MAIB TRILOGY REPORT

Korenbloem

Osprey III

Optik

Marine Accident Investigation Branch
Mountbatten House
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Report 6/2010
May 2010

Extract from

The United Kingdom 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 purposes is to attribute or apportion liability or blame.

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INTRODUCTION

Three fatal accidents, in a very short period of time, provide a powerful illustration of the dangers faced by UK fishermen. The fact that all three deaths occurred when the victims either slipped or were dragged overboard by fishing gear also casts a spotlight on sub-optimal working practices and attitudes to occupational safety that seem to be the norm for some in the industry.

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. Safety issues such as working practices, the use of personal protective equipment when working on deck and the logistics and planning required to recover men from the sea are common to all three investigations. These issues are not new and have already been the subject of a number of MAIB recommendations to the MCA, Seafish and the fishing industry in recent years.

Five years ago, the MAIB published another trilogy report which focused on accidents involving small fishing vessels. In the introduction to that report I wrote:

> *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.*

One could conclude from the results of the MAIB investigations contained in this report that nothing much has changed since 2004, despite a number of accident reports and recommendations being produced by the MAIB.

In 2006, during an MAIB investigation into the serious injury sustained by a crew member of the scallop dredger *Danielle*, the MAIB identified as best practice a pilot scheme being carried out in North East Scotland to engage with fishermen and assist with the production of meaningful risk assessments. The MCA affirmed its intention to extend this scheme across the UK. However, this key commitment has not been taken forward.

In November 2008, the MAIB published a major study analysing UK fishing vessel safety from 1992 – 2006, in which the dangers associated with potters and the more general risk of fishermen being lost overboard were specifically identified. The Department for Transport and the MCA were recommended to *"Agree the coherent resourced plan for reducing the fatality rate in the fishing industry".* A holistic plan has still not been developed.

If the safety record of the fishing industry is to improve, then all stakeholders, including those with responsibility for regulation, training and enforcement need to increase the focus and resources allocated to these important areas. Special attention must be given to improving fishermen's safety awareness and understanding of the risks posed by their work place if occupational accidents, including cases of man overboard, are to be reduced.

Action needs to be taken to develop a comprehensive, timely and properly resourced plan with the clear objective of reducing the rate of fatalities within the fishing industry to a level commensurate with other UK occupations. Accordingly, this report concludes with a single recommendation to the Department for Transport.

STEPHEN MEYER

Chief Inspector of Marine Accidents

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GLOSSARY OF ABBREVIATIONS, ACRONYMS AND TERMS

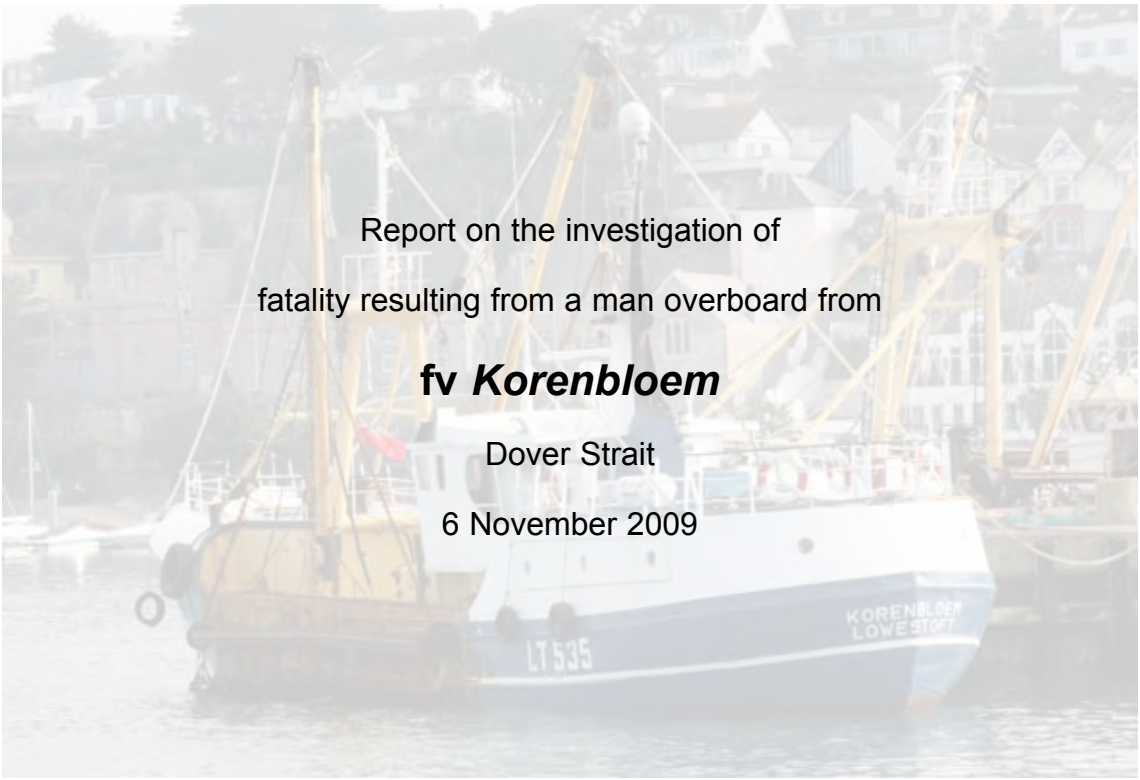
A&E	-	Accidents and Emergencies
ALB	-	All weather lifeboat
ARCC	-	Aeronautical Rescue Co-ordination Centre
BLS	-	Basic life support
C	-	Centigrade
CG	-	Coastguard
cm	-	centimetre
CPR	-	Cardiopulmonary Resuscitation
DH	-	Deckhand
EC	-	European Community
EFF	-	European Fisheries Fund
EN	-	European standard
EPIRB	-	Emergency Position Indicating Radio Beacon
FISG	-	Fishing Industry Safety Group
fm	-	Fathom; common nautical measurement of 6 feet
GRP	-	Glass reinforced plastic
GTA	-	Group Training Association
IFVC	-	International Fishing Vessel Certificate
ILB	-	Inshore lifeboat
ISO	-	International Standards Organisation
kg	-	kilogramme
kW	-	kilowatt
LAF	-	Local Area Facilitator
LOA	-	Length overall

LOLER	-	The Merchant Shipping and Fishing Vessels (Lifting Operations and Lifting Equipment) Regulations 2006
LSA	-	Life Saving Appliances
m	-	metre
MCA	-	Maritime and Coastguard Agency
MFA	-	Marine and Fisheries Agency
MGN	-	Marine Guidance Note
MOB	-	Manoverboard
MoD	-	Ministry of Defence
NFSM	-	National Facilitation Service Manager
nm	-	Nautical miles
PFD	-	Personal Flotation Device
PPE	-	Personal Protective Equipment
PUWER	-	The Merchant Shipping and Fishing Vessels (Provision and Use of Work Equipment) Regulations 2006
RAF	-	Royal Air Force
RFA	-	Royal Fleet Auxiliary
RNLI	-	Royal National Lifeboat Institution
SAR	-	Search and Rescue
SRR	-	Search and Rescue Region
STCW	-	International Convention on Standards of Training, Certification and Watchkeeping for Seafarers, as amended
UTC	-	Universal Co-ordinated Time
VHF	-	Very High Frequency

Dredge bag	-	Combination of chain mail and synthetic netting fitted behind the mouth of the frame in which scallops are collected.
Fishermen's Safety Guide	-	A guide to safe working practices and emergency procedures for fishermen, issued by the MCA.
M Notice	-	Merchant Shipping Notices as issued by the MCA. These are in three differing categories: Marine Safety Notices (MSN), Marine Guidance Notices (MGN) and Marine Information Notices (MIN).
PFD	-	Personal flotation device is the generic term for such equipment as lifejackets and buoyancy aids. Whereas a lifejacket is designed to support an unconscious person face up in the water, with the mouth and nose clear of the water, a buoyancy aid simply gives support in the water to a conscious swimmer. If unconscious, there is no guarantee of a casualty floating the correct way up when wearing a buoyancy aid.
Scallop dredge	-	Any appliance with a rigid framed mouth which is towed through the water and is manufactured, adapted, used or intended for the purpose of fishing for king scallops.
Seafish	-	The Sea Fish Industry Authority works across all sectors of the UK seafood industry to promote good quality and sustainable seafood.
Share fishermen	-	Fishermen who earn their wages purely as a share or percentage of the catch.
Shooting the gear	-	Lowering the fishing gear into the water for fishing.
Top in	-	The act of setting the vertical angle of the derrick boom in order to bring the towing beam closer to the shipside.
Top out	-	The act of setting the vertical angle of the derrick boom in order to move the towing beam further away from the shipside.

Times: All times used in this report are UTC unless otherwise stated

Korenbloem Investigation



Report on the investigation of

fatality resulting from a man overboard from

fv *Korenbloem*

Dover Strait

6 November 2009

SYNOPSIS

At approximately 1900 hours on 6 November 2009, James Grindy, a deckhand on board the scallop dredger *Korenbloem*, fell overboard while the vessel was preparing to shoot the port side scalloping gear. He had been standing on top of the catch in the scallop tray, as he was required to do during shooting and hauling operations. The scallop tray was constructed at almost the same height as the bulwark.

The vessel was in the Dover Strait and the weather was very rough with heavy swell, strong winds and squalls.

Two deckhands who had been working on the starboard side jumped into the water and managed to recover James Grindy on board with the help of the other crew members. After approximately 2 hours, he was airlifted and taken to the nearby Royal Fleet Auxiliary vessel RFA *Mounts Bay*. He was pronounced dead at 2156 having suffered non-survivable injuries, most likely as a result of being crushed between the towing beam and the vessel's hull.

SECTION 1 - FACTUAL INFORMATION

1.1 PARTICULARS OF *KORENBLOEM* AND ACCIDENT

Vessel details

Registered owner	:	Korenbloem Ltd, Brixham
Managers	:	Korenbloem Ltd, Brixham
Port of registry	:	Lowestoft
Flag	:	U.K.
Type	:	Scallop dredger
Built	:	1968 at Den Oever, Holland
Construction	:	Steel
Registered length	:	24.25m
Breadth extreme	:	6.30m
Gross tonnage	:	139
Engine power and/or type	:	597kW, Mitsubishi LT S12Z
Service speed	:	12 knots

Accident details

Time and date	:	1900 on 6 November 2009
Location of accident	:	50º27.1'N, 000º34.4E, Dover Strait
Persons on board	:	6
Injuries/fatalities	:	1

1.2 NARRATIVE

1.2.1 Background

Korenbloem is a beam trawler with the ability to carry out either white fishing or scallop dredging depending on the fishing gear fitted. At the time of the accident she was working as a scallop dredger, operating 12 dredge bags on either side. At the end of each haul the dredge bags, which were suspended between the towing beams and tipping bars, were emptied into long trays (bins) adjacent to the bulwarks by lifting the tipping bar using the gilson winch. During hauling and shooting the gear, deckhands had to climb on top of the bins to attach or detach the gilson clips. The top edges of the bins were nearly at the same height as the bulwarks **(Figure 1)**.

Figure 1

Scallop trays or bins adjacent to the bulwark

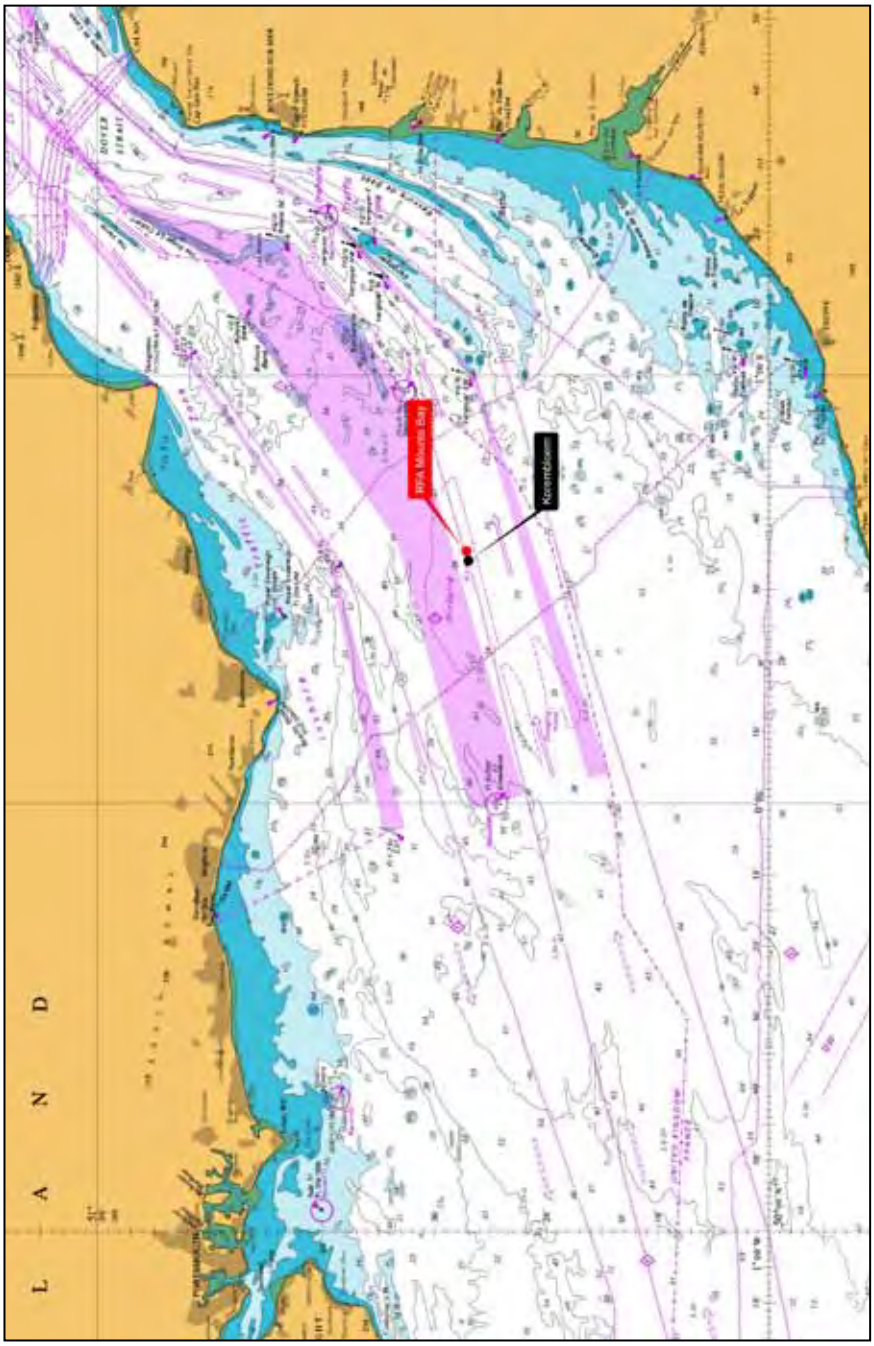
1.2.2 Environmental conditions

The environmental conditions in the area at the time of the accident, as recorded by the Royal Fleet Auxiliary (RFA) vessel RFA *Mounts Bay*, were: heavy rain/ squalls; wind speed of 45 knots gusting to 55 knots from 210º (south-south-west); sea state of 6/7 with south-westerly swell of 2.5m; sea water temperature of 15.2ºC; and visibility of 1.1nm during squalls. The tidal stream was setting west-south-westerly at 1 knot.

1.2.3 Manoverboard (MOB)

At 1030 on 5 November 2009, *Korenbloem* departed her home port of Brixham, Devon, and sailed to her fishing grounds in the Dover Strait **(Figure 2)**. At 0135 on 6 November, she shot her gear and thereafter continued fishing with an approximate turnaround time of 1 hour 20 minutes between each haul. The weather was gradually deteriorating as the day progressed. All four deckhands were on deck until 0300 when the victim, James Grindy, went to the sleeping quarters to get some rest. He returned on deck at 0800 and thereafter was working the gear on the port side; he wore dungaree-style oilskins on top of his normal clothes and had on a pair of working gloves and wellington boots.

Figure 2



Location of the vessels just before airlifting the casualty

Around 1840 the vessel was getting ready for the 13th haul; it was raining quite heavily and the sea state had worsened considerably. At this time James and two other deckhands who were taking a tea break in the galley came out on deck for the hauling. None of them was wearing a lifejacket, safety helmet or harness. The vessel was stopped as the towing beams were hauled up. Having noticed that the port towing beam had come to the surface, pointing the wrong way, they turned it around 180º and then emptied the catch from both port and starboard dredges into their respective bins. The bins were approximately half full.

At approximately 1900, the crew were getting ready to shoot the trawling gear again. From the wheelhouse, the skipper observed James Grindy was standing on the catch in the bin on the port side, holding on to the gilson wire which was still hooked to the port dredge tipping bar. He then looked to the starboard side and saw one deckhand standing on the starboard side bin, and the other deckhand helping him with the gilson wire which had been unhooked. When he looked to the port side again, James was missing. He shouted, "*Where is James?"*, before he ran out of the bridge to the port side and saw James Grindy floating face-down in the water at the aft-most end of the towing beam. The skipper cannot recall whether James was between the towing beam and hull, or outboard of the towing beam.

1.2.4 Recovery from the water

The towing beam with the bridle chains was swinging about and dipping in and out of the water as the vessel rolled, so the skipper ran back into the bridge and topped the derrick out until the gear was approximately 2m away from the ship's side. The deckhand who had been standing on the starboard bin jumped down and ran to the port side. Climbing up on the port bin he saw James in the water beside the last dredge, between the aft end of the towing beam and the vessel. He jumped into the water and was followed shortly afterwards by the second deckhand.

In the meantime, the mate and the off-duty deckhand, who were in the galley, heard the shouts from the bridge and they, too, rushed to the port side. Together with the skipper, they threw a life-ring in the direction of the casualty. The two deckhands in the water held on to the fishing gear to stay afloat and kept James's head out of the water. They tried to put the life buoy around him, but were unsuccessful as he was unconscious and the fish gear they were holding on to was moving around and occasionally bumping them. After approximately 5 minutes in the water, they managed to get James near to the vessel's side where, aided by the swell and the three remaining crew members on deck, they were able to recover him back on board. The two deckhands were also helped back on board immediately afterwards.

1.2.5 Resuscitation efforts

The crew took James into the sheltered stern compartment of the vessel. He was unconscious, but had no visible injuries. Accounts vary as to whether he was breathing at the time. They laid him down on a mattress and began administering cardiopulmonary resuscitation (CPR) and James was observed to be breathing from this point onwards.

At 1912 the skipper alerted Dover Coast Guard (CG) to the situation and asked for an immediate helicopter evacuation. At 1919 Dover CG contacted the French CG at Gris Nez, passed them *Korenbloem*'s position and agreed with them that, as the incident had occurred in the French search and rescue region (SRR) area, a French rescue helicopter would be dispatched. The French CG asked Dover CG whether they had carried out a medical link call with *Korenbloem*.

At 1922, the skipper informed Dover CG that the casualty was frothing from the mouth. At 1926 Dover CG set up a call between a doctor at the Accidents & Emergencies (A&E) department at Queen Alexandra's hospital, Portsmouth, and *Korenbloem*'s skipper. After a brief discussion with the skipper, the doctor confirmed that an immediate transfer to hospital was required. At 1941, the skipper informed Dover CG that James Grindy had stopped breathing.

1.2.6 Helicopter evacuation

At 1943 a French helicopter was assigned to the incident, though its first task was to transit from its base at Le Touquet to Boulogne to pick up a doctor. At 2021 the helicopter was airborne from Boulogne with the doctor on board.

Meanwhile, RFA *Mounts Bay*, which had been 24nm from the scene at the time of the accident, agreed with Dover CG that the casualty would be taken to her as she had facilities for refuelling the helicopter, a well equipped hospital and a trained paramedic. By 2100 RFA *Mounts Bay* had arrived at the scene and was providing a lee to *Korenbloem* for the helicopter operations. The helicopter, which had arrived at almost the same time, instructed *Korenbloem* to turn to the north-east to run down-sea with a following wind. At 2110 James Grindy was winched up to the helicopter and at 2126 he was transferred to RFA *Mounts Bay*. At 2156, the French doctor recorded that James Grindy had died.

