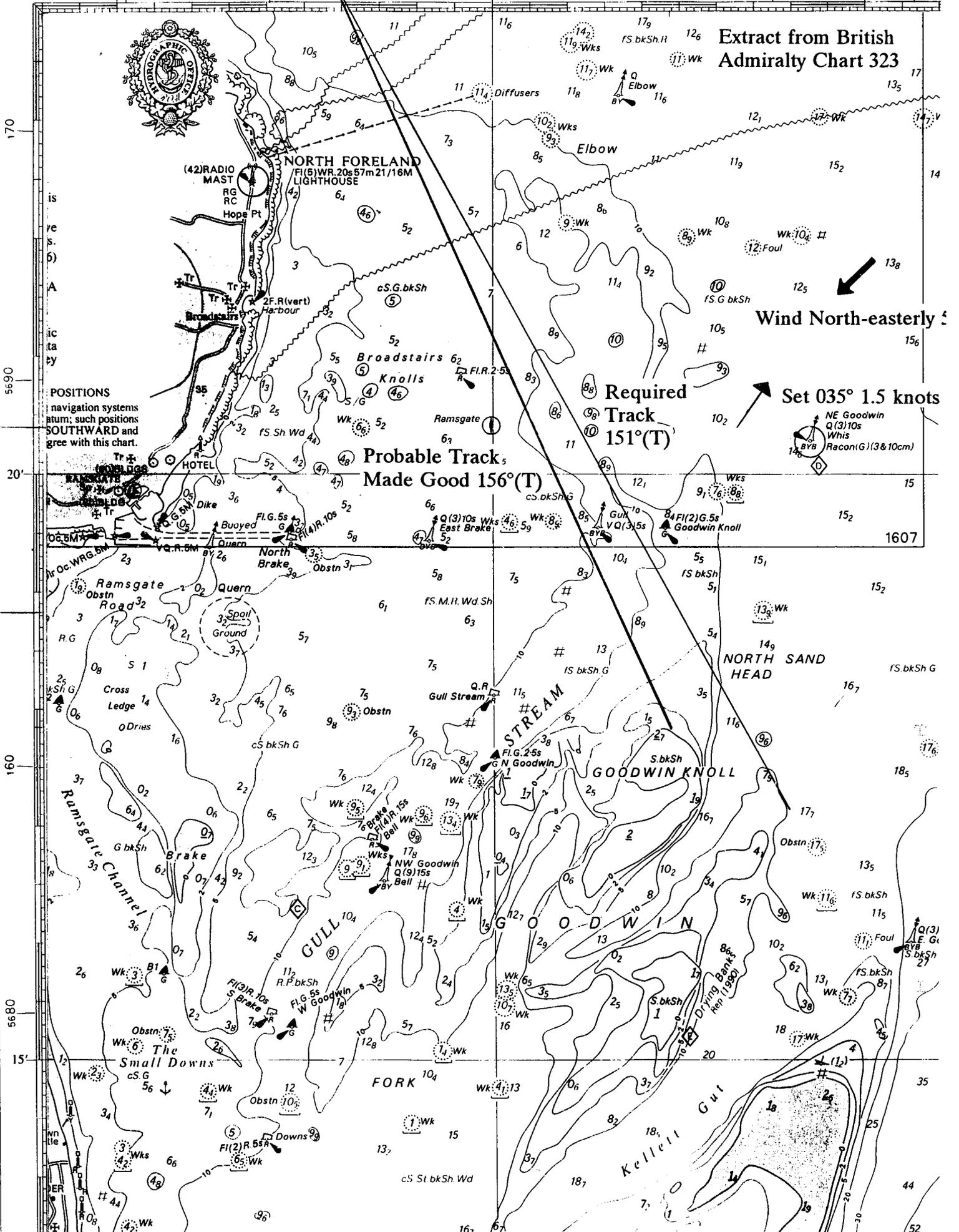
*Comment*

1. This incident shows how important the fundamental rules for good navigational watchkeeping practice are and how, if good simple procedures are in place, potentially hazardous incidents can be avoided. For example:
  - A second person on the bridge would have helped in sighting and identifying navigational marks. Schedule 1 of the Merchant Shipping (Certification and Watchkeeping) Regulations 1982 refers.
  - Night Orders may have highlighted the particular dangers to be expected and thus ensured a greater degree of vigilance. (Merchant Shipping Notice No M.1102).
  - Positively fixing the ship's position by any means which were available and preferably by more than one of those means or, if for any reason this was not possible, estimated positions plotted on the chart, would have indicated the potential for grounding. (Merchant Shipping Notice No M.854 para 21 and Merchant Shipping Notice No M.1102 para 20).
  - Calling the Master when a navigational mark is not seen by the expected time or when having difficulty in fixing the ship's position, is a prudent and sensible practice which should have been followed on this occasion. (Merchant Shipping Notice No M.1102 para 24).
  - Passage planning with proper consideration of the forecasted wind and tidal streams would have highlighted the potential hazard that the choice of course provided. (Merchant Shipping Notice No M.854).
  - Ensuring that the officer of the watch was properly rested before coming on watch would have helped ensure fitness for duty. Schedule 1 of the Merchant Shipping (Certification and Watchkeeping) Regulations 1982 refers.

