Report on the investigations of

the foundering of
fv *Kathryn Jane*
4.6nm west of Skye
on or about 28 July 2004
with the loss of the skipper and
one possible crew member

the capsize and foundering of
fv *Emerald Dawn*
off Kilkeel
on 10 November 2004
with the loss of one life

the foundering of
fv *Jann Denise II*
5 miles SSE of the River Tyne
on 17 November 2004
with the loss of her two crew

Marine Accident Investigation Branch
Carlton House
Carlton Place
Southampton
United Kingdom
SO15 2DZ

Report No 15/2005
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Extract from

The Merchant Shipping

(Accident Reporting and Investigation)

Regulations 2005 – Regulation 5:

"The sole objective of the investigation of an accident under the Merchant Shipping (Accident Reporting and Investigation) Regulations 2005 shall be the prevention of future accidents through the ascertainment of its causes and circumstances. It shall not be the purpose of an investigation to determine liability nor, except so far as is necessary to achieve its objective, to apportion blame."

NOTE

This report is not written with litigation in mind and pursuant to Regulation 13(9) of The Merchant Shipping (Accident Reporting and Investigation) Regulations 2005, shall be inadmissible in any judicial proceedings whose purpose, or one of whose purpose is to attribute or apportion liability or blame.

INTRODUCTION

On 10 November 2004, the small fishing vessel *Emerald Dawn* suddenly capsized and sank whilst fishing in the Irish Sea off Kilkeel. The vessel's skipper was drowned and her owner, who was also the deckhand, spent a night alone and adrift in a liferaft before being rescued. Seven days later, the small fishing vessel *Jann Denise II* foundered in a position approximately 5.5 miles to the south-south east of the River Tyne with the loss of her crew of two. Earlier in the year, on 28 July, the 11.89m inshore prawn trawler *Kathryn Jane* sank to the west of Loch Bracadale with the loss of her crew.

It has been decided to combine the results of the three investigations into the above accidents and produce a single report to better illustrate MAIB concern over safety in this important sector of the UK's fishing industry. All three vessels were less than 15 metres in length and therefore subject to compliance with the MCA's Code for Small Fishing Vessels. This Code places an onus on the owners/skippers to ensure that their boats are operated and fitted out to minimum levels of safety i.e. self regulation. Inspections of these vessels by the MCA are largely confined to equipment checks which are often performed by personnel with limited technical experience. Whilst the lighter touch of authority is largely welcomed by the industry, the causes and circumstances of the accidents highlighted in this report amplify the pitfalls of the current system - a small cadre of owners and skippers who wish to ignore basic safety have more freedom to put themselves and their crews at risk, whilst the more conscientious majority have less contact with experienced fishing surveyors who may be able to provide good advice and guidance.

A 2002 study[1] identified fishing as the most dangerous occupation in Great Britain over the years 1976-1995, with a fatal accident rate of 103.1 per 100,000 worker years, compared with a rate of 8.4 in the construction industry and 2.0 across all workers. A comparison of more recent figures[2] suggests that, unless there has been a very major increase in the proportion of fatal accidents in other industries, fishing has remained, by a large margin, the most hazardous industry in Great Britain.

If further tragic loss of life is to be avoided, the balance between self regulation and the role of the authorities needs to be reviewed. Additionally, establishing new ways of providing skippers and owners with advice on a range of safety issues should be explored.

The results of the MAIB's investigations into the loss of these three vessels indicate a need for basic safety standards to be readdressed, particularly in the area of fitness for purpose, stability, Life Saving Appliances and safety training. There then needs to be a more effective enforcement of these safety standards, which makes a compelling need to link this issue with the fish licence and ship registration processes for small fishing vessels.

Accordingly this report concludes with a single set of recommendations to the DfT, MCA and FISG, which draws on the common lessons from all three investigations.

Stephen Meyer
Chief Inspector of Marine Accidents

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[1] Dr SE Roberts, Department of Public Health, University of Oxford. Published The Lancet, August 17 2002.

[2] 9-year period 1996-2004 - fatal accident rate for fishermen, approximately 113 per 100,000 (MAIB figures).

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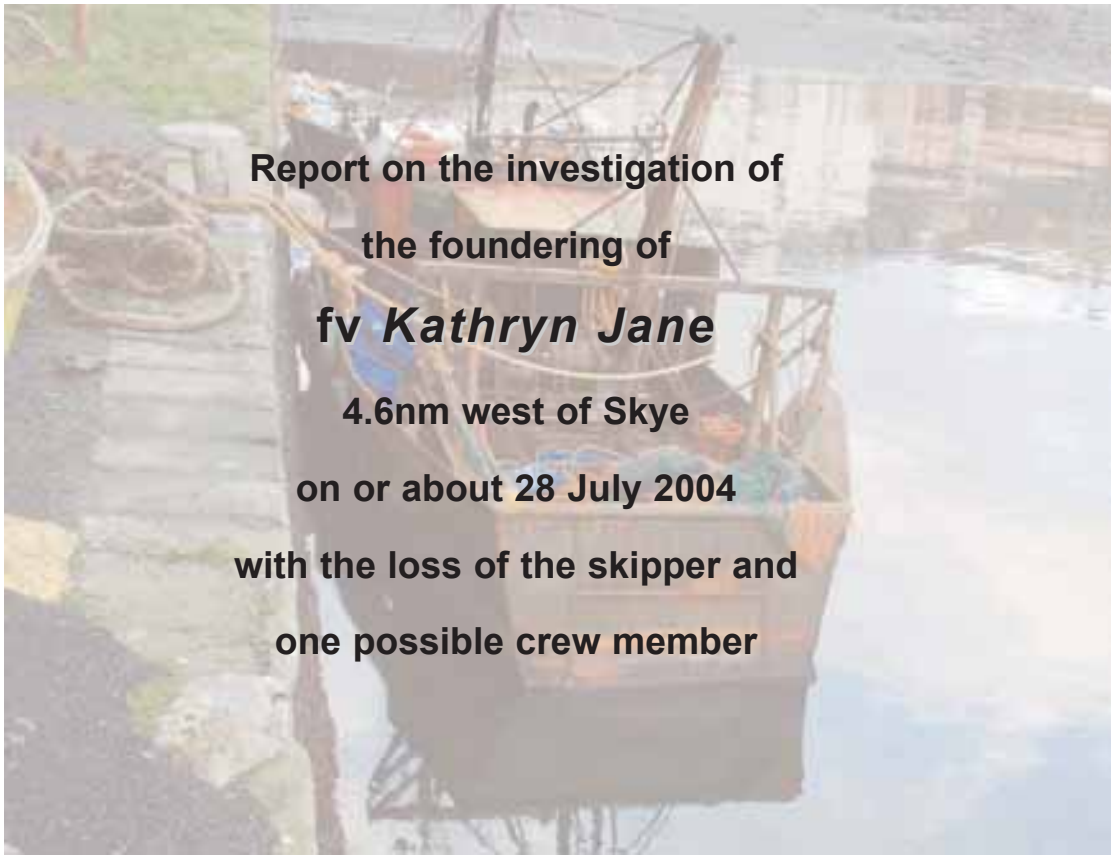
GLOSSARY OF ABBREVIATIONS AND ACRONYMS

AOM(SAR)	-	Area Operations Manager (Search and Rescue)
BUTEC	-	British Underwater Test & Evaluation Centre
CG	-	Coastguard
CG SM	-	Coastguard Sector Manager
DARDNI	-	Department of Agriculture and Rural Development for Northern Ireland
DEFRA	-	Department of Environment, Food and Rural Affairs
EPIRB	-	Electronic Position Indicating Radio Beacon
FISG	-	Fishing Industry Safety Group
fv	-	fishing vessel
GRP	-	Glass reinforced plastic
hp	-	horsepower
HRU	-	Hydrostatic Release Unit
HSC	-	High speed craft
K	-	1000
kW	-	kilowatt
LOA	-	Length Overall
LSA	-	Life Saving Appliances
m	-	metre
MCA	-	Maritime and Coastguard Agency
MGN	-	Marine Guidance Notice
MRSC	-	Maritime Rescue Sub-Centre
MS3	-	Marine Surveyor (grade 3)
MSA	-	Marine Safety Agency (precursor to the MCA)
MSN	-	Merchant Shipping Notice
OAN	-	Operational Advice Notice

pob	-	persons on board
RAF	-	Royal Air Force
RMAS	-	Royal Maritime Auxiliary Service
RNLI	-	Royal National Lifeboat Institution
ROV	-	Remotely Operated Vehicle
rpm	-	Revolutions per minute
RYA	-	Royal Yachting Association
SAR	-	Search and Rescue
SCOTNI	-	Scotland and Northern Ireland (MCA region)
Seafish	-	Sea Fish Industry Authority
SEERAD	-	Scottish Executive's Environmental and Regional Affairs Department
SFIA	-	Sea Fish Industry Authority
SGO	-	Surveyor General's Organisation
SI	-	Statutory Instrument
SIAS	-	Ship Inspection and Survey
SMS	-	short message service (mobile telephone text message)
UTC	-	Universal Time Co-ordinated
VHF	-	Very High Frequency



Report on the investigation of the foundering of fv *Kathryn Jane* 4.6nm west of Skye on or about 28 July 2004 with the loss of the skipper and one possible crew member

SYNOPSIS

The Leith registered 11.89m inshore prawn trawler *Kathryn Jane* sailed from Mallaig at about 0230 UTC on 28 July 2004. On board was the skipper/owner and possibly one other crewman. The vessel subsequently sank and the crew were lost.

Aside from a number of sightings of *Kathryn Jane* by local fishermen during the afternoon of 28 July, the last known contact with the vessel's skipper was via an SMS text message transmitted later that evening.

Nothing more was heard of the vessel, and it was not until 6 August that the skipper's next of kin and concerned fishermen contacted the coastguard about her disappearance.

On 15 August 2004, the skipper of the fv *Kaiyac* snagged his nets on a submerged net 6 miles west of Loch Bracadale. A search was made of the coastline, and debris was found on the shoreline near Neist Point Lighthouse. On 24 August 2004, the body of *Kathryn Jane'*s skipper was discovered on the shoreline of Loch Maddy, North Uist. To date, the body of the other possible crewman has not been found.

The RMAS vessel *Warden,* conducted an ROV search of the area where the fv *Kaiyac* snagged her nets. Despite poor visibility, it was possible to confirm that *Kathryn Jane* was lying in a near upright position in 124m of water. Because of the position of her trawl gear and nets it was apparent that she was trawling at the time of her loss, but the exact reason for her sinking will remain a matter of speculation.

Kathryn Jane had been inspected by MCA officers in Oban during August 2002 and was reported to have no deficiencies. However, the vessel had a reputation among fishermen, harbourmasters and contractors in the west coast of Scotland as being in a very poor state of repair, with numerous holes in the upper deck plating. Despite some of these reports being brought to the attention of the MCA, the vessel was not detained.

It is likely that *Kathryn Jane'*s trawl gear came "fast" some time during late pm on 28 July. In attempting to free the gear, or during the process of coming "fast", it is probable that the deck edge became submerged, and rapid downflooding occurred through holes in the upper deck and the non-watertight fish hold hatch, causing the vessel to founder.

SECTION 1 - FACTUAL INFORMATION

1.1 PARTICULARS OF *KATHRYN JANE* AND ACCIDENT

Vessel details (Figure 1)

Registered owner	:	Mr Allen James Naylor
Port of registry	:	Leith, Scotland
FV Number	:	LH 269
Type	:	Prawn trawler
Built	:	At South Shields in 1981
Flag	:	United Kingdom
Construction	:	Steel
Length overall	:	11.89m
Gross tonnage	:	10.11 tons
Engine power and/or type	:	Main engine - Gardner 8LXB developing 130kW
Service speed	:	Approximately 8 knots

Accident details

Time and date	:	Likely to have been soon after 2100 UTC on 28 July 2004
Location of incident	:	57° 14.14'N 006° 34.03'W 4.6 miles off the west coast of Skye in 124m of water
Light conditions	:	Daylight with sunset at 2051 UTC. Visibility good.
Persons on board	:	One confirmed, one other unconfirmed male
Injuries/fatalities	:	One confirmed fatality and one unconfirmed missing crew member
Damage	:	Total constructive loss

Figure 1

Kathryn Jane

1.2 VESSEL HISTORY

1.2.1 Background

The skipper of the Leith registered inshore prawn trawler *Kathryn Jane* **(Annex 1)** had owned the vessel since 12 October 1992.

The last MCA inspection of *Kathryn Jane* was conducted at Oban on 29 August 2002. No deficiencies were identified at that time. A copy of the SIAS report is at **Annex 2**.

Kathryn Jane spent several years based in Oban. However, towards the end of 2003, she began to operate predominantly from Portree on the Island of Skye. Throughout 2004, up to the time of the accident, the skipper, Allen James Naylor, had become more itinerant, tending to drift from port to port on the west coast of Scotland. The vessel typically fished for periods of up to 2 weeks at a time and, during 2004, periodically landed catches at Mallaig, Gairloch, Portree and at Kyle of Lochalsh.

The skipper often worked alone, but sometimes employed a casual crew member, depending on where he intended to fish and the period of time this would mean at sea.

A review of landing reports for *Kathryn Jane,* covering a period of a year up to 27 July 2004, showed the vessel making meagre catches.

1.3 BACKGROUND TO THE FINAL SAILING

1.3.1 Fishing schedule 21 – 27 July 2004

On 21 July 2004, *Kathryn Jane* was seen entering Mallaig Harbour. The skipper and a crew member, Lance Wiltshire-Butler, tied her up to the pier before landing her small catch of prawns.

Two days later, at 0846 UTC on 23 July, the vessel embarked 774 litres of fuel from Mallaig Pier before proceeding to sea later that day. The next day, *Kathryn Jane* returned once more to Mallaig, to land her catch.

On that day, the skipper had made arrangements for both of his trawl nets to be landed on the pier for collection and repair by Pisces Nets Ltd of Peterhead and Mallaig. The repairs, which were distinctive to the company, comprised fitting a new 16mm diameter blue combination head lining rope and new 160mm mesh top wings using N45 weight twine. On completion of the repair, the nets were returned to the pier for loading on board the vessel.

Both the skipper and crew member returned to *Kathryn Jane* at Mallaig during late pm on 25 July, and loaded the nets on board. The vessel sailed either on 25 or 26 July. *Kathryn Jane* was seen by the skipper of the fv *Pendona,* fishing a few miles off the Point of Sleat, Isle of Skye, once on 26 July and again at 0800 UTC the following day. Neither of these sightings raised concerns about the vessel's operation or safety.

Kathryn Jane entered Mallaig Harbour before midday on 27 July to land her catch and make arrangements to take ice on board for the next period of fishing. At 1940 UTC the skipper took 550.65 litres of fuel on board, which was sufficient for about 4 days' fishing. After taking on the fuel, *Kathryn Jane* tied up alongside the Oban registered fv *Kilbarri,* which was alongside the pier. Soon after, the fv *Connie G* berthed outboard of *Kathryn Jane* **(Figure 2)**. As the skipper of *Connie G* walked across *Kathryn Jane* towards the pier ladder, he noticed a number of holes in the steel upper deck of the vessel. The largest hole was about 100mm in diameter, located just aft of the fish hold hatch.

Figure 2

Location of *Kathryn Jane* in Mallaig Harbour

1.3.2 Meeting with Mallaig harbourmaster – 27 July 2004

On or about 20 July, the chairman of the Mallaig Harbour, who was a fisherman and a retired coxswain of the Mallaig lifeboat, notified the Mallaig harbourmaster of his, and other skippers' concerns about the material condition of *Kathryn Jane*.

From the quayside, the harbourmaster cast his eye over the vessel and was alarmed at the untidy upper deck, and in particular the extent of corrosion and perforation in the deck's steel plating. At about 1300 UTC on 27 July, the

harbourmaster confronted *Kathryn Jane*'s skipper. He firmly voiced his concerns about her very poor condition and her seaworthiness. The skipper did not appear concerned about the harbourmaster's comments, intimating that all was well with the vessel as she was not due for re-inspection by the MCA until 2006.

Having no powers of detention, the harbourmaster duly contacted the Fort William CG SM, who confirmed that *Kathryn Jane* was in date for inspection. No further action was taken.

1.4 NARRATIVE

1.4.1 Leaving Mallaig harbour

At about 0200 UTC on 28 July 2004, the crew of the fv *Kilbarri* arrived at Mallaig pier to prepare to go to sea. They roused the skipper of *Kathryn Jane*, who started his main engine. He then moved the outboard vessel, *Connie G,* by hand, to an adjacent pier, to enable both *Kathryn Jane* and *Kilbarri* to sail.

The crew of *Kilbarri* slipped *Kathryn Jane'*s mooring ropes, and both vessels left the pier. On sailing, *Kathryn Jane'*s skipper was in the wheelhouse. No one saw any other person on board *Kathryn Jane*. *Kilbarri* left Mallaig Harbour entrance and set a westerly course for the Isle of Rhum. *Kathryn Jane* followed immediately behind and, on leaving the harbour, headed towards the Point of Sleat on the south coast of the Island of Skye.

At 0310 UTC, *Kathryn Jane*'s skipper made a brief mobile telephone call that was picked up by the Arisaig transmitter. This was the last voice call made on his mobile telephone.

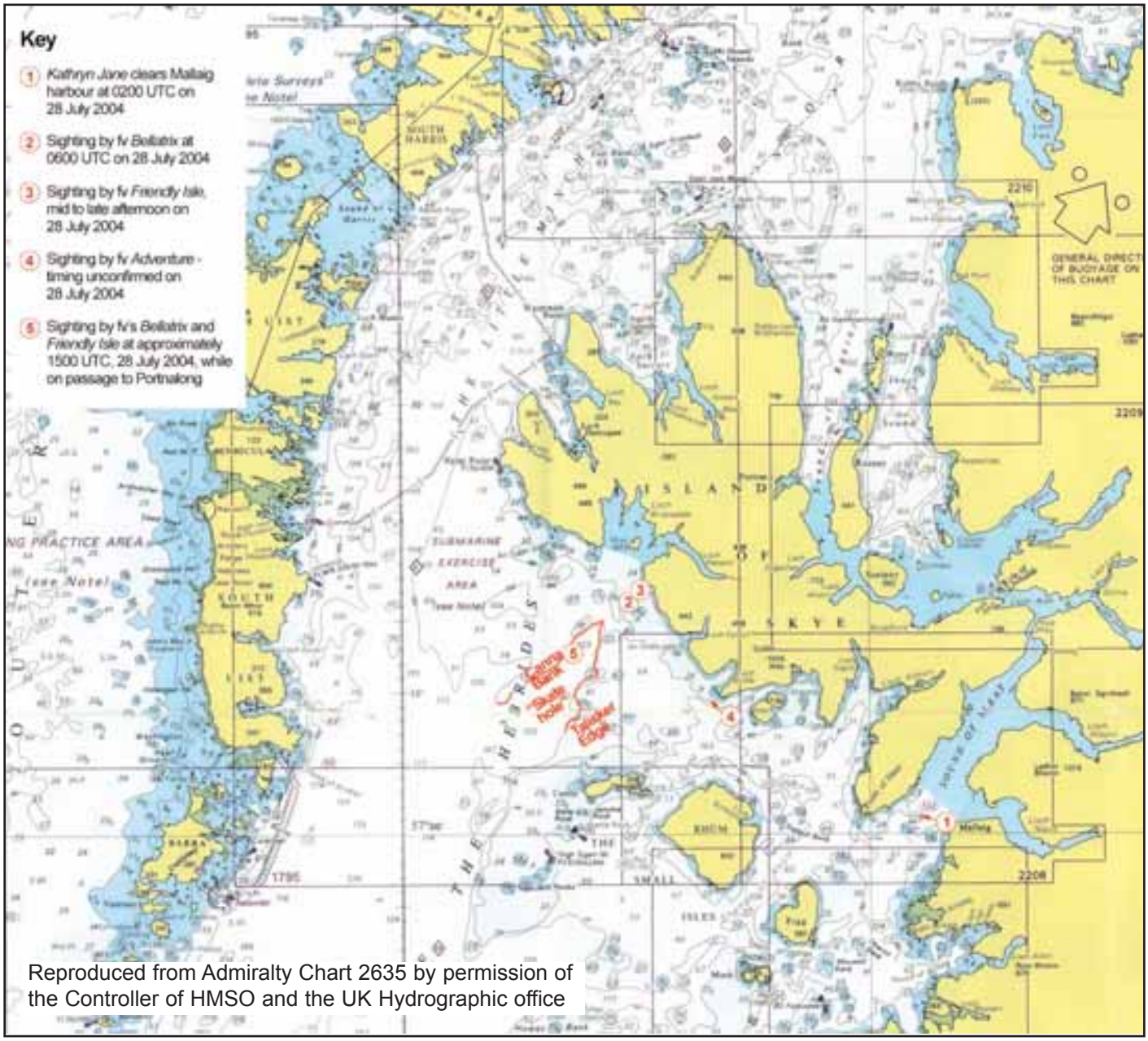
1.4.2 Sightings of *Kathryn Jane*

A chartlet showing the area of the last sighting and local nomenclature is at **Figure 3**.