1.2.7 Postmortem examination and toxicology report

A postmortem examination carried out on 20 November 2009 established that James Grindy had suffered *"a significant blow from a large blunt object possibly part of the boat, possibly part of the fishing equipment that was in the sea".* The blow struck him at the back of the chest and upper abdomen. There were no significant head injuries and minimal external injuries; the internal injuries were described by the pathologist as *"devastating* and *unsurvivable"*. There was no evidence of drowning.

1.3 HISTORY, SURVEYS AND CERTIFICATION

1.3.1 History

Korenbloem was built in the Netherlands and operated under Dutch ownership and the Dutch flag until 1980 when she was brought into UK ownership and registered in the UK. The present owners had taken over the vessel in 2000. The bins for sorting scallops were fitted in 2005.

1.3.2 Survey and inspection

Fishing vessels greater than 24m length are surveyed on a 4-year cycle: once during the international fishing vessel certificate (IFVC) renewal survey, which includes an out of water inspection, and once during an intermediate survey. During renewal and intermediate surveys the fishing gear, including bins, is removed from the vessel. Surveyors at the Maritime and Coastguard Agency (MCA) Marine Office at Brixham also carried out a general inspection of all the vessels based in that port so as to ensure that every vessel was inspected or surveyed at least once a year. *Korenbloem*'s IFVC was renewed on 24 March 2009 following the renewal survey, and consequently the vessel did not receive a general inspection in 2009.

1.4 CREW

1.4.1 General

Korenbloem had six crew members including the skipper, mate and four deckhands. The crew were all residents of Brixham or nearby towns, and all worked as 'share fishermen'. During fishing operations, the four deckhands had an 18-hours-on / 6-hours-off working routine in a 24 hour period.

1.4.2 Deckhand James Grindy

At the time of the accident, James Grindy was 24 years old. He was 185cm (6 feet 2 inches) tall and weighed about 92kgs (14.5 stones). He had started his working career in the Royal Navy, but in early 2009 he joined the 29m Brixham registered scallop dredger *Van Dijck*. He left the vessel after spending 2 months on board, and joined *Korenbloem* in October 2009. He was able to swim and had completed two of the four mandatory courses: *Personal survival techniques* and *Personal safety and social responsibility (basic health & safety training)*. During his time on board *Korenbloem,* James's duties on deck always included standing on the bin at the time of shooting and hauling in order to operate the gilson wire G-clips.

1.4.3 Skipper and mate

The skipper was 49 years old and had 20 years experience as skipper on fishing vessels. In the last 15 years he had worked on several scallop dredgers. While steaming out to the fishing grounds and returning to port he kept the navigation watch.

The mate was 38 years old. He shared the operation of the winch controls with the skipper, and the two of them had a flexible working arrangement which allowed the mate approximately 6 hours on watch and 6 hours of rest during fishing operations.

1.4.4 Other deckhands

Besides James Grindy, there were three other deckhands, of which one was an experienced 33 year old who had spent 18 months on fishing vessels and had around 5 months of experience on scallop dredgers. The remaining two deckhands were 24 and 18 years old respectively. The 18 year old normally stayed on the deck and only went up on the bins on rare occasions.

1.4.5 Crew certification

A fishing vessel between 24m and 30m registered length should have among its crew no fewer than two watchkeepers, holding a minimum of one Class 2 and one Class 3 fishing vessel certificate. The skipper had a 'Second hand' certificate issued in 1987, equivalent to a Class 2 fishing vessel certificate, which qualified him to work as a skipper in limited areas[1]. He was the only qualified watchkeeper on board; the mate did not have a watchkeeping certificate. All crew members except James Grindy had completed the four mandatory Seafish courses[2].

1.5 SCALLOPING EQUIPMENT AND WORKING PRACTICES ON BOARD

1.5.1 Equipment on board

Korenbloem had a 30cm diameter hollow steel towing beam on both port and starboard sides, each equipped with 12 dredge bags. The towing beams were suspended from 'monkey face' plates **(Figure 3)**, and were fitted with solid rubber wheels on both ends. The bottom ends of the dredge bags were connected via chains to tipping bars, which also were suspended from the 'monkey face' plates. The tipping bars could be lifted independently of the towing beams by using G-clips to attach the gilson wires **(Figure 4)**. The tipping bars were of a lighter construction than the towing beams, and were suspended at the same level as the towing beams when out of the water **(Figure 5)**.

The port and starboard derricks were operated by two groups of hydraulic motor driven winches: a towing winch; a gilson winch, which turned the bags over by raising the tipping bar; and a topping winch, which brought the gear inboard or topped it outboard. The winch motors were controlled from the bridge and powered by a hydraulic pump, belt driven from the main propulsion engine.

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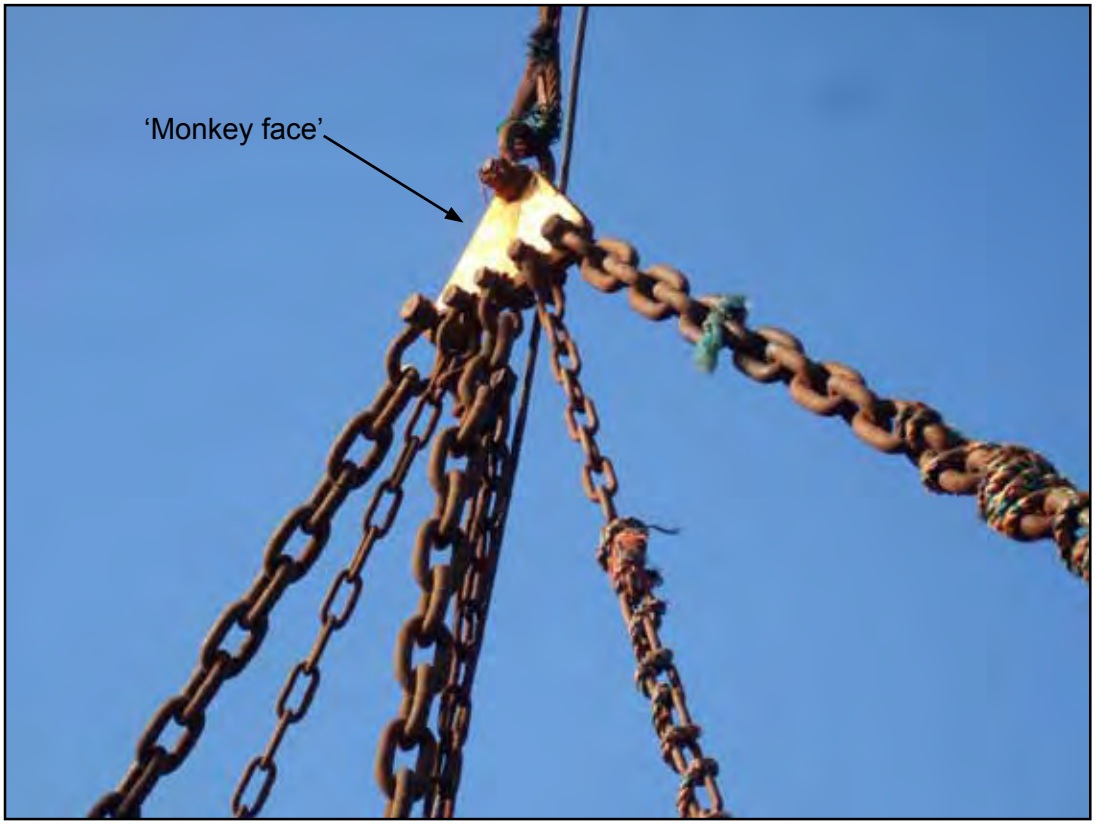
[1] Limited areas - Limited Area means any location within the area bounded by a line from a point on the Norwegian coast in latitude 62° N due west to a point 62° N 3° W; thence to a point 58° N 10° W; thence to a point 53° N 12° W; thence to a point 49°N 12° W; thence to a point 46° 30'N 6° W and thence due East to the French coast

[2] Seafish courses are

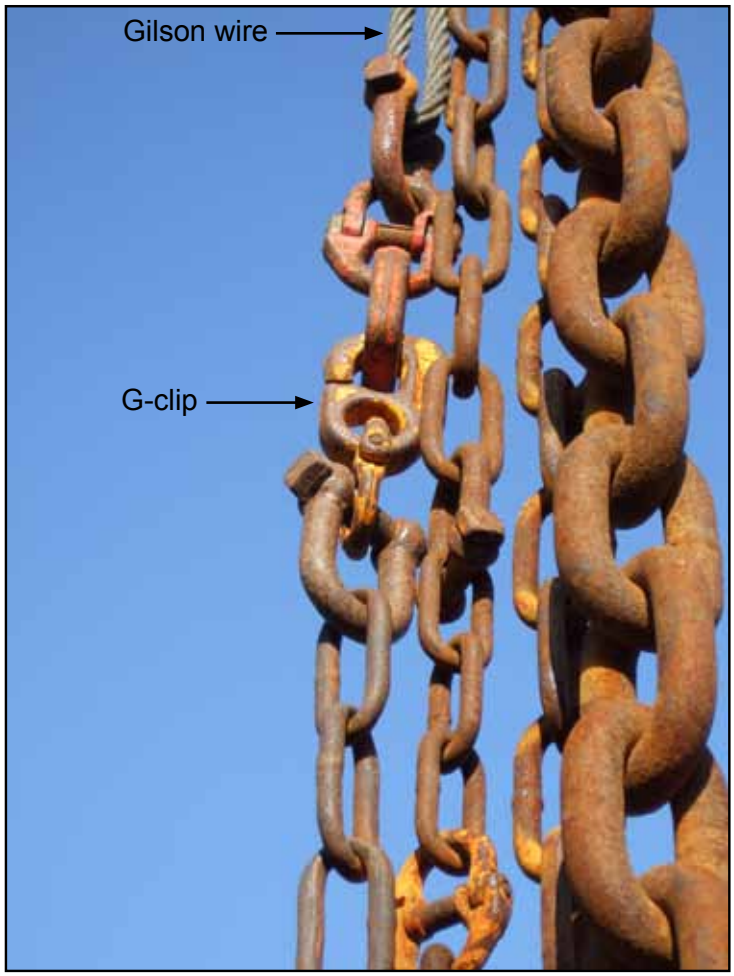
- Personal survival techniques, Fire prevention and fire fighting, Elementary first aid, Personal safety- and social responsibility (basic health & safety training)

Figure 3



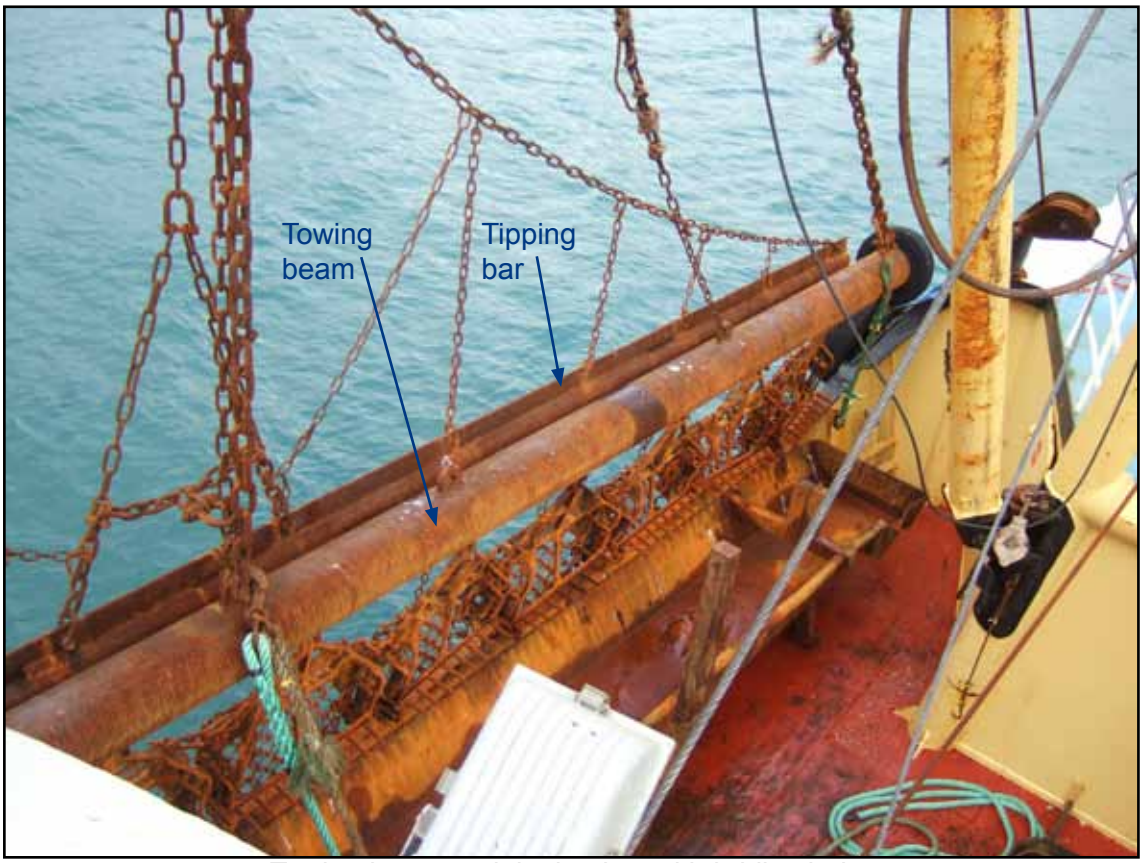
'Monkey face'

Figure 4



Gilson wire with G-clips

Figure 5



Towing beam and tipping bar with bridle chains

Each of the six winches could be individually clutched in or out; but they were operated simultaneously using a single lever located next to the main engine speed control lever **(Figure 6)**.

Catches of scallops were emptied into large bins on each side of the main deck. The bins had hydraulically operated rams under them which allowed them to be tipped for emptying any waste material overboard. When not in use, the fishing gear, including the tipping bars and towing beams, were stowed in cradles positioned directly over their respective bins. Intermediate supports for the towing beams were built into the cradle **(Figure 7)**.

1.5.2 Hauling

While hauling, the towing beams for both sides were brought to the surface of the water and the main engine stopped. Each towing beam was then hoisted up by the warping winch and turned 90º to be brought parallel to the vessel's side. Safety chains were attached to both ends of the towing beam to prevent it from swinging, and then a deckhand would climb up on the bin to attach the gilson line to the tipping bar's chains using a G-clip. After he had climbed off the bin, the towing beam was brought inboard, rested on its cradle over the bin and made fast at three points: forward, middle and aft. Once the towing beam was secure, the gilson winch was operated, causing the tipping bar to rise up, up-ending the dredge bags and emptying their contents into the bins.

Figure 6

Winch controls for operating fishing gear

Figure 7

Intermediate supports for towing beam cradle arrangement

1.5.3 Shooting

To shoot the gear, the securing lashings on the towing beams were released, and each beam was then swung outboard and lowered just enough so that the gilson clip could be unhooked. A bluish grey string spliced into the towing wire was used to indicate to the winch operator when to stop lowering the beam. A deckhand would then climb up on the bin and stand on the catch to unhook the gilson clip, and he then passed the gilson wire to another deckhand who secured it on deck.

Once the deckhand had climbed down from the bin, he held on to the aft end of the towing beam with the attached line while the skipper clutched in the main engine. As the vessel then moved forward, the towing beam would swing through 90º until it was perpendicular to the vessel's side. The towing winch was then used to lower the gear in to the water until it touched the seabed and started the next trawl.

1.5.4 Sorting and stowing the catch

As soon as the gear had been shot away, the crew picked out the scallops and, after ascertaining they were the correct size, deposited them into buckets. The waste material remaining in the bins was then emptied overboard by tipping the bins using the hydraulic mechanism. The catch was bagged and stored in the fish hold below deck. Depending on the size of the catch, the crew normally got between 15 and 30 minutes break between each haul.

1.6 EFF GRANT APPLICATION FOR TIPPING RAIL

1.6.1 EFF Grant

A European Fisheries Fund (EFF) Grant, instituted by Council Regulation (EC)1198/2006 of 27 July 2006, and which was available from 2007-2013, was opened to applicants in England on 15 September 2008. The primary aim of the grant was to encourage sustainable fishing practices. The Marine and Fisheries Agency (MFA) was appointed the UK Management Authority for this scheme in the UK. A total of £111m was made available for the UK, of which just over £38 million was earmarked for England. Article 25 of the EU regulation governing the EFF grant states that grants should not be allocated to projects aimed at increasing fishing capacity.

The application form for the grant **(Annex A)** states that it can be awarded for improvements to: *on board safety, working conditions, hygiene, product quality, selectivity of fishing gear and methods, energy efficiency and for replacing your engine.* The MFA website, however, does not mention that the EFF grants are available for safety initiatives.

Three local area facilitators (LAF) were appointed in England. The LAF's role is to help the fishing community to understand and fill in the applications. The Brixham LAF was also the National Facilitation Service Manager (NFSM) for the EFF and in this capacity co-ordinated the activities of all the LAFs.

1.6.2 Tipping rail

The tipping rail system is a recent innovation implemented in several of the larger Scottish scallop dredgers, which eliminates the need for a tipping bar and gilson to invert the dredge bags. The tipping rail is, effectively, a second movable bulwark which rotates to lift the dredge bags. Steel rings attached to skirts at the bottom of the dredge bags hook on to teeth protruding from the tipping rail as it is raised, inverting the bags over the bins. The tipping rail is hydraulically rotated and is controlled from the bridge so the crew can remain clear of the moving equipment **(Figures 8a, 8b, 8c)**. Some fishing vessel owners have tried other means of tipping the dredges, but none of them have achieved the same level of safety as the tipping rail system.

Figure 8a

Figure 8b

Figure 8c

Tipping rail mechanism

1.6.3 *Korenbloem*'s application to the EFF

In June 2009 *Korenbloem*'s owners applied for a £40,000 grant which represented 40% of the total investment required to install a conveyor belt and tipping rail system on board. The conveyor belt was meant to carry the scallops to a safe working platform under the whaleback[3]. The owners used the services of a local consultant to fill in the application and produce the written business case. The completed application was dispatched to the MFA in London who then forwarded it to the NFSM (LAF for Brixham) for his appraisal. As required by the application form, he consulted the local MFA office at Brixham who filled in section C of the form assessing the overall *importance/value of this project to the development of the fishing industry* as *Medium to High*. However, in the final section of the appraisal form, the NFSM stated:

> *I cannot recommend this application for approval, although I would not oppose the applicant re-applying (not appealing) with a realistic application.*

On 13 November 2009, the MFA wrote to the owners of *Korenbloem* informing them that their grant application was unsuccessful. The letter from the MFA stated:

> *This is because the Selection Panel felt that the project offered only limited social and environmental benefits. The Selection Panel also noted that your vessel would potentially have more days at sea and as you know the EFF grant cannot be used to fund an increase in fishing effort.*

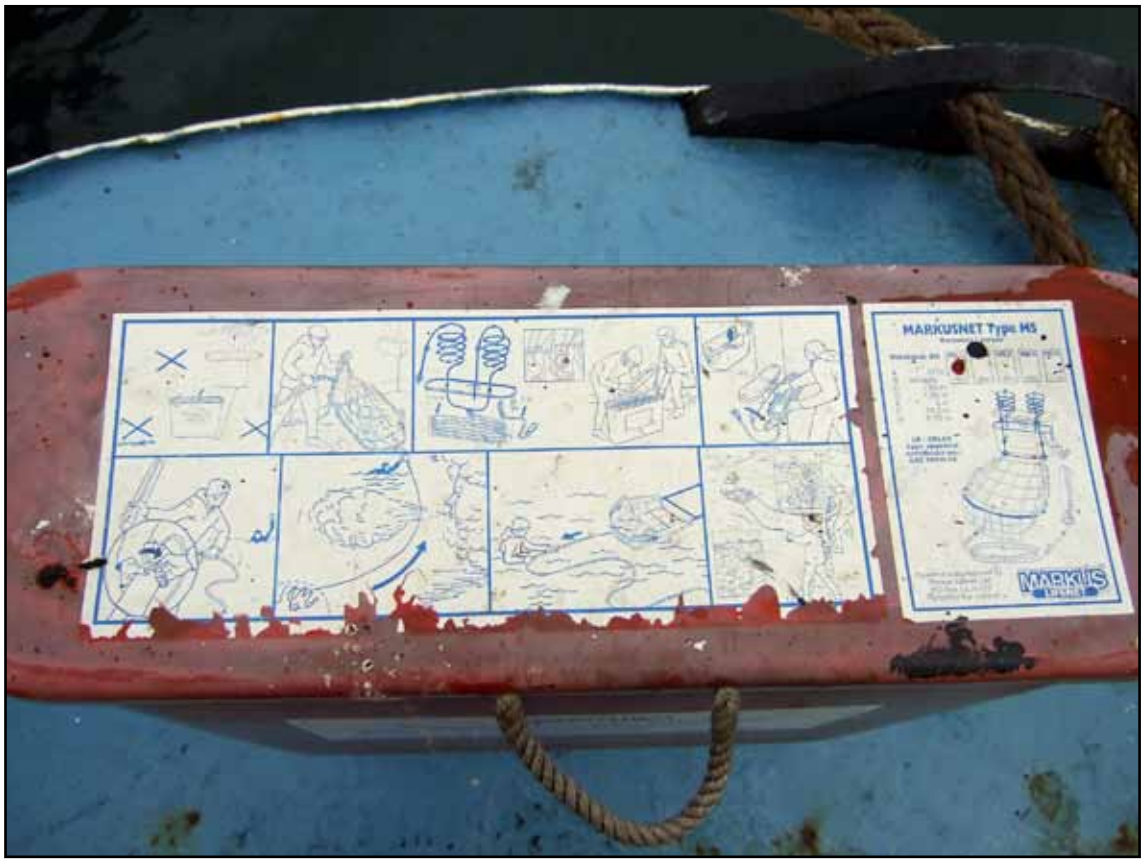
[3] Whaleback: A sheltered portion of the forward deck where water taken over the bow is more easily shed over the sides.