The provision of any one of these procedures would have greatly reduced the likelihood of stranding. The fact that none of these procedures were in place made the event almost inevitable.

2. In addition, in connection with the poor standard of navigational watchkeeping shown, Merchant Shipping Notice No M.1328 draws attention to the "Small Vessels' Navigation and Radar Training Courses" which are run by nautical colleges.

Extract from British Admiralty Chart 323



POSITIONS  
navigation systems  
return; such positions  
SOUTHWARD and  
agree with this chart.

Probable Track 5  
Made Good 156°(T)

Required Track  
151°(T)

Wind North-easterly

Set 035° 1.5 knots

### **3. ATTEMPTED REMOVAL OF ACCESS COVERS CAUSES INJURY TO CREW MEMBERS**

#### **Narrative**

Two incidents occurred on separate vessels, which resulted in injury to crew members. They both involved the attempted removal of inspection or access covers to tanks.

In one case a Chief Officer slackened an ullage port dog during the loading of a small tanker whilst venting of the P/V valves could clearly be heard. The pressure within the tank caused the ullage lid to blow open and eject the flame gauze into the Chief Officer's face.

The second case involved the removal of the securing nuts of an access cover to a bulk carrier's ballast suction well which had been isolated for several months. Internal pressure had accumulated in this well, probably due to the leaking of compressed air from the remote contents gauging system. The crewmen removed all the securing nuts on the cover and then, in order to free the cover from its joint, struck it with a hammer. The cover freed suddenly and was projected upwards by the air pressure within the well, breaking the hammer which struck and injured the crewman's ribs.

#### **Observations**

These two cases provide a clear demonstration of the large quantities of energy which may be present in gases at even modest pressure; energy which may suddenly be released once the gases are free to escape to atmosphere.

#### **Comment**

Guidance on the testing of enclosed spaces and systems for pressure, before securing bolts of covers or joints are fully removed, is contained in the "Code of Safe Working Practices for Merchant Seamen".

#### **4. CHLORINE GAS ESCAPE FROM SWIMMING POOL OF PASSENGER VESSEL**

##### **Narrative**

The swimming pool area of a passenger vessel was reopened to passengers after being closed overnight. The normal backflushing procedures were followed during which a quantity of chlorine gas escaped into the pool area affecting the pool attendant and some passengers. Immediate medical attention was available and all affected persons quickly recovered.

##### **Observations**

1. For the purpose of maintaining hygienic conditions the water in the swimming pool was regularly dosed with sodium hypochlorite; this was the source of the chlorine gas.
2. The management and crewing of the vessel had changed shortly before this incident suggesting that the crew were unfamiliar with the idiosyncrasies of the pool's pumping, filtration and chemical dosing systems.

##### **Comment**

1. The vessel's managers have taken steps to ensure that passengers are prevented from entering the pool area when pumping or chemical dosing operations are likely to cause a release of chlorine.
2. Modifications were made to the chemical dosing system to ensure thorough mixing, so preventing the accumulation of pockets of chemicals.
3. Also, tests for chlorine content of the water are to be performed on a routine basis with clear reporting procedures of the results. During these tests the system will be shut down and the area cleared of personnel.

## **5. POTENTIAL DANGER OF WATER BASED MUD**

### **Narrative**

An offshore supply vessel backloaded a cargo of water based mud from a mobile drilling rig. The cargo was loaded into tanks and circulated during the return passage to port. When alongside, the tank hatches were opened and discharge of the mud commenced.

After approximately one hour, a representative of the consignee boarded the vessel and noted the Mate leaning over the hatch coaming of a tank that was being drained. He advised the Mate not to do so because the cargo was contaminated and was liable to give off hydrogen sulphide gas at a concentration level of 5 ppm.

### **Observations**

1. The cargo was not manifested and the vessel had received no documentation stating that the water based mud was contaminated.
2. It was normal practice to have the tank hatches open during discharge in order to be able to readily monitor the quantity of cargo remaining in the tanks.

### **Comment**

1. Although water based mud is not classed as a hazardous cargo, it can sometimes be contaminated with hydrogen sulphide gas.
2. The short and long term exposure concentration limits for hydrogen sulphide gas are 15 ppm and 10 ppm respectively.
3. Although the concentration of gas was apparently below the above limits, the vessel should have been provided with formal written documentation specifying that the mud was contaminated and would give off hydrogen sulphide gas at a concentration of 5 ppm. A safety data sheet for the gas should have also been supplied.
4. Unless there is a clear justification for not doing so, all bulk liquid cargoes should be loaded, carried and discharged under closed conditions.

## **6. HOW NOT TO PLAN AND CONDUCT A PASSAGE**

### **Narrative**

A 2,333 gross registered tonnage stern trawler/fish factory vessel was awaiting orders and anchored to seaward of the island of Bressay, Shetland at position A. Her Master received orders to move his vessel to another position, B, about three miles to the north-west in the northern approaches to Lerwick Harbour (see chart extract). It was a fine day with a slight sea and good visibility.

It was the Master's intention to take his vessel past the northern tip of Bressay, steer a westerly course for about two miles and then turn to the north towards position B, leaving The Brethren rocks to starboard. He proposed to do this by visual pilotage. The Second and Third Officers were with the Master on the bridge, the Second Officer monitoring the radar and the Third Officer on the wheel.