There were a number of sightings of *Kathryn Jane* on 28 July. At about 0600 UTC, the skipper of the fv *Bellatrix* reported sighting the vessel working in the Loch Bracadale area, to the west of the Island of Skye. The skipper of the fv *Friendly Isle* saw the vessel trawling to the west of Talisker during the mid to late afternoon, and the skipper of the fv *Adventure* saw her off Soay, heading towards Loch Brittle, although he was uncertain when this took place.

At about 1500 UTC, the skippers of the fvs *Bellatrix* and *Friendly Isle* were working along a contour known locally as the Talisker Edge. This is located about 5.5 miles west off Loch Eynort in a designated submarine exercise area. At that time, the skipper of *Bellatrix* sighted *Kathryn Jane* trawling in an area to the west, known as the Canna Bank. The vessels came within about one cable of each other, but there was no communication between them. The skipper of *Bellatrix* noticed that *Kathryn Jane* was trawling, and saw one person on the deck, aft of the deck shelter. There appeared to be nothing untoward to raise his concerns.

Figure 3



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Between 1530 and 1545 UTC, *Bellatrix* completed fishing and proceeded on an easterly course towards Portnalong to land his catch. He noticed that *Kathryn Jane* had moved off the Canna Bank into an area known as the "Skate Hole". As *Bellatrix* proceeded towards Portnalong, he noticed that *Kathryn Jane* was still on his radar screen. This was to be the last positive sighting of the vessel. Both the skippers of the *Bellatrix* and *Friendly Isle* expected *Kathryn Jane* to follow them into Portnalong, especially in view of the worsening weather conditions at that time.

At 2052 UTC on 28 July 2004, *Kathryn Jane's* skipper used his mobile telephone to send an SMS text message. This was his last known communication. However, mobile telephone reception is, at best, intermittent in the area west of Loch Bracadale, so there might have been other attempts to make contact. There are no further records to prove this.

1.4.3 Weather conditions

When *Kathryn Jane* sailed from Mallaig Harbour on the morning of 28 July, the visibility was good, the wind was south to south-easterly, force 3-4 with a sea state of 2-3.

Later in the afternoon, the weather conditions deteriorated. Local fishermen described the conditions as being grey, with driving rain. There was a west-south-westerly swell and the wind was south-westerly force 4-5, increasing to force 5-6 by early evening.

1.4.4 Actions following last sighting of *Kathryn Jane*

Nine days after the last confirmed sighting of *Kathryn Jane*, at 2029 UTC on 6 August 2004, the skipper of the fv *Friendly Isle* contacted MRSC Stornoway. He was concerned about the whereabouts of *Kathryn Jane,* especially as none of the fishing community had recently sighted the vessel or her skipper.

The skipper's wife, who lives in London, was also worried about the time that had elapsed since she had last heard from her husband. On 6 August 2004 she discussed the situation with the Mallaig and Kyle of Lochalsh harbourmasters. She then contacted MRSC Stornoway and the Northern Constabulary at Portree to report her concerns. She was advised to formally report her husband as a missing person, which she subsequently did.

In the meantime, MRSC Stornoway issued a Small Craft Safety Information Broadcast by VHF in an attempt to locate *Kathryn Jane*. The "Broadcast" continued until 1252 UTC on 10 August and was also repeated by the Clyde CG. MRSC Stornoway also checked all harbours that *Kathryn Jane* was known to have visited, and extended the search into the Strathclyde and Forth areas and the Caledonian Canal. These investigations concluded that there had been no positive sightings of the vessel after 28 July 2004.

In view of the lack of response regarding the whereabouts of *Kathryn Jane*, the Northern Constabulary initiated a missing persons investigation into the disappearance of the skipper and possible crew member.

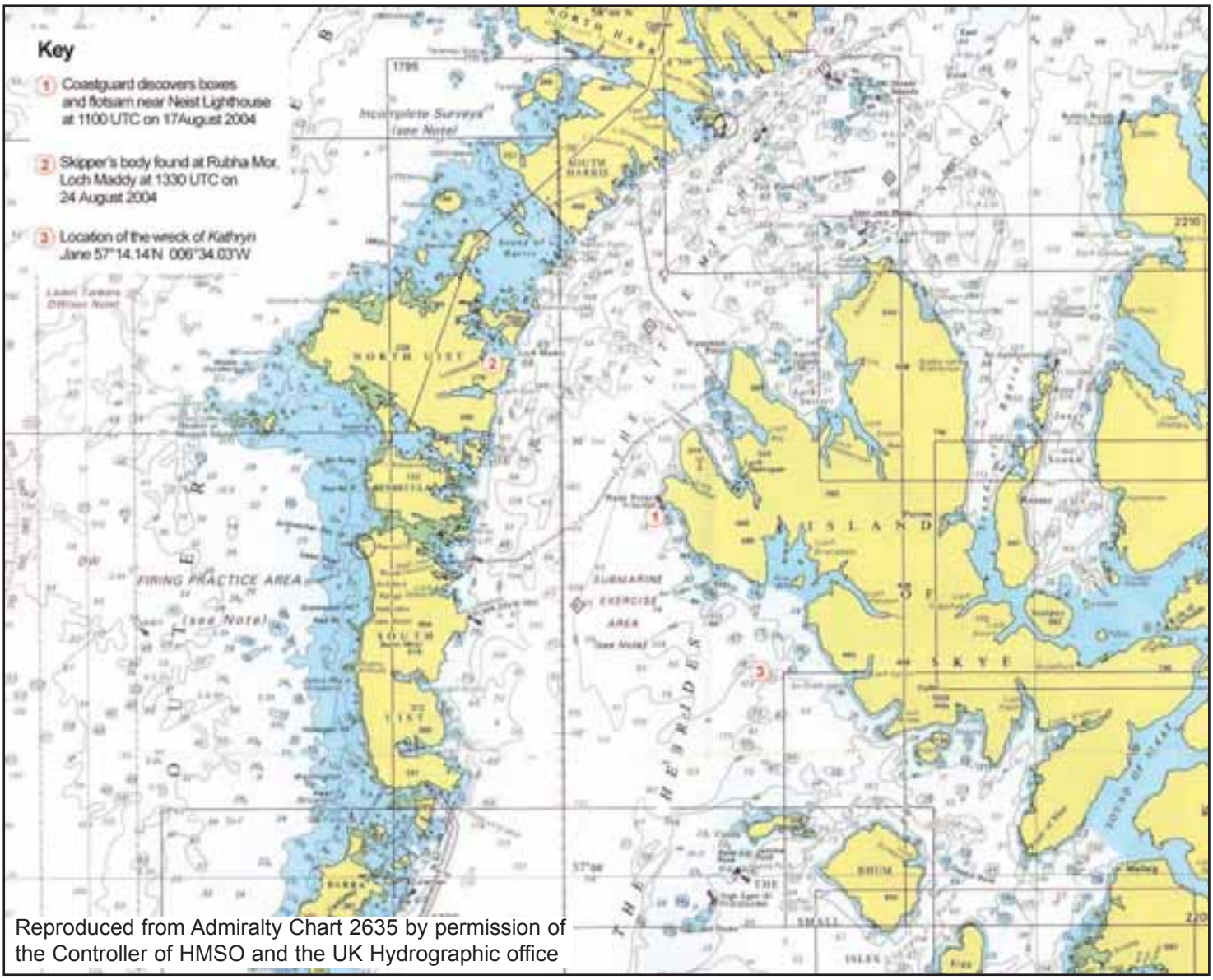
1.5 DISCOVERY OF *KATHRYN JANE* AND SUBSEQUENT SEARCHES

1.5.1 Location of *Kathryn Jane*

On 15 August 2004, the skipper of the fv *Kaiyac* was hauling in his gear in preparation for returning to Mallaig, when his nets became snagged on an underwater obstruction. *Kaiyac* was about 6 miles off the mouth of Loch Bracadale, in water about 100m deep.

The skipper also noticed a contact on his sonar display, but because of the equipment's limitations, he was unable to determine the exact depth or size of the contact.

Figure 4



Reproduced from Admiralty Chart 2635 by permission of the Controller of HMSO and the UK Hydrographic office

As the skipper hauled in his nets they became snagged on a separate net, the weight of which was dragging his stern down. Conscious of the risk, he had no option but to cut the nets to release the weight. Unfortunately, the skipper was unable to take a sample of the snagged net, but he managed to note its description. He later described the submerged net to a representative of Pisces Nets Ltd of Peterhead and Mallaig, who confirmed that it was likely to have been the net from *Kathryn Jane* that they repaired on 24 July.

1.5.2 Coastline search

Following the likely, but at this time unconfirmed discovery of *Kathryn Jane*, coastline searches were conducted by the CG on 17 August in the vicinity of Loch Bracadale. The Mallaig lifeboat searched the surrounding sea areas. At 1100 UTC that day, the lifeboat discovered flotsam, including fishing boxes and baskets, on the shore near Neist Lighthouse **(Figure 4)**. It was not possible to positively identify these as coming from *Kathryn Jane.*

On 24 August 2004, a fisherman discovered a body at Rubha Mor, about 1 mile east of Loch Maddy village on the south shore of Loch Maddy **(Figure 4)**. A life ring bearing the words “Kathryn Jane” and “Oban” was found nearby. The body was later confirmed to be that of the skipper of *Kathryn Jane*. He was found to be wearing standard clothing and no lifejacket. Owing to the lengthy time period between the accident and the postmortem being conducted, the Coroner reported the cause of death as “unascertainable”.

Shoreline searches for the possible crew member continued until 4 September, without success. The Northern Constabulary is continuing its Missing Persons investigation into his disappearance.

1.6 ROV OPERATIONS

1.6.1 Initial ROV survey

As part of its missing persons’ investigation, the Northern Constabulary arranged to survey the reported wreck site. An initial survey was conducted on 19 August 2004 using a large Work Class Super Scorpio ROV deployed from the BUTEC vessel, RMAS *Warden* **(Figure 5)** based at Kyle of Lochalsh. Unfortunately, poor weather conditions, and the absence of the wreck at the reported position, hampered the survey.

Figure 5

RMAS *Warden* and work class Super Scorpio ROV

1.6.2 Continuation surveys

On 26 August, another ROV survey was carried out. A trawl net was identified stretching up from the seabed. Wires were found on the seabed at a position of 57° 14.22' N 006° 34.10' W. A trawl door was identified some 15m west of the trawl net. Worsening weather conditions curtailed further work.

The survey resumed on 31 August, but this time no further wreckage was found.

On 1 September, a third ROV survey identified a vessel approximately 150m south of the position where the trawl door had been found. The position of the wreck was recorded as 57° 14.14' N 006° 34.03'W at a depth of 124m **(Figure 4)**. An illustration of the wreck and trawl gear disposition, based on the observations of the ROV operator, is at **Figure 6**.

The survey found the vessel to be in the upright position, leaning slightly to starboard and with her bow partly embedded in the mud/silt seabed.

Figure 6

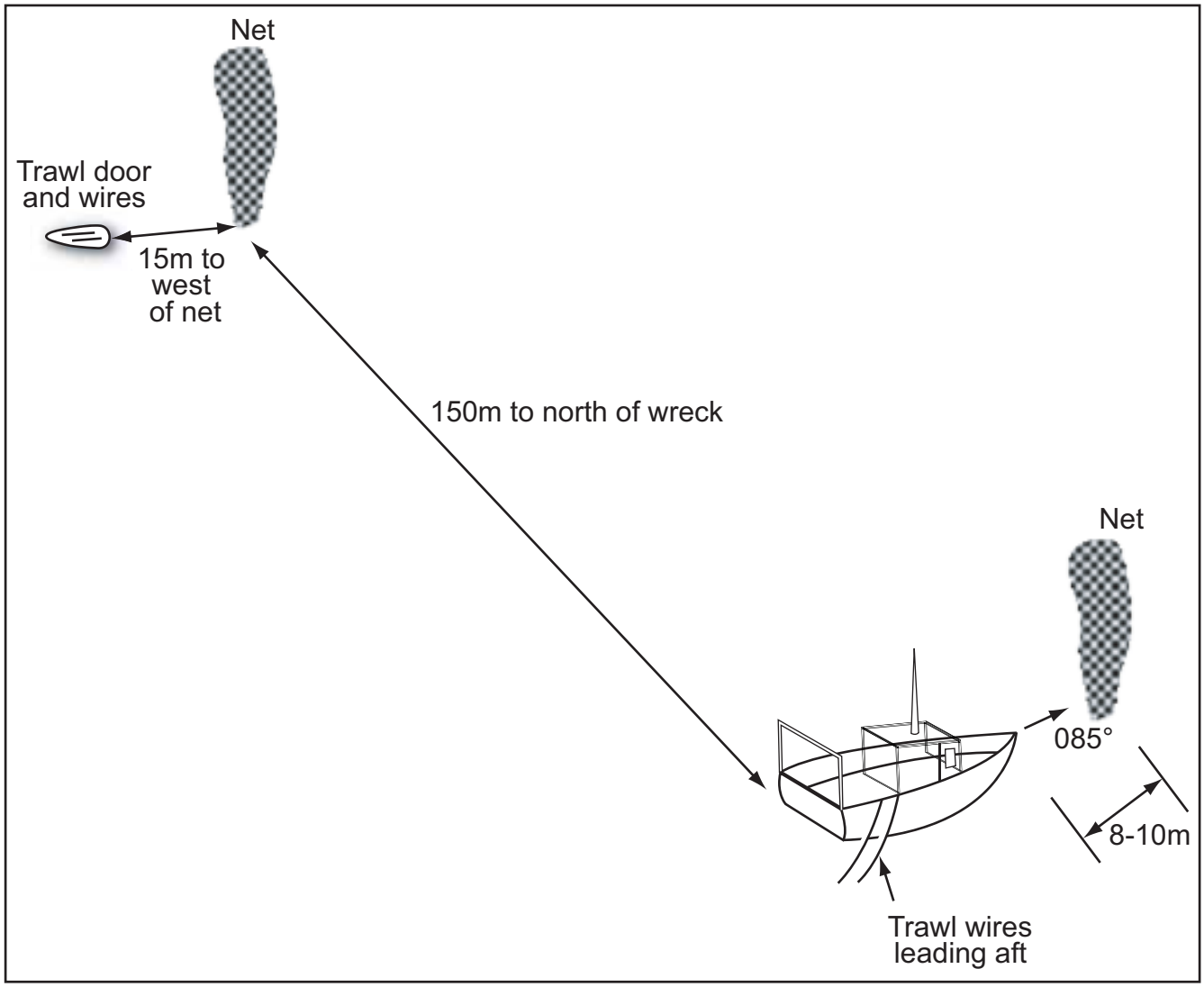


Illustration of wreck and trawl gear dispostion

The survey did not confirm whether or not the liferaft had been released from its stowage on the wheelhouse roof. However, it was possible to confirm that the wreck was that of *Kathryn Jane* by verifying the presence of a welded "eagle" crest that was known to be on the stem of the vessel.

1.6.3 Condition of the seabed

The ROV conducted a 250m radius search from the wreck site. The seabed was found to be mainly free from obstructions; the bottom was mud and silt with slight undulations. A boulder field was identified about 100m to the north-east of the wreck. The boulders were not exceptional, the largest being about 600mm diameter.

1.7 SKIPPER/OWNER

The 50-year-old skipper was known widely as "Findus" and described as a "colourful character" by both fishermen and harbour officials. He had recently led a somewhat nomadic life, not staying at any one port for long. He had held a number of jobs, predominantly as a fisherman. Since the late 1970s he had owned three fishing vessels, acting as the skipper on each of these. He fished mainly off the east and west coasts of Scotland.

The skipper had completed his basic first-aid and basic fire-fighting and fire prevention courses on 20 and 25 May 1994 respectively, and the safety awareness course on 1 December 2002. SFIA has no record of him completing the mandatory Sea Survival Course.

His relationship with other fishermen varied. They saw him as a very sociable person and experienced skipper. However, many were concerned about the material condition of his vessel, especially the holes in the upper deck plating. They made their views known to him. Although recognised as a capable fisherman, many found it difficult to comprehend his ambivalent attitude towards the poor condition of *Kathryn Jane.*

1.8 CREW MEMBER

1.8.1 Background

Lance Wiltshire-Butler is a 55 year old Australian from Perth, Western Australia. He first travelled to Scotland in April 2002, returning twice to Australia in April 2003 and again in April 2004. He finally returned to Scotland later in April 2004. While in Scotland, he had worked mainly in the hotel and hospitality industries in Inverness, until starting work with *Kathryn Jane* on or about 21 July 2004.

Apart from unsubstantiated reports that he had some fishing experience in Australia, there is no evidence to show that he had any experience of sailing in small fishing vessels.

He usually contacted his sister Mariette Wiltshire-Butler in Australia every fortnight. The last contact was made on or about 20 July 2004.

1.8.2 Crew member's actions 21 – 28 July 2004

By 21 July, Mr Butler was serving as a crew member on *Kathryn Jane*, and he was seen on board when she entered Mallaig harbour that day.

On 23 July, he approached the manager of the Marine Bar in Mallaig, who owned several fishing vessels, and enquired if he had any work on his vessels. Mr Butler observed that he had been working as crew on *Kathryn Jane* and expressed his concerns about her condition. He also said that *Kathryn Jane* would be sailing again that evening and that he would be staying with the vessel until he received his pay.

The last positive sighting of Mr Butler, on board *Kathryn Jane*, was during the afternoon of 27 July by the Mallaig harbourmaster. By 1730 on 27 July, he had moved into the nearby Fisherman's Mission, having already made this arrangement with the Mission staff on 24 July.

At about 0900 on 28 July 2004, he was in conversation with the Mission staff. He was in good spirits and indicated that he was planning to travel to Inverness by train at 1030 that day to work in a bar in the town. He also said that he intended to return to Mallaig and stay at the Fisherman's Mission during the weekend of 30 July.

He left the Fisherman's Mission at 0930 and headed in the opposite direction to the train station, towards the harbour. This was the last positive sighting of him.

The last signal from his mobile telephone was recorded at 0218 UTC on 28 July 2004. His bank transactions also ceased on that day.

1.9 DESCRIPTION OF VESSEL

1.9.1 General arrangement

Kathryn Jane was a 10.11 tons prawn trawler of steel construction **(Figure 7)**. Her registered length was 11.89m and she had a beam of 3.66m. The hull was divided from forward, into the accommodation area, engine room, fish hold and steering gear compartment.

The wheelhouse extended for about 75% of the breadth of the vessel, allowing port and starboard access onto the raised forecastle deck. A partial deck shelter was fitted immediately aft of the wheelhouse, extending from the starboard side to a point just to port of the centreline. An echo sounder, fish finder and radar display were fitted in the wheelhouse.

A trawl winch, used for hauling the trawl gear and for use with the Gilson derrick, was fitted on the upper deck, forward of the fish room hatch. An "A" frame was fitted to the stern of the vessel. *Kathryn Jane* carried two nets: a hopper net fitted with "rock hopping" rubber discs and a fine ground trawl net.

The vessel was reported to have a freeboard of about 150mm. The bulwarks were about 600mm high, and were reported to be corroded and holed in various areas. The exposed fish room hatch was not fitted with a watertight cover or tarpaulin. Non watertight boards were used to cover the hatch and provide a degree of watertight integrity.

