Report of the investigation into

the capsize of the fishing vessel

DONNA M

off the coast of the Orkney Islands with the loss of two lives

on 31 August 1999

Extract from

The Merchant Shipping

(Accident Reporting and Investigation)

Regulations 1999

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

CONTENTS

GLOSSARY OF ABBREVIATIONS

FISG	-	Fishing Industry Safety Group
GRP	-	glass reinforced plastic
kg	-	kilogram
LOA	-	length overall
MAIB	-	Marine Accident Investigation Branch
MCA	-	Maritime and Coastguard Agency
MGN	-	Marine Guidance Note
m	-	metre
mm	-	millimetre
SAR	-	search and rescue
SW	-	south-west

GLOSSARY OF TERMS

capsize	-	a roll to starboard or port caused by a loss of stability which leads to a vessel turning onto its side or inverting. A capsize is normally followed by foundering
cat catcher	-	a platform overhanging the stern for stowing gear
creel	-	pot used for catching prawns, crabs and lobsters
founder	-	to fill up with water and sink
free surface	-	the tendency of a fluid to shift with the motion of a vessel, a large free surface can lead to capsize
jury-rig	-	a temporary or makeshift arrangement, which has been rigged to replace a piece of equipment that has failed or been lost
stern gland	-	the seal around the propeller shaft

SYNOPSIS

The accident occurred during the afternoon of 31 August 1999, and the Marine Accident Investigation Branch (MAIB) was informed late that evening. MAIB inspector Richard Barwick carried out the investigation.

Donna M was fishing for crabs and lobsters off the island of Sanday in Orkney. The weather was calm and the visibility good.

When she did not return to her home port when expected, a search was mounted. The next day the body of the skipper was discovered, but the body of the skipper's father, who was also on board, has not yet been found. On 2 September *Donna M* was located on the seabed.

The vessel had a low freeboard at the aft end when loaded and underway. There was a non-watertight access panel in the aft bulkhead with a low lip at the bottom. Water was getting on to the aft part of the open deck and over this lip into the bilges; initially the crew were unaware of this, because the creels were stowed at the aft end. Water taken on board in this way built up to a significant extent. The electric bilge pump failed and the hand bilge pump was inadequate to deal with a large quantity of floodwater. The engine-driven deck wash pump was being jury-rigged to evacuate the bilge water, when *Donna M* capsized.

The crew might have survived had they been wearing lifejackets, because the accident occurred only about a mile offshore. It is recommended that the compulsory wearing of lifejackets be discussed at the next Fishing Industry Safety Group (FISG) meeting.

It is also recommended that a representative from the vessel's insurers arranges for a competent naval architect to rectify *Donna M*'s deficiencies if she is put back into service.

Figure 1

SECTION 1 - FACTUAL INFORMATION

1.1 PARTICULARS OF VESSEL AND INCIDENT

Name	:	*Donna M*
Type	:	Fishing vessel (potter/creeler)
Port of registry	:	Bridlington
Fishing number	:	BRD 28
Official number	:	A10929
Owner	:	Robert Drever (Junior) Newark Cottage, Sanday, Orkney
Built	:	1984
Material of construction	:	GRP
Length	:	8.80m (LOA/Registered)
Breadth	:	2.86m
Depth	:	1.41m
Gross tonnage	:	5.68
Position of accident	:	59° 13'N 002° 32'W
Time and date	:	About 1600 on 31 August 1999
Casualties	:	2 fatalities

A general view is shown in (**Figure 1**)

A plan is shown in (**Figure 2**)

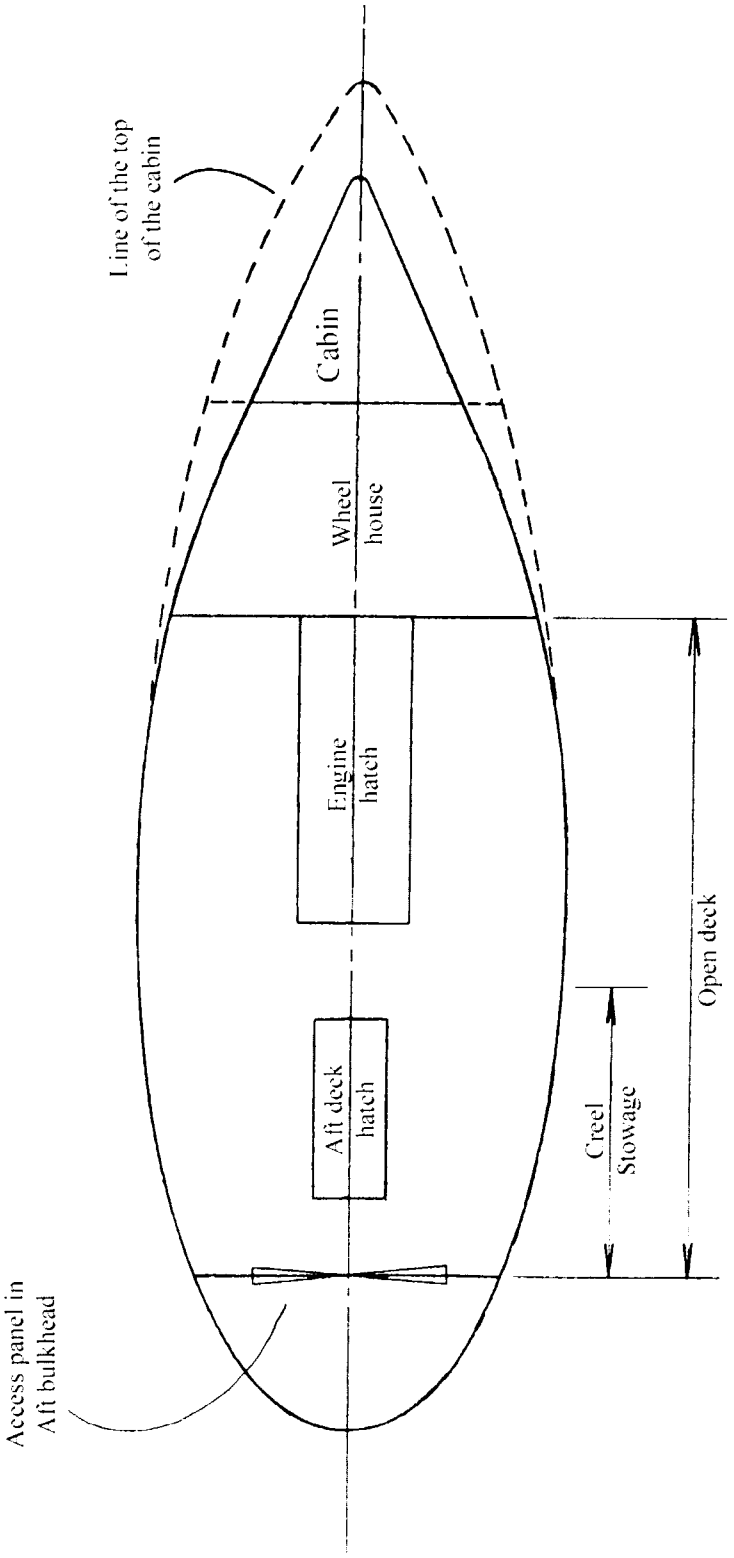
1.2 WEATHER

Wind south-west force 2 to 3, with good visibility and a slight sea.