On passing Score Head, the Master saw an island on the port bow and conned the vessel to pass it to port at a distance of about half a mile. A little later, the Second Officer fixed the position from the radar and marked it on the chart.

As the vessel approached Green Holm, the Master asked the Second Officer how far they would pass from "the island". On being told "two or three cables", he ordered an alteration of course to starboard to increase the passing distance. Shortly afterwards the echo sounder showed rapidly decreasing depths and a further turn to starboard was made. The vessel then grounded heavily on Nive Baa rocks.

### **Observations**

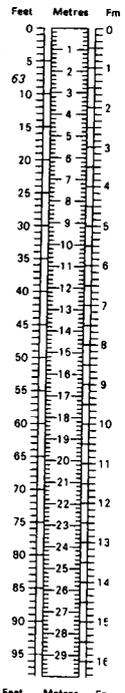
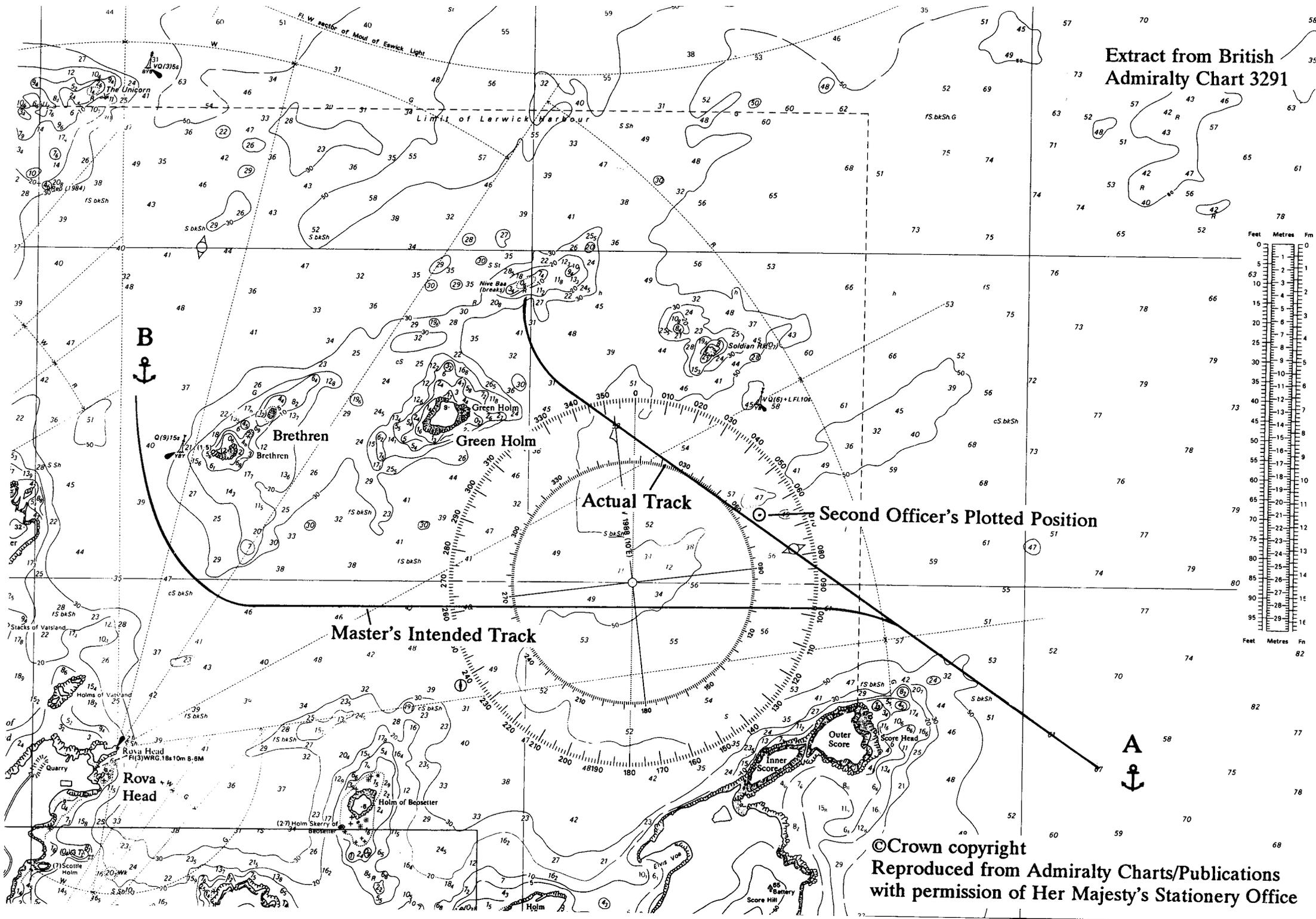
1. The Master had taken Green Holm to be Holm of Beosetter. The Second Officer assumed, from the position he plotted, that the Master intended to pass between Green Holm and Nive Baa. So far as he was concerned, the vessel was very close to what he took to be the intended track. For this reason, the Second Officer did not see it necessary to draw the Master's attention to his plotted position.
2. The vessel was refloated on the following tide but there was extensive bottom damage, fortunately without pollution. Although the Master had decided which route he intended to take, he had not revealed his plan to the Second Officer.