1.7 MANOVERBOARD (MOB) RECOVERY EQUIPMENT AND DRILLS

1.7.1 Recovery system

The MOB recovery system on *Korenbloem* was a Markus Net. The crew was unfamiliar with it and did not know how to use it. The model on board was a 'Markus MS2' which had a 14m attachment line, a 20m lifting line on the inner end, and a 25m throw line with a chest-loop **(Figure 9)**. The net weighed 4kg and was enclosed in a portable storage container. The MOB could be lifted manually, or hoisted with a crane or winch in a standing, sitting or horizontal position. To rescue an unconscious person from the water, another person attached to a life-line had to enter the water and physically drag the casualty into the net.

Figure 9



Markus net

1.7.2 Drills

Although it is mandatory for fishing vessels over 24m in length to conduct fire drills and abandon ship drills, there is no requirement for them to conduct MOB drills[4]. The last recorded MOB drill on *Korenbloem* was carried out during the 4-yearly renewal survey in April 2009. The drill was a talk-through exercise, and no equipment or dummies were used. No other MOB drills were conducted on board in 2009.

[4] A revised over 24m Code, in production at the time of this report, will include a mandatory requirement to conduct manoverboard drills on vessels of this size.

In May 2010, the MCA released an information pack entitled *Safety drills and procedures* **(Annex B)**, and it is now mandatory that emergency drills be carried out during renewal and intermediate surveys on all UK fishing vessels over 15m. The recovery of a MOB has been included in the list of mandatory emergency drills.

1.8 SAFE WORKING PRACTICES

1.8.1 The Merchant Shipping and Fishing Vessels (Health and Safety at Work) Regulations 1997

The Merchant Shipping and Fishing Vessels (Health and Safety at Work) Regulations 1997 require employers to protect their workers and other persons so far as is reasonably practicable, and to ensure that safe working practices are always followed. In particular, Regulation 5(1) General duties states:

> *(a) the avoidance of risks, which among other things include the combating of risks at source and the replacement of dangerous practices, substances or equipment by non-dangerous or less dangerous practices, substances or equipment;*
>
> *(b) the evaluation of unavoidable risks and the taking of action to reduce them;*

Regulation 5(2) defines the obligations of the employer to ensure the health and safety of their employees and states:

> *(a) provision and maintenance of plant, machinery and equipment and systems of work that are, so far as is reasonably practicable, safe and without risk to health;*
>
> *(b) arrangements for ensuring, so far as is reasonably practicable, safety and absence of risk to health in connection with the use, handling, stowage and transport of articles and substances;*

Further guidance is provided in Marine Guidance Note (MGN) 20 (M+F) Implementation of EC Directive 89/391 Merchant Shipping and Fishing Vessels (Health and Safety at Work) Regulations 1997, the Seafish Fishing Vessel Safety Folder and the Fishermen's Safety Guide.

1.8.2 PUWER 2006

MGN 331 (M+F) provides details and guidance on interpretation of The Merchant Shipping and Fishing Vessels (Provision and Use of Work Equipment Regulations) 2006 (PUWER). PUWER came into force on 24 November 2006 and implements, in part, the provisions of EC Directives 89/655/EC and 95/63/EC and applies to UK registered ships including fishing vessels. *"Work equipment"* is defined as *"any machinery, appliance, apparatus, tool or installation for use at work".* Regulation 13 states:

> *The employer shall ensure that every dangerous part of the ship's work equipment is provided with guards or protection devices to prevent access to danger zones or to halt movements of dangerous parts before the danger zones are reached.*

The MCA Marine Office at Brixham is in the process of trialling a self inspection and accounting system for fishing vessels. If the trial is successful, it is expected that it would become mandatory for all commercial fishing vessels to maintain a log called *Loler and Puwer inspections and block accounting* **(Annex C)**.

1.8.3 Guidance available on board *Korenbloem*

The risk assessment on *Korenbloem* was conducted in 2003 with the help of a local consultant based at Brixham. It was updated whenever the vessel changed its mode of fishing from scallop dredging to white fishing. Since April 2007, the document has been reviewed at approximately 1-yearly intervals, and it was last updated on 7 October 2009. MCA surveyors checked that the vessel had a risk assessment during renewal and intermediate surveys and during general inspections.

Leaning over the rail to reach was identified as one of the hazards, and the control measure was identified as, *Gear is topped in and there is little requirement to reach*.

Climbing up to free gear with the possible consequence of injury and falling overboard was considered. The control measure was stated as, *Gear is always topped inboard for work to be carried out.*

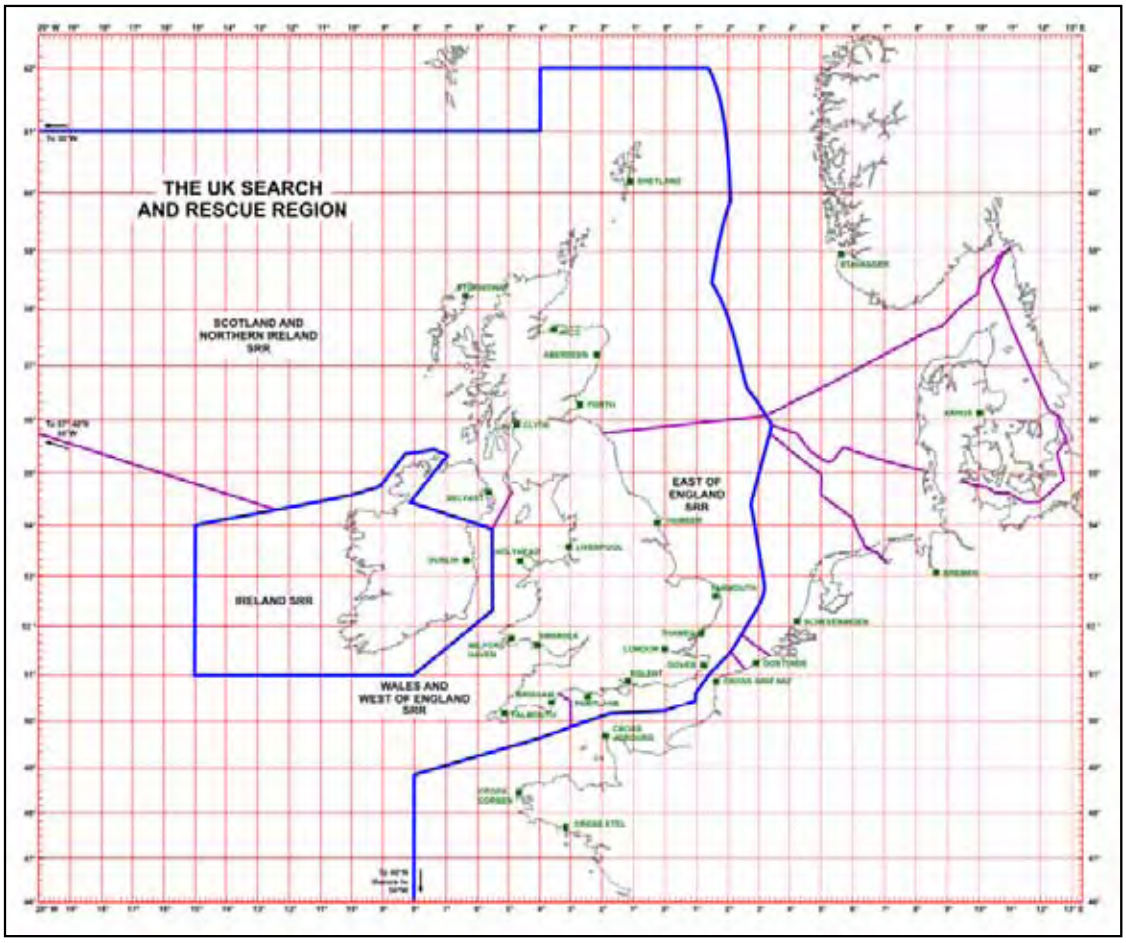
Several other possible hazards specific to scallop dredging were considered, such as dredges dropping, and towing beams moving when in bins and stones dropping from dredge bags. The control measures mostly emphasised the use of safety helmets and safety boots, which along with lifejackets were available on board. Neither 'fishing during rough weather', nor that crew standing in catch bins had no bulwarks to protect them, was addressed in the risk assessment.

1.9 COASTGUARD RESPONSE

UK SAR helicopters are at 45 minutes readiness to launch during the hours of 2200 to 0730. In a joint report by the MCA and Ministry of Defence (MoD), published in June 2001 and titled *Review of UK Search & Rescue Helicopter Provision and Coverage Criteria Report*, it is stated that a SAR helicopter should be capable of reaching all very high and high risk areas and 75% of all medium risk areas within the UKSRR, within 60 minutes of take off.

The regional subdivisions and the international boundaries of the UK SRR are indicated in **Figure 10**. When an incident takes place in the UK SRR, the Aeronautical Rescue Co-ordination Centre (ARCC) at the Royal Air Force (RAF) base at Kinloss, Scotland, assigns the nearest available search and rescue (SAR) helicopter to the incident. On this occasion, the accident occurred approximately 2nm into the French SRR **(Figure 11)**, and thus the responsibility for the helicopter evacuation fell to the French coastguard at Cap Gris Nez.

Figure 10



Map of UK and International Search and Rescue Regions

Reproduced from Admiralty Chart BA 2451 by permission
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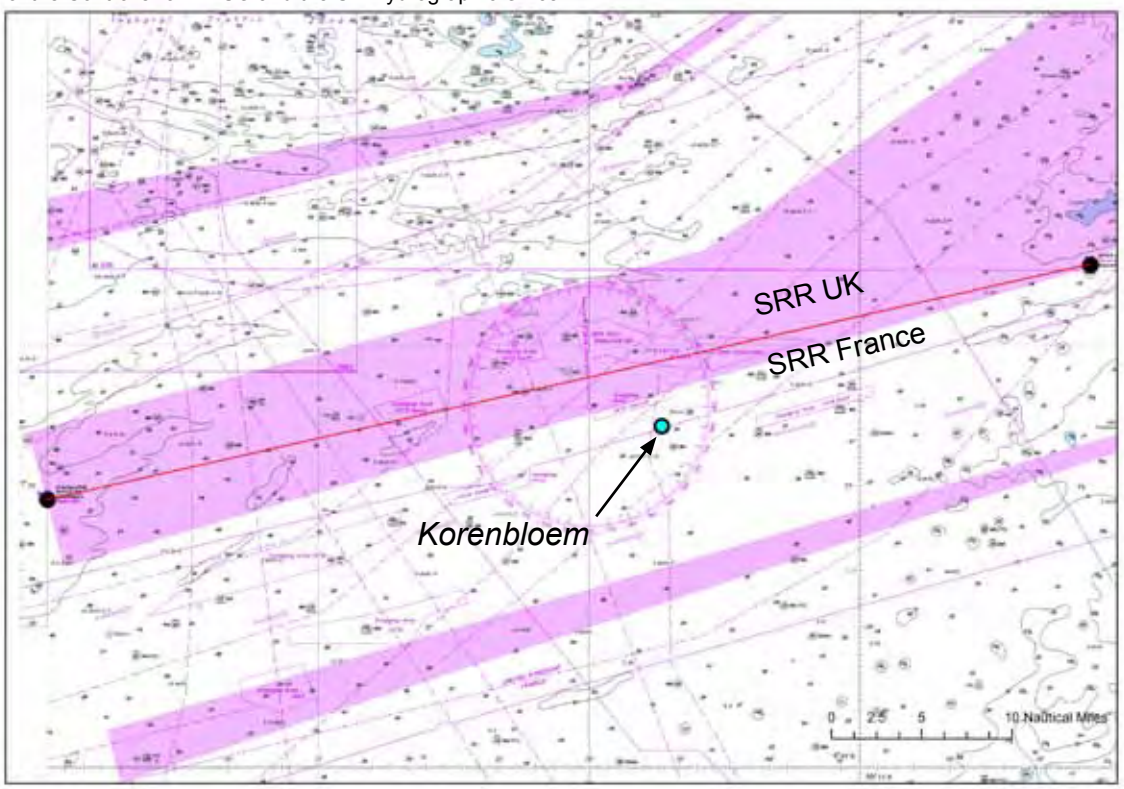
Figure 11



Boundary of UK and French Search and Rescue Regions

1.10 PREVIOUS INCIDENTS

In 2008 MAIB published *Analysis of UK Fishing Vessel Safety 1992 to 2006*. In the period covered by the study, the MAIB recorded 83 MOB fatalities from fishing vessels, of which 27 happened during shooting or hauling operations. The following accidents, including MOB accidents, occurred on UK registered scallop dredgers:

- 1998: a deckhand was killed on the 27m *Geeske* when the fishing gear was accidentally dropped on him, causing severe head injuries.
- 2001: a deckhand was killed on 27m *Philomena* when he was hit by a swinging tow bar and suffered severe head injuries.
- 2006: the left arm of a deckhand on 29m *Danielle* had to be amputated after it was caught in a topping winch used to empty the dredges. The MAIB report on the accident stated:

  A shore-based factory worker would not be allowed to balance on a slippery pole resting on a moving platform, while attending to a heavy chain mail bag with one hand, and trying to control a winch with the other.

- 2009: a deckhand on 23m *Maggie Ann* fell overboard when the lifting becket of a dredge parted while being emptied. He sank immediately and was never found.

None of the deckhands in these incidents were wearing PPE such as a safety helmet, lifejacket or safety harness.

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 FATIGUE

On the day of the accident, James Grindy had rested for 5 hours from 0300 to 0800. He was subsequently on duty until the time he fell overboard at around 1900. If he managed to take an average break of 20 minutes between each of the 8 hauls since 0800, he would have had nearly 3 hours of intermittent rest during the day. Although he might well have been tired, it is unlikely that he was fatigued; therefore fatigue is not considered to have contributed to this accident.

2.3 THE ACCIDENT

James Grindy was last seen, by the skipper, standing on the catch in the port bin waiting for the second crewman to join him so that he could unhook the gilson wire from the tipping bar chains. As there was no eye witness, it is not possible to establish the exact sequence of events immediately before and during the accident. It is unlikely that James was knocked into the water by the towing beam because it had already been lowered over the side ready for him to unhook the gilson clip. However, as the vessel's engine was stopped, the towing beams and tipping bars would have been swinging about considerably due to the roll of the vessel in a beam sea. The instinctive reaction of the skipper on seeing James in the water was to top the derrick out, indicating the beam was still quite close to the vessel's side when James fell in. Therefore, there is a very strong likelihood that either James fell between the vessel's side and the towing beam, or he ended up in that position while attempting to rescue himself. In any case the blunt object, which struck him, causing the *unsurvivable* injuries, was most probably the towing beam either crashing onto him or crushing him momentarily against the ship's side.

Heavy rain, possibly refracting the deck lights; severe rolling of the stopped vessel in a beam sea without the damping effect of the gear in the water; strong winds; having to stand on the wet and slippery catch **(Figure 12)**; and obstructive metal partitions in the bin concealed by the catch, all contributed to making the activity of standing or moving on the bin an extremely dangerous one. In addition, it is possible that under the poor weather conditions, the skipper made an error of judgment and topped the gear out further than normal as he had no means of calibrating its position, except visually. In any case, the tipping bar suspended from the 'monkey face' and a slack gilson wire, would have swung like a pendulum as the vessel rolled. James, in reaching out to unhook the gilson clips, either could have over-extended himself and lost his balance, or more simply lost his footing, causing him to fall overboard.

Figure 12

Scallop tray or bin with catch (not from *Korenbloem*)

2.4 SAFE WORKING ENVIRONMENT

2.4.1 Improvement of safety in scalloping

Historically, many injuries and fatalities have been caused while the fishermen on scallop dredgers have been in close contact with the gear, especially during hauling or shooting operations. The method of tipping the dredges manually with an attached becket rope was made safer by the use of a topping winch, and the introduction of a tipping bar to empty all of one towing beam's dredge bags simultaneously was a further improvement. However, accidents continue to happen because deckhands are still required to operate under, or in close proximity to the towing beams and dredges as they are hauled and shot. In this accident, the activity that resulted in James's death was standing on top of the bin to unclip the gilson wire used to tip out the catch.

2.4.2 Tipping rails and conveyor belts

Any innovation which eliminates or reduces the need for manual handling, can only enhance the safety of fishermen. The tipping rail system avoids the use of the gilson wire, and therefore removes the requirement for fishermen to climb up on the conveyors or bins to attach or remove it. Further, as the conveyor belt is fitted at a low height on the deck, even if the crew had climbed on it for any reason, they would still have been protected by the bulwark. When the tipping rail is raised, it nearly doubles the bulwark height, which makes it even safer. Moreover, the system can be operated remotely.

The tipping rail system is a recent innovation, and it is possible that as the industry gains experience of its use it will find new hazards which have not yet been identified. However, at present the tipping rail system appears to significantly improve crew safety compared with existing systems.

2.4.2.1 EFF grant

Korenbloem's owners were committed to investing £60,000 (60%) in improving their vessel provided they were able to obtain the remaining £40,000 through the EFF grant. It is unfortunate that in making their application, they did not seek the assistance of their LAF and, instead, resorted to using the services of a consultant. Certainly, the variations between the information on the MFA website and the application form regarding the availability or otherwise of funding for safety initiatives, provide potential applicants with ambiguous guidance.

It is more likely that the application would have been successful had there been better dialogue between the consultant and the LAF: the tipping rail and conveyor system would have been installed before November; and this accident could not have happened. Although the EFF grant is primarily designed to encourage sustainable fishing, it is available for safety initiatives as well. In order that owners of other scallop dredgers are better informed, it is essential that the MFA provides clear and unambiguous guidance on its website and disseminates the same information through the LAF for each region.

2.4.3 Barriers and guards

It is recognised that installing tipping rails and conveyors requires a significant financial investment which might not be an affordable option for all scallop dredger owners. Unfortunately, the protection provided by the bulwarks was removed when the bins were fitted, requiring the deckhands to work on top of the bins. James would not have fallen overboard had there been an effective barrier in place. The owners of scallop dredgers have both moral and legal obligations to ensure that the safety of their crew members is not compromised. If sorting bins are fitted and people have to climb on them to carry out their work, then every effort must be made to ensure that the mandatory bulwark height requirements are not violated in achieving such an enhancement.