1.9.2 Emergency communication equipment

Kathryn Jane was not fitted with an EPIRB, nor is one required under current regulations.

Figure 7

General arrangement of *Kathryn Jane* seen in Portree Harbour

1.9.3 Machinery

The vessel was fitted with a Gardner 8LXB, 130kW diesel engine driving a fixed pitch propeller through a reversing, reduction gearbox to provide a service speed of approximately 8 knots. An electric bilge pump with high level alarm was also fitted. It is not known if the bilge pump or related alarm systems were functional at the time of loss, or from which compartments the pump could take its suction.

1.9.4 Lifesaving equipment

A single "Premier" type liferaft was fitted in a cage on the starboard side of the wheelhouse roof. The liferaft was previously identified as being lashed in place by the Portree assistant harbourmaster. He advised the skipper to remove the lashings to ensure that the liferaft could float free in an emergency. It is not known if the lashings were removed at the time of the accident.

Two lifebuoys were fitted on the port side of the wheelhouse roof and were painted with the vessel's name and registration identifier. MCA officers also noticed that they had been lashed down when the vessel had been in Portree. The skipper was advised to remove the lashings. It is likely he did so, as one of the lifebuoys was later recovered.

Although four lifejackets were on board when the skipper's children had visited the vessel at the end of 2003, it is not known how many, if any, lifejackets were carried at the time of the accident.

1.10 MATERIAL CONDITION OF VESSEL

1.10.1 General condition

It was widely known among the fishing communities and harbour authorities on the west coast of Scotland that *Kathryn Jane* was in a poor material condition. The vessel was very dirty and the upper deck was permanently cluttered, making it unsafe. There was almost a total lack of paint coating to provide protection against corrosion. In some ports, fishermen were reluctant for *Kathryn Jane* to berth alongside their vessels in case the vessel sank at the berth, or that they would injure themselves when crossing the vessel. There was also a belief that the vessel was uninsured. Indeed, when the Portree harbourmaster requested proof of insurance, the skipper did not provide it.

Of particular note were the number of perforations and splits in the upper deck steel plating in the areas above the fish hold and steering gear compartment. These had been apparent for a number of years. Although some attempts had been made to conduct some form of repair, it seems that they were of a temporary nature.

The skipper of *Kathryn Jane* appeared reluctant to heed the advice of skippers and harbourmasters, to properly address the poor condition of his vessel.

1.10.2 Recent repairs

In late 2002, shortly after her last inspection by MCA officers in Oban, *Kathryn Jane* went into the nearby Dunstaffange Marina for weld repairs to the deck. However, because of the lack of suitable parent material to weld onto, the repairs were incomplete.

In January 2004, Kyle Marine Ltd of Mallaig repaired a seized rudder stock. The owner of Kyle Marine Ltd reported that the vessel was extremely dirty, untidy and badly rusted, especially on the upper deck.

In February 2004, Hot Rod Welding of Mallaig welded up a number of splits on the upper deck steel plating in the vicinity of the fish hold hatch and winch.

In May 2004 McPhee Engineering of Mallaig replaced the trawl winch pedestal bearing. They also noticed that the winch port drum had been removed and that the shaft was exposed. The winch operator would have been at risk of injury from the exposed rotating winch shaft. Conscious of the hazards, the contractor decided to weld a pipe over the stub shaft, allowing the shaft to rotate within the pipe and thus reduce the risk of injury.

Kathryn Jane grounded off the Kyle of Lochalsh on 27 May 2004 **(Figure 8)**. Following this, the harbourmaster became concerned about the condition of the vessel. His concern was exacerbated by comments from fishermen operating from the port. As a result, the harbourmaster asked the Skye CG SM “to cast his eye” over the vessel.

Hot Rod Welding of Mallaig worked on the vessel once again during mid July 2004 to repair the upper deck holes and splits. Work comprised fitting a doubler plate on the foredeck where water was leaking onto the skipper’s bunk, and welding numerous splits and perforations in the area of the fish hold hatch **(Figure 9)**. The contractor was unable to weld all the splits because of lack of suitable parent material. He informed the skipper that the entire upper deck was flexing badly and needed to be completely replaced. The skipper advised that he intended, at some point, to sail to Glasgow to pick up steel plate for the contractor to replace the deck. No date was suggested for the repair to be planned into the contractor’s schedule.

1.10.3 Water ingress

In June 2004, *Kathryn Jane* suffered water ingress from the rudder stock and possibly from the main shaft stern seal. The Portree assistant harbourmaster noted, as did the skipper of the fv *Iris*, that *Kathryn Jane’*s automatic bilge pump was pumping out about 20-25 litres of water every 2-3 minutes. When questioned about this, the skipper’s response was that he had a “good bilge pump” to deal with the problem. No indication was given that the skipper intended to rectify the obvious leak.

Figure 8

Grounding of *Kathryn Jane* off Kyle of Lochalsh on 27 May 2004

Figure 9

Area of foredeck repair work (circled)

1.11 ACCIDENT REPORTS

Since November 1992, there have been at least eight accidents involving *Kathryn Jane*. The details of these are at **Annex 3**.

1.12 MCA INSPECTIONS/VISITS

1.12.1 Inspections

Kathryn Jane had undergone five inspections between 28 October 1993 and 29 August 2002. Details of the inspections are at **Annex 4**.

1.12.2 Final inspection

Kathryn Jane's final inspection was undertaken by MCA officers in Oban on 29 August 2002. The inspection was conducted in accordance with "The Fishing Vessels Code of Practice for the Safety of Small Fishing Vessels under 12 metres in length", which is published as MSN 1756 (F). The Code does not require inspecting officers to check the vessel's structural condition or stability. A copy of the MSN is at **Annex 5**. The publication has since been amended to include vessels between 12 and 15m in length and is published as MSN 1756 (F) Amendment No1. A copy of the Amendment is at **Annex 6**.

At the time of the inspection, there were unsubstantiated anecdotal reports that the vessel had holes and splits to the upper deck steel plating. It was also common knowledge among local fishermen that the vessel was in poor condition. However, at the time of the inspection much of the upper deck was covered in nets and planking, and the deck was not clearly visible. Despite the poor material condition of the vessel, no attempt was made to examine the defective areas or conduct any examination of her outside the scope of the Code's checklist.

1.12.3 Attempted visit to *Kathryn Jane* by MCA officers in Skye

On 15 July 2004, an MCA officer based in Skye was making a routine visit to the Portree Lifeboat Station when he noticed *Kathryn Jane* was alongside the pier. He decided to visit the vessel in response to the concerns raised by the Kyle of Lochalsh harbourmaster (Paragraph 1.10.2). He was also aware of the general disquiet among the Portree fishermen and the Portree harbour authorities concerning the vessel's condition.

Although *Kathryn Jane* was alongside the pier, either the skipper was not on board, or he did not respond to the calls made by the MCA officer. The MCA's instructions to their officers require that the skipper, or his representative, is present when an officer boards a vessel. Consequently the MCA officer made his observations from the pier. He was concerned about the general state of the vessel, especially the considerable corrosion on the deck, the lack of covers for the hatch and the amount of loose equipment laying about. He mentioned to nearby fishermen that he wished to see *Kathryn Jane*'s skipper and would be returning the following day.

He did return to the harbour the next day, but *Kathryn Jane* had already sailed. The MCA officer did not pursue his concerns or report them to the CG AOM or to the local marine office.

1.13 DEVELOPMENT OF UNDER 12M AND LATER UNDER 15M FISHING VESSEL INSPECTIONS

1.13.1 History

The programme for inspections of <12m fishing vessels began in 1990. At that time, inspections were the responsibility of the Surveyor General's Organisation who were part of the Department of Transport. In the main, marine surveyors (fishing vessels) undertook the inspections, but were occasionally supported by general marine surveyors. Both were located at local marine offices. The inspections were conducted in accordance with the "General Exemptions from the Fishing Vessel (Safety Provisions) Rules 1975, as amended".

In 1994, the MSA was established to replace the Surveyor General's Organisation. Further change occurred when the Coastguard Agency and the Marine Safety Agency were amalgamated to form the MCA in 1998.

From 1999, responsibility for <12m fishing vessel inspections transferred from the MCA surveyors to the CG SMs. The CG SMs assumed this responsibility following a period of training and achievement at an endorsed standard. At this point, inspections were still conducted in accordance with the General Exemptions detailed above.

The next major change occurred on 1 April 2001, with the introduction of SI 2001 No 9, "The Fishing Vessel (Code of Practice for the Safety of Small Fishing Vessels) Regulations 2001".

Following extensive consultation with the SFIA, fishing industry representatives and other interested parties, a Code of Practice for the inspection of fishing vessels below 12m was introduced. The Code was promulgated as MSN 1756(F) – "The Fishing Vessels Code of Practice for the Safety of Small Fishing Vessels under 12 metres in Length" (the Small Fishing Vessel Code) and was developed from SI 2001 No 9.

The "Code", as it has become known, requires vessels to be inspected at intervals not exceeding 5 years, in accordance with a checklist. In the intervening periods, skippers are required to conduct an Annual Self-Certification and sign to the effect that their vessels comply with the "Code". The "Code" centres on checks of lifesaving equipment, emergency equipment and navigational aids. Skippers are also required to conduct a risk assessment on the vessel's operations. While there is no mandatory requirement that the assessment is recorded, the MCA recommends that it is documented. On 23 November 2002, MSN 1756(F) was amended to also include fishing vessels with a registered length of between 12m and 15m.

A more detailed history of the development of what is now the <15m fishing vessel inspections is at **Annex 7**.

1.13.2 Personnel authorised to conduct inspections

Details of personnel authorised to conduct inspections of fishing vessels less than 15m in length is at **Annex 8**.

1.14 TARGETS FOR <15M FISHING VESSEL INSPECTIONS

1.14.1 Target data

At the end of 2004, there were 5954 under 15m fishing vessels on the MCA's Fishing Vessel Register.

The MCA has introduced targets and a management programme to inspect all under 15 metre fishing vessels by 1 April 2006. In February 2005 there were approximately 2800 inspections outstanding, representing 47% of the total. It is not known how many of the vessels inspected are fully compliant.

1.14.2 Target management

Inspection requirements are set out in the MCA's Business and Forward Look Plan. Targets are determined by the Director of Operations, who allocates regional targets to the three CG Regional Operation Managers (SAR). Targets are then allocated to the CG SMs. In practice, some AOMs (SAR) locally manage the targets to take into account the CG SM's loading. Targets are reported back to the MCA headquarters via the AOMs (SAR) and Regional Operation Managers.

The MCA headquarters also monitors target progress through the inspection recording system.

1.14.3 Management of deficiencies

Deficiencies identified during inspection are recorded on Form MSF 1606, and are allocated a deficiency code. These are subsequently transferred onto the SIAS form.

Skippers are required to rectify defects within a specified period, as identified by the inspector, and report this fact to the inspecting MCA officer. This can be by fax, by forwarding copies of receipts for work completed, or by a re-inspection. This information is then held in the vessel's file and the SIAS information updated. When the inspector is satisfied that the vessel is compliant with the Code, a decal certificate is issued.

The procedure for the issue of decal certificates is at **Annex 9**.

1.15 POWERS OF SURVEYORS AND INSPECTORS

The powers of surveyors and inspectors are laid down in the Merchant Shipping Act 1995, Part X. The statute stipulates that surveyors have the authority to detain a vessel. A CG SM is defined as a "Departmental Officer" in accordance with Part X, paragraph 256 (9) (c) of the Act **(Annex 10)** and, as such, has no powers of detention.

Where a person conducting an inspection has doubts about a vessel's general condition, stability, or seaworthiness then he should refer to the marine surveyor (fishing vessels) at the local marine office, in accordance with the guidance to Inspectors (MCA Operational Advice Note 901) **(Annex 11)**. The option of detaining the vessel can then be considered.

1.16 TRAINING OF INSPECTORS OF FISHING VESSELS

CG SMs' inspector training was established in 1998. They attended a 1½ day course run by a team which travelled around the country. Since the end of 2003, this 1½ day training course has been the responsibility of the MCA's Training Centre at Highcliffe in Dorset, and now includes training for CG SMs, CG Watch Managers and Officers and MS3s. A copy of the course objectives is at **Annex 12**.

Following initial training, a further period of "On the Job Training" is conducted. Prospective fishing vessel inspectors are required to understudy a surveyor, or an experienced CG SM, on five fishing vessel inspections. On completion, the CG AOM (SAR), in consultation with the Principal Marine Surveyor (Fishing) approves, where appropriate, the CG SM application for formal endorsement by the MCA HQ as a fishing vessel inspector.

1.17 CG SM'S ROLE

Fishing vessel inspections are normally conducted by MCA sector managers. They are occasionally supplemented by other MCA officers as detailed in **Annex 7**.

There are 61 CG SMs distributed throughout the three CG regions. Scotland and Northern Ireland, and the Western Region have 21, and the Eastern Region has 19.

The primary role of the CG SMs is to manage the MCA's resources within their particular area of responsibility, and to represent the MCA within the local community. CG SMs identify their main function as the management and training of the Auxiliary Coastguard response team members, ensuring that they are fully proficient in all aspects of their duties and responsibilities.

Solid interpersonal skills are vital to the CG SM's role. They are often co-opted onto local awareness, safety and liaison groups. In doing so, they draw on their wide experience and play a vital role in advising members on a broad range of issues.

Under 15m fishing vessel inspections are a relatively new responsibility, and have received a mixed response by the CG SMs. The inspections are frequently seen as subordinate to all other responsibilities, and there generally appears to be little enthusiasm for this important safety-related requirement. These aspects are discussed more fully in Section 2 of this report.

SECTION 2 - ANALYSIS

2.1 AIM

The purpose of the analysis is to determine the contributory causes and circumstances of the accident as a basis for making recommendations to prevent similar accidents occurring in the future.

2.2 POSSIBLE CAUSE OF THE LOSS

2.2.1 General

How *Kathryn Jane* sank is uncertain. There were no survivors of the accident, or witnesses to it. The underwater survey did not provide any clues as to how she was lost.

It is possible that, since no VHF or mobile telephone distress message was received, the vessel sank suddenly and quickly. However, mobile telephone reception in the vicinity of the wreck is, at best, intermittent, so that any emergency mobile telephone call which might have been attempted, could have failed.

The area in which *Kathryn Jane* was lost is a designated submarine exercise area. In such cases it is necessary to consider if it is possible that the fishing vessel was pulled over by a submarine becoming snagged in *Kathryn Jane*'s nets when fishing. This possibility was discounted because MAIB was able to ascertain that no Royal Navy or allied submarines were operating in the vicinity of the Sea of Hebrides where *Kathryn Jane* was lost.

There is evidence that fishing vessels have foundered when hauling in their nets, which have contained large boulders. In this case, the seabed was free from large boulders (paragraph 1.6.3), therefore this possible cause can be also discounted.

Kathryn Jane was probably lost some time during the late evening of 28 July 2004, since the skipper's last communication with ashore was via a mobile telephone text message recorded as sent at 2052. She probably sank in about the position where she was found, close to the Talisker Edge.

Her trawl gear was located some 150m to the north of the wreck on the seabed, however this had been disturbed by another trawler. Therefore, the position found is unlikely to be the position of this gear at the time the vessel sank. Even so, since the gear was spread out over the seabed, points irrefutably to the fact that the vessel was trawling at the time of her loss.

2.2.2 Area of trawling

The skipper of fv *Bellatrix* was witness to the last sighting of *Kathryn Jane*. He confirmed that she was trawling in the area known as Canna Bank and Talisker Edge, which encompasses the deep-water area of the "Skate Hole".

Knowing that *Bellatrix* had enjoyed regular and successful fishing in this area, it is possible that *Kathryn Jane* followed a similar trawling pattern to that of *Bellatrix*.

A certain amount of knowledge and skill is required to fish this area. To avoid snagging his nets on the banks, a skipper must be aware of the gaps in the banks. Otherwise, to cross the bank safely, he has to undertake the time consuming operation of hauling in his trawl gear and then shooting again as he passes over the edge. *Kathryn Jane* was fitted with an echo sounder and fish finder, but it is not known whether they were operational at the time or were able to locate the gaps in the bank.

The possibility is that *Kathryn Jane* had difficulty when coming off, or preparing to go over the Talisker Edge, resulting in her trawl gear "coming fast". This supposition is supported by the fact that only one trawl door was found on the seabed, but two wires were identified coming from the stern of the vessel. This suggests that one door might have "come fast", and possibly remains hidden underneath the seabed.

2.2.3 Possibility of downflooding

Many fishing vessels have foundered because nets have snagged the seabed. Fishing vessels are vulnerable to capsize when trying to free gear that has become “fast”. The deck edge can submerge, and if hatch covers are open or are not watertight, or deckhouse doors are open, downflooding is inevitable, with consequent loss of buoyancy and stability and the likelihood of capsize. The probability of capsize is exacerbated as flooding occurs between compartments that are not watertight.

It is not known if *Kathryn Jane*’s deckhouse doors were open, or if the bulkheads separating internal compartments were watertight. What is known is that her freeboard was little more than 150mm, thus providing little reserve of buoyancy should she have snagged her nets and attempted to break free.

Furthermore, downflooding would have been inevitable. Water would have flowed onto the upper deck through the freeing ports. It would then have leaked through the splits and holes in the deck and down into the hull, resulting in further loss of buoyancy, increased free surface effect, and consequent loss of stability.

The current regulations require hatch coamings to be 300mm high. The height of those on board *Kathryn Jane* is not known. But given a loss of buoyancy, water would have flowed over the fish hold hatch coaming, and leaked between the wooden hatch boards and into the fish hold. The hatch boards were not watertight because there were not enough boards to cover the hatch opening completely, and there was no securely fastened tarpaulin sheet covering the boards.

The deteriorating weather conditions on the day, to about force 5-6, would have combined to exacerbate the flooding situation.

2.2.4 Possibility of internal flooding and bilge pumping

A possible contributing factor to the sinking, but of unknown degree, is water leakage through the hull itself. The longstanding problem of the leaking propeller shaft stern gland was a possible source of flooding on the day of the accident. However, unless the leakage was unexpectedly sudden and substantial, it would normally have been contained by using the vessel's bilge pump.

It is known that the automatic bilge pump and bilge alarm were working in June 2004. Fishermen complained about *Kathryn Jane'*s constantly sounding bilge alarm, which led to the automatic start up of the bilge pump while the vessel was in Portree. However, that the pump was known to be working then, is no guarantee that it was working on the day of the loss. After the complaints, the alarm ceased to sound but the pump continued to operate, suggesting that the alarm could have been disconnected.

If the alarm had not been reinstated, the skipper might have been unaware of increasing bilge water levels which could have inhibited his timely escape before the vessel capsized or foundered.

2.3 SEAWORTHINESS OF *KATHRYN JANE*

2.3.1 General

It is the statutory duty of any owner or skipper to ensure that their vessel is safe to go to sea. Given the evidence collected during this investigation, *Kathryn Jane* was unfit to go to sea because her hatch covers and upper deck were not watertight. Local fishermen and harbourmasters, a chairman of a harbour board and local MCA officers were aware of the condition of this vessel. For many years the skipper had been criticised for her poor condition.

It is not known why the skipper risked his own life, and that of his crew, by continuing to take his vessel to sea while she was in such poor condition. He did attempt to effect repairs to the wasted and cracked upper deck but, in the repairers' opinion, the repairs that were done could only be considered a temporary measure. Permanent repairs would have been far costlier and burdensome on a commercial fishing operation, which was, at best, marginal.

2.3.2 Inspection

Kathryn Jane was last inspected under the auspices of the then <12m fishing vessel Code by an MCA officer in Oban in August 2002.

During the inspection, the inspecting officer completed a simple checklist which was used to verify that the type and amount of lifesaving, bilge pumping, navigational aids and fire-fighting equipment on board satisfied Code requirements.

The Code does not require the vessel to be inspected for seaworthiness. At the time of the inspection in August 2002, the vessel was known to be in poor condition, and possibly unfit to go to sea. The poor condition was not reported to the professional MCA surveyors who would have been better qualified to conduct a detailed examination of the vessel's structure and empowered to detain the vessel, if considered appropriate.