### **Comment**

1. This accident would probably not have happened if, before starting the passage, the Master had laid off his intended track on the chart and shown it to the Second Officer.

2. **The Master should then have given explicit instructions to the Second Officer as to what he expected him to do during the passage. For example, to monitor the position at frequent intervals and notify him if the vessel was not keeping to the planned track. Merchant Shipping Notice No M.854 includes a comprehensive guide to the planning and conduct of passages. The following comments in the preamble to the Notice are relevant to this accident: "Accidents happen because one person makes the sort of mistake to which all human beings are prone in a situation where there is no navigational regime constantly in use which might enable the mistake to be detected before an accident occurs".**

Extract from British Admiralty Chart 3291



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## **7. NEW SEAMAN INJURED DURING CARGO OPERATIONS**

### **Narrative**

A Ro-Ro cargo vessel was engaged in loading operations while alongside in port. A trailer was reversed into the corner of the vehicle deck, leaving a small clearance between the rear of the trailer and a side frame. The trailer was then raised in order to position a supporting trestle underneath it. During this operation, the trailer rolled backwards and trapped the leg of a seaman, who had moved into a position between the trailer and the frame, in readiness to commence lashing.

### **Observations**

1. The seaman had just joined the vessel.
2. The management company has indicated that all new seamen are to be instructed to keep well clear of trailers until authorised by a competent person to move in and commence lashing.

### **Comment**

1. As the seaman was new to the vessel, he should have been properly supervised.
2. Section 4.6.13 of the "Code of Safe Working Practices for Merchant Seamen" highlights the importance of informing a new crew member as soon as possible after he boards, of the occupational safety arrangements and of the particular hazards associated with the vessel. It also advises that older hands should be reminded of the need to maintain a high level of safety consciousness and to set a good example to the less experienced crew member.
3. Section 2.14 of the Roll-on/Roll-off Ships - "Stowage and Securing of Vehicles - Code of Practice" advises that no attempt should be made to secure a vehicle until it is parked, the brakes, where applicable, have been applied and the engine has been switched off.

## **8. INJURY DUE TO INCORRECT WIRING OF DOUGH ROLLER SAFETY GUARD**

### **Narrative**

A cook was using a powered dough roller to prepare some pastry in the galley.

The machine consisted of a powered horizontal belt running between two rollers. A third roller was situated over this belt at mid length; this roller could be adjusted so that the gap between the belt and roller suited the required thickness of the dough. The dough could be rolled out by placing it on the belt and starting the belt drive so that the dough was forced between the belt and the third roller. Belt direction would then be reversed and operation repeated with a smaller clearance between the belt and the roller until the desired dough thickness was achieved.

Control of the direction of belt's movement was altered by way of a guard attached to a directional switch. This guard was also designed to prevent the operator's hands from being trapped between the belt and roller. Thus, in operation it was intended that the converging belt/roller was covered by the guard and the diverging belt/roller area was unguarded. The tendency for objects to be dragged in between belt and roller should thus have been prevented.

This type of operation was being performed by the cook when his hand was dragged between the roller and the belt.

Inspection of the machine immediately established that the combined switch/guard operated incorrectly. It was wired in such a way as to require the guard to cover the outlet from the roller/belt rather than the inlet area. The machine had been wired in this fashion when it was installed in the ship several years previously. Correct operation was swiftly restored by rewiring the switch.

### **Observations**

1. Clearly no proper assessment had been made of the safety requirements of this machine and the persons using it.
2. Further, no functional tests had been performed during any electrical safety checks on the machine.

### **Comment**

The operator of this machine, or his supervisor, should have had the manufacturer's operating instructions available to him. Without such information the operator may have had insufficient knowledge to operate the machine safely and to recognise defects in its operation.

## **9. OCCUPANTS OF AN ANGLING VESSEL THROWN INTO THE WATER WITHOUT LIFE-JACKETS**

### **Narrative**

An 8.3 metre glass reinforced plastic motor vessel left harbour with eight anglers and the Skipper on board early one October morning. The wind was NW3 but a moderate sea was running and visibility was good. The vessel anchored approximately 1 mile offshore for the anglers to fish. Later on when the anchor was being retrieved, the anchor rope fouled the propeller, causing the vessel's stern to swing into the sea.

Working through a trunk in the deck over the propeller the Skipper managed to cut the anchor rope away. When he had finished this he felt that the vessel was floating deeper in the water and was somewhat down by the stern. The engine cover was removed and a large amount of water was found to be present in the bilges. The electric bilge pump was started and the manual bilge pump put into operation. Flares were set off and while the Skipper was broadcasting a MayDay to the Coastguard the boat went down steeply by the stern, temporarily trapping him in the wheelhouse.

The flares were seen by a pilot cutter and by a small pleasure boat and these two boats rescued everyone from the water. All survivors were taken by ambulance to hospital and later discharged.