2.4.4 Personal protective equipment (PPE)

Personal protective equipment (PPE) is considered the last line of defence in ensuring safety at work. It is acknowledged that wearing a safety harness attached to a life-line while working on deck would be cumbersome given the constricted environment. However, if a life-line was attached only for the duration that the crew member had to climb on the bin to handle the gilson clips, it would prevent them falling overboard. On *Korenbloem*, there were no barriers or guards to prevent such an eventuality and, until such time as a safer method of work is implemented, the use of a safety harness and life-line should be considered as part of the safe working process.

2.4.5 Summary

The most effective method of achieving a safe working environment is by the elimination of hazards. In the case of scallop dredging, this is not entirely achievable, and therefore the next best strategy would be to physically separate the crew members from the fishing gear during the most hazardous parts of the operation: shooting the gear and hauling in the catch. The tipping rail and conveyor system achieves this objective. On vessels where sorting bins are still in use, it is vital to ensure that the mandatory height of 1m provided by the bulwark is maintained at all times, and fishermen should not be required to climb up on the bins if there are then no further barriers between the bins and the open sea. If there is no alternative to working on the unprotected bins, a safety harness or similar safety device should be worn.

2.5 ACHIEVING SAFETY AT WORK

Korenbloem's risk assessment was drawn up by a local consultant who had not included many of the obvious safety issues such as working on deck in rough weather and operating the gear while standing on the catch in a bin without any safety barriers. Use of PPE such as hard hats, goggles and safety boots was repeatedly mentioned as a means of preventing injury but, though available on board, these were seldom used in practice.

The process of identifying hazards; thinking about ways to either eliminate or control them; documenting the thought process; and reviewing them as and when the nature of the work changes, can only be worthwhile if the work practices match the words in the document. On *Korenbloem*, the work on deck was carried out with little consideration to the written risk assessment document, and as such it had limited practical value.

The risks associated with standing on a catch of scallops, without any guardrails or restraints, to unhook the Gilson G-clips were obvious and those risks were multiplied by the vessel's movement in rough weather. The acceptance of such working practices as routine demonstrates an unacceptably high tolerance of risk. In this instance the risk became reality, and a man lost his life. There is no need for such unsafe working practices to go unchallenged; skippers and crews, supported by the owners, must start taking more responsibility for their own safety if the fishing industry is to reduce its high fatality rate.

2.6 SURVEYS AND INSPECTIONS

Korenbloem was surveyed twice in 4 years, and inspected once annually. However, the potential hazard posed by fitting the scallop bins flush with the bulwark was not identified during these surveys.

In practice, the bins extended the bulwark inboard and, as such, did not pose a hazard until anyone climbed on top of them to operate the gilson clips. As the bins are removed during the surveys, it is understandable that the danger of falling into the sea from the bins was not readily apparent to the attending

surveyor. As all the equipment used for catching, sorting and storing fish would be classed as work equipment, it is now mandatory under PUWER for the flag state to enforce their safe operation. The self inspection and accounting system being trialled by the MCA is a very positive development as it includes all the fishing gear as fitted.

In order to appreciate the implications of fitting additional equipment, such as bins, it is necessary for the surveyor to see them in place. Therefore, it would be prudent for surveyors to insist on seeing the vessel in the 'ready to sail' condition during surveys and inspections.

2.7 MANOVERBOARD RECOVERY

Jumping into the cold and rough sea to retrieve their shipmate was a very courageous and selfless act on the part of the two deckhands. However, if they had ingested water due to a cold water shock gasp reflex or been hit by the gear, they could quite easily have drowned as they were not wearing lifejackets. Their three remaining shipmates would then have had to deal with three casualties instead of one. It was very fortunate that nothing happened to the men who jumped in on this occasion, but this accident re-inforces the case for wearing lifejackets when working on deck.

James's injuries were devastating, and the postmortem report indicates he would not have survived even if he had been wearing a lifejacket. However, he probably floated because he lost consciousness quickly and became still in the water; the air trapped within his clothes giving him the necessary buoyancy. Had James not suffered the injuries he did, he would have been struggling to swim and remain afloat because of all the working clothes and boots he had on. This movement would quickly have expelled the air trapped in his clothing, making him less buoyant. In these circumstances a lifejacket would have been essential.

The owner and skipper are responsible for ensuring that regular drills are conducted on board. Had MOB drills been regularly conducted on *Korenbloem*, the crew members would have perhaps responded in a safer manner; at the very least they might have considered the use of lifejackets and life-lines before jumping into the open sea. Luckily, the heavy swell aided the recovery of James from the water, but MAIB has investigated many fatalities which occurred because the MOB could not be recovered quickly enough. None of the crew members, including the skipper, thought of using the Marcus net because it was an unfamiliar piece of equipment. The talk-through MOB drill conducted by the MCA surveyor does not appear to have benefited the crew very much. It is essential that fishing vessel crews have a sound knowledge of manoverboard procedures, and that these are practised frequently to prove the kit works and the crew is familiar with its use.

2.8 HELICOPTER EVACUATION

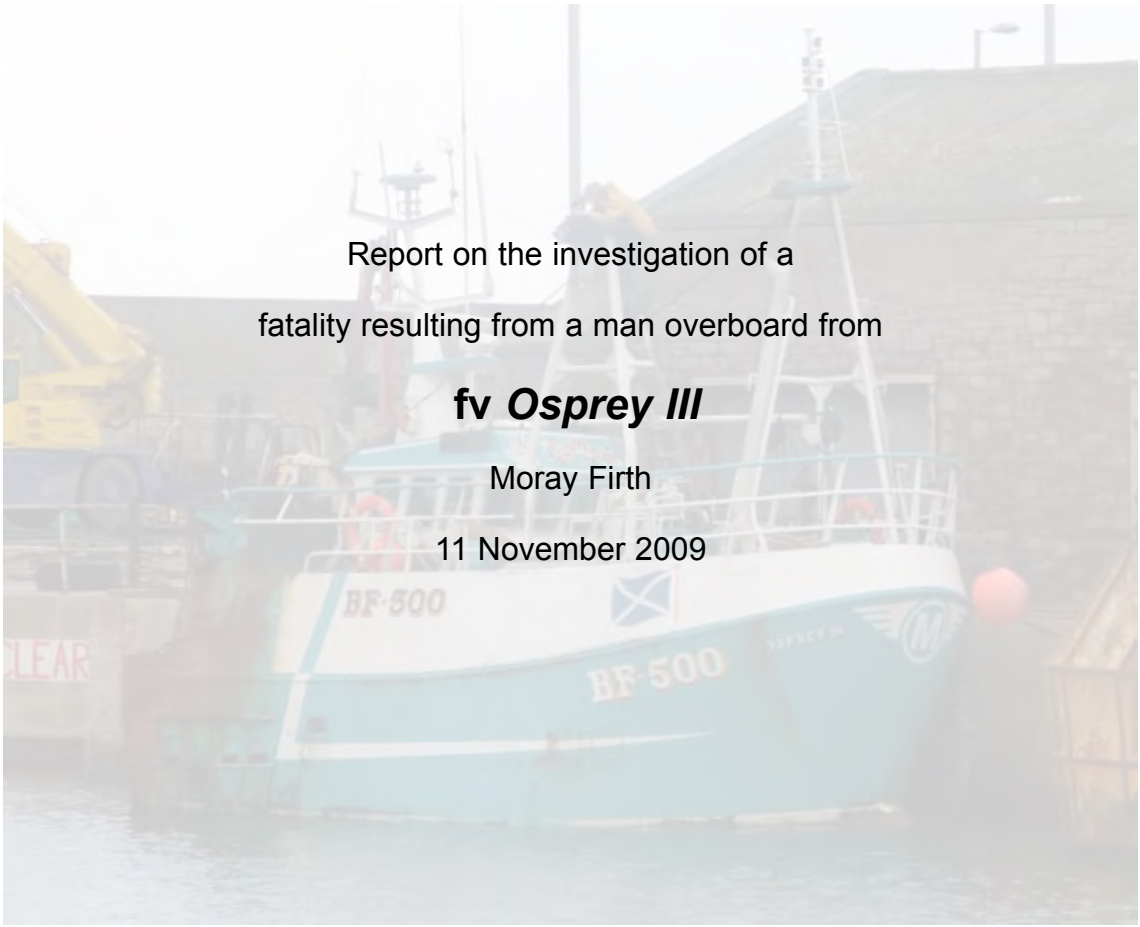
Dover CG's determination that the accident occurred in the French SRR, was correct. With the handover between SAR authorities; the delays caused by the med-link call; the French aircraft having to stop at Boulogne to collect a doctor before it deployed; and the delays caused by the rough weather on scene, it took nearly 2 hours from the time the alert was raised to James being winched off the vessel. While the delay seemed interminable for *Korenbloem's* crew, it was probably reasonable in the circumstances; the UK target for SAR response just to the north of their position was only slightly less, at 1 hour and 45 minutes[5].

In this accident, James's injuries were so severe that, even if the SAR response had been immediate, it would have made no difference to the outcome.

COMBINED SAFETY ISSUES, ACTIONS TAKEN, MAIB COMMENT AND RECOMMENDATION START ON PAGE 67.

[5] Comprising 45 minutes to get airborne during the night and up to 60 minutes of flight time to the scene.

Osprey III Investigation



Report on the investigation of a

fatality resulting from a man overboard from

fv *Osprey III*

Moray Firth

11 November 2009

SYNOPSIS

During the evening of 11 November 2009, the UK registered stern trawler *Osprey III* was retuning to Macduff, Scotland after a day's fishing. When lowering a damaged net back to the deck following repair, a bight of the net entered the water. This caused the portion of the net flaked on the deck to run over the stern and into the water. William Antonio, a Filipino deckhand, became entangled in the net and its ground gear, and was dragged overboard.

The skipper acted quickly to retrieve the net and manoeuvre the vessel next to William, who had surfaced close by. A line and a lifebuoy were thrown to him, but the skipper and remaining deckhand were unable to recover him back on board. After about 12 minutes on the surface William disappeared as the skipper and deckhand tried to move him to the stern where the vessel's freeboard was lowest. Despite an extensive search and rescue operation by seven vessels and a helicopter, William was not found before the search was called off the same evening. His body was eventually recovered from the seabed by *Osprey III* 1 week later.

SECTION 3 - FACTUAL INFORMATION

3.1 PARTICULARS OF *OSPREY III* AND ACCIDENT

Vessel details

Registered owner	:	Mara Ltd
Port of registry	:	Banff
Flag	:	UK
Type	:	Stern trawler
Built	:	2000, Macduff
Classification society	:	None
Construction	:	Steel
Length overall	:	9.90 metres
Gross tonnage	:	16.53
Engine power and/or type	:	194kW / 3406-TA Caterpillar
Service speed	:	6 knots

Accident details

Time and date	:	1840 on 11 November 2009
Location of incident	:	57° 45.633N 002° 28.787 W 5.5 nm north of Macduff, Scotland
Persons on board	:	3
Fatalities	:	1
Damage	:	None

3.2 NARRATIVE

3.2.1 Events leading to the accident

At 0330 on 11 November 2009, the UK registered stern trawler *Osprey III* sailed from her home port of Macduff, Scotland, to head for fishing grounds 12.4nm to the north. On board were her Scottish skipper and two deckhands. One of the deckhands was also Scottish; the other was a Filipino named William Antonio.

After a day's fishing, the vessel started her last haul at 1710. As the net was brought in, the skipper noticed that it was torn on the lower starboard side edge adjacent to the ground gear. The contents of the net were emptied into the fish processing hopper. The net was then wound back onto its drum and the vessel headed back to Macduff at a speed of about 3 knots.

The skipper decided to repair the net during the return voyage, which was his usual practice. To achieve this, he slowly payed out the net from the drum while the two deckhands flaked its cod end over the port side of the net deck. As soon as the square of the net was reached, the net was suspended from the power block to afford access to the damaged area. Although some of the ground gear was suspended over the stern of the vessel, it was clear of the water.

When the skipper finished the repair, which took about 1 hour, he decided to raise the net in order to free a flip up line which he thought was possibly entangled in the ground gear. He told the crew what he was going to do and then went to the wheelhouse to operate the power block. The deckhands stood either side of the net drum **(Figures 13 and 14)** from where they could check the flip up line and re-stow the net on its drum on completion. Both were wearing oilskins over their work clothes, and sea boots.

The skipper raised the net, but soon lowered it back to the deck when the ground gear was found to be clear of obstructions. As he did so, part of the net entered the water, causing its flaked portion on the deck to run out **(Figure 15)**. The skipper immediately shouted a warning to the deckhands, but William turned to the port side of the vessel and took a step towards the running net. William's boot became entangled in the gear, which pulled him over the bulwark into the sea. It was about 1840, and *Osprey III* was about 6.4nm from Macduff **(Figure 16)**; it was dark, the sea was calm and its temperature was about 10°C.

3.2.2 Attempted rescue

The skipper immediately pressed the manoverboard (MOB) button on the chart plotter. He also deselected the propulsion unit, which allowed him to haul in the net onto the drum at full power. As the net was hauled onto the drum, which took less than 1 minute, the other deckhand saw one of William's boots caught between the dog rope and the net.

Figure 13

Photograph of the aft deck

Figure 14

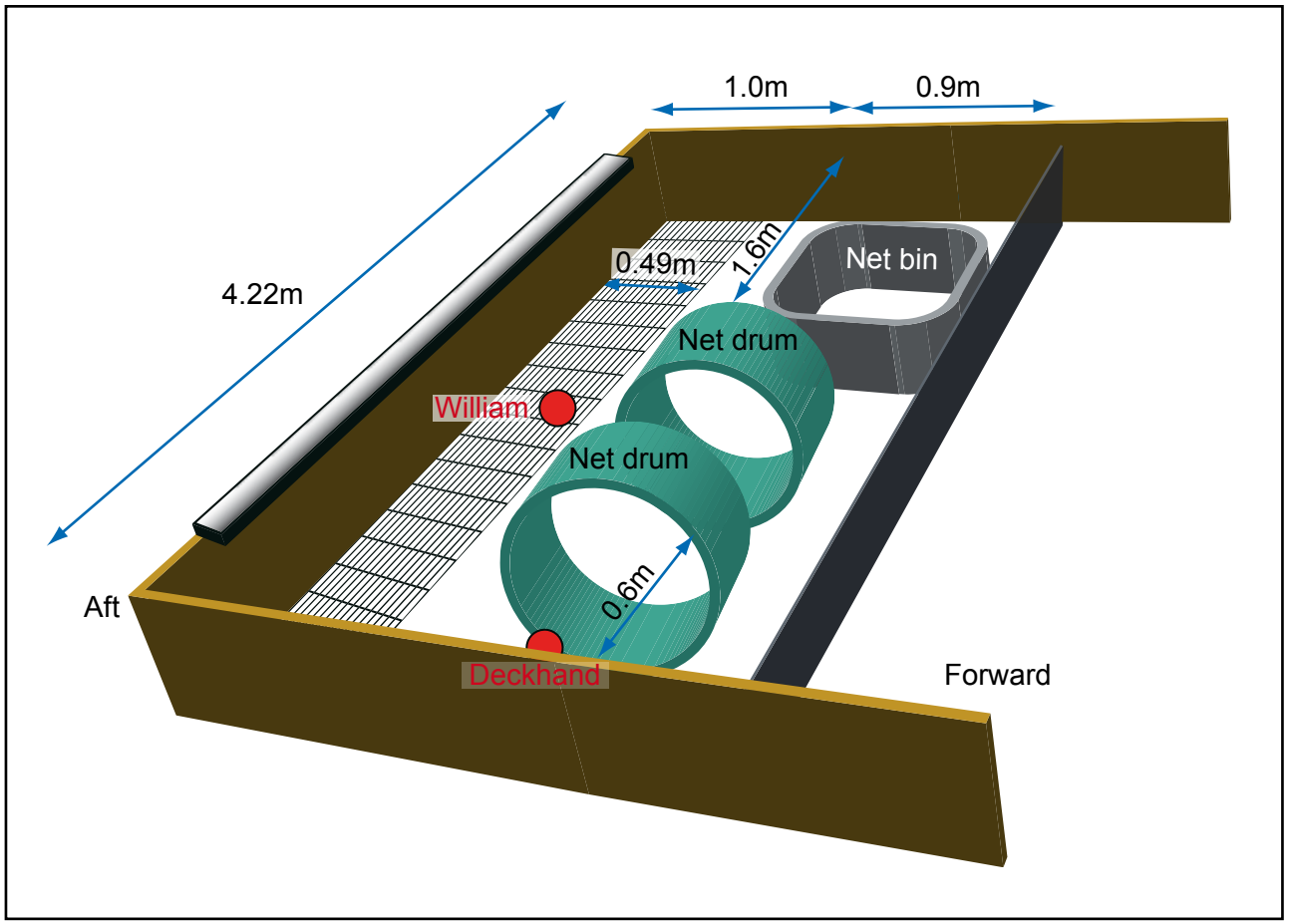
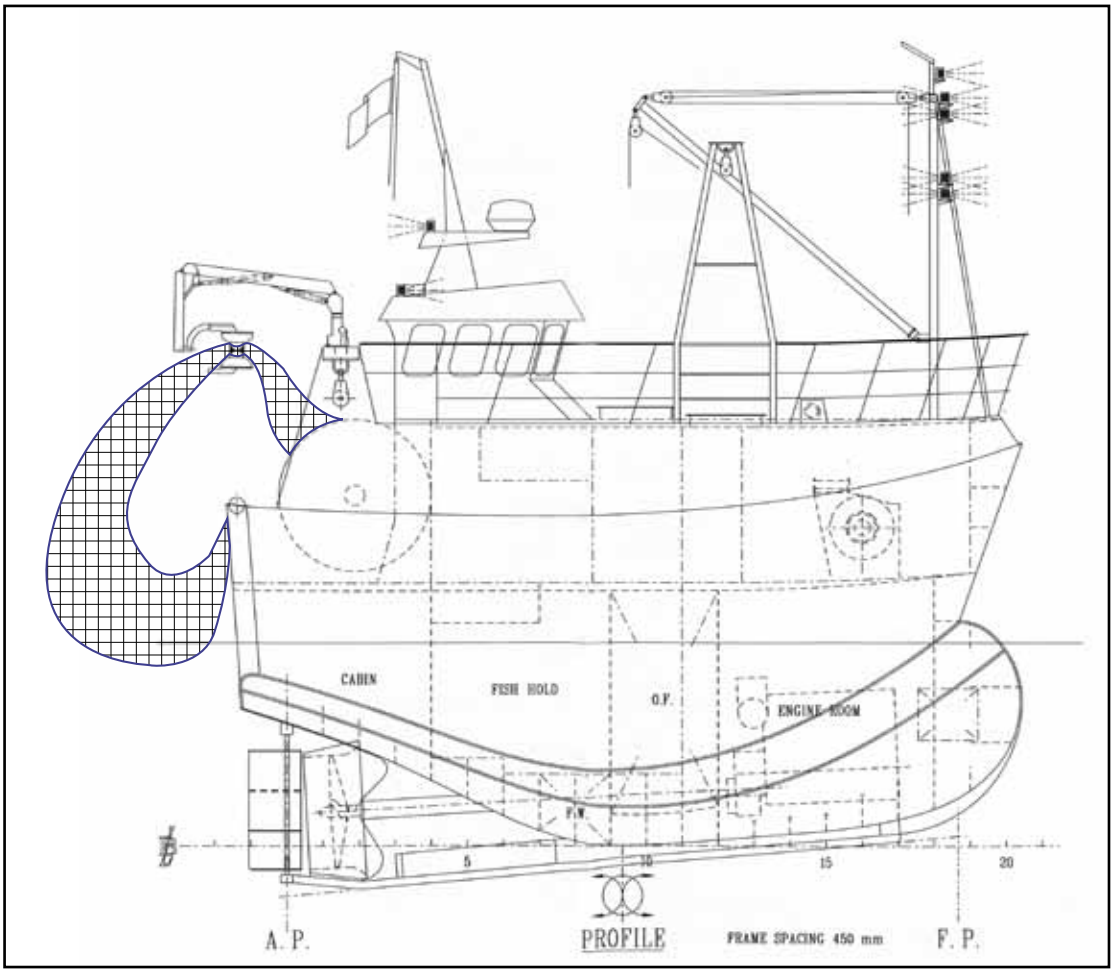