In view of concerns regarding the condition of *Kathryn Jane*, 13 days before her loss, an MCA officer in Skye attempted to board the vessel to carry out a more detailed examination of her general condition. However, he was unable to do so without the owner, or his representative, present. He was wise not to board alone, since there might have been health and safety issues in doing so without someone present who was aware of the potential hazards on board.

There is no doubt that had he been able to undertake a more detailed inspection of the vessel, and given his knowledge of boats, he would have reported his observations to his superiors, who could then have acted on his concerns.

2.3.3 Unseaworthy vessels

The MCA has documented procedures for inspecting officers to follow for the reporting of a vessel's condition should they suspect that it is in need of further examination, or be unseaworthy **(Annex 11)**.

However, evidence suggests that inspecting officers are sometimes reluctant to make this assessment, possibly due to their background, which may include little or no maritime experience. Some are unhappy to conduct inspections and report possible deficiencies as they live within the local tight knit fishing community and may be faced with detaining a neighbour, or acquaintance's vessel. Indeed, in recent years, there appears to have been only one case within the SCOTNI region when an inspector has called in a surveyor to examine a vessel.

2.3.4 Sector manager concerns

With regard to the CG SMs' concerns over inspections, with many working in the Scottish Isles and mainland, this task conflicts with other priorities. In their view, and that of line managers, their primary role is the training of CG auxiliaries, together with local community liaison responsibilities.

These points may partially explain why there are still some 47% of targeted fishing vessel inspections outstanding with only 1 year to run of the 5-year period for completion of all inspections. Other factors that have been identified which affect the inspection rate are that:

- Skippers do not always try to avail themselves for inspections: they often do not respond to MCA letters, are available only at short notice and well outside the normal working day.

- CG SMs are the subject of abuse by the skippers.
- Skippers do not abide by agreed inspection rendezvous venues and times.
- Targets are viewed as being unrealistic and unbalanced, with little or no account taken of CG SMs' other workload.
- Some CG SMs feel that their level of experience and training is insufficient for them to make a judgment about the material condition of the vessel or its seaworthiness.
- Fishing vessels are sometimes "garaged" out of season so that inspections are sometimes impractical or unlikely.

At Scottish regional management level there is an assumption that CG SMs are proactive in targeting fishing vessels for inspections. However, this is not always the case: some CG SMs adopt a reactive approach in that they simply wait for skippers to request an inspection. Often, these requests are not forthcoming.

2.4 FATIGUE

Kathryn Jane sailed soon after 0200 UTC on 28 July 2004. If the skipper remained awake from this time up to the vessel's loss, which was some time after 2052 UTC, he would have been working for up to 21 hours. This, coupled with the worsening weather conditions, and effort required to, possibly, single-handedly shoot and haul his gear, makes it quite probable that fatigue was a factor which could have affected his judgment.

If the crew member was on board, it is likely that the skipper would have had some rest. However, without hard evidence that a crew member was on board, this remains a matter of speculation.

2.5 POSSIBILITY OF A SECOND PERSON ON BOARD

There is contradictory evidence as to whether a second person was on board *Kathryn Jane* at the time of the loss. None of the sightings of the vessel, during her final voyage, indicate that there were two people on board.

There is a confirmed sighting of the possible crew member, Lance Wiltshire-Butler, in Mallaig after the vessel sailed. It is also known that he made his way towards the harbour at about 0930 on 28 July, and that he had indicated to other witnesses that he would be remaining with *Kathryn Jane* until he received payment for his previous trips.

The skipper of the Fraserburgh registered fv *Seamar* recalls seeing *Kathryn Jane* in Mallaig Harbour at about 1200 -1300 on an unspecified day at the end of July. Although unsure of the day, he was confident that it was the last time *Kathryn Jane* was in the harbour prior to her loss on 28 July.

When the vessel sailed out of the harbour that day, the skipper of *Seamar* saw *Kathryn Jane*'s skipper on the upper deck, suggesting that another person was in the wheelhouse conning the vessel.

It is conceivable that *Kathryn Jane* returned to Mallaig Harbour to pick up the crew member before proceeding back towards the "Skate Hole" off Loch Eynort. The distance from Mallaig to the Skate Hole is about 28nm, or about a 3.5 - 4 hour passage. Although tight, the timings would allow *Kathryn Jane* to be in the general positions of other sightings during the day.

Lance Wiltshire-Butler's mobile telephone records and bank transactions ceased on the day of the loss. There have been no other sightings of him since. Given that his disappearance coincides with the loss of the vessel, and that he was known to have been on board previously, it is considered likely that he was on board when she sank.

What is known for certain is that Lance Wiltshire-Butler had not attended any UK safety courses. A mandatory requirement, provided by The Fishing Vessel (Safety Training) Regulations 1989, is that registered fishing vessel crew members must have completed courses on fire-fighting, first-aid and survival at sea, before embarking to sea.

Had he attended a survival at sea course, he would have been better prepared to cope with an emergency. However, it is not possible to say whether it would have helped save him had he been on board when *Kathryn Jane* foundered.

2.6 EFFECTIVENESS OF LIFESAVING EQUIPMENT

2.6.1 Lifejackets

When the owner's body was found, he was not wearing a lifejacket. Witnesses say they had never seen him wear one when working on his vessel. This is not unusual. Given the likelihood that any lifejackets that were on board were between decks, the chance of timely donning them in a sudden emergency would have been slight.

Many MAIB investigations into accidents resulting in the loss of life from fishing vessels, conclude that such eventualities would be significantly reduced if fishermen wear a lifejacket on board at all times or, alternatively, if they are stored readily available on deck. There are lifejackets designed to be worn constantly, so fishermen have little excuse for not doing so.

2.6.2 Liferaft

The various searches for *Kathryn Jane* and her crew did not locate a liferaft from the vessel. Despite this observation, *Kathryn Jane* was known to have had a liferaft that was fitted to the wheelhouse roof. The Portree assistant harbourmaster had seen it lashed onto its cradle. The probability is that either the liferaft was, indeed, lashed down and could not be activated, or, if an HRU was fitted, it was fitted incorrectly or failed to operate.

2.7 EPIRB

An EPIRB was not fitted to the vessel and it is not required under the existing Code for below 15m fishing vessels. However, if an EPIRB had been fitted, and been properly attached to the vessel, it would have released and activated once the vessel sank below the surface of the sea. Emergency services would then have been alerted, and could have responded by instigating a search and rescue mission immediately after the accident occurred. A rapid mobilisation of SAR units in the area, would have provided *Kathryn Jane'*s crew with the best chance for survival.

2.8 COST OF SAFETY EQUIPMENT

During the investigation, it was identified that fishermen are often reluctant to invest in safety equipment such as liferafts, EPIRBs and working lifejackets because of the initial purchase price and subsequent maintenance costs. It is understood that funding may be available for items of non-mandatory safety equipment via DEFRA and the equivalent offices in Scotland, Wales and Northern Ireland. Should funding assistance be provided and the equipment purchased, this would go a long way to improving the survival rates of fishermen in under 15m fishing vessels, in the event of the loss of their vessel.

2.9 ADEQUACY OF THE BELOW 15M CODE FOR SMALL FISHING VESSELS

The Code does not require that a fishing vessel's structure is sufficiently sound, and that its stability is suitable for it to safely operate at sea. The requirement that the vessel must be seaworthy is provided by the Merchant Shipping Act 1979. MSN 989, aimed at fishing vessels under 12m length, makes reference to this Act and the responsibility of owners and skippers to ensure that their vessels go to sea in a seaworthy state. A copy of MSN 989 is at **Annex 13**.

Small fishing vessels are not routinely surveyed for the purpose of seaworthiness by the MCA. It is the responsibility of the owner and skipper to ensure that a vessel's stability and structure is safe. The only routine intervention by the MCA is to inspect these vessels under the provisions of the Code, which concentrates primarily on lifesaving equipment and navigational aids.

For safety of life at sea, it is as important to examine a vessel for seaworthiness as it is to check that lifesaving and navigational equipment is properly available. A seaworthy vessel is as likely to save lives as the lifesaving equipment installed on board. The MAIB investigations into a number of accidents, including those listed below, confirm this:

- fv *Charisma* – 30 January 2002 – stability concerns
- fv *Mariscos* – 18 December 2002 - risk assessment

- fv *Kirsteen Anne* – 31 December 2002 – stability concerns
- fv *Amber* – 6 January 2003 – stability concerns
- *fv Kingfisher* – 26 April 2004 – risk assessment and general condition of the vessel.

Further, all of the above investigations have questioned the effectiveness of the Code as a means of improving fishing vessel safety.

This investigation finds no exception in that *Kathryn Jane* went to sea in an unsafe condition despite having been inspected and reported to have satisfied the conditions of the Code, 2 years before her loss.

The status of her stability is unknown and, indeed, like the majority of small fishing vessels, it was never checked and verified as safe. Nevertheless, the vessel was permitted, under the current inspection regime, to sail and fish unhindered.

While the MCA is addressing shortfalls in the Code, such as the management issues necessary to ensure that inspection targets are met, what is also needed is an inspection regime which ensures structural condition and stability standards are met in vessels covered by the Code.

The voluntary nature of the Code, and self-certification have been shown by this, and other accidents, to be ineffective. The best way of ensuring that all fishing vessels <15m do meet acceptable safety standards, would appear to be linking their registration and licensing to the safety system.

SECTION 3 - CONCLUSIONS

3.1 CAUSE AND CONTRIBUTORY FACTORS

It is not known how *Kathryn Jane* sank. It is likely that her trawl net became fast on the seabed, and an attempt to free the net resulted in downflooding, loss of buoyancy and stability.

Possible contributing factors were:

- Poor condition of the steel upper deck which was cracked and holed, allowing any water on deck to leak into the hull. [2.2.3, 2.3.1]
- Downflooding through the non-watertight fish hold hatch. [2.2.3]
- Minimal freeboard of the vessel. [2.2.3]

3.2 OTHER SAFETY ISSUES

1. Canna Bank and Talisker Edge are areas where danger of snagging of nets was most likely. Local knowledge or sonar is required to ensure safe crossing without hauling trawl gear. [2.2.2]
2. The poor condition of *Kathryn Jane* was known to MCA officials. This knowledge was not followed up to prevent the vessel from going to sea in an unseaworthy condition. [2.3.2]
3. The skipper employed a crew member who had not undertaken any mandatory safety courses as required by law. [2.5]
4. The chances of survival of the fishermen was reduced if the only lifejackets available were stowed between decks, preventing rapid donning in an emergency. [2.6.1]
5. The liferaft might have been rendered useless because of the possibility that it was lashed to its cradle on the wheelhouse roof. [2.6.2]
6. Although there was no requirement for an EPIRB to be fitted on *Kathryn Jane*, if one had been on board, and correctly fitted, a rescue mission would have been quickly initiated, thus improving the chances of survival. [2.7,2.8]
7. The below 15 metre Code for Small Fishing Vessels is inadequate in that it does not require initial and regular inspections to check for the safe condition of the structure and stability. [2.9]
8. The voluntary nature of the Code, and self-certification have been shown by this, and other accidents, to be ineffective. The best way of ensuring that all fishing vessels <15m do meet acceptable safety standards, would appear to be linking their registration and licensing to the safety system.

Report on the investigation

into the capsize and foundering of

fv *Emerald Dawn*

off Kilkeel

on 10 November 2004

with the loss of one life

SYNOPSIS

On 10 November 2004, at about 1500 UTC, the small fishing vessel *Emerald Dawn* suddenly capsized without warning and then foundered. The skipper lost his life in the accident, and the vessel's owner, who was also the deckhand, spent a night adrift in a liferaft before being seen by a passing ferry and then rescued.

Emerald Dawn, which was 8.69m long, was being used for potting at the time of the accident. She had sailed from Kilkeel, Northern Ireland, at about 0945. The weather conditions were moderate with a force 5 wind and good visibility. At about 1100, she had arrived at her fishing grounds where she hauled and shot away four strings of pots. Another three strings of pots were then hauled and stored on board to be shot at another location.

Once the last string of pots had been stowed on board, the vessel was set to steer towards Kilkeel at slow speed while the skipper noted down information on the catch and prepared to start the passage. The owner was washing down the deck and the skipper was busy in the wheelhouse when *Emerald Dawn* started to list to port. The list increased until the vessel capsized, tipping the crew into the water. The vessel carried on rolling to port until she was fully inverted. The crew had no time to make a distress call.

Neither crew had lifejackets on, although the skipper had been able to grab a buoyancy aid from the wheelhouse as the boat went over. The vessel righted herself after a while, but the stern remained submerged. The skipper tried, unsuccessfully, to put the buoyancy aid on while treading water. The owner, who was a poor swimmer, struggled back aboard and was able to release the liferaft from the wheelhouse roof. He inflated it and climbed inside. While he was sorting out the equipment, he saw the skipper through the opening in the liferaft canopy and he prepared to paddle towards him. However the skipper could not be seen the next time he looked out. *Emerald Dawn* sank shortly afterwards.

The owner's brother became concerned that mobile telephone calls to the boat had been unanswered and the vessel was overdue; he alerted the coastguard shortly after 1600. A search for the missing vessel started but, by then, it was dark. The liferaft and its equipment, which hadn't been serviced for 12 years, were in very poor condition. There was no operational torch or light, the distress signals did not work and there was no other means of drawing the attention of the search craft at night.

The liferaft was not seen until just after 1100 the next day. The owner was airlifted to hospital suffering from hypothermia and subsequently made a full recovery. The wreck of *Emerald Dawn* was located and identified on the day after the accident. The skipper's body was found some days later on the seabed not far from the wreck.

Possible causes for the sudden capsize of the vessel were considered, and it was concluded that flooding in the engine compartment was the only plausible one. A failed hose in the salt water cooling system was the most likely source of the flooding. The leak was not detected by the crew as there was no operational bilge alarm fitted to the vessel, and pots had been stowed on top of the hatch to the engine compartment preventing visual inspection of the space.

The owner was present on *Emerald Dawn* when it was inspected by the MCA in October 2004. A number of deficiencies were noted, two of which had been identified as needing rectification before the vessel put to sea again. The owner had not understood the urgency of this requirement and the vessel had sailed on several fishing trips between then and the time of the accident, without the necessary remedial action being taken. Owners and skippers should be in no doubt about the status of such deficiencies.

Vessels like *Emerald Dawn* are not required to carry a liferaft or an EPIRB under the present regulations, but this accident has clearly demonstrated the benefit of carrying lifesaving appliances like these. Liferafts need to be properly serviced to ensure they operate correctly in an emergency.

The owner had not attended all the basic safety training courses required under current regulations. MAIB has found that non-compliance with the fishing training regulations is common. The Maritime and Coastguard Agency is aware of the problem, and some action has recently been taken to improve the situation.

Emerald Dawn should have complied with the provisions of The Code of Practice for the Safety of Small Fishing Vessels. However, the owner, who had only recently become involved in operational fishing, had not heard about the Code before the inspection. This, and other cases investigated by MAIB, indicates that the Code is not effective.

Figures 10 and 11 - *Emerald Dawn*

SECTION 4 - FACTUAL INFORMATION

4.1 PARTICULARS OF *EMERALD DAWN* AND ACCIDENT

Vessel details

Owner	:	Shane Murnaghan
Fishing number	:	N967
Official number	:	C17944
Built	:	Aquastar (Guernsey) in 1986 to a Napier design
Construction material	:	GRP
Length overall	:	8.69m
Gross tonnage	:	9.05
Engine and propulsion	:	Ford Sabre 180hp 2725ET driving a single fixed pitch propeller

Accident details

Time and date	:	About 1500 on 10 November 2004
Position	:	54° 01'N 005° 50'W
Vessel	:	Capsized and foundered
Injuries/fatalities	:	One crew fatality One crew member suffered from hypothermia

Photographs of *Emerald Dawn* are shown in **Figures 10 and 11**.

4.2 BACKGROUND

The boat builder Aquastar, based in Guernsey, built the GRP hull of *Emerald Dawn* in 1986. The hull design was referred to as a "29 footer". In 2003, she was being operated out of Ramsgate under the name of *Pride of the North*, where she was used for bottom trawling.

On 14 April 2004, the vessel was sold and transferred to a new owner in Kilkeel and her name was changed to *Emerald Dawn*. The owner's brother used her for trawling out of Kilkeel until August 2004, when she was taken out of service for a refit.

Towards the end of September 2004, *Emerald Dawn* was returned to service to fish for crabs using pots. Fishing was not a full-time occupation for the crew. The vessel was used for potting until the time of the accident in November 2004.

In October 2004, about 3 weeks before the accident, the vessel was inspected by the MCA for compliance with The Code of Practice for the Safety of Small Fishing Vessels. Several deficiencies, which had been identified during the inspection, had not been rectified by the time of the accident.

4.3 NARRATIVE OF EVENTS

All times are UTC.

4.3.1 The capsize and sinking

On the day of the accident, *Emerald Dawn* sailed from Kilkeel at about 0945. The crew comprised the owner, who was acting as deckhand, and the skipper. The weather was good with a moderate force 5 breeze causing a choppy sea. After clearing the harbour, they headed approximately easterly towards seven strings of pots that had been laid on a previous trip. They made a speed of about 6-7 knots and arrived at the northernmost string **(Figure 12)** at about 1100.

The crew then hauled and shot away four strings of pots. The crabs that had been caught were removed from the pots and placed in fish boxes.

The next three strings, consisting of about 53 pots in total, were then hauled and stored on board in the positions shown in **Figure 13**, to be shot away at another location. At about 1415, before the last string was stowed, the engine hatch was lifted in order to check the space; no floodwater was noticed at this time. Some of the pots were then stowed on the hatch, preventing further access to, and visual inspection of, the engine compartment. The last string of pots was hauled on board at about 1450.

It had been the skipper's intention to take the vessel back to Kilkeel to land the catch before departing again to shoot the remaining three strings of pots. With this in mind, the vessel was headed roughly towards Kilkeel at slow speed. The owner was washing down the deck with the deckhose and had his back to the wheelhouse. The skipper was in the wheelhouse, probably setting the autopilot and recording details of the catch. He kept meticulous fishing records.