### **Observations**

1. The cause of the initial flooding has never been identified, but it is thought likely that the stern gland may have been damaged by the fouled anchor rope.
2. Due to the suddenness with which the vessel sank all the persons on board were thrown into the water without life-jackets.
3. It is very fortunate that there were boats nearby to render assistance within 10 to 15 minutes of the survivors entering the water. With the sea temperature at about 10 °C, unconsciousness amongst some of the survivors could have been expected after about 30 minutes in the water and deaths from hypothermia may have followed after a further 30 minutes.
4. There was no bilge alarm fitted and the electrical bilge pump had to be switched on from inside the wheelhouse, as it did not operate automatically from a float switch. The boat was already low in the water before it was realised that it was flooding, which left little time either to stem the flooding and save the boat or to abandon it in an organised manner.
5. The boat was not carrying a liferaft. Fortunately all survived, but it might have been a different story if help had not been immediately to hand.

*Comment*

1. If the vessel had been equipped and operated to the minimum standard specified in "The Safety of Small Commercial Motor Vessels - A Code of Practice" a bilge alarm would have been fitted, a liferaft would have been carried and life-jackets would have been readily to hand and consequently the danger to the lives of the occupants would have been significantly reduced.
2. The organisers of sea angling trips should be aware of the potential dangers inherent in such trips. These dangers can be minimised if they charter properly manned and equipped vessels. Vessels which are not certificated or licensed should be avoided.

## **10. UNSAFE SYSTEM OF WORK CAUSES SERIOUS INJURY TO FISHERMAN**

### **Narrative**

A deckhand was seriously injured whilst working in the enclosed factory deck on board a stern freezer trawler. He fell through an open hatch into the fish hold. Prior to his accident, the deckhand was alternating between two working positions. One position was located on a closed section of the forward fish hold access hatches, the other was on a closed section of the after fish hold access hatches, which remained open during the processes of freezing, boxing and stowing the fish. These access hatches had a coaming height of 0.27 metre and were not fenced nor guarded in any way.

The accident occurred when the deckhand, moving from the after working position to the forward one, was stepping up onto the closed access hatch cover, across the corner of the open section. His foot slipped and he fell sideways and backwards through the open hatch into the fish hold, falling a distance of about 4 metres. He sustained injuries to his head and fractures to his ribs and vertebrae. At the time of the accident the weather was fine and the sea calm with little or no motion on the vessel.

### **Observations**

1. The immediate cause of this accident is obvious, the deckhand slipped whilst attempting to access his working position close to an unfenced/unguarded open hatch. However the underlying and fundamental cause of this accident and of many others that occur on fishing vessels, was the failure of the management ashore to see that the Skipper and Mate on board devised and enforced a safe system of work, as part of their wider responsibility to ensure that the vessel was operated in a safe and proper manner.
2. There are Health and Safety regulations relating to the fencing of hatches on fishing vessels, but these do not apply to a fishing vessel at sea.
3. The system of work for this deckhand did not take account of the serious danger to his safety posed by the unfenced open hatch to the fish hold. Although there were no applicable regulations requiring the fencing of these access hatches, the danger they posed when open was obvious and the circumstances of this accident were easily foreseeable.
4. The investigation of working practices on the factory deck revealed other equally obvious dangers for which the system of work took no account. The accident to this deckhand should have alerted the management and the Skipper to the weaknesses in their systems of work and stimulated a thorough review. Some consideration was given to fencing the hatches but this was rejected for various reasons. The result was that other deckhands, who subsequently performed the task of the injured man, were subjected to exactly the same degree of danger as had caused this accident. The vessel was eventually taken out of service by the operators, for commercial reasons.

## *Comment*

1. It is recognised that fishing is a dangerous occupation and that in respect of many of the dangers to which fishermen are exposed, much depends on the care and vigilance of the individual if accidents are to be avoided. However this does not excuse management, Skippers and Mates who ignore obvious dangers in their working practices, where those dangers could have been substantially reduced with a little more thought and care.
2. As part of the legal duty to operate vessels in a safe and proper manner, management and Skippers have a responsibility to devise and enforce safe systems of work on board their vessels. This requires a rational assessment of the risks of injury and a positive approach to finding ways to reduce such risks. If this is not done the safety of fishermen will depend entirely upon their own vigilance and care, in which case inexperience, loss of concentration and/or 'contributory negligence' will eventually take its toll, as demonstrated by this avoidable accident.
3. Section 31 of the Merchant Shipping Act 1988 places a duty on the owner to take all reasonable steps to ensure that the vessel is operated in a safe manner. Section 27 of the Merchant Shipping Act 1970, as substituted by Section 32 of the 1988 Act, imposes a duty on the Skipper (or any person employed on board) 'to preserve any person on board from death or serious injury'. Failure to discharge any of these duties is a criminal offence.
4. The Department of Transport publication 'Fishermen and Safety' is a guide to safe working practices for fishermen. It includes advice about working near hatches. This booklet is free of charge and can be obtained from the Marine Safety Agency in Southampton or from any MSA District Marine Office.

## **11. TWO CREW ARE INJURED DURING WINCH OPERATIONS**

### **Narrative**

A 15.6 metre, wooden, shelter decked, stern trawler had just stopped fishing to haul the gear. The weather and sea were calm. There were four in the crew: the Skipper was in the wheelhouse, the winchman was operating the winch inside the shelter and the two deckhands were aft by the gallows.