Diagram showing the position of deckhands



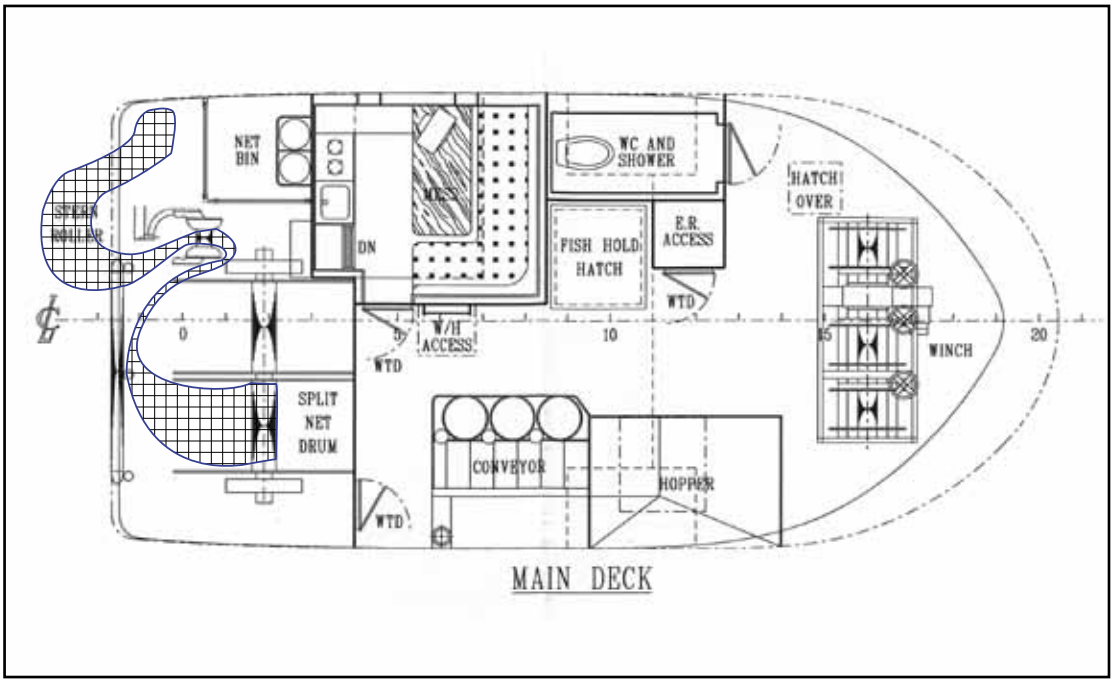


Diagram showing arrangements when net entered the water

Reproduced from Admiralty Chart BA 222 by permission
of the Controller of HMSO and the UK Hydrographic Office

Figure 16

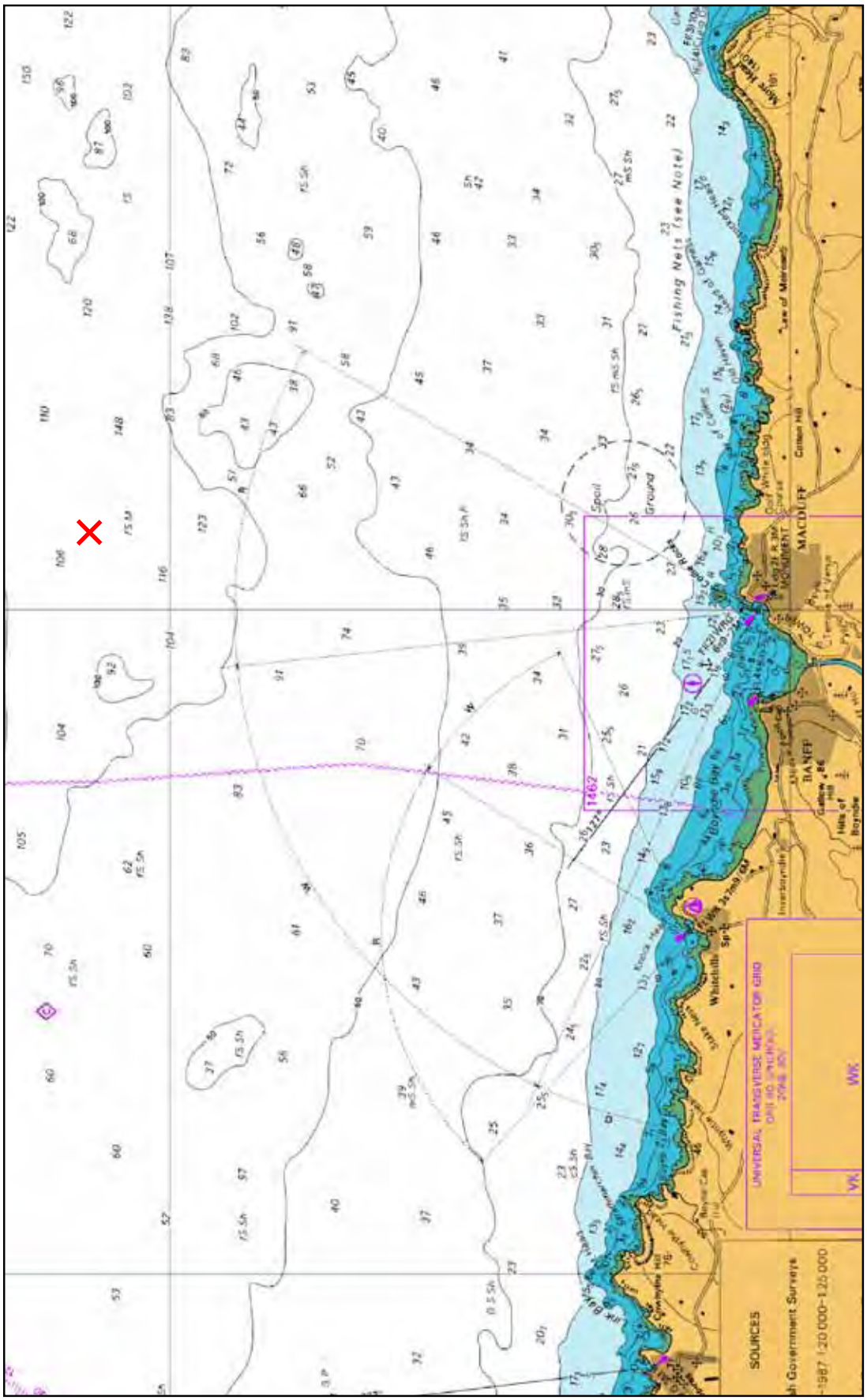


Chart extract showing position of manoverboard

The deckhand called out for William and went onto the shelter deck to try and see him in the darkness beyond the arc of *Osprey III*'s deck lights. Meanwhile, the skipper manoeuvred the vessel ahead and to starboard in order to return to the MOB position indicated on the plotter.

On hearing a call from William, the deckhand went to the starboard bow and saw him between 3 and 5 metres away. He alerted the skipper, who manoeuvred the vessel to leave William close off the starboard bow. The skipper then left the wheelhouse to assist.

The deckhand threw William a line with a loop, which William grabbed with both hands. The deckhand pulled William to the vessel's side, where the skipper and the deckhand encouraged him to get into the loop or to tie the rope around himself; William did neither. The skipper and deckhand tried to pull William on board, but were unable to do so because the line kept slipping through William's hands. Another line was tied to a lifebuoy, which was lowered to a now very weary William. William managed to put his left arm through the lifebuoy and continued to hold onto the rope with a loop.

The skipper decided that it would be easier to recover William over the vessel's transom where the freeboard was lower. He told the deckhand to go aft, and then pulled William towards the stern, shouting encouragement as he did so. At the stern, the skipper saw that William was still holding on, and passed the lines to the deckhand on the net deck. The deckhand pulled on the lines, but soon realised that William had let go. William had been in the water for about 12 minutes, but was no longer visible and could not be heard.

The skipper returned to the wheelhouse and called to a nearby fishing vessel, *Just Reward,* on VHF radio to request her skipper to inform the coastguard of the manoverboard. This was done at 1852. The coastguard immediately activated the Macduff and Fraserburgh lifeboats, and an RAF rescue helicopter. Seven vessels searched for William in worsening weather conditions until 2351, when the search was terminated. William's body was trawled off the seabed by *Osprey III* 1 week later. A postmortem examination concluded that William had died from drowning.

3.3 OWNERSHIP AND CREW

Osprey III was owned by her skipper in partnership with his brother, the Scottish deckhand, and a relief skipper. In addition to her skipper and part owner deckhand, the vessel usually operated with one or two Filipinos hired through PG Manning Ltd, a UK-based manning agency.

The skipper had been a fisherman for 28 years and held a fishing vessel Class 2 Certificate of Competency and a Class 2 Certificate of Competency (Engineer Officer) since 1990 and 1995 respectively. He had skippered a number of fishing vessels during the past 21 years and had completed a safety awareness course in 2002, a merchant navy fire-fighting course in 1990, first-aid at sea courses in 1990 and 1995, and a basic sea survival course in 1981.

William Antonio was 28 years old and had completed courses in fire prevention and fire-fighting; elementary first-aid; proficiency in personal survival techniques; and personal safety and social responsibility in the Philippines, in 2003. He qualified as a deck rating on 2 March 2005 and held an STCW 1995 Certificate of Competency issued by The Philippines' maritime administration. William joined *Osprey III* in April 2009; it is not known if he had previously worked on board a fishing vessel. He was trained in the vessel's operation by her crew and had not seen the net pulled from its drum other than when it was being shot. William's native language was Tagalog, but he was able to speak and understand English.

The Scottish deckhand was a career fisherman with 33 years experience, and held a fishing vessel Class 2 Certificate of Competency on the merit of his time served. He had sailed with the skipper on his previous vessels and had worked on board *Osprey III* since build. He had completed a safety awareness course in 2002, a fire-fighting course in 1982, a first-aid at sea course in 1995, and a basic sea survival course in 1981.

3.4 THE VESSEL

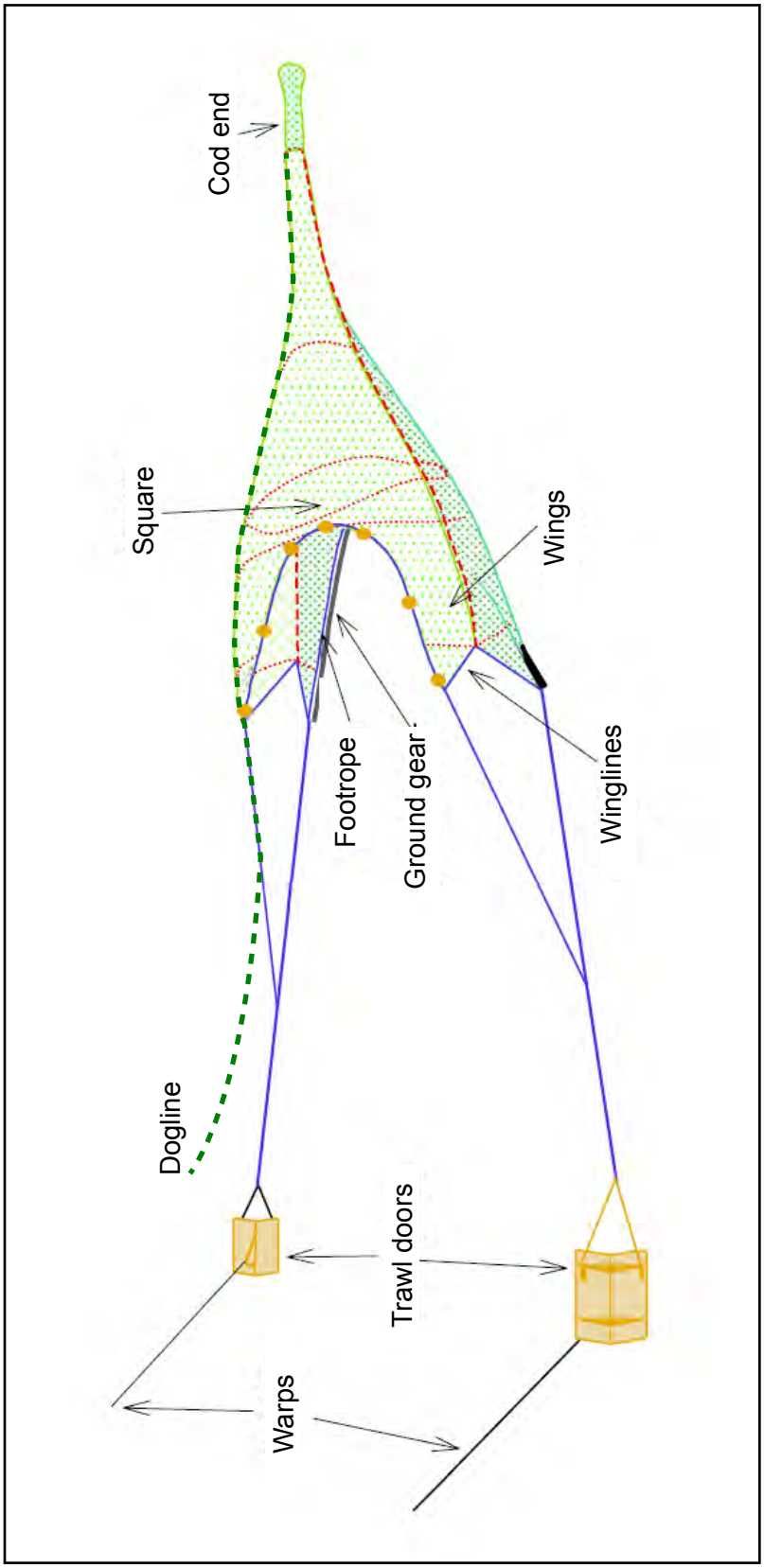
3.4.1 Operation and training

Osprey III usually trawled during daylight, completing about four trawls a day in the summer and three in the winter. When shooting and hauling nets, the skipper was usually in the wheelhouse, with two deckhands on the net deck. The Filipino crew were trained on board in the vessel's operation and use of her fishing gear. Emergency drills were not conducted.

3.4.2 Layout and fishing gear

The vessel was designed by Macduff Ship Design Ltd and built by Macduff Shipyards Ltd. She was driven by a Caterpillar 3406-TA engine, which also powered the vessel's hydraulic system. Two bottom trawl nets were stowed on net drums sited near the stern. The starboard net, which was used on 11 November, was designed for rocky seabeds. Its ground gear consisted of a series of discs with rubber spacers attached to its footrope. In addition to the ground gear, the footrope of the net had a flip up line attached to it to prevent large boulders from being swept into the net and causing damage **(Figure 17)**. The port net was designed for use with sandy seabeds.

Figure 5



Bottom trawl net

3.4.3 Safety equipment

The safety equipment carried on board included:

- Six lifejackets
- One four-man liferaft with hydrostatic release
- One EPIRB with hydrostatic release
- Two immersion suits

The skipper was aware of the possibility of falling overboard when working on the net deck and had also provided two pairs of buoyancy trousers for use by the Filipino crew. The trousers had a buoyancy of 50 Newtons and were intended for use by competent swimmers near to a bank, shore, or who have help and a means of rescue close at hand. The label on the trousers clearly stated that the garments' purpose and suitability was for use in sheltered waters.

A rope ladder was carried on board but was stowed under the shelterdeck and was not readily available or easy to use.

3.5 CODE OF PRACTICE

The Code of Practice for the Safety of Small Fishing Vessels 2001 as amended in 2007 (The Code) provides requirements for all fishing vessels under 15m LOA relating to safety equipment (see the checklist of requirements shown in Annex 1.4 of **Annex D**), inspection, annual self-certification, risk assessments and safety training. Vessels under 15m LOA are not required to carry a dedicated method of Manoverboard (MOB) recovery or to conduct emergency drills.

The skipper was required to certify annually that the vessel complied with the Code, and to present her for inspection to the Maritime and Coastguard Agency (MCA) at intervals not exceeding 5 years. *Osprey III* was first inspected in 2003. She was next inspected in July 2009 at the request of the skipper. At the time of the inspection, the vessel was out of the water, completing a refit, but remained fully crewed. The skipper's certification and proof of training was checked, but that of the other crew was not. No deficiencies were identified during the inspection.

Guidance to the MCA inspectors for the completion of the inspection of fishing vessels less than 15m is provided in MSIS27 Chapter 1, Annex 1. The document provides advice and information on the MCA's policy for inspection, issue of safety certificate decals and inspection procedures. It includes guidance on the examination of crew certificates, safety equipment and the general condition of vessels.

3.6 SAFETY AT WORK

The Merchant Shipping and Fishing Vessel (Health and Safety at Work) Regulations 1997 apply to all vessels, and require employers to protect the health and safety of their workers and others so far as is reasonably practicable. In signing the annual declaration required by The Code, *Osprey III*'s skipper confirmed that he had completed a health and safety risk assessment for his vessel. The assessment was not recorded in writing. Although written risk assessments are strongly recommended by the MCA, they are not required by The Code or the Health and Safety at Work Regulations.

Further guidance on these regulations is provided by the MCA in its Marine Guidance Note (MGN) 20 (M+F), Merchant Shipping and Fishing Vessel (Health and Safety at Work) Regulations 1997, and Fishermen's Safety Guide. Guidance is also provided by the Sea Fish Industries Authority (Seafish) in its Fishing Vessel Safety Folder, in which checklists help fishermen to consider the hazards encountered in their work and to take precautions aimed at stopping or reducing work-related accidents on board. The folder makes frequent reference to the possibility of fishermen falling overboard, and the precautions to be taken to prevent this from occurring.

3.7 PERSONAL PROTECTIVE EQUIPMENT (PPE)

The Merchant Shipping and Fishing Vessels (Personal Protective Equipment) Regulations 1999 require employers to ensure that when their employees are at risk from a hazardous work activity on board, they are supplied with personal protective equipment (PPE). Such equipment should be regarded as a last resort, where risks cannot be reduced or avoided.

Further guidance is given in MGN 311 (F), Working and Protective Gear for Fishermen. Annex 1 of this MGN provides a checklist for fishing vessels under 24 metres registered length for PPE which may be considered for certain hazardous situations.

3.8 PERSONAL FLOTATION DEVICES (PFD)

The standard EN ISO 12402-1:2006 sets out the details for each type of PFD and defines two classes:

- Those which provide face up in-water support to the user regardless of physical conditions (lifejackets) and;
- Those which require the user to make swimming and other postural movements to position the user with the face out of the water (buoyancy aids).

Part 10 of the standard provides advice on selection of a PFD, drawing attention to the need to choose a device that meets the correct standards for the circumstances in which they will be used.

3.9 SAFETY TRAINING

All crew working on board a UK registered fishing vessel are required to have completed the following safety courses or equivalents:

- Sea survival techniques
- Fire prevention and fire-fighting
- Elementary first-aid
- Health and safety (safe working practices)

New entrants to the UK fishing fleet must attend the sea survival techniques course prior to going to sea for the first time. The remaining courses must be completed within 3 months of the start date. Fishermen who have worked for 2 or more years on fishing vessels are designated as “experienced fishermen” and are required to attend a 1 day course on safety awareness. This course includes classroom-based modules on risk assessment and MOB recovery.

The courses are conducted within the UK by Seafish and Group Training Associations (GTAs). Attendees are not assessed and there is no requirement for refresher training.

The MCA accepts SCTW certificates in lieu of the sea survival, fire-fighting and prevention and first-aid courses. However, it does not accept equivalents for the health and safety or safety awareness courses. More information on the mandatory and voluntary training for fishermen can be found in MGN 404 (F).

3.10 SIMILAR ACCIDENTS

In November 2008 the MAIB published its Analysis of UK Fishing Vessel Safety 1992 to 2006. Of the 256 fatalities recorded during this period, 83 fishermen lost their lives as a result of going overboard, 65 of which happened at sea. These figures exclude persons overboard as a result of other events such as the vessel capsizing.