1.3 HISTORY

Island Plastics built *Donna M*'s hull on the Isle of Wight in 1984. This company no longer produces glass reinforced plastic (GRP) hulls, and has no records of this design. Island

SKETCH PLAN (At the level of the open deck)



Plastics only supplied the hulls; the purchaser generally undertook the outfit. The outfit included building the wheelhouse and cabin, and installing the mechanical and electrical systems.

Donna M had recently been bought; the previous owner, who operated the vessel for about four years, lived on Harris in the Western Isles. He had used *Donna M* mainly for prawn creeling; about 50 creels weighing 3.5kg each were normally carried (total weight 175kg). Occasionally he used the vessel for lobster fishing, when approximately 30 creels were carried. He had fitted ballast below the aft deck hatch to level the trim. The cat catcher was in place when the previous owner was operating the vessel.

The skipper collected *Donna M* from Harris and sailed it back to Sanday in July 1999.

On 11 August she was surveyed (**Annex 1**) with a view to obtaining an enterprise grant. In the third to last paragraph of the survey report it states: "the wiring could be improved on".

On 12 August 1999, *Donna M* was taken to Kirkwall to collect 25 creels and 18 x 25 litre drums of diesel (weight of fuel 380kg). The creels were stowed at the aft end of the open deck, and the diesel was stowed forward of this and alongside the engine hatch. During the trip to Kirkwall, the skipper used the radio, and the engine driven pump was used to wash the deck.

Between 14 and 27 August, while the skipper was on holiday, his father visited the vessel to pump the bilges. He was unable to operate the electric bilge pump, so he used the hand bilge pump instead. This worked satisfactorily as there was very little water on board. When the skipper returned from his holiday he told his father that it was not the electric switch marked 'bilge pump' in the wheelhouse which worked this pump, but another switch on the same panel.

Only one rope (string) of creels was on board for the fishing trip on 30 August 1999.

1.4 CREW

Robert Drever (Junior) aged 28, the skipper. He was an experienced fisherman, having fished since leaving school, serving on a number of vessels involved in creeling. Recently, however, he had spent about four years farming. Mr Drever had received training in basic survival at sea, basic fire fighting and prevention, and basic first-aid. He had just started using *Donna M*; the trip on 30 August 1999 was the first time he had been fishing in the vessel. He was known to be a careful fisherman.

Robert Drever (Senior) aged 65, the skipper's father. His main occupation was farming, but he had extensive experience of the sea. He had spent periods working part-time as a fisherman, and had owned a number of small fishing vessels.

1.5 NARRATIVE

All times are British Summer Time (Universal Co-ordinated Time plus one hour).

Donna M left the island of Sanday at about 1430 on 31 August 1999 to creel for lobsters and crabs. When the vessel got underway from Kettletoft pier, witnesses noticed the stern was low in the water. She first motored to the east side of Els Ness (**Figure 3**), where a rope of creels was laid. *Donna M* then went to a position southeast of the Holm of Elsness where the rope of creels laid on 30 August was recovered. She then headed for the bay between Els Ness and Tres Ness (which is known as Sty Wick), where another rope of creels was laid. The crew of the fishing vessel *Loch Roag* were the last to see *Donna M* at about 1600, roughly halfway between the two headlands of Els Ness and Tres Ness.

The skipper had told his wife he would be back at about 1700. By about 1930 he had still not returned, so she told the skipper's brother, Billy Drever. He went to Kettletoft to see if *Donna M* was in, but when he arrived to find that she was not, he spoke to Ian Harcus, *Kelly T*'s skipper, who agreed to begin a search.

The coastguard was called at 2123, when the family felt that a professional search was necessary. The coastguard issued a "Mayday Relay" at 2204. Just before 2225 the owner's dog, which had accompanied the fishermen on board *Donna M*, returned home wet, exhausted and smelling of salt. The skipper's wife called the coastguard again at 2225 to let them know that the dog had arrived home alone.

1.6 SEARCH OPERATION

RAF and coastguard helicopters, the Kirkwall lifeboat, the supertanker *Loch Rannoch*, the supply vessel *Stream Truck*, the fishery patrol vessel *Sulisker*, the vessel *Tulip*, and the fishing vessels *Amethyst* and *Kelly T*, all took part in the search.

Donna M's engine hatch was found in Sty Wick on the night of 31 August/1 September 1999.

Mr Drever (Junior's) body was recovered at 0830 on 1 September 1999 in the Bay of Lopness, Sanday; the cause of death was drowning. He was not wearing a lifejacket. At the time of writing this report the body of the skipper's father has not been found.

The coastguard search and rescue (SAR) operations ended at 1713 on 1 September 1999.