Using the winch, the warps were hauled through a block on each of the gallows. As the nylon towing pennants, which were still attached to the warps, approached the blocks the deckhands called to the winchman to stop hauling.

Unfortunately, the winchman did not hear the commands to stop hauling and both deckhands were caught between the towing pennants and the gallows. The deckhand at the port gallows was able to duck out from under the towing pennant but he received a cut above his eye in the process. The deckhand at the starboard gallows was not as fortunate: he was pinned against the gallows by the towing pennant before the winch was stopped and suffered a broken collar bone, cracked ribs and bruising to the chest.

The casualties were evacuated by helicopter to hospital.

### **Observations**

1. It is clearly a poor layout design which results in the winchman having a restricted view of the aft gallows.
2. The deckhands had approached the gallows to unhook the towing pennants without taking the precaution of waiting to see the warp stop, and by doing so had placed themselves in a dangerous position.
3. Both casualties suggested that similar accident could be avoided by "standing well out of the way until the towing pennants have been brought up to the blocks".
4. This accident could very easily have resulted in fatalities.

### **Comment**

1. The factors relating to this accident are well covered by the recent Merchant Shipping Notice No M.1561 "Dangers from Winches, Machinery and Fishing Gear". The following relevant advice is contained in that notice:

- **DO** keep well clear of all running gear.
- **DO** ..... maintain a reliable communication system between the wheelhouse, winch control positions and the working deck.
- **DO NOT** stand .... in a bight or within the line of leads of a wire.

2. **A hands-free intercom/tannoy system would improve communications between the winch operator and crew working on the aft deck.**
3. **An emergency stop button for the winch located on the aft deck might have prevented this accident.**

## **12. FLOODING OF AN ELDERLY WOODEN FISHING VESSEL**

### **Narrative**

A 50 year old wooden fishing vessel with a crew of five was operating about 40 miles from land. The sea was moderate and the wind was decreasing to force 5 - 6. The flooding started in the fish hold area but as there were no watertight bulkheads between this space and the engine room both spaces flooded to a depth of about a metre. The vessel's bilge strum boxes choked which resulted in the bilge pumping system being ineffective. The Coastguard was alerted, and a rescue helicopter took a portable pump to the flooded vessel. The pumping operation was successful and she was escorted safely into harbour.

### **Observations**

1. On checking the records, this was the third incident of flooding to this vessel within four years.
2. It was considered by more prudent fishermen that the Skipper of this elderly fishing vessel was operating her at too high a speed in these conditions.
3. The cause of flooding was loss of caulking from between the hull planking in way of the fish hold.

### **Comment**

1. The Skipper should have remembered that his first responsibility is the safety of his crew.
2. Operators of elderly wooden vessels may consider the carriage of a portable self-contained diesel driven pump to be a useful back-up.
3. Because so many of this type of vessel are lost, serious consideration should be given to making the bulkhead between the fish hold and engine room as watertight as possible.
4. The 'Do's' and 'Don'ts' which may help to prevent fishing vessels being lost through flooding are set out in Merchant Shipping Notice No M.1327.

### **13. UNSAFE PRACTICE DURING HAULING**

#### **Narrative**

Two separate incidents resulted in hand and wrist injuries to fishermen engaged in hauling operations. Both of the vessels concerned are about 20 metres registered length and used for stern trawling from an aft gallows.

The general practice on such vessels is as follows:

During hauling operations two crew members are stationed at the gallows, one at either side and another is positioned at the forward winch. The two trawl warps are simultaneously heaved on their respective sides via an upper gallows block then a lower gallows block to the winch. After the trawl doors are secured to the gallows, the winch is used to heave the bridles. Each bridle consists of a single sweep, leading from the trawl door to a swivel connection, and a double sweep, leading from the swivel connection to the mouth of the trawl net.

On the two vessels concerned the single sweep is normally heaved on board until the swivel connection reaches a position between the upper gallows block and the stern. Hauling is then stopped and any apparent twists in the double sweep are removed by manually turning the swivel after which hauling is resumed. However, there is a tendency for the double sweep to twist as it passes through the lead block system to the winch. In order to prevent the twists travelling back along the double sweep and so closing the mouth of the net, any twists which appeared at the roller of the upper gallows block are removed by manually separating the two parts of the double sweep as they pass over the stern towards the block.

In each of the two cases, one of the two fishermen who were engaged to remove the twists inadvertently delayed the removal of his hand, which resulted in it becoming trapped between the two parts of the double sweep and being drawn into the block. Fortunately, in both cases the winch operator had a clear view of the fisherman and was able to prevent further injury by stopping and then reversing the winch.

#### **Observations**

1. The practice of untwisting the double sweep while it was in the process of being heaved on board was common on both vessels.
2. In the first case, the fisherman was very experienced in the hauling operation and put the cause of his accident down to a lapse of concentration. In the second case, the fisherman was very inexperienced and was not being properly supervised.