Figure 12

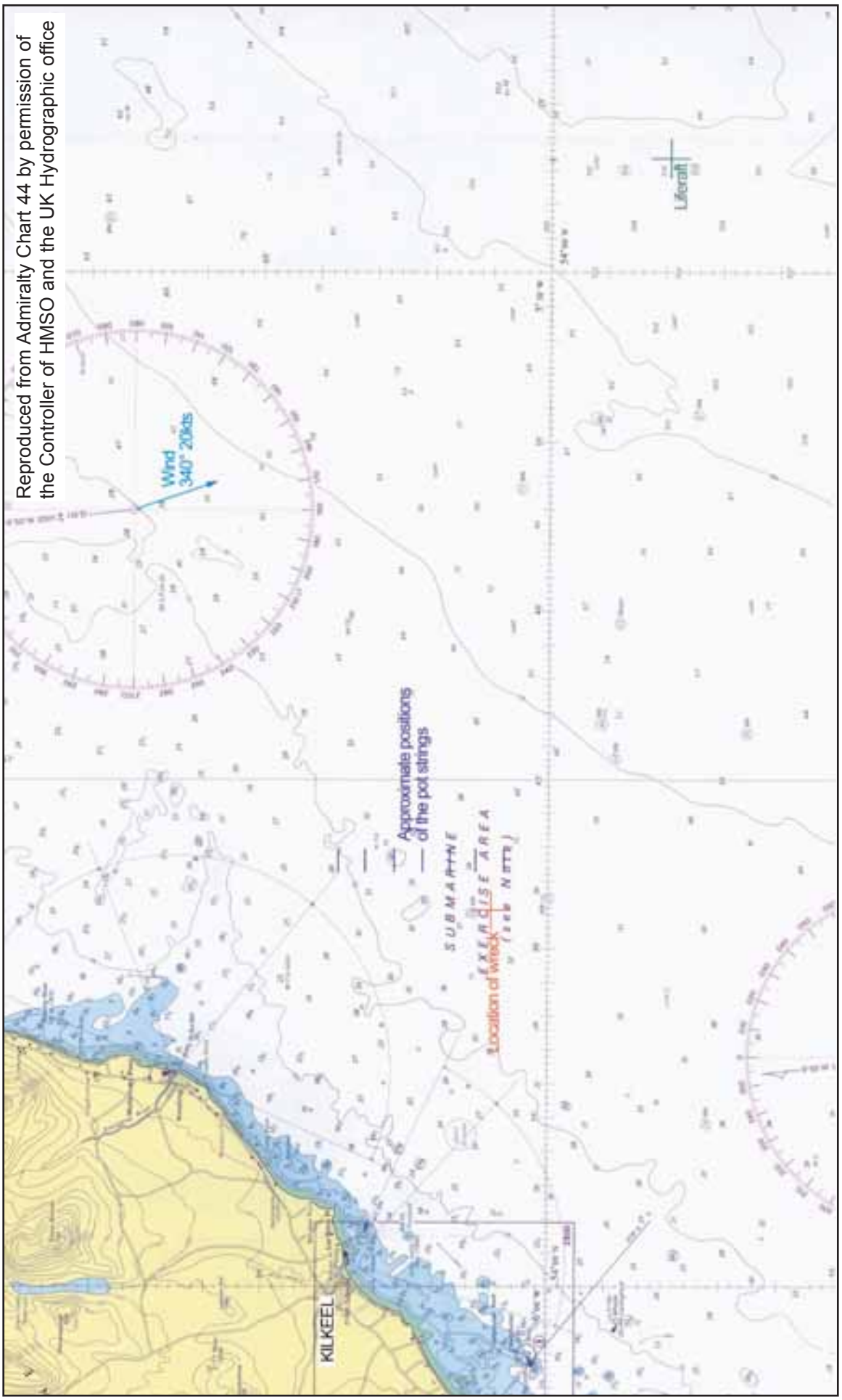
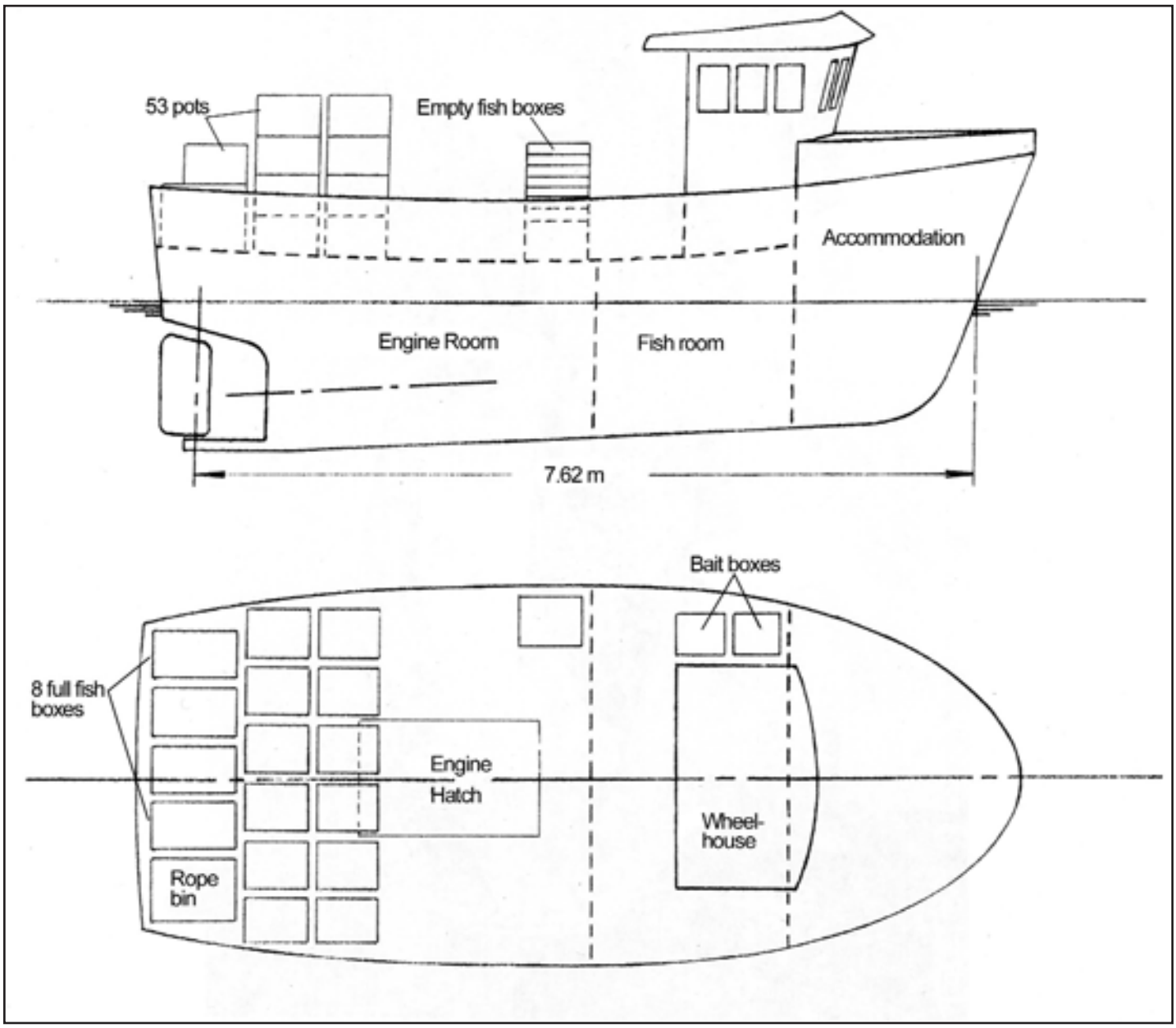

Reproduced from Admiralty Chart 44 by permission of the Controller of HMSO and the UK Hydrographic office
Wind 340° 20kts
Approximate positions of the pot strings
Location of wreck
SUBMARINE EXERCISE AREA
KILKEEL
Lifecraft

Figure 13



Emerald Dawn

At about 1500, the skipper realised that something was wrong and he shouted to the owner that the port side was dipping into the sea. The owner shouted back to close the throttle as he thought that this might right the boat. However, the vessel capsized to port before the skipper had time to do this. The owner was tipped into the sea. The skipper managed to grab a buoyancy waistcoat as he left the wheelhouse before he, too, was thrown into the water. There was no time to use a VHF radio or mobile telephone to send a distress message. The vessel carried on rolling to port until she was fully inverted.

Initially the propeller was still turning. The owner saw that the skipper was trying to zip up a blue and yellow buoyancy waistcoat. The skipper had kicked off his boots. After a minute or two, *Emerald Dawn* righted herself and lay with her stern submerged and her bow sticking up out of the water. The skipper told the

owner to take off any heavy clothing and his boots to aid buoyancy; he also tried to encourage the owner to stay clear of the vessel. The owner could not swim very well, so he struggled back to the vessel and boarded it. He was able to get on the foredeck and reach the liferaft painter, which he pulled. The liferaft inflated, bursting its straps. With some difficulty, the owner then managed to get into the raft.

The liferaft only had one opening in the canopy. As it slowly rotated, the owner periodically saw the skipper in the water and he shouted that he would be with him shortly. The skipper was close to *Emerald Dawn* and did not look to be in great distress. The owner continued to try to sort himself out in the liferaft. He cut the painter, which attached the raft to *Emerald Dawn,* and started to get ready to paddle towards the skipper. However, the owner could no longer see him. *Emerald Dawn* sank a short time later.

4.3.2 Search and rescue

The owner's brother first raised the alarm when he became concerned that the crew were not answering their mobile telephones or the VHF radio and the vessel was overdue in Kilkeel. The coastguard station was informed at 1622.

The coastguards began to organise a search immediately, however it was dark by the time it was properly underway. During the night, a fishery protection vessel, two helicopters, five lifeboats, and 20-30 fishing vessels were involved in an extensive search. A Nimrod maritime patrol aircraft joined in when it became light.

The search vessels found and started to recover *Emerald Dawn*'s pots, but one string was found to be snagged on the bottom. At about 2300, the fishery protection vessel sailed over the area and, using the echo sounder, identified what appeared to be a wreck on the seabed in 40m water depth.

Meanwhile, the owner had discovered that the liferaft and the equipment inside were in very poor condition. He had no means to attract the attention of the search craft. The flares failed to go off when he tried to use them, the torch didn't work, there was no reflective tape on the canopy **(Figure 14)** and the internal and external lights were not operational.

The owner could hear a helicopter from time to time, he saw lights on vessels taking part in the search and, occasionally, vessels passed quite close to him. The coastguard search pattern had been set to cover a wide area allowing for the different drift rates of a person in the water and a liferaft.

The liferaft's rubber buoyancy tubes were perished and leaking air. The raft's pump had broken into two pieces, so the owner kept the raft inflated by blowing into the tubes. The liferaft was also not watertight and he frequently had to use the bowl part of the broken pump to bail the water out **(Figure 15)**. Surviving through the night was an ordeal, and the owner was cold and tired by the next day.

Figure 14

Photograph showing condition of liferaft

Figure 15

A crew member on the freight ferry *Moondance* saw the liferaft at 1102 on 11 November **(Figure 12)**. The ship's whistle was sounded, which alerted the owner, who was seen by the bridge team when he put his head outside the canopy. The coastguard was contacted and, at 1117, a helicopter airlifted the owner to hospital where he was treated for hypothermia. He had drifted about 14 miles in the liferaft during the night.

The search for the skipper continued using the new information that the owner had been able to pass on.

In the late morning of 11 November, police divers were able to confirm that the wreck detected by the fishery protection vessel was that of *Emerald Dawn*. She was lying nearly upright with a slight list to port.

Police divers returned to the wreck on 13 November. During this second dive, the skipper's body was found on the seabed a short distance from *Emerald Dawn*. He was lying on his back and not attached to the wreck. There was no sign of his buoyancy waistcoat. His body was recovered ashore at 1257 that day. The postmortem indicated that he had died from drowning.

4.4 ENVIRONMENTAL CONDITIONS

At the time of the accident, the wind was force 5 from north-north-west, the visibility was good and the weather was improving. There was no significant tidal stream. The sea temperature was about 11º Celsius.

4.5 CREW AND SAFETY TRAINING

The Fishing Vessels (Safety Training) Regulations 1989, as subsequently amended, require all fishermen to undertake training in basic fire-fighting and prevention, basic first-aid, and basic survival at sea.

The skipper had worked on fishing vessels for over 10 years since leaving school. He had served on large offshore fishing vessels and had obtained a Deck Officer Certificate of Competency (Fishing Vessel) Class 2. He attended the course on safety awareness on 31 January 2002. He was a strong swimmer.

The owner, who was acting as deckhand, had served an apprenticeship as a marine mechanic after leaving school. He had worked mostly ashore, with the occasional trip to sea for engine trials. He had been on occasional fishing trips, but was not an experienced fisherman. He had attended the safety awareness course on 11 January 2002, but had not attended the other three statutory basic safety training courses. He suffered from seasickness and was a poor swimmer.

4.6 THE VESSEL AND SAFETY EQUIPMENT

Emerald Dawn had two watertight transverse bulkheads, which divided the hull into three watertight compartments **(Figure 13)**. The owner had found that the GRP hull and its fittings were sound and very little water leaked into any of the compartments.

The forward space formed a cabin for the crew but, as the vessel only operated during the day, it served mainly as a storeroom. Among other stores and equipment, survival suits and inherently buoyant lifejackets were stowed in this space. In addition, two self-inflating lifejackets and two buoyancy aids were kept in the wheelhouse. There was no toilet or cooker on board.

The compartment under the wheelhouse (marked fish room on the figure) was originally a Vivier tank, but was not used as such by the present owner. This compartment was used to store general equipment such as coils of rope.

The engine room was the largest of the three compartments. It extended from the aft bulkhead of the fish room to the transom and contained the engine, steering gear and two GRP fuel tanks.

Any water which might have leaked into the engine room could be pumped out using an electrically-powered bilge pump. Another pump, which was belt-driven from the front of the engine, supplied the deck wash hose with seawater. The deck wash system could also be configured to pump from the engine room and thus act as a secondary bilge pump.

It is not known whether a bilge alarm was fitted to *Emerald Dawn*.

Engine cooling was provided by a pumped salt water system. Water entered the hull via a sea inlet valve, and was then piped to a circulation pump and on to a heat exchanger. Once the salt water left the heat exchanger, some of it was piped into the exhaust system to help with silencing, and some was taken overboard at the transom. About five reinforced moulded rubber hoses were fitted in the system and connected using Jubilee clips.

The salt water cooling system pump supplied about 123 litres per minute at full engine power, which was 2500 rpm. The pump supplied water at a slower rate when the engine rpm was lower.

There were engine cooling water and oil temperature gauges in the wheelhouse, and a new suite of navigation and communication instruments had been recently fitted.

The vessel carried a liferaft, which was stowed on the wheelhouse roof, and which was sold to the present owner with the vessel in April 2004. It was manufactured in 1977, and was therefore over 27 years old at the time of the accident **(Figure 16)**. The name of the manufacturer is not known.

It was not known when this liferaft was last serviced. A flare in the raft with an expiry date of 2/92 indicates the likelihood that it was at least 12 years ago **(Figure 17)**. All the equipment in the liferaft was in very poor condition and most was inoperable. The gas cylinder was badly corroded **(Figure 18)**.

There were no lifebuoys on the vessel on the day of the accident.

Figure 16

Identification number and date on buoyancy tube

Figure 17

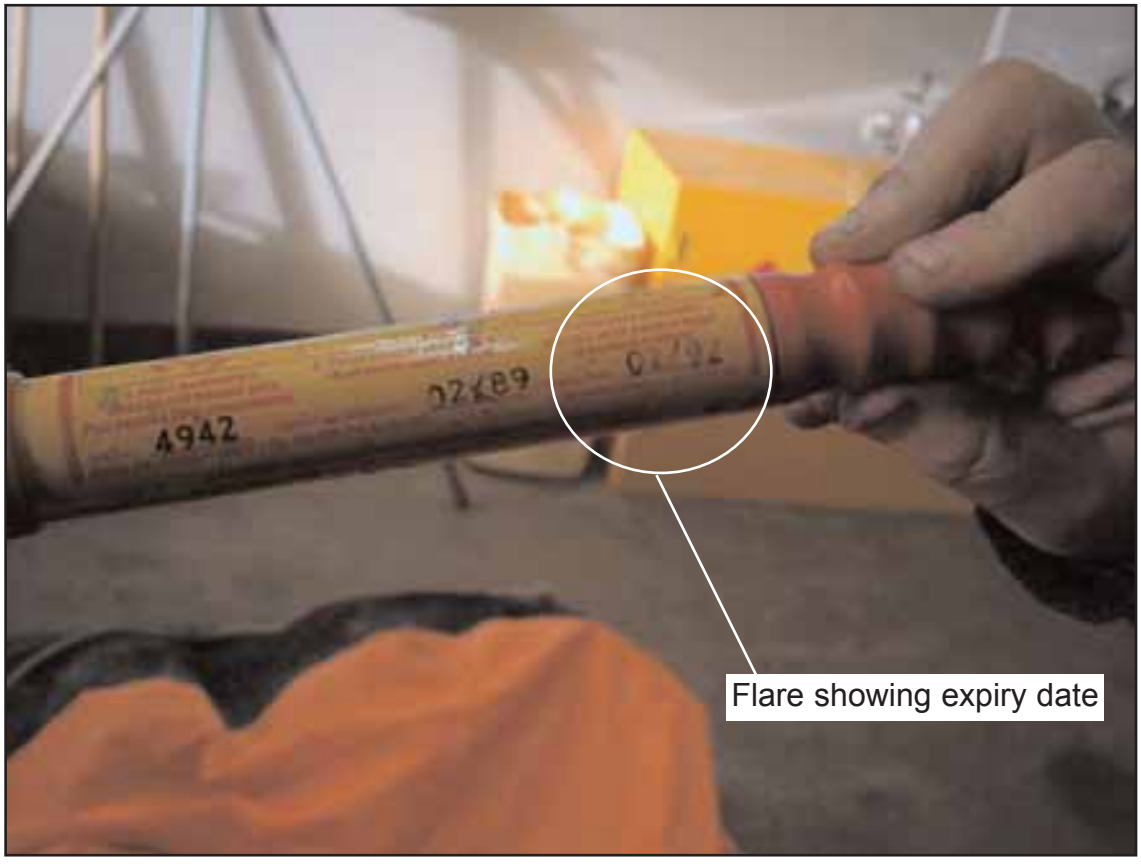


Figure 18

Figure 19

Emerald Dawn under refit

4.7 REFIT

In August 2004, *Emerald Dawn* was lifted out of the water for a refit at a marina on the south side of Carlingford Loch **(Figure 19)**. The owner was an experienced marine mechanic and he carried out the refit work himself.

The work included the following items that are relevant to the accident:

- All the pipework for the salt water cooling system was inspected and one copper pipe, fitted between the heat exchanger and the exhaust system, was found to be worn and was replaced by a new galvanised steel pipe.
- A new transducer for the fish finder was fitted.
- Work was carried out on the propeller and shaft, including renewal of the stern gland.
- Guardrails were fitted on the port side **(Figure 11)**.

4.8 THE CODE OF PRACTICE FOR THE SAFETY OF SMALL FISHING VESSELS

The Code of Practice for the Safety of Small Fishing Vessels came into force on 1 April 2001. The Code specifies requirements for fishing vessels under 15m in overall length.

Emerald Dawn came under the Code and was categorised as a decked vessel of up to 10m in length. The safety equipment that was required to be carried on this category of vessel is shown in **Annex 14**. Of particular note are the requirements for the vessel to be equipped with a bilge alarm and lifebuoys.

In order to advertise and promulgate the Code before it came into force, the Maritime and Coastguard Agency (MCA) wrote to all owners of small fishing vessels **(Annex 15)**. MCA staff also organised roadshows, which comprised presentations to fishing communities around the UK and opportunities for fishermen to ask questions. It was hoped that most owners would voluntarily bring their vessels up to the standard to meet the requirements of the Code and that, once this had been achieved, MCA staff would inspect the vessels to confirm compliance.

MCA coastguard sector managers had been allocated the task of carrying out inspections of small fishing vessels to check on compliance with the Code. Previously, all survey work had been carried out by specialist surveyors within the Agency, and some coastguard sector managers found that this work was difficult to reconcile with their tasks associated with search and rescue.

Marine technicians have recently been recruited by the MCA to, among other things, assist coastguard sector managers with these inspections. Marine technicians are given about 8 weeks' formal training, including a 1½ day course on the inspection of small fishing vessels. They also gain practical knowledge by accompanying experienced surveyors.

4.9 MCA INSPECTION

On 22 October, an MCA marine technician was in Kilkeel to carry out previously arranged inspections of two under 15m fishing vessels. When these inspections had been completed, he took the opportunity to look at other small fishing vessels which had yet to be inspected under the Code.

The technician found the owner working on *Emerald Dawn*. He spoke to the owner and explained that his vessel would have to be inspected under the Code. This was the first time that the owner had heard about the requirements of the Small Fishing Vessel Code.

The owner allowed the technician to come aboard and the inspection took place. The technician usually followed the checklist **(Annex 14)** contained in the Small Fishing Vessel Code.

The technician completed an MSF1606 form at the end of the inspection. The information on this hand-written form was entered on the MCA database on 29 October, and a printout from the database was made during the investigation on 11 November **(Annex 16)**. A number of deficiencies were recorded, some of which needed to be rectified before departure (action code 17), including servicing of the liferaft. Some needed to be rectified within 14 days (action code 16). A completed copy of MSF 1606 was given to the owner before the technician left the vessel. However, the owner did not fully appreciate the significance of the action codes, despite an explanation of their meaning being printed on the back of the form. *Emerald Dawn* sailed on several fishing trips between 22 October and the accident on 10 November with the deficiencies still outstanding. The marine technician did not mention the lack of a working bilge alarm on the form.