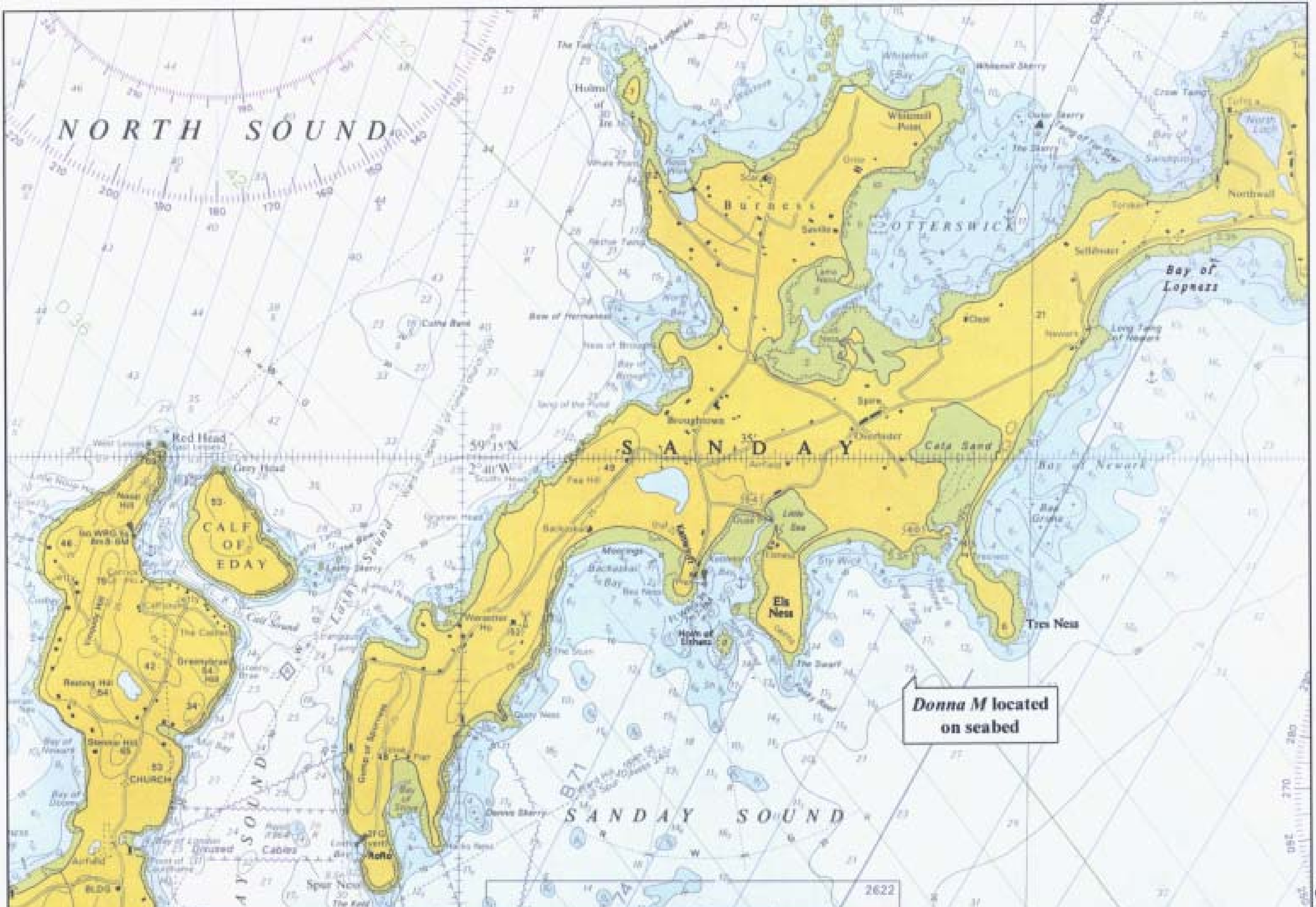
Donna M was located by the crew of *Kelly T* at about 0700 on 2 September 1999 in Sty Wick, close to where she was last seen, in position 59° 13'N 002° 32'W in about 12m of water.

1.7 RECOVERY

During the afternoon of 2 September 1999, divers examined *Donna M*. She was lying on her keel but tilted to starboard, with one rope of creels on board. A tool kit from *Donna M* was found on the seabed about 9m (30') from the wreck. The engine control was in neutral.

At about 2000, *Kelly T* used the tow-rope that had been made fast to the bow by the divers, to haul *Donna M* back to Kettletoft, but because of the tides, she was not brought alongside

Figure 3



Reproduced from Admiralty Chart 2250 by permission of the Controller of HMSO and the UK Hydrographic Office

the pier until the next morning. At low water *Donna M* was loaded on to a trailer and taken by ferry to the mainland, where she was placed in a large shed in Kirkwall. The police arranged the mobile crane and the lorry/trailer.

Donna M had been using 75 creels. All but two were recovered and stowed on the pier at Kettletoft (**Figure 4**).

The lifebuoy on top of the cabin went down with the vessel, but came free and floated away during the recovery operation.

Kelly T recovered the rope of creels laid by *Donna M* in Sty Wick. The spacing between the dan buoys (at each end of the rope of 25 creels laid by *Donna M*) was about 278m (0.15 mile). The normal spacing would have been about 556m (0.35 mile); *Kelly T* used ropes of 50 creels and the normal spacing between the dan buoys was 1296m (0.7 mile).

One of the fenders from *Donna M* was found on a beach between Els Ness and Tres Ness.

1.8 INSPECTION

The MAIB inspected *Donna M* in a large shed on 6 September 1999. There was no damage to indicate the hull had been leaking, although there were some scrapes on the starboard bottom, which may have been made during the recovery.

After this inspection, the vessel was moved to a nearby slipway where she was put in the water using a mobile crane (**Figure 5**) so that the freeboards could be measured. Because it was necessary to pump out floodwater in the bilges at the forward end, hoses were connected to the hand bilge pump on the vessel. However, the pump was leaking around the seal in its plastic body, and it was obvious that it was not designed to evacuate a large quantity of water, so an electric pump powered by a mobile generator was acquired. The freeboards were measured (**Figure 6**); the distance from the aft scuppers to the waterline was 115mm (4.5″), no creels were on board. The bottom of the scuppers was at the same level as the open deck. During the in-water test no flooding was noticed, apart from a small amount of rainwater which collected in the bilges, because it was raining. *Donna M* was taken out of the water late on 6 September 1999 and placed in an open compound close to the slipway.

Donna M was examined again by the MAIB on 7 September in the compound. The stern gland and rudderstock were closely examined from the outside. It was not possible to get access to the inside to view the rudderstock.

The engine hatch cover was not on board.

The aft deck hatch cover (**Figure 2**) was taken off by removing about 20 screws; the hatch had also been sealed with mastic. Once this hatch cover was removed, a loose bilge float switch was found. There was no bilge alarm, so the switch must have operated the bilge pump directly when it was working. The electric bilge pump could be seen in the lowest part of the hull under the shaft (**Figure 7**), with the wires disconnected. Before it broke, the connection had been made by winding the wires together and covering them with insulating