Most fatalities occurred when crew members were engaged in shooting or hauling fishing gear, or as a result of being washed overboard during heavy weather, and only one was reported to have been wearing a lifejacket at the time.

SECTION 4 - ANALYSIS

4.1 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.

4.2 ENTANGLEMENT IN GEAR

The working area on the aft deck of *Osprey III* was very confined **(Figures 13, 14 and 15)**. This resulted in her deckhands being close to the moving gear when working with the nets. William Antonio had been on board for over 6 months and was familiar with the vessel's work practices. However, the sudden loss of the net over the stern following repair was unexpected and was an event not previously seen by him.

It is possible that William misunderstood or did not hear the skipper's warning, which was given in a broad accent, and that he moved intentionally towards the net to try and stop it from running free. If this were the case, this action, albeit reflexive, indicates either a lack of awareness or a disregard of the dangers involved. However, the possibility that William's movement towards the net was involuntary because he was already entangled in the net, cannot be discounted.

Once William's foot was entangled in the gear, there was nothing that could have been done to prevent him from being dragged overboard. Given the speed of *Osprey III*, the net would have been running at a rate of about 30 feet (9.1m) every 6 seconds, and the skipper and other deckhand would have had virtually no time to react.

4.3 ATTEMPTED RECOVERY

On seeing William pulled overboard by the net, the skipper's actions to haul in the gear, mark the vessel's position, and manoeuvre her were quick and positive. Consequently, *Osprey III* remained sufficiently close to William to enable him to be seen after he surfaced, and to throw him a line. William remained afloat alongside the vessel for about 12 minutes, but three significant factors prevented the skipper and deckhand from recovering him back on board.

First, William was unable to hold onto the lines when the skipper and crew tried to pull him up the vessel's side. This was not surprising as his hands would have been cold and wet. Like many others, he might not have been able to support his own weight when holding onto a rope, even with warm, dry hands.

Second, the skipper and deckhand were unable to grab William with their hands because of the vessel's high freeboard and because no means of recovering him were readily available. There are a number of MOB systems designed for smaller vessels, and these are relatively inexpensive. In this case, as William was conscious, the provision of a readily available rope ladder or scrambling net would have substantially increased his chances of recovery and survival.

Finally, neither the skipper nor the deckhand was practised in recovering a person from the water. Although this topic is covered to some degree in the Seafish Safety Awareness course, there is no requirement for fishing vessels under 12m to drill man overboard recovery, and therefore most do not. In this case, a simple drill would have quickly highlighted the problems set by the vessel's freeboard and lack of dedicated equipment. This might have prompted remedial action to have been taken.

4.4 DROWNING

In view of the water temperature, William would have experienced shock when first immersed. Such a shock can cause a person to gasp and inhale water; it can also cause heart attack and death within 2 to 3 minutes. However, as William was able to free himself from his boots, surface, and remain afloat while recovery was attempted, it is almost certain that he drowned as a result of the onset of swim fatigue and the loss of his motor functions, rather than the shock induced by the cold water.

Had William worn the flotation trousers provided by the skipper, their buoyancy would have enabled him to remain afloat. Consequently, he would have found it easier to hold onto the lifebuoy and other line. However, the trousers would not have ensured his mouth was kept out of the water, and so would not have prevented him from drowning. This would have been achieved only if he had worn a level 150 lifejacket. Many types of personal flotation devices are available, and care is required to ensure that such devices provided to the crew are fit for purpose.

4.5 CREW SAFETY

The skipper did not provide a written assessment of the risks encountered in the operation of his vessel. Therefore, it is impossible to determine the extent and quality of his assessment. The provision of a liferaft, an EPIRB, buoyancy trousers, and immersion suits indicates that the skipper considered some of the dangers faced by himself and his crew sufficient to justify the carriage of safety equipment in excess of that required by regulation (see the checklist of requirements shown in Annex 1.4 of **Annex D**).

However, although net repair during passage was routine practice, the dangers to the deckhands presented by the large amount of net on the confined deck does not appear to have been properly considered. Along with the provision of buoyancy trousers for use by the Filipino deckhands only, the failure to enforce the wearing of the trousers, the unsuitability of the trousers for use in the vessel's area of operation, and the lack of a procedure to recover a person from the water, this indicates that the assessment of the risks on board *Osprey III* was neither comprehensive nor effective. The danger posed by the net could have been significantly reduced by keeping William clear of the deck until his presence was absolutely necessary.

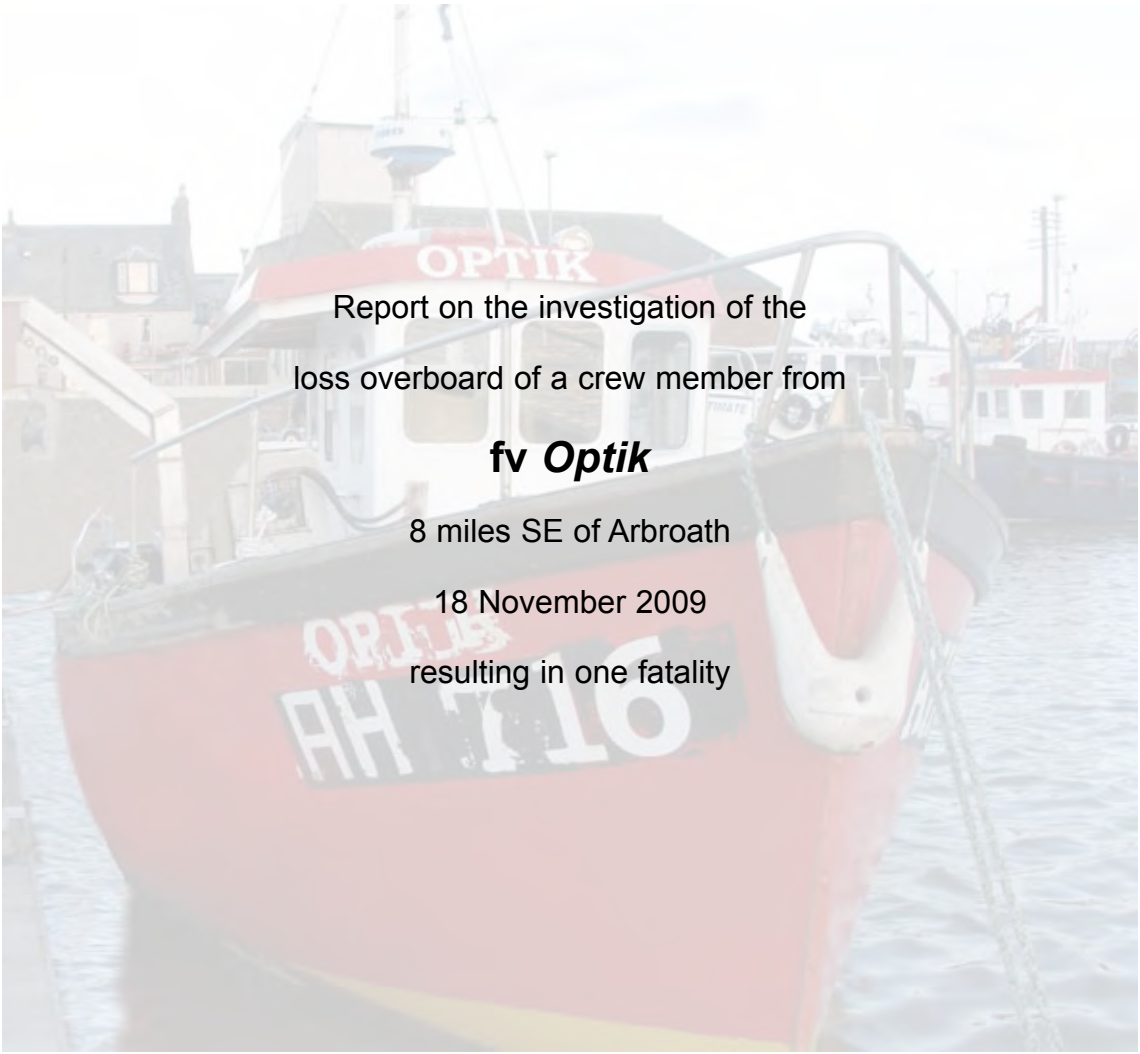
Inadequate risk assessment is a common factor in many fishing vessel accidents and the ability of the skipper of *Osprey III* to complete an effective assessment was unlikely to have been any different to many of his peers. Although the skipper had attended a safety awareness course in 2002, which included risk assessment, it is unreasonable to expect the attendance on such 1-day courses to equip fishermen with sufficient knowledge and skills to enable them to complete a realistic and effective risk assessment.

4.6 ENFORCEMENT OF MANDATORY TRAINING

Although William was required to have attended a health and safety course within 3 months of joining *Osprey III*, this was not known by the skipper, nor was compliance checked during the vessel's inspection in July 2009. There is no way of knowing what effect, if any, William's attendance on this course would have had on his behaviour on board *Osprey III* but it might have equipped him with a greater awareness of the dangers that can be encountered when working with running gear, and on fishing vessels in general.

COMBINED SAFETY ISSUES, ACTIONS TAKEN, MAIB COMMENT AND RECOMMENDATION START ON PAGE 67.

Optik Investigation



Report on the investigation of the

loss overboard of a crew member from

fv *Optik*

8 miles SE of Arbroath

18 November 2009

resulting in one fatality

SYNOPSIS

Raymond Davidson, a crewman on the creel fishing vessel *Optik*, was dragged overboard while shooting creels. The vessel's skipper succeeded in recovering the casualty to the vessel's side by hauling in the rope which had initially dragged him overboard. However, despite the casualty being hoisted to the davit block by his ankle, the skipper was unable to get him onboard. A crewman from another nearby fishing vessel was transferred to *Optik* to assist in pulling the casualty on board. Once on board, first-aid was administered by way of chest compressions and artificial respiration, but these were stopped after a few minutes as the casualty appeared to be lifeless. Thirty minutes later, crew members of the Arbroath lifeboats attended and restarted resuscitation to the casualty, and this continued until he subsequently arrived in hospital. Small signs of life were initially detected by the hospital staff, but it was not possible to resuscitate him.

The accident happened during a routine creel shooting operation which, despite having been carried out many times, had never been properly evaluated to make the operation as safe as possible. During the shooting operation, the casualty was required to work in close proximity to unguarded ropes on deck; during this operation his foot became entangled in a rope and he was dragged overboard and down to the seabed by the weight of attached fishing gear.

SECTION 5 - FACTUAL INFORMATION

5.1 PARTICULARS OF *OPTIK* (Figure 18) AND ACCIDENT

Vessel details

Registered owner	:	Privately owned
Port of registry	:	Arbroath – AH 716
Flag	:	British
Type	:	Creel fishing
Built	:	1979
Construction	:	Glass reinforced plastic (GRP)
Length overall	:	9.20m
Gross tonnage	:	6.44t
Engine power and/or type	:	97kW
Service speed	:	6 knots

Accident details

Time and date	:	1300, 18 November 2009
Location of incident	:	8 miles SE of Arbroath
Persons on board	:	Two
Injuries/fatalities	:	One fatality
Damage	:	None

Photograph courtesy of Kevin c/o Trawlerphotos

Figure 18

Optik in 2008

5.2 NARRATIVE OF EVENTS

The creel fishing vessel *Optik* sailed from Arbroath at approximately 0600 on 18 November 2009 and made her way to the Bell Rock fishing grounds, 10 miles to the south-east. This was her first time at sea following 4 days of bad weather. The passage to the fishing grounds was uneventful and *Optik* arrived at her first fleet of creels at first light, at about 0745, whereupon the routine fishing process of hauling, emptying, re-baiting and shooting creels began.

Optik had approximately 500 crab creels, set in fleets of 20, around the Bell Rock area and was fishing them (hauling and shooting) in a clockwise direction around the Rock. Another four Arbroath based vessels were in the vicinity and were also engaged in creel fishing.

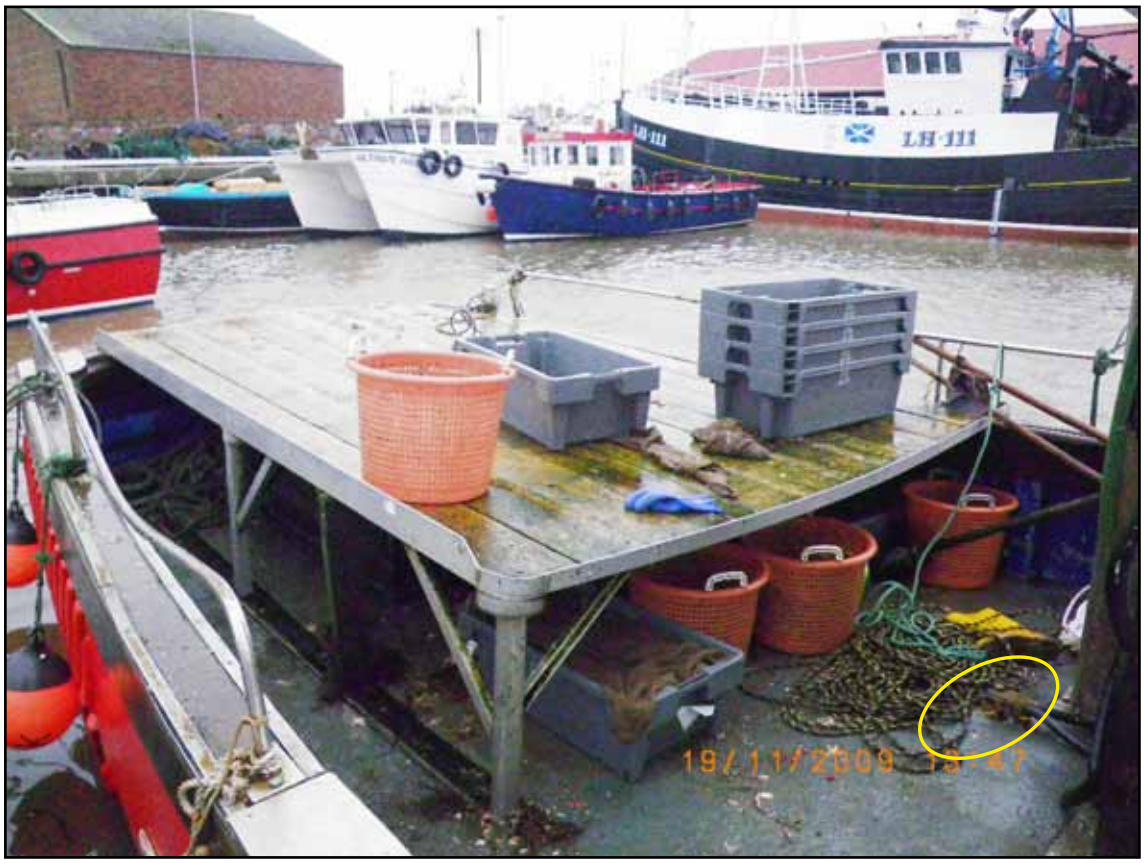
Through the course of the morning *Optik*'s skipper and crewman, Raymond Davidson (the casualty), hauled and re-set 10 fleets of creels. During this time, the wind varied between force 4 and 6 (Beaufort), south-westerly. The weather conditions were not particularly good and had deteriorated throughout the morning to a point where the skipper was reaching his limit for comfortable fishing. At around 1230 *Optik*'s skipper had already decided that, after shooting the current fleet of creels, they would return to port because of the weather and sea conditions.

Optik was shooting her last fleet on a south-easterly heading, beam on to the south-westerly wind and swell, at a speed of 4 or 5 knots. The skipper was in the wheelhouse monitoring the vessel's position while the crewman was on the deck between the shooting table and the wheelhouse **(Figure 19)**, monitoring the shooting. The skipper was not studying the actual shooting process but, as was common practice, awaited a call from his crewman to indicate the last creel had been shot, so that he could record the position on *Optik*'s track plotter for later retrieval. Instead of a clear, precise shout from abaft the wheelhouse door indicating the last creel was shot, an abnormal shout was heard from somewhere behind the wheelhouse and over to port, prompting the skipper to look behind, where he saw the crewman being dragged aft, in a curled up position, over the shooting table.

The skipper's reactions were immediate; he placed *Optik'*s engine full astern and stopped her in the sea, being careful not to go too far astern and take the creel rope into the propeller. He rushed to the stern where the rope was still running and, as he grabbed it to bring it round to the creel hauler; he noticed there was little weight on the rope.

The line was quickly hauled in and the casualty was pulled back to the surface where it was seen that, as well as the line being caught around his left ankle, there were also several turns tangled around his torso.

Figure 19



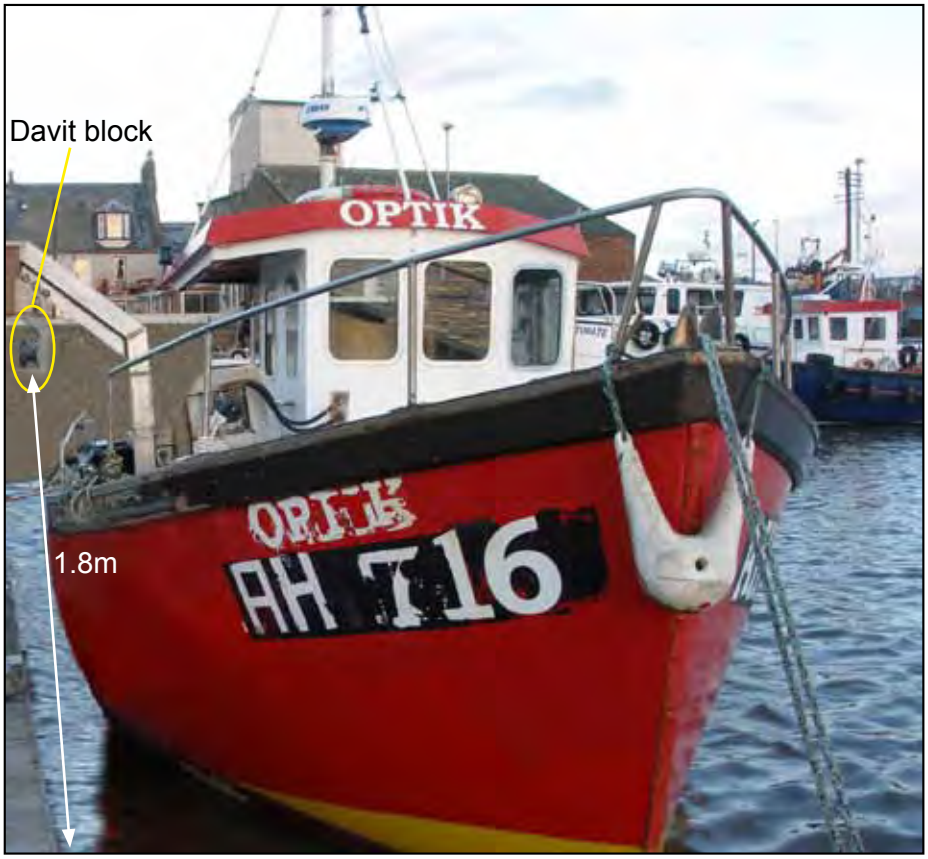
Optik's deck (after the accident) showing the approximate position of the crewman before he was dragged overboard by the rope shown

Optik's skipper continued to haul the rope until the casualty's ankle was touching the davit block **(Figures 20a & 20b)** and he was suspended, head down, towards the sea. There were no signs of life in him at this time. The skipper cut the rope free from around the casualty's torso and attempted to pull him back on board. Despite several attempts, the skipper was unable to get sufficient grip to haul the casualty up and over the bulwarks and slack the retaining rope from the hauler at the same time. Realising he could not recover the casualty alone, he ran into the wheelhouse to use the VHF to call the nearby fishing vessel *Orianne* for help.

Orianne was hauling creels about ⅓ of a mile away from *Optik*; her crew had noticed *Optik* laying stopped in the sea for about 5 minutes, but thought little of it until they heard *Optik*'s skipper's call for help over the radio. Without hesitation they cut away their gear and raced towards *Optik*.