*Comment*

1. The practice of manually separating the two parts of the double sweep while it is in the process of being heaved on board is unsafe. The alternatives to this practice would be to stop hauling before attempting to untwist the ropes or to accept the consequences of twisted ropes, eg increased rope wear and restriction of the net mouth.
2. In both cases, only the prompt action of the winch operator prevented what could have been a much more serious outcome.
3. Appropriate advice on safe working practices with winches is provided in the "Fishermen and Safety" booklet and in Merchant Shipping Notice No M.1561.

## **14. FISHING VESSEL BACK FLOODS THROUGH ITS BILGE PUMPING SYSTEM**

### **Narrative**

A 23 metre steel fishing vessel with four persons on board was 25 miles out to sea. The wind was force 5 and freshening and a 2 metre swell was running. At 0400 hours the engine room bilge alarm sounded and water was found to be up to the tail shaft. The engine driven bilge pump was started but the water level continued to rise. When it had flooded over the engine room floor plates the pump was stopped and the bilge and sea valves closed. After this was done the level of flood water stopped rising.

The vessel was pumped dry using the manual bilge pump and she was escorted back to port by the local lifeboat.

### **Observations**

1. After the vessel returned to port the bilge system was inspected. The engine room bilge valve shared a chest with the deck wash sea valve. It was established that the valve lid of the engine room bilge suction valve had disintegrated and fallen into the bilge suction pipe. This had caused a partial blockage of the suction pipe, thus preventing the bilge from being properly pumped out.
2. It was the practice on this vessel to maintain slightly open the sea suction valve on the deck wash pump valve chest, even when trying to pump bilges. Thus, water from within this chest was able to bypass the damaged bilge valve lid, and into the engine room bilge, both when using the deck wash system and when pumping bilges.

### **Comment**

Vessels have been lost due to back flooding through the bilge pumping system. In this case the Skipper acted correctly and saved his vessel by stopping the pump and closing all sea valves. Merchant Shipping Notice No M.1327 advises fishermen to "close all sea valves (and other valves controlling the inlet and outlet of water through the hull) when the cause of the flooding is not known or cannot be controlled".

## **15. INCORRECT OPERATION OF BILGE PUMP LEADS TO LOSS OF FISHING VESSEL**

### **Narrative**

A steel hulled fishing vessel of 21.4 metres length was operating as a pair trawler in the North Sea with a crew of six . Due to mechanical difficulties this vessel, and its partner vessel, decided to head for port in order to obtain spares. After several hours steaming the Skipper noticed that the vessel was rather low in the water. Inspection established that substantial amounts of water were in both the engine room and fish hold. Attempts to use the bilge system to pump out the vessel proved ineffective and the Skipper decided that the vessel should be abandoned. All of the crew safely transferred to the partner vessel with the aid of a liferaft.

The flooded vessel sank several hours later.

### **Observations**

1. The normal practice employed for pumping bilges on this vessel included keeping the sea suction to the bilge pumps partly open. The object of this practice was to prime the pumps and to ensure the pumps did not run dry.
2. It is common practice on many fishing vessels to allow bilge pumps to be left running without close supervision. Maintaining an open sea suction is a method of preventing the pumps from overheating if and when the bilges become dry.
3. In this incident the sea suction was left partly open while attempting to pump out the vessel.

### **Comment**

1. Clear advice on the proper use of bilge systems is contained in Merchant Shipping Notice No M.1327. In particular it advises that the sea suction on a bilge pump should be closed after the pump is primed and running.
2. Keeping the sea suction open to a bilge pump, when attempting to clear bilges, must reduce the rate at which water is removed from the bilges; of the total quantity of water being pumped some is coming from the sea and some from the bilges. In a flooding emergency it is essential to pump at the maximum possible rate from the bilges. This can only be done if no water is being drawn from the sea; the sea suction must therefore be closed.

## **16. WATERTIGHT BULKHEAD SAVES FISHING VESSEL**

### **Narrative**

A 16 year old, 16 metre wooden fishing vessel with a crew of five was found to be taking water in her fish hold. The fish hold was approximately half full of water. Weather conditions were winds force 6, seas rough.

The engine driven bilge pump was started on the fish hold but this soon choked on debris. Pumping operations continued with a hand pump and the Skipper alerted the Coastguard. Two portable pumps were lowered to the vessel by helicopter and the crew put these into operation. It took 3 hours to pump the vessel dry.

The vessel was taken to a nearby harbour for repair. Curiously, while she was alongside the quay for a week waiting to be slipped for examination and repair, she remained quite dry.

### **Observations**

1. The precise cause of the flooding has not been determined. However, three possible sources for water entry were identified: (i) a faulty non-return valve in the fish hold hand pump overboard discharge - which is just at the waterline; (ii) solid waste jamming open the non-return valve to the fish hold bilge suction; (iii) missing caulking in the hull side just above the waterline in way of the fish hold.
2. That the vessel survived this serious flooding incident is almost certainly because she was fitted with a watertight bulkhead between the engine room and the fish hold. The watertight bulkhead restricted the flooding to a manageable level. Although the current regulations do not require that watertight bulkheads are fitted to wooden fishing vessels, the owners of this vessel were prudent enough to have this done. Their prudence has been rewarded and the crew and vessel are safe. They have also saved themselves a considerable amount of money by this modest investment.
3. The vessel was not fitted with a bilge alarm. This has now been remedied and both the fish hold and the engine room have been equipped with them.
4. The Skipper of the vessel commented that from now on he would ensure that the fish hold is to be kept clean and free of any loose bits of wood, spare fish papers and other rubbish.