Figure 4

Figure 5

Freeboards

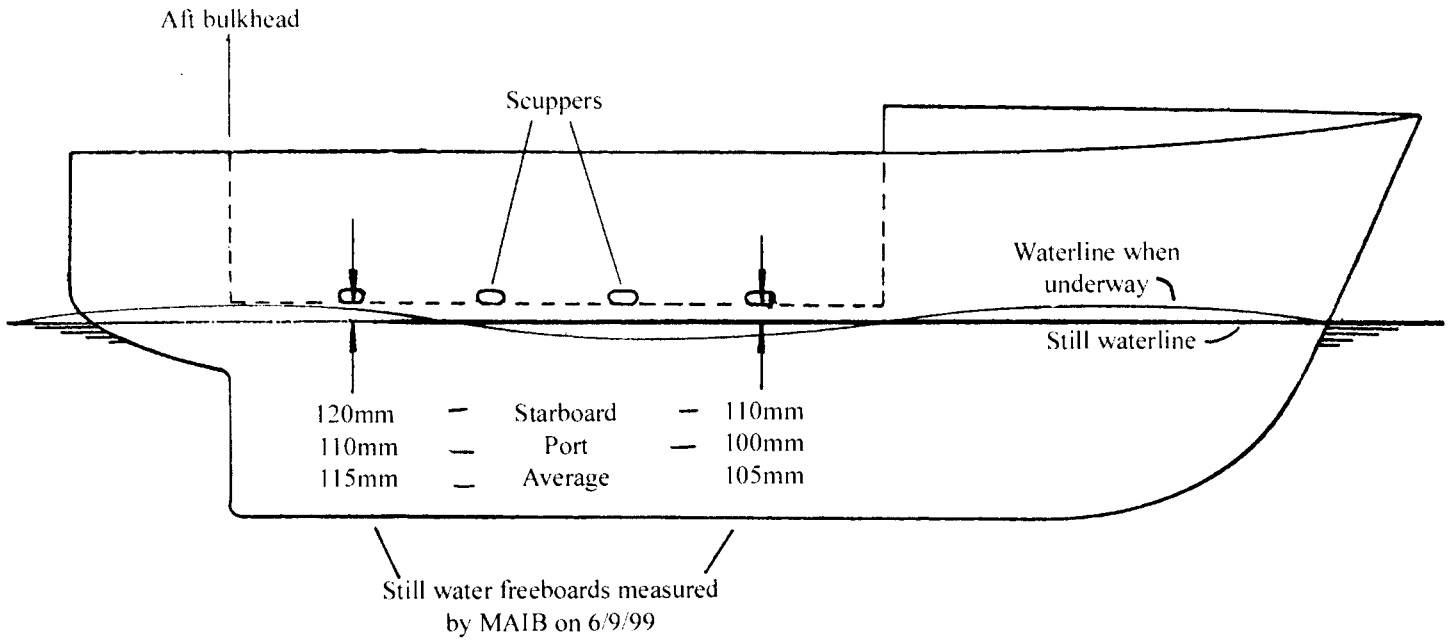


Figure 6

tape. Concrete and pig iron ballast was present (**Figure 7 & 8**). The aft deck hatch cover was not removed while Mr Drever owned the vessel.

An opening around the shaft made the compartment under the aft deck hatch and the area around the engine, into one space. There was a watertight bulkhead at the forward end of the engine space.

The non-watertight access panel in the aft bulkhead was inspected (**Figure 9**). It was recessed in a groove along the lower edge and secured by two shoot bolts at the top. The body of the fuel tank was behind the access panel. The lip at the bottom was only 92mm (3.6") deep in the middle. When the access panel was removed, a bottle of water was poured through the opening and it flowed forward into the lowest part of the hull by the bilge pump.

The sill on the door into the wheelhouse was 160mm (6.3") deep, and the coaming around the engine hatch was 255mm (10.0") deep (**Figure 10**). No washboards, which could have been used to raise the sill on the door, were found.

The emergency batteries, which were in a cabinet under the wheelhouse seat, had become dislodged.

The engine driven pump was also examined (**Figure 11**). The hoses had been removed. The valve in the seawater inlet to the engine driven pump was closed. The vessel's tool kit was normally kept in the wheelhouse; the divers found it close to *Donna M* on the seabed.

The inlet suction hose had been removed from the manual bilge pump (**Figure 12**).

Two bags of mackerel bait, weighing about 5kgs (11lbs) each, were in the wheelhouse. One of the bags was open and some of the contents had been used. The bait was normally kept on the open deck.

An inflatable lifejacket and a buoyancy waistcoat were found in the wheelhouse (**Figure 13**). The buoyancy waistcoat was normally kept on the back of the wheelhouse chair.

During the inspection, the integrity of the exhaust pipe was checked. The cooling water for the engine was discharged through the exhaust pipe, so if cracked, the cooling water would get into the bilges. A hosepipe was inserted in the exhaust pipe discharge (on the starboard side of the hull at the aft end) and a jet of water was put in; no leaks were seen from the exhaust pipe inside the vessel.

The VHF radio was tuned to channel 16, which is used to contact the coastguard.

1.9 LOADED CONDITION

On the passage from the Holm of Elsness to Sty Wick, *Donna M* was carrying 50 creels; 25 weighed 15.2kg (33.4lbs) each, and 25 weighed 12.8kg (28.2lbs) each, totalling 700kg (1540lbs). The catch from the creels just retrieved would also have been on board. The 50 creels filled the aft deck area from the aft bulkhead almost up to the engine hatch. They were stowed three or four high. The heaviest rope of creels was deployed to the seabed just before

Figure 7

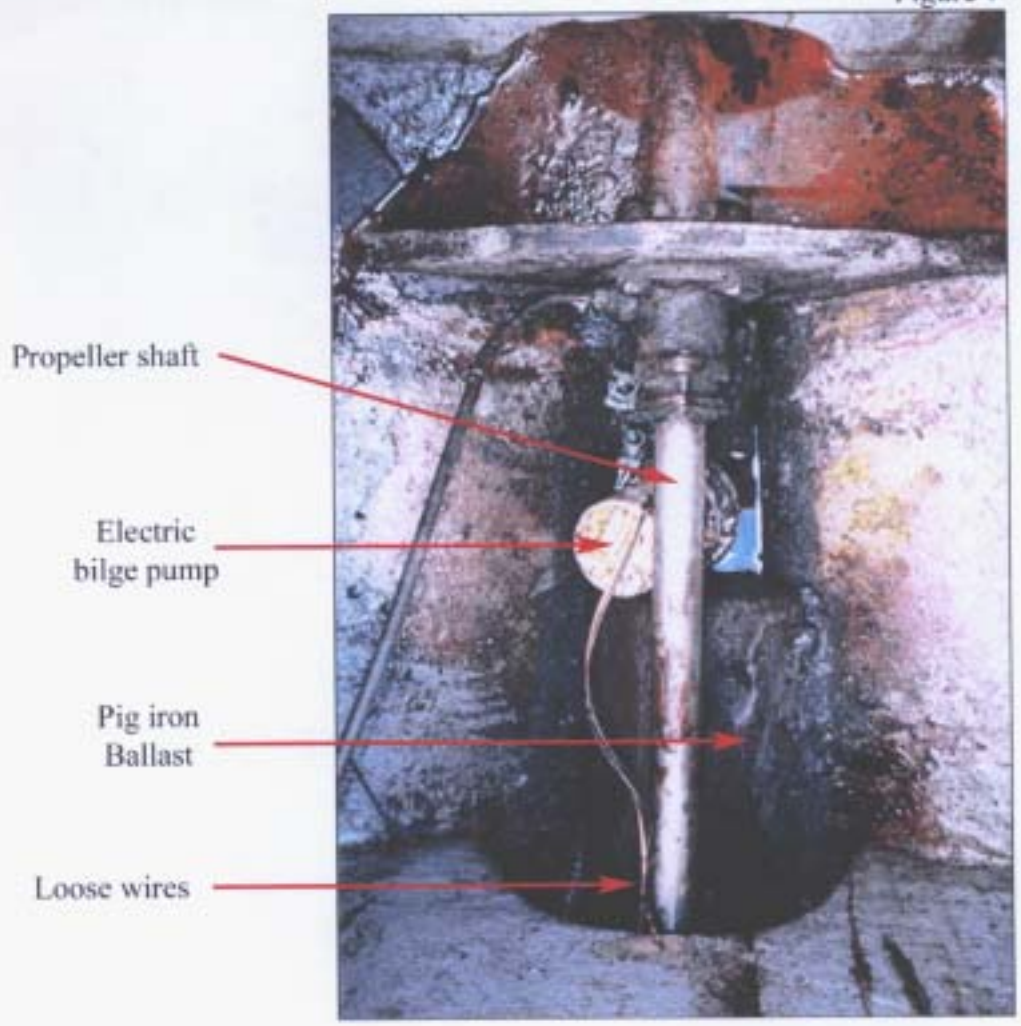


Figure 8 (Aft deck hatch removed)