On 9 November, the owner had received a letter from the MCA **(Annex 17)** reminding him that there were deficiencies on *Emerald Dawn* which had to be rectified. The owner understood from the letter that he had a further 15 days to carry out this work. In the event, the only identified deficiency that had been attended to by the time of the accident, was that a fire extinguisher had been put on board.

The owner fully intended to rectify the rest of the deficiencies specified in the inspection report in due course.

SECTION 5 - ANALYSIS

5.1 AIM

The purpose of the analysis is to determine the contributory causes and circumstances of the accident as a basis for making recommendations to prevent similar accidents occurring in the future.

5.2 THE PROBABLE CAUSE OF THE CAPSIZE

Emerald Dawn has not been salvaged, therefore no inspection of the vessel has been possible. However, during the investigation, a number of possible causes for her sudden capsize were considered, including:

- The effect of overloading

The vessel could have been overloaded to induce neutral or negative stability and cause the vessel to capsize.

A sketch showing the distribution of the variable load on board is shown at **Figure 13**. It is concluded from this that the vessel was not heavily loaded at the time of the accident. MAIB believes that the vessel's intact stability in its loaded condition was satisfactory and that this hypothesis can therefore be discounted.

- Autopilot malfunction

It is conceivable that an autopilot malfunction caused the rudder to be put hard over and that this induced sufficient upsetting moment to cause the vessel's capsize. However, as stated above, *Emerald Dawn*'s intact stability was sufficient, and she was only motoring at slow speed at the time of the accident. Therefore, the effect of a sudden hard over movement of the rudder would have been minimal.

It is concluded that an autopilot malfunction could not have produced a sufficiently high upsetting moment to cause *Emerald Dawn* to capsize unless her stability had been dramatically reduced by another cause.

- Snagged fishing gear

The snagging of fishing gear while towing or hauling has caused vessels to capsize in the past. A string of pots was found to be snagged on the wreck during the search for *Emerald Dawn*. However, *Emerald Dawn* was not hauling or shooting at the time of the loss, therefore snagged fishing gear is not considered to be a causal factor in this accident. The MAIB believes that the string of pots found had fallen from the vessel when she capsized.

- Sudden catastrophic event – collision with another vessel or the effect of a large wave.

The owner was on deck at the time of the accident, and does not recall any sudden catastrophic event. Therefore, a collision with another vessel, or the effect of a large wave, have been discounted.

- The effect of flooding

Incipient flooding causes the sudden and unexpected loss of a number of UK registered fishing vessels every year. Flooding of this sort typically occurs because of failure of the hull or hull fittings, or through a leak in the salt water engine cooling or deck wash systems. Previous cases have shown that, at the time, the crew are often unaware that flooding is occurring. As water enters the breached space, the vessel's freeboard is reduced and her stability is substantially affected by free surface effect. The vessel's stability can become neutral, or negative, and capsize can occur at any time when even a small upsetting moment is applied. A working bilge alarm can give timely warning that flooding is occurring so that preventative measures can be taken and/or lifesaving appliances can be made ready. If no bilge alarm is fitted, the crew may become aware of the flooding through a change in the movement of the vessel, or because problems are experienced with electrical, propulsion or deck wash systems. Occasionally, the crew remain unaware of the flooding until the moment of capsize.

Of the three watertight compartments within the hull of the vessel, only the engine space was large enough to contain the flooding necessary to have caused the capsize.

Despite the fact that the owner did not recall noticing any warning signs, including a change in the movement of the vessel, the MAIB believes that **incipient flooding of the engine space probably caused the sudden and unexpected capsize of *Emerald Dawn***.

5.3 THE LIKELY CAUSE OF THE FLOODING

A number of possible flooding causes have been considered, including:

- Hull failure

The GRP hull was not severely loaded by the sea conditions or the loading condition of the boat. Prior to the accident, the hull had proved to be sound and leakproof, and the vessel had recently undergone an out of the water inspection which had discovered no defects. GRP is not prone to unexpected and catastrophic failure, and the survivor does not recall seeing or hearing any contact before the capsize. For these reasons, it is considered unlikely that hull failure was the cause of flooding.

- Leaking stern gland

This seal between the propeller shaft and the hull was renewed at the refit about 2 months before the accident. No significant leakage was observed after the boat was returned to the water. The engine space was checked and nothing untoward was noticed about 30 minutes before the accident. It is very unlikely that a leaking stern gland could have led to enough floodwater entering the hull to cause a capsize in the timescale involved.

- Deck wash system

The pump to the deck wash system was powered by a take off from the engine which kept running momentarily even after the vessel's capsize. The owner was using the deck hose in the time leading up to the capsize, and he did not notice any drop in water pressure. For this reason, it is very unlikely that flooding occurred because of a burst pipe or failed joint in this system.

Additionally, the possibility that water downflooded from the deck into the engine space was considered, but, as there was a coaming around the engine room hatch, and no history of this problem, this has been discounted.

- Engine cooling system

The pump to the engine cooling system was also powered by a take off from the engine. A failure in the inlet side of the system might have caused the engine to overheat and alarm in the wheelhouse. No alarm was heard and no increase in temperature was noticed. However, it is possible that, as the engine was only on idle speed, and floodwater surrounding the engine would have kept the engine cool, no alarm would have been triggered. A failure in the outlet side of the system would only have been detected by noticing that water was not discharging through the exhaust and over the stern. Although the owner frequently checked that the cooling water was discharging correctly, this would have been difficult in the minutes preceding the accident as pots were piled high at the stern of the vessel **(Figure 13)**.

A failure in the salt water engine cooling system was the likely cause of the flooding on *Emerald Dawn*.

5.4 THE FAILURE IN THE COOLING SYSTEM

The following factors associated with a failure in the seawater cooling system on *Emerald Dawn* have been considered:

- Probable cause of failure

Failure of metal pipework is a common cause of flooding on fishing vessels. However, *Emerald Dawn*'s owner had inspected the system during the refit about 2 months before the accident, and he had replaced one pipe that was worn. For this reason, failure of the metal pipework is considered unlikely to

have been the cause on this occasion. Failure of either the sea inlet valve or the heat exchange unit are also possible causes but, as these are components that do not often fail, it is considered more likely that the failure occurred through a problem with the flexible hoses in the system. Such hoses have previously been known to burst or fail and cause similar accidents.

- Rate of flooding

The owner recalls checking the engine room about 30 minutes before the capsize when, apparently, no floodwater was present in the space. The estimated timing of this inspection corresponds roughly with the moment before the last string of pots was lifted, brought on board and stowed on the engine room hatch.

The engine was not on full power during the 30 minutes before the capsize. Bearing this in mind, it is unlikely that a failed cooling system could have pumped enough water on board to cause a capsize during this short period.

Witness recollection of precise timing after an accident is notoriously unreliable and, for this reason, the MAIB believes that the owner's recollection is possibly wrong and that the hatch was lifted at an earlier time.

- Visible indications of the failure

The cooling water was discharged through the exhaust and directly over the stern through the transom. The owner was particular about regularly checking the discharge, to confirm that the cooling system was working. On this occasion, he recalls making this check shortly before the capsize and noticing nothing wrong. However, the stowage of pots and catch **(Figure 13)**, would have considerably hampered access to the aft end in order to make this check and, for the reasons explained above, it is possible that the owner's recollection about the time of this check is incorrect.

The owner did not notice any change in the movement or handling of *Emerald Dawn* before the capsize, but as he was busy washing down the deck, slight changes could easily have been missed.

Flooding of the engine space would have disabled the alternator, which was belt-driven and located low down at the front of the engine. A failed alternator would have led to the battery no longer being charged. A gauge in the wheelhouse would have given an indication of this failure, but the instrument was small and not easily noticed.

The battery was located high in the engine space and would have continued to supply electrical power to the wheelhouse equipment for a limited period.

5.5 BILGE ALARM

Emerald Dawn was required to be fitted with an operational bilge alarm under the Code of Practice for the Safety of Small Fishing Vessels. There is conflicting evidence about whether a bilge alarm was fitted. However, none who had knowledge of this vessel, including the owner, his brother and the previous skipper could recall ever testing a bilge alarm or hearing it activate. It is probable, therefore, that there was no operational bilge alarm fitted to *Emerald Dawn* at the time of the accident.

As is typical on many potting vessels, pots were stowed on the engine hatch, making the space inaccessible. Under these circumstances, a properly functioning bilge alarm is vital to give warning of flooding.

Had the crew of *Emerald Dawn* received early warning, it is likely that they could have taken action to either halt the flooding or, at least, prepare the safety equipment on board and make a distress call. Any of these actions could have saved the skipper's life.

5.6 THE CODE OF PRACTICE FOR THE SAFETY OF SMALL FISHING VESSELS

The Code of Practice for the Safety of Small Fishing Vessels has been in force for 4 years, but a substantial proportion of the fleet of small fishing vessels has yet to be inspected for compliance. Vessels and their owners cannot always be easily located and contacted. Coastguard sector managers, who have been given the task of arranging the inspection of the vessels under the Code, have found it difficult to reconcile this responsibility with their search and rescue duties.

The MCA went to considerable efforts to publicise the Code in the fishing press and in roadshows at fishing communities, and it was hoped that fishermen would voluntarily bring their vessels up to the required standard. This has not happened. *Emerald Dawn*'s owner did not know about the Code before the inspection on 22 October 2004. This case, and other similar accidents investigated by the MAIB, indicate that publicity about the Code, and especially the mandatory equipment that must be carried, needs to be improved.

5.7 MCA INSPECTIONS UNDER THE CODE

After the inspection on 22 October 2004, the owner was given a copy of the inspection report (MSF 1606), the details of which are contained in the printout reproduced at **Annex 16**. The owner did not fully appreciate what was required of him and, in particular, that the vessel should not put to sea again until two essential shortfalls (Action Code 17) were attended to. Despite an explanation of the action codes being reproduced on the back of form MSF1606, it is felt that the statutory duty of the owner to comply in the time indicated, could and

should be more clearly communicated. The MCA should also revise its training course on small fishing vessel inspection to make it clear that MCA staff are effectively detaining vessels when Action Code 17 is used, and that skippers and owners should be in no doubt about this.

Although the marine technician followed up his inspection with a letter to remind the owner of the deficiencies which had been found, this was ineffective in ensuring that the deficiencies were corrected in a timely fashion.

There is an MCA procedure for the inspection of under 15 metre fishing vessels, which is part of the MCA's Quality Management System. This procedure, MCA 901, is currently being revised to include, among other things, instructions with respect to following up the correction of deficiencies identified during inspections. Additionally, the MCA has recently issued Operational Advice Note (OAN) 371 to its staff, which provides further guidance on the inspection of small fishing vessels.

5.8 LIFERAFTS AND EPIRBS

The liferaft carried on *Emerald Dawn* was over 27 years old and had not been serviced for about 12 years.

The Code of Practice for the Safety of Small Fishing Vessels does not include a requirement for a vessel like *Emerald Dawn* to carry a liferaft. However, MCA survey policy is clear that, if a liferaft is carried, it should be serviced in accordance with its manufacturer's instructions. The inspection of this vessel under the Code established an urgent need for the liferaft to be serviced, but the owner had not done this before the accident. In the event, the liferaft saved the owner's life. However, it was in poor condition and most of the equipment it carried was inoperable. It is fortunate, therefore, that it inflated and maintained its buoyancy sufficiently to support him. Had it been properly equipped with working lights and retro-reflective tape, he might have been discovered earlier.

The MAIB believes that a properly serviced liferaft, which is capable of carrying all the people on board a vessel, is an essential piece of equipment for all small fishing vessels that come under the Code.

The carriage of an electronic position indicating radio beacon (EPIRB) is not a requirement of the Code, and one was not carried on *Emerald Dawn*. However, EPIRBs can and do save lives. Given the circumstances of this accident, an EPIRB would have alerted the coastguard very soon after the vessel had capsized. The position indicated by the beacon would have enabled the rescue services to home in on the correct emergency position, and the chances of survival of anybody in the water would have been greatly increased.

The Department of Agriculture and Rural Development for Northern Ireland has funding available for the issue of non-mandatory safety equipment like liferafts and EPIRBs to fishing vessels of under 15m in length which operate from the Province. The MAIB welcomes this initiative.

5.9 LIFEJACKETS AND LIFEBUOYS

Self-inflating lifejackets and buoyancy aids were kept in the wheelhouse in case of an emergency, but were not routinely worn. In the event, the skipper had only enough time to grab the first thing which came to hand, a buoyancy waistcoat. The skipper tried to put the waistcoat on while he was in the water, but this is very difficult to accomplish. When his body was found, he was not wearing the waistcoat, and one was later found on the surface by a vessel involved in the search **(Figure 20)**.

The MAIB has recommended, several times in the past, that fishermen should routinely wear self-inflating lifejackets all the time when they are at sea. Accidents like this one can and do occur, even in benign weather conditions, and often without warning. There are now a number of self-inflating lifejackets that are designed for constant wear. They are compact, rugged and should not cause undue hindrance when fishermen are working. Lifejackets that comply with the Code of Practice for the Safety of Small Fishing Vessels are required to be fitted with a light. The MCA inspection of the vessel identified that the lifejackets on *Emerald Dawn* did not have lights **(Annex 16)**. If the skipper had been wearing an approved lifejacket, his life might have been saved. If the owner had been wearing a lifejacket, this would have helped him to get back to the vessel, especially bearing in mind he was a poor swimmer. Had the lifejacket been fitted with a light, this could have been used to draw attention to himself during the night.

Figure 20

Photograph of the buoyancy waistcoat

Lifebuoys were required to be carried on *Emerald Dawn*, and the fact that they were not was identified at the time of the MCA's inspection. This deficiency had not been rectified by the time of the accident, despite the requirement to have done so within 14 days of the inspection (Action Code 16). In the event, lifebuoys could have provided vital buoyancy for the people in the water. The MAIB considers them to be essential safety equipment, and that Action Code 17 (to be rectified before putting to sea again) would have been more appropriate.

5.10 SAFETY TRAINING

The Fishing Vessels (Safety Training) Regulations 1989, as subsequently amended, require all fishermen to undertake training in basic fire-fighting and prevention, basic first-aid, and basic survival at sea. Fishermen are also recommended to undertake training in safety awareness.

The owner had only undertaken one basic safety training course, that of safety awareness, which had been offered free to all fishermen until the course became a requirement on 1 January 2005.

This case, and many others investigated by the MAIB, highlights an apathetic attitude to safety training among many fishermen. The MCA has recently issued an operational advice note (OAN 398) to its staff on this subject. In future, if the crew of a fishing vessel does not meet the requirements of the basic safety training legislation when it is inspected, this will be recorded as a deficiency. The MAIB supports this initiative and believes that safety training can be effective in saving lives.

5.11 FATIGUE

Fishing was not a full-time occupation for the crew. The vessel worked only during the day and only on a few days each week. Both the crew had a good night's sleep prior to embarking on the trip. Therefore, there is no evidence to suggest fatigue of the crew as a factor in this accident.

5.12 THE CAUSE OF DEATH

The postmortem indicated that the skipper had died from drowning. When he was found, he was wearing a coat, jeans and oilskin bottoms, but no boots. He had told the owner that he had kicked these off after they had entered the water. The sea was cold, and there were moderate waves caused by the force 5 wind. He might have suffered from cold shock and passed out soon after entering the water but, in any case, without buoyancy to support him, and with his heavy clothes waterlogged, he would have quickly become cold and tired.

SECTION 6 - CONCLUSIONS

6.1 SAFETY ISSUES

The following safety issues have been identified from the foregoing analysis. They are not presented in any order of priority.

- Incipient flooding of the engine space probably caused the sudden and unexpected capsize of *Emerald Dawn*. [5.2]

- A failure in the salt water engine cooling system, possibly a burst flexible pipe or failed joint, was the likely cause of the flooding on *Emerald Dawn*. [5.3. 5.4]

- The vessel's owner did not detect any sign that the vessel was being flooded. [5.4]

- It is apparent that there was no operational bilge alarm fitted to *Emerald Dawn* at the time of the accident. [5.5]

- Had the crew of *Emerald Dawn* received early warning of the flooding, they could have taken action to either halt the flooding or, at least, prepare the safety equipment on board and make a distress call. Any of these actions could have saved the skipper's life. [5.5]

- The Code of Practice for the Safety of Small Fishing Vessels has been in force for 4 years, but a substantial proportion of the fleet of small fishing vessels has yet to be inspected for compliance. [5.6]

- This case, and other similar accidents investigated by the MAIB, indicate that publicity about the Code, and especially the mandatory equipment that needs to be carried, needs to be improved. [5.6]

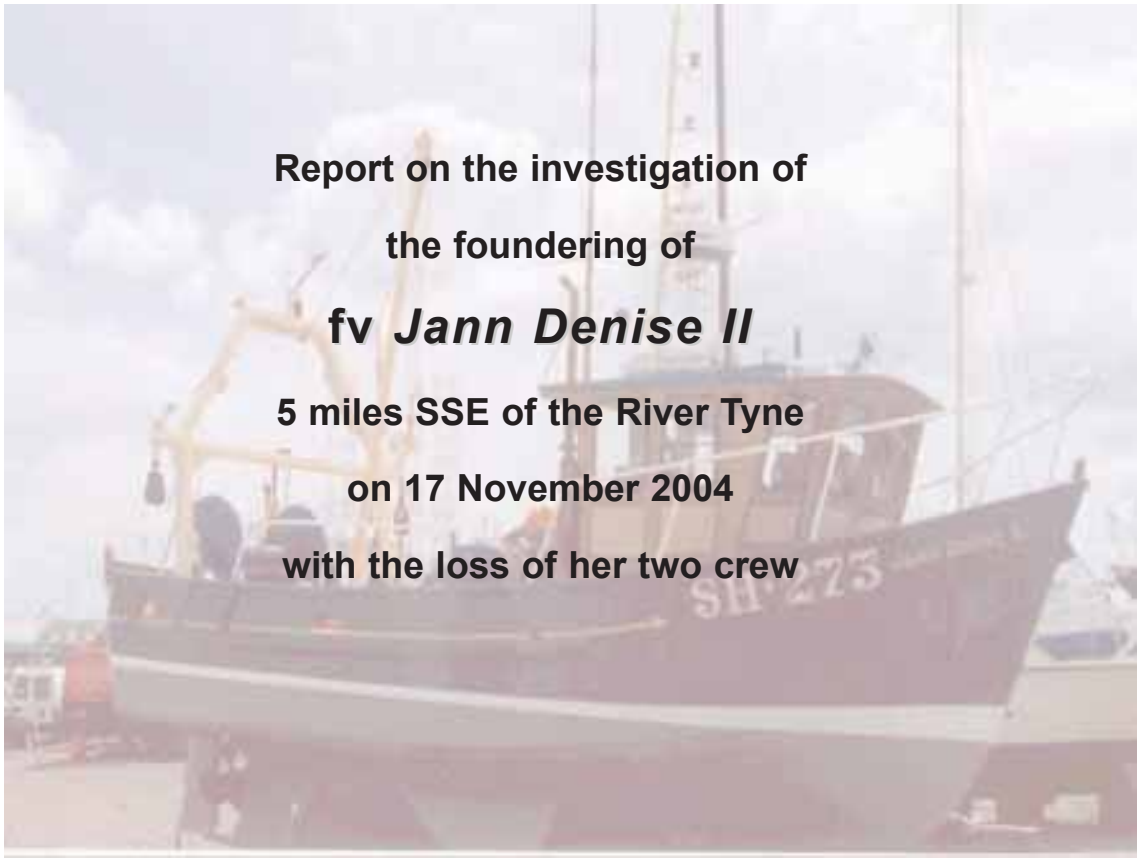
- Although the MCA inspection identified deficiencies in the equipment carried by *Emerald Dawn*, some of which needed to be rectified before the vessel went to sea again, she still had many of the deficiencies at the time of the accident some 3 weeks later. [5.7]

- *Emerald Dawn* was not required to carry a liferaft. The one that was carried was over 27 years old, and had not been serviced for about 12 years. In the event, it saved the owner's life, but a properly maintained liferaft would have better served his and the skipper's needs after the accident. [5.8]

- The carriage of an EPIRB would have helped the rescue efforts considerably. [5.8]

- If the skipper had been wearing an approved constant wear lifejacket, his life might have been saved. [5.9]

- If the vessel had carried lifebuoys, as she was required to, they might have provided valuable buoyancy to the people in the water. [5.9]
- The owner, like many other fishermen, had not undertaken the safety training courses which every fisherman is required to do. [5.10]



Report on the investigation of

the foundering of

fv *Jann Denise II*

5 miles SSE of the River Tyne

on 17 November 2004

with the loss of her two crew

SYNOPSIS

At approximately 1240 on 17 November 2004, the fishing vessel *Jann Denise II* foundered 5.5 miles south-south east of the River Tyne. As a result of the foundering, her crew, Robert Temple the skipper, and his brother Brian, lost their lives.