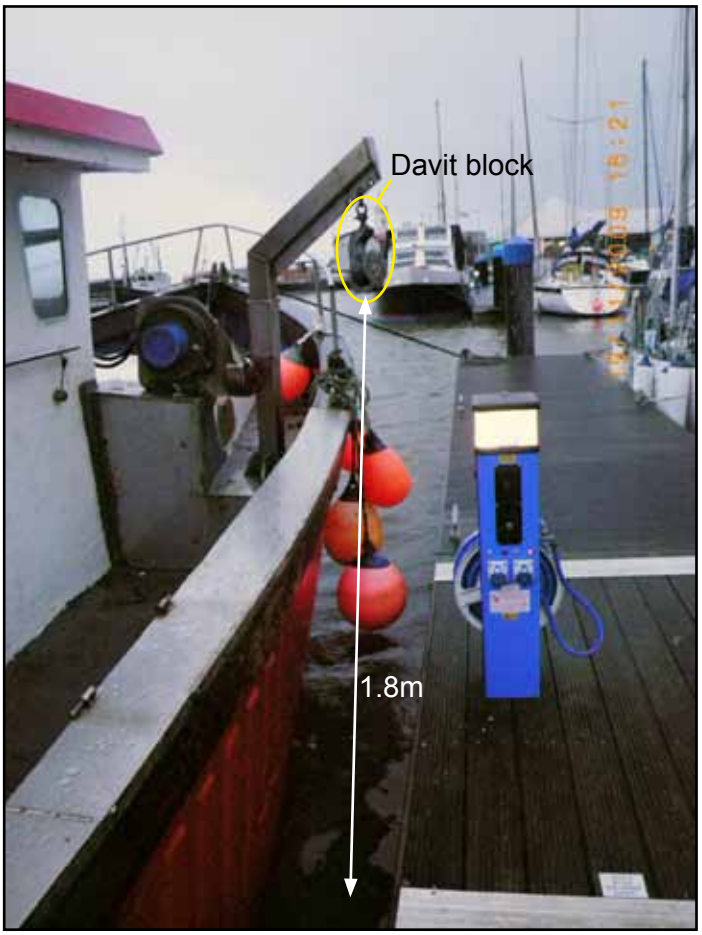
The radio call for assistance, which was made on VHF channel 14, the local working channel for Arbroath fishing vessels, was overheard by the skipper of *Lichtie Lass*, several miles away; he was also a coxswain for the Arbroath Royal National Lifeboat Institution (RNLI). As *Orianne* headed to *Optik*'s aid, the skipper of *Lichtie Lass*, realising the urgency of the situation, contacted Arbroath lifeboat station directly by mobile telephone and instructed them to launch to a manoverboard (MOB) incident off the Bell Rock. The duty lifeboat mechanic immediately paged the vessel's crew, and at 1315 informed Forth Coastguard (CG) that they were about to "self launch."

Figure 20a



Davit block used to recover the casualty

Figure 20b



As *Orianne* came around *Optik*'s bow, her skipper and crewman could see a seemingly unconscious body suspended upside down by his ankle from the creel hauler davit. They realised the situation was desperate and recognised the only way to help was to get another person on board *Optik*. *Orianne* was manoeuvred close across the stern of *Optik* to enable her crewman to jump between the vessels in the not inconsiderable swell. As the vessels passed within a few feet of each other the crewman jumped across, successfully landing on *Optik*'s shooting table. *Orianne*'s crewman did not think to don a lifejacket before attempting the hazardous transfer.

Once *Orianne*'s crewman was on board *Optik* he and the skipper quickly dragged the casualty over the bulwark rail onto the deck; he was grey, cold and had no detectable pulse or any other signs of life. Basic life support (BLS) through mouth to mouth ventilations and chest compressions was immediately applied. These continued for about 5 minutes, before the skipper and *Orianne*'s crewman assessed that the casualty was beyond help, and covered him with an oilskin jacket.

At around 1325 communications were established between Forth CG and the skipper of *Optik*. However, the CG were not informed that BLS of the casualty had ceased.

At 1326 the Arbroath all weather lifeboat (ALB) reported "on service" to Forth CG, giving an estimated time of arrival with *Optik* of 1400. The faster inshore lifeboat (ILB) also reported on service soon afterwards.

Forth CG contacted the air rescue co-ordination centre (ARCC), Kinloss, and requested helicopter assistance; ARCC Kinloss duly assigned a helicopter from RAF Boulmer to assist. At 1346 rescue helicopter R131 was airborne heading to the accident scene approximately 85 miles away.

Arbroath ILB's progress was hampered by the poor sea conditions and it arrived alongside *Optik* at 1353, only a few minutes before the larger ALB. Lifeboat crew members, highly trained in cold water immersion recovery techniques, boarded *Optik*, where they found the casualty in a recovery position. Despite finding no obvious signs of life, the lifeboat crew commenced oxygen assisted BLS, unaware that previous BLS had ceased about 30 minutes earlier. BLS continued (as their training required) until R131 arrived on scene at 1420. The casualty was hoisted on board the helicopter within a short space of time.

Life support continued to be administered to the casualty on board R131 until it arrived at Ninewells Hospital, Dundee, at 1436. He was then handed over to the care of the hospital, but was not showing any obvious signs of life. However, detailed examination by Accident and Emergency (A&E) staff using advanced medical equipment detected a slight trace of electrical activity within

the unconscious man. His core temperature at this time was 29.4˚ centigrade (C) – deeply hypothermic. Unfortunately, despite intensive and sustained attempts by the A&E staff, the casualty could not be re-warmed or revived and was pronounced dead at 1630.

5.3 KEY PERSONS

5.3.1 The casualty

Optik's crewman, Raymond Davidson, aged 52, was a self taught mechanic and had sailed intermittently on various trawlers over a period of time. His experience in creel fishing was gained mostly on board *Optik*, where he joined as a share fisherman soon after the boat was purchased by the skipper. He held mandatory certification in Basic Sea Survival, Fire Fighting and Safety Awareness, and a further non-mandatory certificate in Stability Awareness. He did not hold the required certification in First Aid at Sea.

5.3.2 The skipper

Optik's skipper/owner had spent most of his working life at sea on board tugs and offshore petrochemical industry support vessels. In 2005, at age 58, he retired from offshore working and purchased his first fishing vessel, *Optik*. Prior to this he gained fishing experience on board the Arbroath based creel fishing vessel, *Boy Joshua*[6], where he sometimes crewed when not working offshore. He held mandatory Sea Fish Industry Authority (Seafish) approved training certificates in Safety Awareness, and the non-mandatory Stability Awareness courses. Additionally, he held Standards of Training, Certification & Watchkeeping (STCW) approved certification in Advanced Fire Fighting, Proficiency in Survival Craft and Rescue Vessels and Proficiency in Medical First-aid Aboard Ship, which had been obtained in 2001 and MCA approved Tug Master (near coastal) and Tug Mate (unlimited) certificates of competency.

5.3.3 *Orianne's* crewman

The crew member of *Orianne,* who jumped across to *Optik* in the open sea, was aged 50 and had been a fisherman most of his working life, except for a short period working on offshore petrochemical industry support vessels.

He held a Mate's Full and Special Certificate of Competency which allowed him to sail as mate on UK fishing vessels worldwide, or skipper of under 30m vessels within a Limited Area around the UK coast.

In addition to his Certificate of Competency he held statutory certification in Fire Fighting, Basic Sea Survival, Safety Awareness and First-Aid, which he obtained in 1999.

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6 *Boy Joshua*'s skipper was lost overboard on 16 August 2007. His body was found later that day. He was not wearing a flotation device.

5.4 VESSEL DESCRIPTION AND MODIFICATIONS

Optik was built in 1979. Her wheelhouse was placed slightly further aft than most other fishing vessels of the same hull design to allow easy access to her foredeck. However, this resulted in less room on her aft working deck. The vessel had changed ownership several times and had been rigged for various fishing activities during the last 30 years, including trawling and creeling.

The wheelhouse gave access to a forecastle via a companionway forward. The forecastle housed two bunks, galley facilities, a toilet and access to the engine space. The forecastle was also used for storage, and held a 4-man liferaft, which the vessel was not required to carry.

When *Optik* was purchased, the current owner fitted a shooting table, or platform, on the working deck aft to facilitate "self shooting" of creels **(Figure 21)**. This was a common practice on many Arbroath creel vessels at the time. The shooting table measured 3.65m long x 2.44m at its widest point and tapered slightly towards the stern. This allowed approximately 24 creels to be stowed flat on the table with a walkway down its starboard side and free deck space of 1.07m between the front of the table and aft wheelhouse bulkhead. Installation of this shooting table blocked off the dedicated engine space access hatch from the main deck, requiring an alternative access to be opened up in the watertight bulkhead between the forecastle and engine space.

Figure 21

Shooting table on aft deck of *Optik*

In June 2009 the skipper further modified the vessel by removing part of the wheelhouse from *Optik*'s starboard side **(Figures 22a and 22b)**. The modification provided more clear deck space and therefore improved safety in the area of the hauling position. A new sleeved box section hauling davit was also installed at this time, enabling the davit arm to be lifted and rotated through 90°, and prevent it from becoming fouled when *Optik* was moored alongside other fishing vessels. The snatch block on the outboard end of the davit was 1.8m above the waterline **(Figures 20a and b)**.

During this most recent modification to *Optik*, the skipper took moveable equipment ashore for safe keeping, as the vessel was unsecure and open to the elements during the refit. After completion of the refit the equipment was mostly put back on board. However, *Optik*'s complement of lifejackets was not returned to the vessel and, at the time of the accident, 20 weeks later, was still not on board.

Photograph courtesy of Kevin c/o Trawlerphotos

Figure 22a

Optik undergoing modifications to starboard side of wheelhouse to enlarge deck space

Figure 22b

Optik showing completed modifications to wheelhouse and davit arm

5.5 METHOD OF FISHING

Optik's creels were mainly used to fish for brown crab and lobster. The total number of creels deployed in the sea at any one time was approximately 500. These were steel framed parlour creels weighing approximately 11kg each. Once baited and set on the seabed the creels would usually be recovered after about 24 hours, but in November, when catches and weather conditions were poorer, the skipper liked to haul all the creels in rotation about once every 3 days. His preferred fishing grounds were around the Bell Rock, where he found he suffered fewer losses to his gear as a result of accidental contact with scallop dredgers' or trawlers' gear.

Each fleet consisted of 20 creels of typical dimensions 66cm x 48cm, which fitted comfortably onto *Optik*'s shooting table. The creels were set at 10 fathom (18.3m) intervals on the seabed, attached to a 10mm diameter leaded back rope (main line) by 1 fathom (1.83m) long leg ropes. At the end of each fleet was a 30 fathom (54.9m) dhan rope leading to the surface, attached to a dhan and marker buoy to facilitate retrieval from the sea **(Figure 23)**.

Figure 23

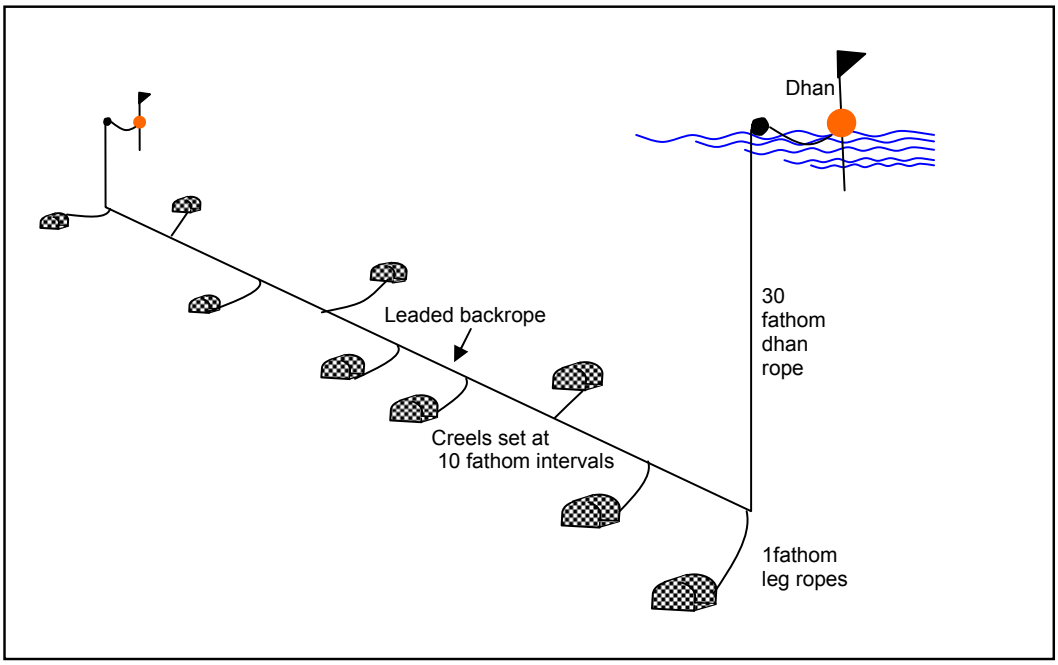

Diagram of a typical creel fleet

5.5.1 Hauling process

Both skipper and crewman would be on deck to haul in the creels. The skipper would, according to wind and/or tide, manoeuvre the vessel to pick up the floating dhan buoy from the surface, feed the rope through an open snatch block on the davit arm and over the “V” wheel of the hauler. Once recovered, the dhan buoy was stowed on the port side of the vessel, between the wheelhouse and the bulwark **(Figure 24a)**; this became the last item of gear to be dropped overboard during the shooting process. As the 30 fathom dhan rope came over the hauler it was also pulled across and coiled close to the dhan buoy, just in front of the shooting table, to leave a clear deck between the table and the wheelhouse bulkhead. The dhan rope connected to the back rope to which creels were fastened; the back rope was hauled through the snatch block and allowed to coil freely on the deck directly below the hauler **(Figure 24b)**. As each creel came up to the snatch block, the skipper lifted the creel and simultaneously threw the leg rope out of the block, allowing the back rope to continue unhindered around the hauler. The creel was then emptied of catch and debris, re-baited and stowed on the shooting table by the crewman in preparation for shooting. Once a further 10 fathoms of back rope had been hauled, the next creel would appear under the davit arm, and the process would be repeated until the entire fleet of 20 creels was hauled and stowed on the shooting table. As each creel was stowed sequentially on the shooting table from forward to aft, the crewman would make sure the bights of back rope, to and from the hauler, were leading clear from the table and stowed close against the starboard bulwark. Finally, the second 30 fathom dhan rope would be hauled and stowed at the aft starboard side of the shooting table in preparation for shooting (see **Figures 24a to c** for the hauling process). Hauling was a physically demanding task and neither skipper nor crewman wore PFD’s during the process.

Photograph courtesy of Kevin c/o Trawlerphotos

Figure 24a

Representation of dhan buoy in recovered position with section of rope obscured between shooting table and wheelhouse

Photograph courtesy of Kevin c/o Trawlerphotos

Figure 24b

Representation of back rope coiled under the hauler and initial sequence of creels stowed on the shooting table

Note: Hatched lines represent ropes out of sight, inboard of the bulwark

Photograph courtesy of Kevin c/o Trawlerphotos

Figure 24c

Representation of fleet of recovered creels stowed
on the shooting table in preparation for shooting
Note: Hatched lines represent ropes out of sight, inboard of the bulwark

5.5.2 Shooting process

Shooting was carried out with only the crewman on deck and the skipper steering from the wheelhouse. The vessel's speed during shooting was normally between 4 and 5 knots.

The dhan and its attendant rope placed at the stern of the vessel was dropped overboard by the crewman and streamed on the surface as the skipper positioned the vessel for the fishing ground. When instructed by the skipper, the crewman would shoot the first creel (this was the last creel hauled in the hauling process) off the table; he then positioned himself in a place of relative safety just behind the wheelhouse door. Thereafter, the creels would shoot freely from the table every 10 fathoms, assisted by the drag of the gear already in the sea. The crewman would normally advise the skipper when the last creel went overboard so that he could record its position for later retrieval. The crewman then took the dhan buoy from its position between the wheelhouse and port bulwark as the last of the dhan rope was running, and throw it overboard from his position abaft of the wheelhouse. It was at some point as the last creel went overboard that the casualty's foot became entangled in the dhan rope about 2 fathoms from where it joined the back rope.

5.6 ENVIRONMENTAL CONDITIONS

On the day of the accident the wind was from the south-west, force 4 to 6 with a 1.5 - 2.5 metre swell. At the time of the accident the flood tide was running to the south-west, against the wind direction, thus creating sharp, irregular seas. Ambient air temperature was 9°C and the sea temperature was recorded by the ALB as 10.4°C.

5.7 *OPTIK*'S SAFETY INSPECTIONS

In accordance with The Code of Practice for the Safety of Small Fishing Vessels of Less than 15m Length Overall (LOA), (The Code), fishing vessels under 15m LOA are subject to a Maritime and Coastguard Agency (MCA) safety inspection at 5-yearly intervals. Currently, inspections of under 10m vessels are usually carried out by MCA CG sector managers. Following a successful inspection, the inspecting officer will issue a safety certificate decal, valid for 5 years, which is required to be displayed in the wheelhouse. In addition to these 5-yearly inspections, vessels may also undergo random or targeted inspections during the 5 year period.

Optik displayed an in date MCA safety certificate decal in her wheelhouse, under a previous name, granted to her previous owner shortly before the vessel was sold; this was due to expire in April 2010. However, the vessel was the subject of a targeted inspection, because of the change of ownership, by a CG sector manager on 15 October 2007. This inspection identified seven deficiencies, requiring the skipper to carry out corrective actions and notify the MCA in writing upon completion. In addition, *Optik* was served with an Improvement Notice which required the crew to provide evidence, before 19 January 2008, of training in Basic Sea Survival, Basic Fire Fighting, Safety Awareness and First-aid.

Confirmation for correction of the vessel's deficiencies was submitted in writing to the MCA on 23 October 2007, and a new safety certificate decal was issued. The necessary training was completed within the time period except for the casualty's first-aid training. A booking confirmation for the casualty's training course was supplied by a training provider, allowing the Improvement Notice to be removed. However, he did not attend the first-aid course, and this was still outstanding at the time of the accident.

During the targeted inspection, the CG sector management also informed the skipper that his 4-man liferaft would require servicing in a few months time, even though it was carried surplus to requirement of The Code for that length of vessel.

Skippers are also required to annually self certify that their vessel still complies with the Code and that risk assessments of the vessel's operational work practices are current. This had not happened in the case of *Optik*.

5.8 SIMILAR ACCIDENTS

The MAIB Analysis of UK Fishing Vessel Safety 1992 – 2006[7] identified that, of the 65 fatalities resulting from persons going overboard at sea, during the period of the Study, nearly a third occurred on potting vessels, generally as crew became entangled in ropes during shooting. Further, only 6 weeks before the accident on *Optik* a crewman was dragged overboard to his death while shooting crab creels on the Kirkwall registered *Noronya.*

Noronya was a state of the art modern vivier creel vessel with numerous in-built safety considerations, and well thought through risk assessments, with suitable control measures in place for mitigating dangers. One such consideration was a dividing partition between the creel back rope and the crew on deck. The accident on *Noronya* was caused by a bight of the back rope being laid out over the dividing partition and onto the deck to enable a repair to the rope – this was a departure from the fully assessed routine method of repairing the back rope. During shooting, the casualty's leg became entrapped in the bight, and he was pulled overboard with the rapidly sinking gear. The back rope was swiftly retrieved, but with no sign of the casualty. His body was not recovered despite a prolonged search.

Noronya's skipper had gone to considerable lengths to ensure safety on his vessel. On this one occasion a departure from the appropriately risk assessed and established method of effecting gear repairs led to a crewman's death.

[7] Available from the MAIB or at: http://www.maib.gov.uk/cms?file=FishingVesselSafetyStudy.pdf

SECTION 6 - ANALYSIS

6.1 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.

6.2 FATIGUE

The accident occurred during *Optik*'s first day at sea after being weather-bound for several days, allowing those involved to be well rested before embarking on their day's work. Fishing operations on *Optik* occurred during daylight hours only. Notwithstanding any limitations imposed by weather conditions, in November, this meant the vessel had a working window of just over 8 hours. The crew of *Optik* were able to take ample periods of rest between fishing operations. Fatigue is not considered a contributory factor in this accident.