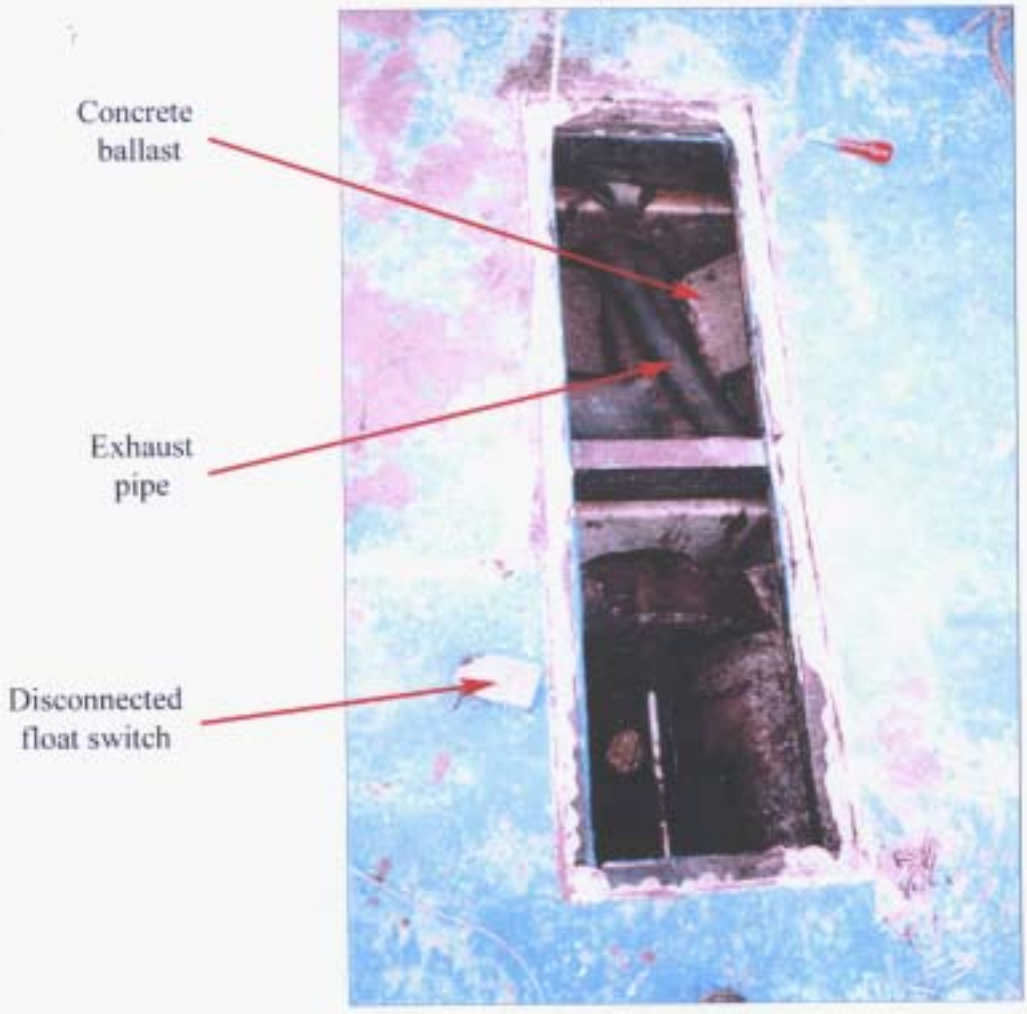


Figure 9

Figure 10

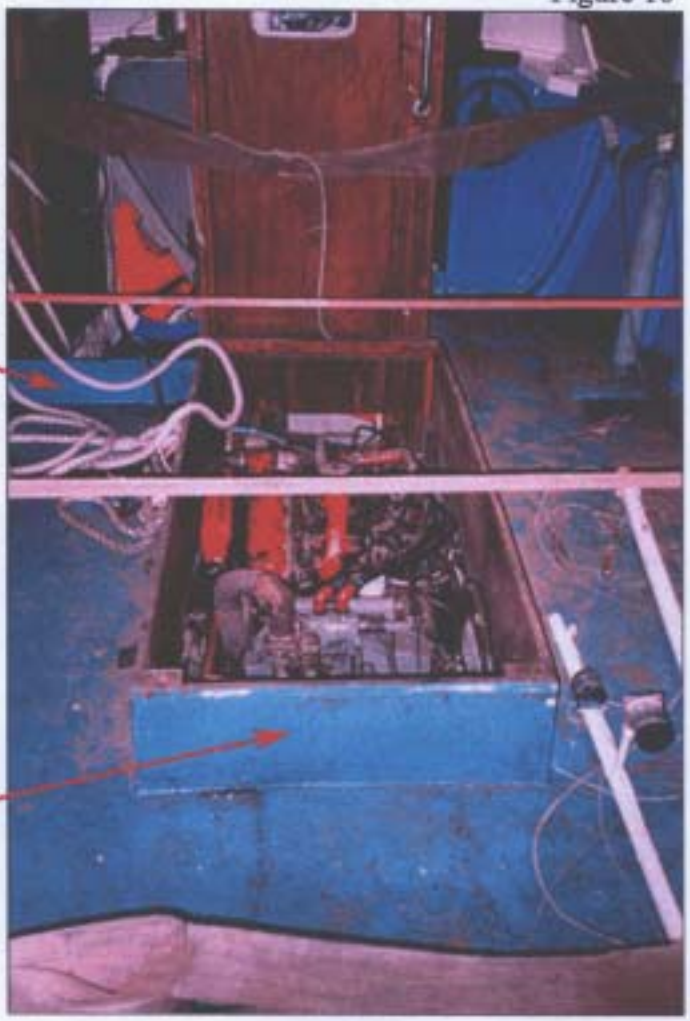


Figure 11

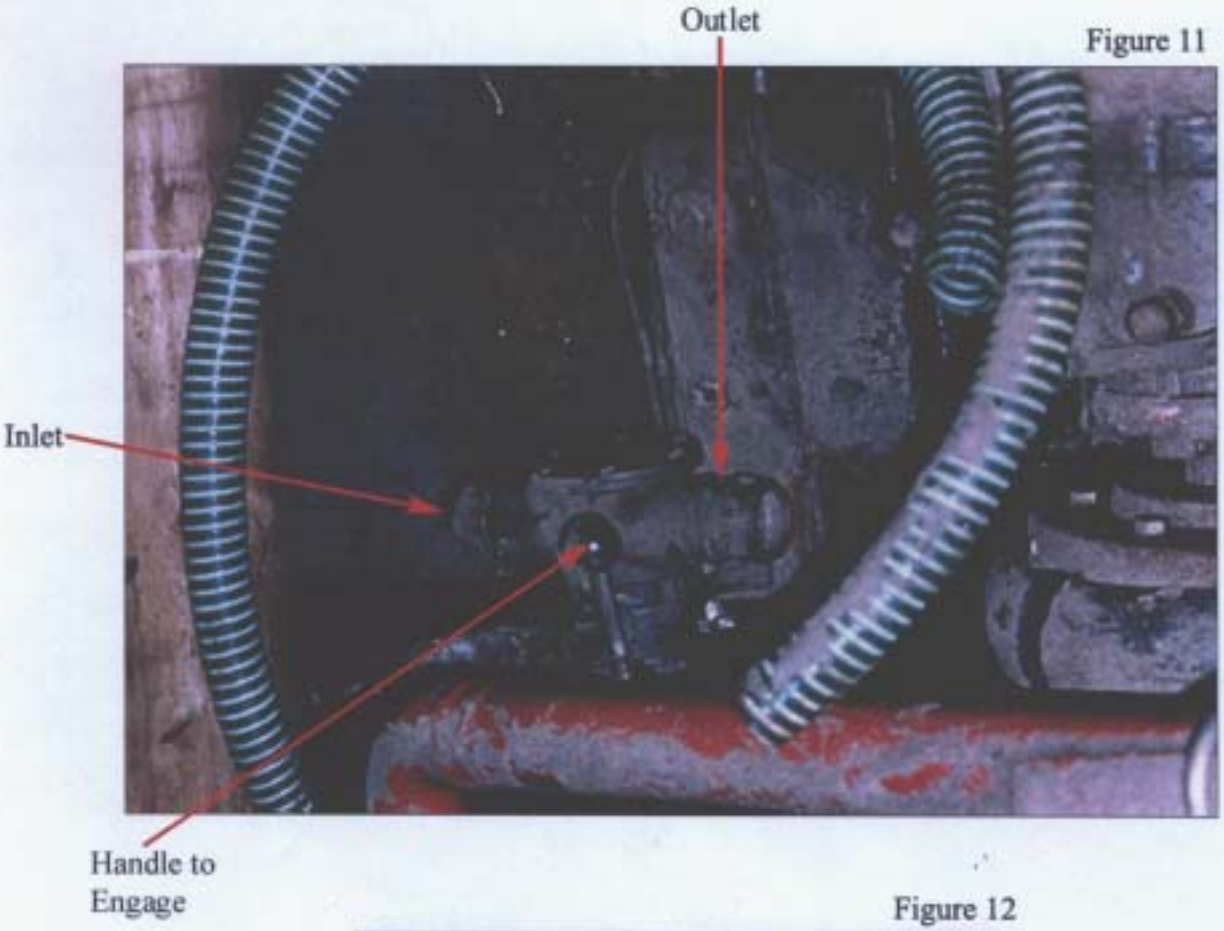


Figure 12

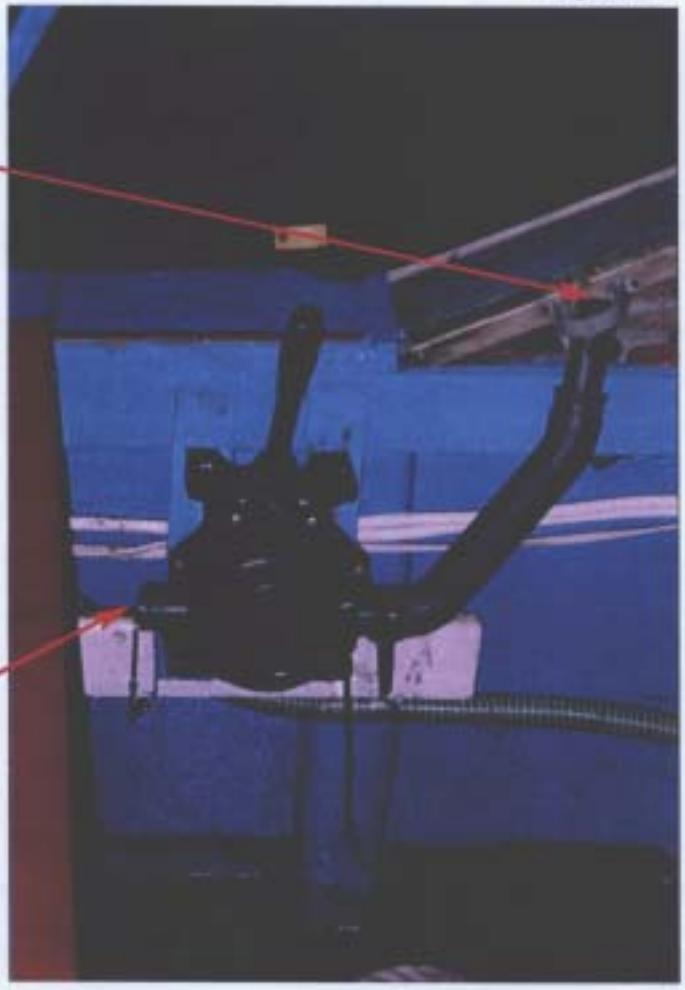


Figure 13

Figure 14

the accident. The cat catcher contained the basket for the anchor with its length of chain/rope. The fenders had not been taken in, and were still attached to the sides.

The creels first laid on 31 August 1999 weighed 12.8kg each.

1.10 LIFESAVING EQUIPMENT

Lifesaving equipment required

Under the Fishing Vessel (Safety Provision) Rules 1975 *Donna M* should have carried the following lifesaving equipment:

- Two lifebuoys, one of which should have attached to it a buoyant heaving line, and
- Six red star distress signals.

Additionally, under the Fishing Vessel (Life-saving Appliances) Regulations 1988 she should have carried:

- Three lifejackets, of which two were required to be fitted with a lifejacket light.

Or

Under a general exemption to the above rules dated 1 April 1998, the following lifesaving equipment should be carried:

- One lifejacket with whistle, light, and retro-reflective tape for each person on board.
- Two lifebuoys, one with 18m of buoyant line attached; or one lifebuoy with 18m of buoyant line attached, plus one buoyant rescue quoit and line.
- Three parachute flares, plus two hand-held flares, plus one smoke signal.

Lifesaving equipment actually carried

- One inflatable lifejacket and one buoyancy waistcoat.
- One lifebuoy.
- Three hand-held flares

SECTION 2 - ANALYSIS

2.1 HULL

Donna M's hull was thoroughly examined from the outside; there was no indication that it was leaking. The stern gland looked to be a good seal; this would have been continuously under water, and any problem would have shown up before the accident. Little water was found in the bilges while the owner was on holiday, which indicates that the stern gland was tight. The rudderstock looked satisfactory from the outside. Access from the inside was not practical, because of the cat catcher and the fuel tank etc. The rudderstock should have been installed inside a tube attached and sealed to the hull at the bottom. The top of the tube should have been well above the waterline, if not, water could have entered the hull in a heavily loaded condition, and/or when the vessel trimmed by the stern when underway. If a tube was not installed, a seal should have been fitted between the hull and the rudderstock.