Jann Denise II was steaming back to the port of North Shields after early completion of a fishing trip due to worsening weather conditions. The last communication from the vessel was at approximately 1200, when the skipper spoke to his wife by mobile telephone. The vessel was last sighted by another local fishing vessel, *Frem,* shortly afterwards. Once it was realised the vessel was missing, a full search of the area was conducted by Humber Coastguard.

Subsequent events included a search for the wreck, an underwater survey and, eventually, the salvage of the vessel itself. Neither of the brothers' bodies were found on board. MAIB inspectors carried out extensive interviews, a very detailed examination of the wreck, as well as an inclining experiment and metallurgical tests.

All the evidence indicates that *Jann Denise II* began to take water in her aft steering compartment and her engine room due to the poor structural condition of the vessel. The flooding probably went undetected by her crew until the latter stages, when it is believed an attempt was made to pump out the bilges. However, before the bilges could be emptied, the vessel was swamped by seas; significant downflooding occurred and she sank rapidly by the stern. There was no time to transmit a "Mayday".

The investigation found that the vessel's high-level bilge alarm float switch had been disconnected before the accident, and one of her bilge pumps was not operational. It also found that her inherent stability was marginal, which was a significant factor in the loss of the vessel.

Several safety issues have arisen as a result of this investigation. These include:

- The absence of a structural survey and formal evaluation of stability for small fishing vessels.
- The lack of understanding of the importance of stability and seaworthiness of small fishing vessels by skippers and owners.
- The absence of any requirement for fishing vessels less than 10 metres registered length to carry a liferaft or an EPIRB.
- The scope and effectiveness of the MCA's inspection regime.

SECTION 7 - FACTUAL INFORMATION

7.1 PARTICULARS OF *JANN DENISE II* AND ACCIDENT

Vessel details

Registered owner	:	Mr Robert Temple, Houghton-Le-Spring, Tyne and Wear
Registration Number	:	SH 273
Port of registry	:	Scarborough
Flag	:	UK
Type	:	Fishing vessel (prawn trawler)
Built	:	1988 Pembroke Dock
Agents	:	Caley Fisheries Ltd, North Shields
Construction	:	Steel
Length overall	:	9.79m
Gross tonnage	:	9.12
Engine power and/or type	:	Gardner Diesel 127hp
Service speed	:	8 knots
Other relevant info	:	Single screw propeller

Accident details

Time and date	:	Approximately 1240 on 17 November 2004
Location of incident	:	54° 59.43'N 001° 15.82'W
Persons on board	:	Two
Injuries/fatalities	:	Two fatalities
Damage	:	Total loss

Figure 21

Jann Denise II

7.2 TIMES

All times in this report are UTC.

7.3 BACKGROUND

Jann Denise II was owned and operated by her skipper. He purchased the vessel in the port of Scarborough 27 months before the accident and, since then, operated her on a daily basis from the port of North Shields.

The vessel was equipped for trawling, and predominantly fished the prawn grounds off the north-east coast of England.

According to her agents, Caley Fisheries Limited of North Shields, *Jann Denise II* was well maintained and her earnings were typically 60-80K per annum.

7.4 DESCRIPTION OF VESSEL

7.4.1 General

Jann Denise II was built of steel construction at East Llanion Marine Limited, Pembroke Dock, in 1988 **(Figure 21)**.

She had one deck above the waterline, with a forward wheelhouse. Forward of the wheelhouse, under a raised deck, was an accommodation area with sleeping arrangements for two people. Aft of this area, below the main working deck, was the engine room.

Aft of the engine room, was a watertight compartment, which housed the steering flat.

On the working deck, aft of the wheelhouse, was a hydraulic trawl winch. To the port side of this winch was the engine room access hatch. Further aft, on the starboard side, was the access hatch to the steering flat compartment.

A net drum was also located aft on the working deck. This had been fitted by the current owner.

The current owner also fitted a marine ply shelter-deck, supported by aluminium framework across the full width of the vessel, from directly aft of the wheelhouse, to a position mid-way down the working deck.

7.4.2 Machinery

Jann Denise II was fitted with a six cylinder Gardner 6LXB diesel engine developing 112kW. The engine drove through a reduction gearbox to a fixed, right-hand propeller. Both the engine speed and gearbox control levers were situated in the wheelhouse **(Figure 22)**.

Figure 22

Wheelhouse engine and gearbox control levers

The engine drove a fresh water and seawater circulating pump and a deck wash pump. An hydraulic pump supplying the trawl winch, net drum and “A” frame lowering arrangements was driven from the free end of the engine. No engine driven bilge pump was fitted.

The rudder was controlled by an independent closed circuit hydraulic system, with its electrically driven, hydraulic pump situated on the after bulkhead of the forepeak compartment **(Figure 23)**. Directional control was achieved either by the autopilot or by a hand tiller situated at the starboard side of the wheelhouse **(Figure 24)**. In the event of failure of the pump, steering could be maintained using the ship’s wheel, which provided hydraulic power directly to the hydraulic rams situated on the rudder stock.

A 24 volt electrical system was provided by two sets of 2 x 12 volt batteries. One set was dedicated to main engine starting, and the other 24 volt system provided electrical power to the services. The systems could be cross-connected in the event that power from one set of batteries was unavailable.

Figure 23

Steering gear hydraulic pump arrangement

Figure 24

Wheelhouse hand tiller arrangement

7.5 LIFESAVING APPLIANCES

Jann Denise II was equipped with the following lifesaving appliances:

- One Premium Lifeguard 4-man liferaft (Serial No 40346), which was stowed on the wheelhouse roof and fitted with a hydrostatic release unit.
- Two lifejackets.
- Eight emergency red flares: three parachute and five hand-held.
- Two smoke floats.

The liferaft was last serviced in June 2004, and was in date. The liferaft's hydrostatic release unit was out of date for servicing by 2½ years.

7.6 THE CREW

Jann Denise II carried a crew of two, the skipper/owner and his brother. Both were experienced fishermen.

Under the Fishing Vessel (Certification of Deck Officers and Engineering Officers) Regulations 1984, the vessel was not required to have any certificated persons on board.

The skipper, Robert Temple, was 34 years of age. He had several years' experience, and had worked on board other local vessels. He had served as skipper on one vessel before he purchased *Jann Denise II*. It was reported that he was conscientious and looked after his vessel.

The other crew member, his brother Brian, was 27 years of age. He, too, was experienced and had worked on board other fishing vessels before joining *Jann Denise II.*

The skipper had completed the three basic mandatory training courses in force at the time of the accident: Basic Survival at Sea, Basic Fire-Fighting and Prevention and Basic First-Aid, in June 1986. His brother had completed two: Basic Survival at Sea and Basic Fire-Fighting and Prevention. He had also completed a VHF Radio course. Neither had completed the (then) voluntary 1-day Safety Awareness course.

7.7 ENVIRONMENTAL CONDITIONS

The weather conditions at the time of sailing were a light westerly breeze, force 2 to 3, with a 1m northerly swell. The visibility was good.

At the time of the accident, the weather conditions had deteriorated to a westerly force 6 to 7, creating a very confused swell.

7.8 NARRATIVE OF EVENTS

Jann Denise II left her home port of North Shields between 0530 and 0600 on 17 November 2004. On board were the skipper and his brother.

Once clear of Tyne piers, she began steaming in an easterly direction towards the local prawn fishing grounds. She shot her trawl at approximately 0700, in a position some 8-10 miles east of the River Tyne.

Once the gear was shot, the vessel continued trawling until approximately 1100, when the skipper decided, because of worsening weather conditions, to haul in the gear and head back to port.

When the gear was hauled on board, the catch, which weighed approximately 400kgs, was landed on deck and left in the cod end. Shortly after 1100, *Jann Denise II* began steaming back towards the Tyne in a westerly direction at an estimated speed of 3 - 3.5 knots.

Once underway, the skipper spoke to a colleague on the fishing vessel *Sophie Louise* by VHF radio, and informed him of his intentions. During the course of the conversation, *Jann Denise II*'s skipper raised no concerns, apart from light conversation about the weather conditions, and that "he could see more water than he could sky".

At approximately 1200, the skipper's wife spoke to him by mobile telephone. He informed her that the weather was worsening and that he was returning to port. That was the last time anyone heard from *Jann Denise II.*

At approximately 1230, *Jann Denise II* was sighted by another local fishing vessel, *Frem,* whose skipper reported that she was approximately 45 minutes behind his boat, steaming towards her home port in a position some 5.5 miles east-south-east of the Tyne.

Later, at 1600, the skipper of another local vessel, *Trudy May,* realised that *Jann Denise II* was not in the harbour. He then tried contacting her by VHF radio, without success. The alarm was then raised.

7.9 THE SEARCH

When the skipper of *Trudy May* could not raise *Jann Denise II* by VHF radio, he informed the coxswain of the RNLI lifeboat who, in turn, informed Humber Coastguard.

Humber Coastguard immediately launched a major search of the area around Tynemouth, covering 60 square miles of sea, and requested attendance from Rescue Helicopter 131 from RAF Boulmer, RNLI lifeboats from Tynemouth, Hartlepool and Sunderland, and shore search teams from Sunderland Coastguard Rescue Team and Tynemouth Volunteer Life Brigade. A police fixed wing aircraft from Teesside, with forward looking infra red search equipment was also requested.

In addition to the emergency services, at least 15 local fishing vessels joined in the search.

Sometime later, the fishing vessel *Bonaventure,* which was involved in the search, reported smelling diesel in a position where it was believed *Jann Denise II* might have foundered. This was followed by the discovery of a new echo sounder "mark" on the seabed, which was believed to be the wreck of *Jann Denise II.* This was confirmed by a divers' survey on 21 November (see 7.10).

The search for the two brothers continued until 2130, when Humber Coastguard called it off for the evening.

The following day, 18 November, the search was resumed, and local fishing vessels picked up debris, which was positively identified as belonging to *Jann Denise II.*

After the rescue services had searched an area of 1200 square miles, Humber Coastguard eventually called off the search as the light faded.

7.10 DIVE SURVEY

On Sunday 21 November, a dive team from Tyne and Wear Marine Limited, on behalf of the local fishing community, conducted an underwater survey of the vessel, free of charge. Its prime objective was to discover if either of the two crew members' bodies were still on board the wreck.

The divers found the wreck lying on its keel with a 10-15° list to starboard. Overall, the vessel had sustained very little damage. The following findings were also made:

- All the wheelhouse windows were intact.
- The forward mast and stays were all intact, but the radar dome was slightly damaged.
- The liferaft was not in its cradle.
- The wheelhouse door was lashed back in the open position.
- The steering flat compartment hatch was in the open position.
- The engine room hatch was in the closed position, but unsecured.
- All the fishing gear was in the stowed position, with the cod ends still attached to the gilson, unopened on deck with the catch intact.

The divers then conducted a thorough search of *Jann Denise II*, but no bodies were found.

7.11 ROV SURVEY AND WRECK RECOVERY

In the interest of future safety, the MAIB made an exceptional decision to recover the wreck.

As a precursor to the recovery, the MAIB carried out an underwater survey of the wreck on 11 December 2004.

An ROV, with onboard lighting and camera, was used to collect images of the wreck. The survey was conducted during a suitable weather window, working from a locally chartered surface support vessel which had been temporarily fitted out with independent power supplies, monitors, recording equipment and appropriate lifting arrangements.

The ROV began operations with a tidal stream of 1.5 knots running in a southerly direction, and a south-easterly wind of 10 knots. The seabed in the vicinity of the wreck was sand and shells. The visibility obtained by the ROV was assessed as moderate to good.

Observations made during the ROV survey are at **Annex 18**.

On 12 December 2004, the day following the ROV survey, the heavy lift vessel *Sarah Grey* was contracted by the MAIB to recover the wreck of *Jann Denise II* from the seabed.

A dive team had already carried out preliminary operations for the lifting of the vessel prior to *Sarah Grey*'s arrival. This included the slinging of steel strops through *Jann Denise II*'s freeing ports to aid the lift, which, in turn, were attached to buoyed lines for ease of recovery.

With *Sarah Grey* in position over the wreck site, her main lifting wire was attached to the lifting strops, and *Jann Denise II* was raised slowly from the seabed to a position some 2-3 metres below the sea surface. By then, the weather conditions had deteriorated to such an extent that it had become unsafe to lift the wreck fully to the surface.

A decision was then made to tow the wreck, under-slung, closer in land, to enable the final part of the lift to be completed safely.

Some 3 hours later, the final part of the lift was completed, 0.5 mile from Tyne Piers, in the lee of the land.

Once *Jann Denise II* had been raised to the surface and secured alongside, portable pumps were placed on board. She was then pumped dry before being towed to a secure berth on the River Tyne, arriving at 2000 that evening.

The following morning, it was discovered that overnight *Jann Denise II*'s engine room, forepeak and steering compartment had flooded substantially. Again, portable pumps were placed on board and she was pumped dry before being lifted completely out of the water and placed on *Sarah Grey*'s deck.

Later that afternoon, *Jann Denise II* was lifted from the deck of *Sarah Grey* onto the dockside at Tyne Dock to enable a thorough survey to be completed. The findings of the survey are described in **Annex 19**.

During the survey, one “vee” shaped split and two cracks were discovered on the port side of the hull below the waterline level. The damaged areas, and a reference section of the hull, were removed for independent metallurgical analysis by Cambridge Test House Ltd.

The section that contained the two cracks included part of the forward bulkhead of the steering gear compartment. This was found to be badly corroded, resulting in a 4/6mm^2 hole which would have allowed water to pass freely between the engine room and steering gear compartment and vice versa.

During tests, it was found that the reference section had also suffered cracking. Relevant extracts from the report are at **Annex 20**. A non-destructive hull plate thickness test was also conducted, the results of which are at **Annex 21**.

7.12 INCLINING EXPERIMENT

Following recovery of the vessel, the MAIB commissioned an inclining experiment to be conducted to examine *Jann Denise II*’s stability. This work was carried out by Marine Data International. Relevant extracts from the report dated 7 February 2005 are at **Annex 22**.

The experiment concluded that *Jann Denise II* had a very low level of inherent stability and insufficient freeboard, which probably contributed to the accident.

7.13 LIFERAFT AND HYDROSTATIC RELEASE TESTING

Jann Denise II’s liferaft, which was recovered along with the wreck, was subjected to rigorous testing by Cosalt Ltd (Southampton), an independent test authority.

The tests concluded that the painter, which was secured to the vessel’s structure, had been pulled out by 4 metres. At this extent, another 15cm remained inside the container, which needed to have been pulled out in order to inflate the liferaft. There was no evidence of the liferaft or the painter having been packed incorrectly, or the painter having become caught, or jammed, inside the container.

Cosalt Ltd was unable to identify why the liferaft painter had not fully extended. The report is at **Annex 23**.

The hydrostatic release unit for the liferaft was also recovered; the MAIB commissioned the manufacturer to conduct tests on the equipment. The test showed that the HRU operated correctly, probably at a depth of 4 metres. The HRU had operated as designed and its internal components were in serviceable condition. The report is at **Annex 24**.

7.14 VESSEL HISTORY

The previous owner of *Jann Denise II* had bought the vessel in 1998. Before that, it had operated out of the small Essex port of Tollesbury, predominantly in estuarial waters, for approximately 6 months of the year.

He had purchased the vessel specifically to trawl inshore from Scarborough, and during his ownership, the vessel rarely fished in weather conditions exceeding force 4 - 5, unless a lee could be obtained from the land.

He made some modifications to the vessel:

- to achieve a central towing position, the 'A' frame on the aft end of the working deck was strengthened;
- heights of the hatch coamings were raised.

The general condition of the vessel then was reported to be good, but the deck was poor.

A problem with ingress of water from the rudder stock into the steering flat compartment was regularly experienced. This required the installation of an electrically driven submersible bilge pump in that compartment. He reported to the new owner that, by varying the thickness of the packing in the rudder stock gland, he had rectified the problem prior to selling the vessel on.

After he sold the vessel to Robert Temple, he kept in contact with him. On one occasion during a telephone conversation, Robert Temple mentioned that there was a problem with the gearbox, and that a crack had developed in the hull near the stern tube. Robert Temple later reported that he had rectified the problem with the gearbox and had the crack weld repaired.

After *Jann Denise II* arrived in the port of North Shields, Robert Temple equipped her for prawn trawling. He had a net drum and a gilson derrick fitted on the deck, and a marine ply shelter was also fitted.

Most of this work was carried out by a local firm of metal fabricators and engineers. In addition, over a period of 2 years, other work was carried out, most noticeably, weld repairs to a split in the deck at the base of the 'A' frame, on the port side. This repair was carried out four times during that period. After the third repair, in June 2004, Robert Temple asked the firm to quote for a replacement aft deck; this they did. The work, however, was not carried out. The last time the split was repaired was in October 2004.

The bilge pump float switch was replaced in June 2004.

7.15 CURRENT REGULATIONS

The Fishing Vessels (Code of Practice for the Safety of Small Fishing Vessels) Regulations 2001, or 'the Code', as referred to in this report, came into force in April 2001. A copy of the Code, reproduced in MSN 1756 (F), is included at **Annex 5**.

The Merchant Shipping and Fishing Vessels (Health and Safety at Work) Regulations 1997 came into force in April 1998. MGN 20 (M+F) contains the relevant guidance for these regulations and, in particular, how to conduct a risk assessment. A copy of MGN 20 (M+F) is included at **Annex 25**.

The Code was developed in collaboration with the fishing industry and, when initially issued, was applicable to vessels under 12m registered length. The Code has since been expanded to cover vessels under 15m length overall. The Code requires that vessels carry safety equipment as detailed in the appropriate checklist. Owners/skippers must also complete a health and safety risk assessment of risks arising in the normal course of work activities or duties, as detailed in MGN 20 (M+F). The vessel owner/skipper must annually self-certify that the vessel complies with the Code, and have the certificate available for inspection. Since introduction of the Code, just over half of the small vessel fleet had been inspected by January 2005.

Jann Denise II was last inspected by the MCA on 10 May 2001 in the port of Scarborough, while still under the ownership of her previous owner. At that time she complied with the requirements of the Code. In addition, she also carried a fully functional EPIRB.

Unlike the codes of practice applicable to larger vessels, the Code does not stipulate any stability or construction requirements for under 15m fishing vessels. No one had any idea of the stability limitations of *Jann Denise II* and no check had been carried out. Likewise, her structural integrity had never been examined.

7.16 OTHER LOSSES

During the period 1992 to 2003, 141 under 12m fishing vessels were lost as a result of flooding and foundering, or listing and capsize. From these losses, 53 fishermen lost their lives.

More recently, on 30 January 2002, the mussel dredger *Charisma* capsized with the loss of one of her crew. *Charisma* was salvaged and thoroughly examined. She was carrying 7.5 tonnes of mussels on deck at the time of the accident. It is believed that flooding occurred through the overboard discharge as a result of the vessel's heavy loading. With no watertight bulkheads or functioning bilge alarm, the floodwater, coupled with the significant deck cargo, caused her to capsize.

On 31 December 2002, the potter *Kirsteen Anne* capsized with the loss of both her crew. Her loss was a result of poor stability caused by modifications made to her since she was built, the weight of the fishing gear carried, and a build up of floodwater in the bilge. There were no specific requirements for stability or freeboard and her crew were unaware of any loading limitations for the vessel.

On 6 January 2003, the inshore trawler *Amber* capsized with the loss of her skipper. It was later found that she had picked up a heavy rock in her trawl and, while attempting to retrieve her gear, capsized. The subsequent investigation found her stability to be poor and her freeboard low. In addition, the owner had made several modifications to the vessel: the gunwale had been raised, a steel shelter was added, a net drum fitted on the stern, the engine had been replaced. No bilge alarm was fitted to the vessel.