### **Comment**

Several of the lessons to be learnt from this accident are already covered by Merchant Shipping Notice No M.1327 "Losses of Fishing Vessels Through Flooding". It is recommended that all crew members of fishing vessels should make themselves familiar with the contents of this notice, a copy of which can be obtained from any local Marine Safety Agency office.

## **17. ACCIDENT TO DECKHAND WHEN SHOOTING POTS**

### **Narrative**

A 10 metre potter was operating in calm seas. At the time of the accident pots were being shot away. The deckhand was aft lifting the pots onto the gunwale and letting them go as the rope became taut. The wind was light and the sea calm.

Several pots in the current string had been passed over the side. The deckhand was holding the next pot in the sequence on the gunwale. Unfortunately it fell off onto the aft deck. When the rope to this pot became taut the pot was lifted and jammed between the bulwark and the fish hold hatch coaming and the deckhand's leg was trapped between the pot and the fish hold hatch cover.

The Skipper cut him free and had him airlifted to hospital. His leg was crushed but no bones were broken.

### **Observations**

1. The deckhand appeared to have a well thought out system for organising the pots and ropework to minimise the risks involved in shooting. However, as this case unfortunately shows, shooting pots is a hazardous operation requiring total concentration on the part of the operator.
2. One means by which the operation can be made safer is to contain the pot ropes by pound boards to a channel down the side of the vessel. By this means the crew are completely separated from the pot ropes.

### ***Comment***

If the ropes had been contained by pound boards which formed a channel down the side of the vessel, it is unlikely that this accident would have occurred as the pot would have been prevented from falling back inboard by the pound boards.

## **18. FATALITIES DUE TO CORDAGE NOT FIT FOR USE**

### **Narrative**

#### **Case No 1**

A 60 metre stern trawler while at sea in calm conditions was hauling her net when it was discovered that the net was entangled around the cod end rope. To untangle the net the cod end rope was stoppered off to a post at the transom and the winch was slackened off. Seven of the crew took about 15 minutes to clear the net, but before all of them had left the working area a loud bang was heard. The cod end rope and net ran freely over the aft end under the weight of the net in the water. One of the crew members received a fatal blow on the head from a joining shackle in the cod end rope.

#### **Case No 2**

A 23 metre fishing vessel was alongside the pier discharging her nets ashore prior to being slipped for a refit. All six crew were employed in the project. Part of the net was ashore and to lay out the remainder, a hauling rope was fixed using leading blocks. After re-positioning the blocks for a second pull, a block secured to a handrail broke free, striking and killing a fisherman employed under the Youth Training Scheme.

### **Observations**

1. The cause of both tragic accidents was the failure of ropes. In the first incident the stopper rope broke and in the second incident it was the rope securing the block to the handrail.
2. In both cases the quality of the rope selected for taking heavy loads was inadequate.
3. In the second incident, unfortunately the casualty was standing within the bight.

### **Comment**

1. Some guidance on the care of ropes can be found in section 15.4 of the "Code of Safe Working Practices for Merchant Seamen".
2. A decision on whether a rope is, or is not, fit for further use must be based on its condition and if any defects have been observed during an examination. The examination should only be undertaken by someone who knows what defects to look for and how to look for them.
3. It is strongly recommended that a length of rope which has been found to be defective should be cut into short unusable lengths to prevent any possibility of it being returned to service accidentally.

## 19. FAILURE OF BILGE ALARM LEADS TO LOSS OF A FISHING VESSEL

### **Narrative**

A 23 metre steel fishing vessel was operating in the North Sea with a crew of five. After shooting the gear the crew remained on deck for about one and a half hours gutting and stowing the fish. Having completed this work the crew placed their wet clothes in the engine room, then made tea or went to bed. The Skipper remained on duty in the wheelhouse. About an hour after the crew had turned in he noticed the vessel's lights flickering. On going into the engine room to investigate he found water to a level above the floor plates.

After the crew were alerted and the Coastguard contacted for assistance, attempts were made to pump out the engine room using the vessel's own pumps but this proved futile. The Skipper decided to abandon the vessel due to the depth of the floodwater and the nature of the vessel's rolling. All five men took to one of the vessel's liferafts and the vessel capsized approximately five minutes later. The crew were safely recovered by a Coastguard helicopter about an hour later.

### **Observations**

1. No signs of flooding were observed by the crewmen when they placed their wet clothes in the engine room to dry, about an hour before the discovery of the flooding. It is therefore concluded that the rate of flooding must have been rapid.
2. Although the vessel was equipped with a high level bilge alarm, it failed to operate during this incident.
3. No clear cause of the flooding has been established but, due to the implied rate of flooding it is speculated that part of the engine cooling water system failed.

### **Comment**

1. Whatever the true cause of the engine room flooding, a fully operational bilge alarm would have given the crew a very much earlier indication of flooding, possibly giving them time to identify, and even to rectify its cause.
2. The advisability of testing bilge alarms regularly and having their audible function switched on is covered in Merchant Shipping Notice No M.1327, together with other sensible advice on action in the event of flooding.