2.2 LOADED CONDITION

Donna M was heavily loaded on her return trip from Kirkwall, when she carried 25 creels and 18 drums of diesel oil. The creels were stowed at the aft end of the open deck, and the diesel oil was stowed forward of this and alongside the engine hatch, so the weight of the fuel would not have had as great an effect on the sinkage at the aft end. It is considered that *Donna M*'s freeboard was marginally better during that trip, than on the day of the accident. The electric bilge pump had been used during this trip, and water was seen to discharge from the outlet on the port side. It is assumed that the bilge water did not build up to a significant extent when coming back from Kirkwall.

The previous owner had told the skipper that *Donna M* was fitted with ballast (**Figure 7 & 8**), although Mr Drever had not seen it, because since purchasing the vessel the aft deck hatch had not been removed. The skipper was content to carry 50 lobster/crab creels as he thought the previous owner had loaded *Donna M* with a similar weight.

The MAIB assumes the fuel on board at the time of the accident to be the same as when the inspector measured the freeboards on 6 September 1999, although it is possible that some fuel may have been replaced by sea water during the time *Donna M* was underwater.

2.3 FREEBOARD

Donna M's freeboard was low (**Figure 1**); when unloaded it was only about 115mm at the aft end. Calculations have shown that the freeboard at the position of the aft bulkhead was about 25mm with 700kg of creels loaded on the aft part of the open deck. The freeboard at the aft end would have decreased further when the vessel was making way. Vessels are designed like this because a wave at the stern improves hydrodynamic efficiency (in simple terms a wave crest at the stern tends to push a vessel forward, whereas a trough at the stern tends to pull a vessel back). The low freeboard at the aft end when *Donna M* was loaded and making way has been verified by witnesses.

Although there are no statutory freeboard requirements for fishing vessels less than 12m in length, there are for workboats. Since many workboats are also used for fishing, these requirements are a good guide. The MCA "Code of Practice for the Safety of Small Workboats" gives the requirements for freeboard in paragraph 12.2.1. An 8.8m long workboat like *Donna M* requires a minimum freeboard of 233mm when fully loaded.

When *Donna M* was making way with 50 creels on board, the aft scuppers allowed water to run on to the open deck. The water on the aft part of this deck would not have been obvious to the crew, because the creels were stowed there. The motion of the vessel led to water lapping above the low lip of the access panel in the aft bulkhead, and this water found its way into the bilges. The process would not have been rapid initially because although the access panel in the aft bulkhead was not sealed, it was a fairly tight fit. However, as more bilge water was taken on, the freeboard was reduced further, speeding up the process, leading to the free surface effect of the floodwater building up to a significant extent.

The access panel in the aft bulkhead could have been sealed with screws and mastic like the aft deck hatch, because regular access was unnecessary. There was no stowage space behind this panel; it only allowed access to the body of the fuel tank.

The non-watertight access panel in the aft bulkhead, in association with the low freeboard, was the main weak point of *Donna M*.

The previous owner had used *Donna M* mainly for prawn creeling. The weight of his prawn creels was about 500kg (0.5 tonne) less than the weight of the lobster/crab creels used when the accident occurred. The previous owner occasionally used *Donna M* for lobster/crab fishing, when about 30 creels were carried. *Donna M* was not capable of carrying a load of 50 lobster/crab creels because this reduced the freeboard to an unsafe level.

2.4 BILGE PUMPS

When *Donna M* was recovered, the electric bilge pump was not working. The electrical wire connections close to the bilge pump were not soldered and had come apart. A dry connection does not provide good contact, and had it become wet due to a build-up of bilge water, the pump would have failed. The crew might have tried to complete the circuit by pulling on the wires, and this could have caused the connections to break.

When the electric bilge pump stopped working, the crew might have been unaware of it. Had the pump been turned on and no bilge water been discharged, the crew might have thought there was no water there. When making way, it was not possible to hear the pump working, above the noise of the engine.

The low freeboard led to a build-up of bilge water, which could have disabled the electric bilge pump by penetrating the dry connection in the wiring. The pump could have failed due to some other problem in the wiring, which was generally in a poor condition. It is unlikely that there was a problem with the batteries as they were in a protected position in the wheelhouse; although they were found dislodged when inspected, this probably occurred during the capsize. It is fairly safe to assume that the electric pump was used during the

fishing trip the day before and that it failed sometime during the voyage on the day of the accident.

The first positive sign that something was wrong would probably have been water coming on to the open deck, forward of where the creels were stowed, indicating an increase in draught. Frequently an unexplained increase in draught is caused by ingress of water, which the crew would have tried to pump out with the electric bilge pump. Initially they might have assumed that there had been no ingress if no bilge water was discharged, but as the vessel sank further down they probably realised that the pump was not working. At this stage it is likely they removed the engine hatch, and then seen water in the engine space. They tried to get the electric pump started by pulling the wires, but when the wires parted, they used the manual bilge pump.

The manual pump was inadequate for pumping a large quantity of water. The crew then attempted to jury-rig the engine driven pump; the hoses had been removed indicating that this conversion was underway. The toolkit was found on the seabed close to *Donna M* which indicates it was on the open deck (**Figure 14**) just before the accident (the toolkit would have been needed for the work on the pump). There was no suction hose connected to the manual bilge pump when *Donna M* was inspected by the MAIB; this hose may have been removed just before the capsize, with the intention of fitting it to the engine driven pump.

It would have been advisable to remove the aft deck hatch, before putting *Donna M* into service. The skipper could then have seen the poor state of the wiring to the bilge pump. This would probably have prompted him to refurbish the electric bilge pumping system. Advice on flooding and bilge pumping is contained in MGN 49 (F), which is published by the MCA, and is available free of charge.

2.5 RECONSTRUCTION

The first time the skipper had taken *Donna M* to sea with 50 creels on board was on 31 August 1999. This heavier loading led to water slowly getting into the bilges. When the crew became aware of the problem, one set of creels was hurriedly deployed, as indicated by the smaller than normal spacing between the creels when they were recovered. The crew also threw the bait forward into the wheelhouse. It is unlikely that any fisherman would want to have fish bait in the wheelhouse, so bait found here suggests the crew threw it there in an effort to increase the freeboard of the after end.

The space under the open deck extended from right aft to the bulkhead forward of the engine, which is more than half way along the vessel (**Figure 2**). The crew may not have realised the danger they were in, because most of the free surface was not visible. It could only be seen through the open engine hatch. When the free surface of bilge water in this space became large enough, *Donna M* lost stability and capsized to port or starboard. The capsize was probably sudden since the crew did not have time to get their lifejackets.

Both the crew were poor swimmers, and they would have stood little chance of surviving a rapid capsize which is a disorientating experience, and the clothing and boots they wore would have dragged them down. Although *Donna M* was only about a mile offshore it is not surprising that only the dog managed to survive.

Donna M was found in 12m of water, almost upright on the seabed; vessels that capsize tend to right themselves when they sink.

2.6 RADIO

The coastguard did not receive a distress message from *Donna M*.