As a result of these three investigations, a number of recommendations were made to the Department for Transport and the MCA to improve safety in this sector of the industry. These recommendations are shown at **Annex 26**.

7.17 PRESENT SITUATION

Primarily, as a result of the recommendations made by the MAIB, the following actions have been taken by the MCA:

Firstly, the Wolfson Unit of the University of Southampton conducted a research project (Research Project 529) on behalf of the MCA. The aim of this research was to advise the MCA of effective methods of assessing the stability of fishing vessels of less than 12m registered length.

Phase 1, which was completed in September 2004, identified freeboard and range of stability as major factors affecting the stability and survivability of small fishing vessels. Its primary recommendation was the formulation of simple guidance, using existing standards as a basis, for the determination of the minimum freeboard and maximum load that a vessel can carry.

Phase II, due to begin in early 2005 for an expected duration of 9 months, aims to develop and deliver criteria for use in assigning minimum freeboard and maximum loading to all fishing vessels under 12m registered length.

A stability check, using a method such as a roll test to provide ongoing assessment of stability, will also be required. Application of the criteria should be simple, and should enable a person, not necessarily a surveyor or naval architect, to carry out the assessment.

Further, the MCA, in conjunction with Seafish, has developed a stability awareness training course which will be delivered to the fishing industry by Seafish Group Training Associations. Currently, it is uncertain whether this training will be mandatory or voluntary, or whether it will be delivered to all fishermen, or to only those who are likely to be in charge of a navigational watch.

Finally, recognising that there is no requirement for skippers and deck officers of fishing vessels of less than 16.5m operating in the limited area, to be qualified, the MCA is proposing changes to the certification structure to ensure that all skippers of fishing vessels over 10m are qualified to a recognised standard.

SECTION 8 - ANALYSIS

8.1 AIM

The purpose of the analysis is to determine the contributory causes and circumstances of the accident as a basis for making recommendations to prevent similar accidents occurring in the future.

8.2 CIRCUMSTANCES OF THE LOSS

The circumstances of the loss of *Jann Denise II* are uncertain, but whatever happened, the loss occurred very quickly, since her skipper had insufficient time to transmit a “Mayday”.

The condition in which the vessel was found on the seabed discounts a collision with another vessel. Also, the fact that the main propulsion and steering machinery, when tested, confirmed that it was fully functional prior to the loss, rules out any machinery problems which might have made the vessel susceptible to the weather conditions on the day.

When the loss did occur, *Jann Denise II* was steaming towards port in a westerly direction, which was confirmed by the settings on the main engine controls and the last sighting of her by *Frem.*

When the skipper of *Sophie Louise*, and the wife of *Jann Denise II*’s skipper spoke with him, they detected nothing untoward. It remains a matter of speculation to conclude that the skipper was concerned for his own, and his brother’s safety, because of his remarks that “he could see more sea than he could sky”.

Had the bodies of the two crew members been trapped in the wheelhouse, it would have been indicative of a sudden capsize. Other evidence which discounts capsize is that the tools would not have been left randomly scattered on the aft deck if she had capsized, **Annex 18**.

With no apparent evidence to indicate what happened to *Jann Denise II,* MAIB conducted a thorough survey and inspection of the vessel, a comprehensive analysis of her stability and metallurgical tests on sections of her hull.

8.3 STABILITY AND FREEBOARD

The results of the stability analysis demonstrated that *Jann Denise II* had very poor stability, especially when compared with the stability requirements for larger fishing vessels.

Jann Denise II’s righting moment was marginal. Floodwater, and its free surface effect, added or shifted weights, or a combination of all three factors coupled with external forces could have completely diminished her stability. This could have meant that her ability to resist any destabilising force, and return to the

upright was minimal. Given the condition she was in on her way back to port with her catch on the deck, it would have taken only 3 tonnes of floodwater in her bilge for her stability to be almost completely lost.

Further, the vessel's freeboard of 40cm and a bulwark height of 35cm was minimal. This meant that the heeling force required to submerge the deck edge would also have been minimal. Once the deck edge is immersed, stability is rapidly reduced with any downflooding that may follow. Had she been a larger vessel, over 12m registered length, she would not have been permitted to operate as a commercial fishing vessel with such a low freeboard. (Since she was built, the registered length limit has been increased to 15m.)

At present there is no requirement for existing fishing vessels less than 12m (now 15m) overall length to comply with any kind of stability criteria. In response to previous MAIB recommendations, the MCA, as the agency responsible for legislation and its enforcement, is proposing changes to facilitate the introduction of a simple form of stability criteria and assessment. However, usually, before any proposals can be legislated, they must first be accepted by industry through a form of lengthy consultation. Previous attempts to legislate this class of fishing vessel have met with strong opposition from industry. Even if accepted, current proposals rely heavily on individual operators, with appropriate guidance, being responsible for assessing the stability of their own vessels.

In reality, it is unlikely the majority of skippers and owners of small fishing vessels will comply. Left to self-assessment, many small fishing vessels will still operate with marginal stability. Once criteria are introduced, a far better solution would be for suitable assessments to be undertaken by qualified surveyors. This is already mandatory for larger vessels.

With respect to stability awareness and training, the introduction of a one-day training course would benefit the industry enormously. SFIA are currently investigating the development and provision of such a course, but the scope and applicability has yet to be determined. However, if the course is to be voluntary, it is likely that many fishermen will not attend. Likewise, if it is to be delivered to certificated fishermen only, many small fishing vessel operators will potentially be denied the opportunity to improve safety.

A mandatory stability awareness course, delivered to all fishermen, would be more beneficial to the industry.

8.4 VESSEL CONDITION

The MAIB survey and inspection of *Jann Denise II,* revealed that her structural condition was poor, especially on the working deck. The after section of the deck was very thin, and the deck's port side was perforated in several places. Also, at the base of the 'A' frame on the port side, a substantial split was

present. The extent of this split before the vessel sank is uncertain. What is likely is that it was made worse when she hit the seabed on sinking and when she was recovered for examination.

However, it is reasonable to assume that there would have been some degree of splitting before the accident. The area in way of the split had been repaired, on average, every 3-4 months, and the deck plating in that area was very thin. Given this condition, seawater on deck would inevitably have drained down into the steering flat compartment.

Metallurgical tests showed that part of the "vee" split in the port side of the hull, in way of the engine room, had existed for some time. This would have resulted in an amount of flooding to the engine room bilges. The flooding could probably have been dealt with by periodical use of the engine room bilge pump once manually activated.

Part of the fracture was undoubtedly caused when the vessel hit the seabed when she sank. Nevertheless, the original damage would have progressively worsened as the vessel pounded into westerly seas. The fracture could have opened, allowing more floodwater into the engine room bilges than was usual. The water would have transferred to the steering gear compartment through the 416mm^2 corrosion hole in the dividing bulkhead, causing the vessel to trim by the stern.

The upper rudder stock bearing bush was badly worn, and visible staining in this area provided evidence that water had been leaking through the bush for a prolonged period of time. Therefore, it is reasonable to assume that, to a certain degree, water had been present in the steering flat compartment.

The access hatch to this compartment was found in the open position. It is unlikely that the skipper would have been steaming back to port with it open, especially in the weather conditions on that day. Apart from the crew opening this hatch, the only other way it could have opened would have been during capsize. There was no evidence of capsize.

Jann Denise II was inspected by the MCA in 2001. This inspection was only to confirm that her safety equipment and navigational aids were in place, in accordance with the requirements of the Code. No examination of her structural condition took place since, under the current requirements of the Code, there is no requirement to do so. This is in contrast with the survey requirements for larger fishing vessels (over 15m registered length) where structural survey is mandatory.

Whilst the Code requires that fishermen conduct a risk assessment of their fishing operations, there is no requirement for the owner to document the results. All that is required is a verbal affirmation to the inspector that a risk assessment has been completed. Consequently, without supporting documentation, the inspector cannot verify that the risk assessment has been completed.

A factor contributing to the loss of the vessel was her unsafe structure and stability. The skipper was a conscientious and very experienced fisherman and a proud and successful owner. Evidently, he was prepared to spend money to ensure that his vessel was able to go to sea and fish. It is possible that he was unaware of the cracks in the hull and the potential consequences of the split in the deck. He was also probably unaware of the vessel's poor stability.

Jann Denise II is one of many small fishing vessels involved in similar accidents that have been subsequently found to be unseaworthy. Previous MAIB investigations have highlighted many occasions where opportunities to rectify structural deficiencies have been lost due to lack of knowledge or thorough inspection.

Although it is currently the owner's responsibility to ensure that his vessel is in a fit state to go to sea, had *Jann Denise II* been subject to the same survey regime as that of larger vessels, this accident might have been avoided.

8.5 BILGE ALARM AND BILGE PUMPING

The MAIB survey and inspection also revealed that the electrical bilge pump in the steering flat compartment was not operational, and that the pump had been disconnected from the overboard discharge piping. As a result, any floodwater that accumulated in this space would have had to pass into the engine room through the 416mm^2 corrosion hole before it could be pumped out using the engine room bilge pump.

The non-return valve in the system, designed to prevent backflooding, was ineffective because the valve was fitted on the pump body, and not to the overboard discharge pipe.

It is extremely unlikely that the skipper would have proceeded to sea with the bilge pump in the steering flat compartment disconnected. This would allow unrestricted backflooding into that compartment when the overboard discharge outlet was submerged, as it frequently would have been when at sea. It is therefore reasonable to assume that the pump was disconnected whilst at sea, possibly to aid an investigation into why the pump was not working.

The electrical bilge pump in the engine room had an auto start and a high level audible bilge alarm facility. However, neither was working, as the high level bilge alarm float was not connected to the system. The survey revealed that it was disconnected before the accident, but it is not known when. It is a matter of speculation as to how, and why, such a crucial safety device was rendered ineffective. What is known, from MAIB investigations of similar incidents, is that fishermen disconnect bilge float switches to stop the irritating sound of the alarm as water accumulates in the bilges.

With the high-level alarm float disconnected, it is unlikely that the rising water level would have been detected at an early stage, hence delaying its removal. The situation would have been exacerbated because the engine room bilge pump suction was situated in the forward area of the engine room. With the vessel trimmed by the stern, there would have to have been a significant amount of flood water in the vessel before the bilge pump suction was covered.

8.6 SUITABILITY OF VESSEL FOR OFFSHORE FISHING

Since *Jann Denise II* was built, she had operated mainly in estuarial waters or close inshore, in relatively benign weather conditions. It has been impossible to confirm whether the vessel was built solely for this purpose, as the builder emigrated to Canada some time ago. Nevertheless, despite the fact that she had operated on several occasions in worse weather conditions than those experienced on 17 November 2004, returning to port safely, given her condition and marginal stability it was fortunate that an accident did not occur sooner. With this in mind, it is considered, given the vessel's design, construction and stability, that she was probably unsuitable for the more demanding conditions of offshore fishing.

In view of the lack of available information about *Jann Denise II,* the skipper was probably unaware of her unsuitability for operating offshore. He purchased the vessel based on his level of knowledge and understanding, especially in relation to stability. It is reasonable, to conclude that he did not suspect that the vessel was unsuitable for the operation he intended.

It would have been prudent for the skipper to have sought advice from an experienced source, who might have been able to provide him with a more informed opinion as to the suitability and overall condition of *Jann Denise II* before he purchased the vessel.

8.7 LOSS SCENARIO

Although no one will ever know with any degree of certainty what actually happened to *Jann Denise II* and her two crew members, the following scenario is the most probable based on the evidence found.

For most of the voyage on that day, it is likely there would have been water ingress into the steering flat compartment, probably from two sources: the upper rudder stock and the split in the aft deck on the port side. It is also quite probable that there was ingress of water into the engine room bilge from the crack in the hull, when *Jann Denise II* headed back to port to escape the bad weather.

With undetected flooding occurring in both compartments, her freeboard and stability would have been gradually reduced to an extent that water would have been shipped through the freeing ports and, probably, over the bulwarks. The weight of the catch in the cod ends would have compounded this effect.

It is considered that this would have been the situation as *Jann Denise II* steamed to port. The comment made by the skipper to his colleague, that "he could see more sea than sky" would support this.

The skipper and his brother were probably both in the wheelhouse as the situation worsened. Possibly, they would then have become aware that the sea keeping properties of the vessel were unusual. It is then feasible that at least one of the men went aft to investigate, lifting the steering gear compartment hatch to discover flooding. Their immediate reaction would have been to try and rectify the problem by activating both bilge pumps, since they would have been aware that water was also draining into the engine room. They would then have realised the aft pump was not working. They might then have attempted to rectify the problem; perhaps believing there was a blockage in the pump or piping. It is possible the pump was disconnected from the discharge pipe to free a suspected blockage. Soon after, the vessel was swamped, allowing downflooding into the open hatch. *Jann Denise II* would then have begun sinking rapidly by the stern, with both crew suddenly finding themselves in the water.

As the vessel sank suddenly, there would not have been time to transmit a "Mayday".

8.8 LIFERAFT, HYDROSTATIC RELEASE UNIT AND EPIRB

Despite the fact that under current regulations *Jann Denise II* was not required to carry a liferaft, one was carried on board. Tragically, it failed to operate correctly.

It is not known why the liferaft failed to inflate, despite it having been packed correctly. The liferaft was found, on the seabed near the wreck. Had it inflated, it might have been possible for one, or both of the crew to board it.

Even though the hydrostatic release unit was overdue for servicing by more than 2 years, it operated satisfactorily.

Other investigations carried out by the MAIB have revealed that a liferaft canister and painter can become snagged on a ship's structure or rigging, despite the HRU having operated correctly. This prevents the painter from pulling out fully to inflate the liferaft.

Once snagged, water can leak into the non-watertight canister. The leak is then exacerbated as the head of water increases when the vessel sinks. As water accumulates in the canister, the buoyancy decreases to an extent that it cannot float to the surface. It is possible that the canister fell away from the vessel with the shock of her hitting the seabed. The MCA has conducted research into the adequacy of liferaft stowage on vessels. The results of this research, and resulting advice were published in MGN 267(F), a copy of which is at **Annex 27**.

When *Jann Denise II* was examined, damage to the radar dome on the wheelhouse roof was noted. It is possible that this damage was caused by the liferaft canister being caught under the radar for a period of time as the vessel sank. The risk of this occurring is identified in MGN 267. The notice strongly recommends that owners/skippers check that liferaft containers are situated in an area free from overhead obstructions.

There was no EPIRB on board the vessel when she sank, even though one had been fitted when *Jann Denise II* was last inspected in May 2001 by the MCA in Scarborough. It was established that the previous owner removed the EPIRB but the reasons for this were not known. Had an operational EPIRB been fitted to the vessel, within minutes the emergency services would have been aware that *Jann Denise II* was in trouble, and a search, based on the position obtained from the EPIRB, launched immediately.

Being less than 10m in length, *Jann Denise II* was not required to carry an EPIRB. A liferaft and an EPIRB are both vital pieces of safety equipment. It is considered that all 'Code' fishing vessels (ie fishing vessels of 7m to 15m in length), should be required to carry them on board.

During the MAIB investigation, it was identified that fishermen are often reluctant to invest in safety equipment such as liferafts, EPIRBs and working lifejackets because of the initial purchase price and subsequent maintenance costs. It is understood that funding may be available for items of non-mandatory safety equipment via DEFRA and the equivalent offices in Scotland, Wales and Northern Ireland. Should funding assistance be available, and the equipment be widely purchased, this would improve significantly the survival rates of fishermen in under 15m fishing vessels in the event of the loss of their vessel.

8.9 CODE OF PRACTICE FOR THE SAFETY OF SMALL FISHING VESSELS

The Code of Practice relies on three actions to promote safety: a health and safety risk assessment; self-certification by the owner; and the inspection by the MCA (Coastguard).

Even though *Jann Denise II* was inspected in Scarborough in 2001, it made very little difference to her safety, and would not have prevented this accident. A more thorough survey and inspection regime, which included a check on the vessel's stability and structural condition, might well have prevented this accident.

The conclusion of this investigation supports that of many MAIB investigations into small fishing vessel losses. That is, the Code of Practice for the Safety of Small Fishing Vessels, as presently prescribed, contributes little to ensuring the seaworthiness of a vessel.

SECTION 9 - CONCLUSIONS

9.1 SAFETY ISSUES

The following safety issues have been identified by the MAIB investigation. They are not presented in any order of priority:

1. The marginal stability of the vessel. [8.3]

2. The absence of a structural survey or formal evaluation of the vessel's stability. [8.3]

3. The skipper's failure to appreciate that his vessel was unstable and unseaworthy. [8.4]

4. Unsuitability of the vessel to operate as a fishing vessel offshore. [8.6]

5. The skipper's lack of awareness that the vessel was flooding. [8.7]

6. The vessel's poor structural condition. [8.7]

7. There is no requirement for fishing vessels of less than 15m registered length to carry an EPIRB. [8.8]

8. The liferaft was stowed in a position on the wheelhouse roof under the radar, which might have impaired its ability to float free and inflate. [8.8]

SECTION 10 - ACTION TAKEN FOLLOWING THE THREE INVESTIGATIONS

10.1 MARITIME AND COASTGUARD AGENCY INSTRUCTIONS

The MCA HQ has taken action on a number of <15m fishing vessel inspection related instructions. These include:

- Promulgation of OAN 371 – Issue of Decals to Fishing Vessels of Less than 15 Metres Overall - dated 1 October 2004. The instruction details the procedures to be adopted for the issue of decal certificates. They also include the procedures for the recording of deficiencies identified during an inspection, and the follow-up actions required to remedy these deficiencies.
- A complete review of the Instructions for Safety Inspections of Under 15 metre Fishing Vessels – Quality Management System Documentation Procedure - MCA 901 dated 28 February 2003.
- A review of The Code of Practice for the Safety of Small Fishing Vessels of less than 15m length overall by the Steering Committee of the Fishing Industry Safety Group. The draft Code is currently at the consultation stage.
- Promulgation of OAN 398 – Enforcement of the Fishing Vessels (Safety Training) Regulations dated 17 January 2005. This instruction provides guidance on the action to be taken in the event that crew are found to be non-compliant with the mandatory safety training requirements.

10.2 SCOTNI REGIONAL OPERATIONS MANAGER (SURVEY & INSPECTION)

The SCOTNI Regional Operations Manager (Survey & Inspection) promulgated instructions - "<15m Fishing Vessel – General Condition" on 13 December 2004 **(Annex 28)**. The instructions require inspectors to take due account of watertight integrity, freeboard and possible increase in top weight during inspections.

SECTION 11 - RECOMMENDATIONS FOLLOWING THE THREE INVESTIGATIONS

The Fishing Industry Safety Group (FISG) is recommended to:

2005/164 Agree, develop and implement measures to ensure <15m Code fishing vessels are "fit for purpose".

Measures should, as a minimum, take due cognisance of, and define appropriate limits on:

- Areas of operation
- Stability
- Mode of operation
- Outfit and equipment
- Periodic owner checks.

The Department for Transport is recommended to:

2005/165 In consultation with DEFRA, establish a link between the inspection, registration and licensing of <15m fishing vessels.

Seafish is recommended to:

2005/166 Develop and promulgate to the fishing industry, a list of suitably experienced personnel to provide fishermen with expert advice when purchasing and/or making significant modifications to fishing vessels. Such advice should include:

- Assessment of vessels (fit for purpose) during pre-purchase survey
- Guidance on operational limitations and assessment of stability.

The Maritime and Coastguard Agency is recommended to:

2005/167 Ensure that there is an adequate network of qualified MCA fishing vessel surveyors who are available to survey fishing vessels whenever required to do so.

2005/168 Review the current training and guidance for MCA fishing vessel inspectors, to ensure clear terms of reference are established and understood with respect to the inspection and possible detention of fishing vessels.

2005/169 Work with DEFRA, SEERAD and DARDNI to make government funding for the provision of non-mandatory LSA more easily available.

Marine Accident Investigation Branch
August 2005

Safety recommendations shall in no case create a presumption of blame or liability