The VHF radio on board *Donna M* was tuned to the distress frequency. This does not necessarily mean that the crew were trying to contact the coastguard, because channel 16 is also used to make initial contact with other fishing vessels, before moving to another channel. It is possible the skipper tried to send a distress message, but the radio failed because the electrical wiring on *Donna M* was poor.

2.7 SURVEY

The survey report (**Annex 1**) was produced at the request of the owner with a view to obtaining an enterprise grant. The work was undertaken by a boat builder (not a qualified surveyor), but the report is considered to be a good description of *Donna M*. The comment on the condition of the wiring was particularly relevant. The low freeboard of the vessel would not have been obvious, because she was surveyed out of the water.

2.8 EXPERIENCE

The trip on which the accident occurred was only the second time that this skipper had taken *Donna M* fishing, which meant that he was unfamiliar with the vessel and her fishing gear. Previous investigations have shown that crews who are working new vessels are particularly vulnerable to accidents, even after substantial experience on other vessels.

2.9 LIFEJACKETS

The skipper was not wearing a lifejacket when his body was found. A lifejacket and a buoyancy waistcoat were on board *Donna M* when she was recovered, which suggests the skipper's father was not wearing any form of buoyancy aid either.

Had lifejackets been worn, the crew would probably have survived, because *Donna M* was only about a mile offshore when the accident happened. If the crew were working on the engine driven pump just before the accident, they would have had to kneel on the deck and lean over the engine hatch coaming. Neither the inflatable lifejacket, nor the buoyancy waistcoat, would have caused much of a hindrance to the wearer while working on the pump.

There have been many other accidents to fishing vessels, where the wearing of lifejackets could have saved lives. Lifejackets are not worn because some of them are bulky to wear when working, but compact, approved inflatable lifejackets are now available which should avoid the problem. Some fishermen think that wearing lifejackets does not fit the tough image

of the industry. This view is not generally shared by the families of fishermen who want their loved ones to be safe as possible when at sea.

If fishermen were statutorily required to wear lifejackets, the 'image problem' currently felt would be overcome. No extra costs would be incurred, as lifejackets are required to be carried. Some fishing vessel owners already require their crews to wear lifejackets, as a company rule.

It is acknowledged that this is a controversial subject, but a debate should be started, in particular the views of fishermen's representatives should be formally sought. To this end an agenda item on this matter should be raised at the next FISG meeting.

2.10 LIFERAFT

There is no requirement to carry a liferaft on a fishing vessel of *Donna M*'s size, but it is strongly recommended that this equipment is fitted; had one been installed on *Donna M* the crew's chances of survival would have been increased.

2.11 FUTURE

If, and before, *Donna M* returns to service, a competent naval architect should specify and oversee the modifications and refurbishment. He should take note of the deficiencies of the vessel shown in this report, and in particular, the lack of adequate freeboard.

SECTION 3 - CONCLUSIONS

3.1 FINDINGS

1. *Donna M* had a freeboard of about 25mm at the aft end when loaded, and this would have been reduced when making way. [2.3]

2. Water was getting on to the aft part of the open deck, over the low lip at the bottom of the non-watertight access panel in the aft bulkhead, and then into the bilges. [2.3]

3. The free surface effect of the floodwater built up to a significant extent. [2.3]

4. The non-watertight access panel in the aft bulkhead was the main weak point of *Donna M*. [2.3]

5. *Donna M* was not capable of carrying a load of 50 crab/lobster creels. [2.3]

6. The bilge float switch was not connected. [1.8]

7. The electric bilge pump failed or was not operating, and the hand bilge pump was inadequate. [2.4]

8. The coastguard did not receive a distress message from *Donna M*. [2.6]

9. The crew had little experience in operating this vessel. [2.8]

10. The crew were not wearing lifejackets. [2.9]

11. If lifejackets had been worn the crew would probably have survived. [2.9]

3.2 CAUSES

Immediate cause

Donna M took on board a large quantity of floodwater, which caused the vessel to capsize and founder.

Underlying causes and contributory factors

The underlying cause was a lack of sufficient freeboard in relation to the access panel in the aft bulkhead. The heavy load of creels and the ballast increased the draught at the aft end.

A contributory factor was poor electrical wiring, which probably led to the failure of the electrically powered bilge pump.

Another contributory factor was the inexperience of the crew with this particular vessel.

SECTION 4 - RECOMMENDATIONS

The Fishing Industries Safety Group is recommended to:

1. Raise an agenda item on the compulsory wearing of lifejackets for fishermen when working on deck, and to seek the views of fishermen's representatives on this subject.

Alistair McLeod Insurance is recommended to:

2. Arrange for a naval architect to oversee the modifications which should be made to *Donna M* if she is returned to service. Deficiencies such as the lack of adequate freeboard, as highlighted in this report, should be noted.

ANNEXE 1

Survey report on *Donna M*

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BOATBUILDER AND CHANDLER

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7 Hillside Road
Stromness
Orkney

11 August 1999

S Drever
Newark, Sanday

Survey Report on M.F.V. Donna M.

Reg.No. BRD 28 R.S.S.No. A10929 Type I.P.27 Built 1984

This is a Glass Reinforced Plastic type vessel used for fishing. The layout from forward is Foredeck with store under; Wheelhouse; Open cockpit deck; Aft locker and Cat cage.

The store forward is entered from the wheelhouse, the hydraulic tank is fixed here. The plywood built wheelhouse, offset to Port, with good alround vision contains the following: switch panel, Huson 60 v.h.f., Furuno G.P.S. Navigator, Furuno Sounder, Gas 2 Ring Cooker, Morse engine controls, compass, 2 x 12v Batteries in locker with on/off switch, Hydraulic steering.

The cockpit deck made from plywood covered in G.R.P. on wooden beams. There is a hatch aft giving access to the sterngear, there is only 1 rudder stop.
Aft is a storage locker with a stainless steel fuel tank and steering ram.
The engine is in a raised box aft of the wheelhouse. This is a 4 cylinder Ford 4D75h.p. with with gearbox with an Aquadrive connection to the shaft, which drives a 3 bladed propeller. The hydraulic pump is driven off the front end of the engine and a Jabsco deckwash pump is belt driven off the stubshaft.
Around the deck are guard rails, the starboard rails need repair.
The Hauler is to starboard in the shelter of the wheelhouse.

The hull has been painted and extra cladding fitted aft to Port. There is a wooden protective keel shoe, steel skeg and steel balanced rudder. Bilge keels are fitted, both could do with refastening.

Other equipment includes Rope cutter, submersible pump, Henderson Mk V Hand Pump, not connected, Set of Flares in date, 1 Fire Extinguisher, 2 Deck lights, Navigation and fishing lights, 1 Life ring and 1 Anchor.

This boat was surveyed on the beach in Sanday and the general condition appears to be good although there are some repairs to be done and the wiring could be improved on.

I would value this boat at £16,000. (sixteen thousand pounds)

This survey is done in my capacity as boat builder and not as a qualified surveyor

I. B. Richardson

Ian B Richardson