6.3 THE ACCIDENT

Optik was shooting broadside to wind and sea, with the vessel's motion aggravated by the tide setting against the wind direction. It is possible that the casualty stumbled due to the vessel's motion and, in doing so, placed his foot on the running dhan rope, resulting in his entanglement. What is not clear, is why he was on the port side, behind the wheelhouse of *Optik* at that time, as normally he would not go there until the second dhan was almost ready to be thrown overboard. This was a deviation from the normal working practice, just as the lead up to the *Noronya* accident was a few weeks earlier (Section 5.8). Both accidents emphasise the need for crew members to fully consider the potential consequences of any such deviations and to communicate these to their colleagues.

The casualty's ankle was caught in the dhan rope about 2 fathoms (3.7m) above the last creel; this is known from the amount of rope retrieved to deck during his rescue. It is highly probable he was dragged to the seabed due to the weight and tension created by the fleet of creels already streamed on the seabed. The skipper noticed there was little weight on the dhan rope as he took it to the hauler to recover his colleague – this would indicate that both the last creel and the casualty were on the seabed, rather than suspended mid water.

The skipper saw the casualty in a curled-up position as he was pulled overboard; this was probably a desperate attempt by the casualty to reach down and free the rope from his ankle.

6.4 RESCUE AND SUBSEQUENT ACTIONS

The decision of the skipper of *Lichtie Lass* (who was an Arbroath RNLI coxswain) to instruct the Arbroath ALB to self launch as soon as he overheard the MOB broadcast from *Optik,* ensured this SAR asset was mobilised at the earliest opportunity. HM Coastguard was subsequently briefed of the situation by the lifeboat crew as they prepared to launch.

The decision to transfer a member of *Orianne*'s crew across to *Optik* was undoubtedly a brave reaction to a difficult situation. However, as was the prevailing custom on *Orianne*, the crew member was not wearing a PFD[8] and he could easily have slipped and fallen into the sea during the transfer, with potentially further tragic consequences.

Based on a re-enactment of events conducted during the MAIB investigation, it is estimated that it took around 10 minutes from the time the casualty went overboard until *Orianne*'s gear was cut, she proceeded to *Optik*, and the crew man was placed on board to assist in his recovery. By this time, the casualty had stopped breathing. Thereafter BLS was quickly administered but was discontinued after approximately 5 minutes because there were no signs of life. BLS was again commenced once the Arbroath ALB reached *Optik* approximately 30 minutes later, and then continued until the casualty's delivery at Ninewells hospital by R131.

In cases where casualties have fallen into cold water and have stopped breathing, it is sometimes possible to revive them. Under these circumstances the body's metabolism slows due to the effects of severe, rapid cooling, and the heart rate weakens and slows to a rate that makes detection of any pulse very difficult. The hospital staff were able to detect very small signs of life in the casualty but, by then, unfortunately it was not possible to resuscitate him.

6.4.1 First-aid training

First-aid training for fishermen is delivered as a 1-day attendance course. In common with the other mandatory safety courses provided by Seafish, there is no examination at the end of the course to verify competence, and there is no requirement for fishermen to attend periodic refresher courses. In fact, both the skipper of *Optik* and the crewman who helped him recover the casualty, had attended additional first-aid training courses relating to certificate of competency and offshore industry employment requirements. However, these courses had been provided approximately 8 years before the accident occurred.

BLS was provided to the casualty for only a few minutes after he was recovered to the deck of *Optik* because he was showing no signs of life. It was resumed once the more highly trained RNLI staff arrived on scene, and then continued until Mr Davidson's death was determined in hospital. There have been many

8 Following the loss of the skipper of *Boy Joshua*, the crew of *Orianne* started wearing constant wear inflatable lifejackets. The habit dropped off after a short period of time.

reported cases where individuals have succumbed after being immersed in cold water but have subsequently been revived even though, to an untrained observer, all signs of life have been lost. It is therefore important that BLS is continued in such circumstances for as long as possible until expert medical advice can be obtained. This principle is explained during the mandatory first-aid courses attended by fishermen but, in the absence of refresher training, it is a detail that could easily be forgotten with time. The need to provide fishermen with refresher training in first-aid would appear to be compelling.

Notwithstanding the above, it is highly improbable that the casualty would have survived even if continuous BLS had been administered from the time he was recovered to the deck of *Optik*, due to the depth of water to which he was submerged, the prevailing sea temperature and the trauma involved.

6.5 MCA INSPECTIONS AND ASSISTANCE

S.I. 2001 No. 0009 – The Fishing Vessels (Code of Practice for the Safety of Small Fishing Vessels) Regulations 2001 applies to all UK registered fishing vessels of less than 15 metres length overall. The Code requires that owners present their vessel for a safety inspection at intervals of no more than 5 years. Between those periods, owners must ensure their vessel remains Code compliant, and confirm so by means of annual self certification. MCA's M Notice, MSN 1813 (F), gives a summary of The Code requirements **(Annex D)**. Self certification is not sent to the MCA but, instead, is required to be retained on board for presentation to an MCA surveyor or inspector when required.

The 5-yearly inspections focus mostly upon life saving appliances (LSA) and equipment required to be carried by the vessel as indicated in The Code's annexes. Following inspection, the inspecting officer issues a "Report of Inspection" and, if successful, a safety certificate decal which is to be displayed in the wheelhouse. Alternatively, the Report of Inspection may contain deficiencies which are required to be corrected within a given time frame. Once corrective action has been applied, the vessel's skipper or owner is required to notify the MCA that such action has been taken, and a decal is subsequently issued. Should a skipper or owner fail to notify the MCA of appropriate corrective actions, the MCA may issue a detention notice upon a vessel until such corrective actions are completed. Inspecting officers are not required to return to vessels to confirm if corrective actions have been applied, but instead apply the principles of good faith when notified by the skipper or owner that deficiencies have been addressed. In the case of crew training deficiencies, an extended time limit is given to obtain the necessary training. The MCA is pragmatic in this respect, realising it can be difficult for crew members to meet shore based training schedules, and therefore considers evidence that individuals are booked on a training course as being sufficient confirmation that crew members will complete the required training.

Several deficiencies were identified as a result of a targeted Code inspection of *Optik* in October 2007. The skipper/owner addressed these and notified the MCA promptly of the corrective actions he had taken. Likewise, the request for further training was addressed and the Improvement Notice issued as a result of the earlier inspection duly lifted. However, although evidence was submitted to the MCA which confirmed the casualty was booked on a first-aid course, he never completed the training. Two anniversaries of *Optik*'s 2007 inspection passed without her skipper completing self certification statements to confirm that the vessel complied with The Code, or that risk assessments were current.

There is no requirement for the MCA to assess the operational practices during fishing when conducting vessel inspections. However, a brief evaluation in harbour by someone with a basic understanding of creel fishing, would have quickly established that prudent controls were not in place for *Optik*'s shooting procedures.

Following the accident, the MCA inspected and detained the vessel for failing to comply with The Code on numerous counts.

6.5.1 Assistance in reviewing operational practices

There is a perception that assessing the risks onboard fishing vessels is a complicated process which requires input from specialist experts. This is a fallacy; invariably, the most effective assessments of operational dangers are carried out by those involved in and affected by the working process. In reality, safe working generally results from skippers and crews carefully considering and discussing work processes, then applying measures to remove or reduce inherent dangers.

However, the MCA has rightly identified that many fishermen had difficulty with the concept of formalised risk assessment. In 2005 the Scottish and Northern Ireland (ScotNi) region of the MCA appointed a Fishing Vessel Safety Officer to go on board over 15m fishing vessels and facilitate safety discussions among crews with a view to removing the perceived mystique surrounding formal analysis of working procedures. This proved to be very successful, and gave crews inclusion and ownership of safety management on their vessels. As part of its Analysis of UK Fishing Vessel Safety 1992 to 2006[7] MAIB identified this initiative as best practice, and considered making a recommendation to extend this process, throughout the other MCA regions. However, during collation of information for that Study, the MAIB was formally advised that the MCA and Seafish would expand the initiative to offer all UK fishermen similar practical assistance in analysing their working procedures. As a consequence, no recommendation was made. However, since publication of the Study, no expansion of the initiative has taken place. Indeed, it is understood that the process is no longer conducted even in the MCA's ScotNi region.

During the period February 2007 to March 2008, Seafish assisted 170 vessel crews with working procedure reviews (risk assessments), enabled by EU and UK Government funding. Unfortunately, since that time funding has not been available and, as a consequence, Seafish has no longer been able to provide the service. MCA continues to offer risk assessment advice on an ad-hoc basis, to mainly under 15m vessel operators.

6.6 OPERATIONAL EFFICIENCY AND SAFETY CONSIDERATIONS

Soon after purchase of the vessel, *Optik*'s skipper fitted a shooting table **(Figure 21)** at bulwark height, similar in design to that fitted on board *Boy Joshua*. It is of note that *Optik*'s skipper learned most of his fishing practices from the skipper of *Boy Joshua*, who drowned after either falling or being dragged overboard while hauling creels on 16 August 2007. He was not wearing a PFD at the time. The limited time spent by the skipper of *Optik* on only one fishing vessel prior to acquiring his own vessel would not have allowed him to acquire a well rounded experience of fishing processes; something that is often gained only by spending time on different vessels and observing alternative methods of operation.

Without the installation of the shooting table or, alternatively, a ramp or bulwark opening door, each creel would have been required to be lifted and thrown overboard manually during the shooting process. Installation of the shooting table greatly simplified the process and reduced much of the manual handling, and contact with the gear, together with the accompanying fatigue, thus making the procedure safer. However, the shooting table was longer than required. Fleets of 20 creels could have been stowed on a platform at least 1 creel length (66cm) shorter than that installed, thus leaving additional deck space behind the wheelhouse where the dhan rope that dragged the casualty overboard was stowed. This would have further facilitated the installation of a transverse dividing partition from the port bulwark part-way across the deck to starboard. Such a dividing partition would have separated crew from the dhan rope during shooting. Even without shortening the shooting table, the existing deck space would have permitted such a partition. The Sea Fish Industry Authority (Seafish) "Potting Safety Assessment"[9] of 1999 highlights the importance and benefits of such simple measures.

The fitting of the shooting table effectively closed off the only engine space access. To overcome this, the skipper had cut an opening in the forward transverse bulkhead, potentially compromising the vessel's survivability in the event of flooding. Furthermore, the stowage of too many creels on the raised, bulwark height shooting table would also have reduced her stability. Safer,

[9] Seafish Report No. SR524; can be found on the Seafish website via the following link http://www.seafish.org/resources/publications.asp This report was produced for the fishing industry safety group (FISG) but was not disseminated widely to the fishing industry.

similar self shooting status could have been achieved by creating a gateway in the transom bulwark and fitting an alternative watertight flush deck hatch to the engine space, thereby keeping the weight of creels at deck level and the overall centre of gravity lower.

The alterations of summer 2009 were carried out as a result of the skipper considering potential operational improvements in consultation with his crewman. It was recognised that reducing the wheelhouse size would give improved deck space and safety without compromising wheelhouse facilities, and such a modification was subsequently carried out. Unfortunately, this informal review of operations was not carried through to take in the entire fishing procedure, in particular the design of the shooting table and layout of the deck.

Although there is a requirement for a working operations risk assessment, there is no need for it to be documented. However, the formal act of recording an assessment helps focus the mind to carry out a more systematic, thorough, analysis. The informal working and safety planning carried out by *Optik*'s skipper was flawed as it did not identify the need for control measures to separate people from the fishing gear.

Thorough and practical assessment of risks by the skipper and crew of a fishing vessel is not a bureaucratic exercise; it is essential for safe operations.

6.6.1 Manoverboard consideration

It was the skipper's belief that in the event of an MOB from *Optik,* a casualty would be able to assist himself in some way and, once thrown a rope, would secure this around himself and be assisted back on board by the other crewman, using the creel hauler. This, however, took no account of the case of an unconscious person's recovery, especially one not wearing a flotation device for support. MAIB investigations have identified numerous accidents where fit and healthy persons who have fallen overboard have lost all ability to help themselves within a minute or two, due to the debilitating effects of cold shock and ingestion of water. It is much more difficult to recover a person from the water than most fishermen realise. If crewmen are to have any chance of surviving going overboard, the means of recovery needs to be considered, discussed and practised.

The PFDs belonging to *Optik,* which were removed during the 2009 modifications, were one MCA approved abandonment type lifejacket and one constant wear inflatable 150 Newton (N) type. Neither skipper nor casualty were in the habit of wearing PFDs, even when they were carried on *Optik*. Whilst it is possible that a 150N lifejacket might have been insufficient to support the crewman and the entangled creel on this occasion, in most overboard situations, a lifejacket will make the difference between life and death.

Seafish provides a Fishing Vessel Safety Folder, which is a pro-forma document, to assist fishermen to consider the dangers in their working operations and apply control measures to stop or reduce operational accidents. This document makes frequent reference to the possibility of crewmen going overboard, and provides considerations to reduce the chances of this happening. What the document does not do is provide guidance on recovery of an MOB, or highlight issues to consider when carrying out the dangerous tasks involved in recovering a person from the sea.

The casualty's best chance of survival would have been for him to cut the rope pulling him overboard. Unfortunately, although there were knives in various locations on board *Optik*, there was not one to hand at the location of entanglement. It is therefore essential that one is kept readily available during such operations.

6.6.2 Musters and drills

There is no legal requirement for the crew of fishing vessels below 12m in length to conduct emergency drills, or inspections of lifesaving appliances. Past investigations by the MAIB have frequently shown they are seldom carried out even on larger fishing vessels, which are obliged to do so. Had appropriate musters and drills been carried out on *Optik,* they would have revealed that the lifejackets had not been replaced on board following the refit of summer 2009, and identified the lack of means to recover a man overboard.

COMBINED SAFETY ISSUES, ACTIONS TAKEN, MAIB COMMENT AND RECOMMENDATION START ON PAGE 67.

COMBINED SAFETY ISSUES AND ACTIONS TAKEN

SECTION 7 - SAFETY ISSUES

The following safety issues were identified during the course of the three accident investigations.

7.1 SAFE SYSTEMS OF WORK

1. The tipping rail system appears to be a vast improvement on existing methods of emptying the dredge bags on scallop dredgers as it removes the need for the crew to stand close to the gear, and it can be operated remotely. [2.4.2 ***Korenbloem***]

2. The scallop tray (bin) installation on the vessel was nearly the same height as the bulwark, resulting in the elimination of the 1m mandatory barrier required to be maintained by the bulwark. Standing on a bin full of catch during rough weather significantly increased the risk of falling overboard. [2.4.3 ***Korenbloem***]

3. The risk assessment document held on board *Korenbloem* did not include the risk of falling overboard while standing on the bin. There were several risk mitigation strategies in the document which required that crew members make appropriate use of PPE; in practice, the crew paid little attention to the advice in this document. [2.5 ***Korenbloem***]

4. As the scallop bins are removed from the vessel during surveys, the danger of crew members falling overboard was not readily apparent to the surveyors. [2.6 ***Korenbloem***]

5. The deceased was possibly unaware of the dangers of stepping towards the free-running trawl. [4.2 ***Osprey III***]

6. The deceased might have misunderstood the skipper's warning. [4.2 ***Osprey III***]

7. The vessel's risk assessment was neither comprehensive nor effective, and the skipper's training in risk assessment was limited to its coverage in a 1-day safety awareness course he had completed in 2002. [4.5 ***Osprey III***]

8. The casualty was not standing in the normally relatively safe position for the shooting operation. [6.3 ***Optik***]

9. There is no requirement for MCA inspecting officers to evaluate potential operational dangers when conducting Code inspections. [6.5 ***Optik***]

10. No annual self certification for the vessel's compliance with The Code was carried out. [6.5 ***Optik***]

11. The MCA has failed to extend the ScotNi process of assisting fishermen in reviewing their working procedures. The successful initiative previously conducted within the ScotNi region no longer exists. [6.5.1 ***Optik***]

12. Seafish no longer offers assistance to fishermen with help in completing safe working procedures reviews. Assistance offered by the MCA in this area is ad-hoc. [6.5.1 ***Optik***]

13. No structured working procedure review was carried out of the fishing operation. [6.6 ***Optik***]

14. The skipper's informal risk assessments did not consider the possibility of reducing the shooting table's dimensions to give increased deck space. [6.6 ***Optik***]

15. There were no separating barriers between the crew and the fishing gear. [6.6 ***Optik***]

16. The Seafish potting Safety Assessment of 1999 was not widely promulgated to industry. [6.6, footnote 8 ***Optik***]

17. Insufficient consideration had been given to the recovery of a man overboard. [6.6.1 ***Optik***]

7.2 USE OF PERSONAL PROTECTIVE EQUIPMENT

18. It is acknowledged that wearing a safety harness attached to a life-line while working on deck would be cumbersome given the constricted environment. However, if a life-line was attached only for the duration that the crew member had to climb on the bin to handle the gilson clips, it would prevent them falling overboard. [2.4.4 ***Korenbloem***]

19. Jumping in to the cold sea without lifejackets and life-lines, to rescue their shipmate, was a brave and instinctive reaction by the two deckhands who were on deck at the time of the accident. However, it could easily have resulted in further casualties. [2.7 ***Korenbloem***]

20. The deceased drowned because he was not wearing a personal flotation device. [4.4 ***Osprey III***]

21. The buoyancy trousers provided for use by the deceased were not suitable for the vessel's area of operation. [4.4 ***Osprey III***]

22. *Orianne*'s crewman carried out an open sea transfer without a PFD. [6.4 ***Optik***]

23. Neither the skipper of *Optik* nor the casualty were in the habit of wearing PFDs. [6.6.1 ***Optik***]

24. There were no lifejackets on board *Optik.* [6.6.1 ***Optik***]

7.3 MANOVERBOARD RECOVERY AND DRILLS

25. MOB drills were not regularly carried out by the crew and they were unfamiliar with the Marcus net for MOB recovery. [2.7 ***Korenbloem***]

26. Although the deceased was alive and on the surface for about 12 minutes, there were no means readily available to recover him back on board the vessel. [4.3 ***Osprey III***]

27. The crew had never practised the recovery of a man overboard. [4.3 ***Osprey III***]

28. Recovery of an unconscious MOB was not fully considered as part of any risk assessment. [6.6.1 ***Optik***]

29. Seafish's safety folder does not include a section dedicated to recovering MOB. [6.6.1 ***Optik***]

30. There is no regulatory obligation to carry out emergency drills, or inspections of LSA, on small fishing vessels and they are seldom carried out even on larger fishing vessels where they are obligatory. [6.6.2 ***Optik***]

7.4 OTHER

31. The EFF grant application by the owners of *Korenbloem* for the tipping rail and conveyor system was rejected for a number of reasons. However, these could have been resolved before the application was submitted by seeking the assistance of the LAF. [2.4.2.1 ***Korenbloem***]

32. The variations between the information on the MFA website and the EFF grant application form regarding the availability or otherwise of funding for safety initiatives, provides potential applicants with ambiguous guidance. [2.4.2.1 ***Korenbloem***]

33. The deceased had not completed mandatory safety training. [4.6 ***Osprey III***]

34. BLS to the casualty was stopped prematurely following the initial rescue. [6.4, 6.4.1 ***Optik***]

35. Initial rescuers had not attended first-aid training for over 8 years as there is no requirement for refresher training in mandatory basic safety courses. [6.4.1 ***Optik***]

36. The use of the bulwark height shooting table would have compromised the vessel's stability if excessive creels were stacked on top of it. [6.6 ***Optik***]

37. Installation of the shooting table promoted the cutting of an engine space access in an otherwise watertight bulkhead. [6.6 ***Optik***]

SECTION 8 - ACTIONS TAKEN

8.1 FOLLOWING THE ACCIDENT ON *KORENBLOEM*

8.1.1 Korenbloem Ltd has:

Converted the vessel for white fish beam trawling. Subsequently it reapplied for the EFF grant for the tipping rail and conveyor system and was successful in its application. The system has since been commissioned.

8.1.2 The Marine Management Organisation[10] has:

Reviewed its website to ensure that the qualifying criteria for EFF grants is clear and refers to the potential availability of grants for non-mandatory safety initiatives.

8.2 FOLLOWING THE ACCIDENT ON *OSPREY III*

8.2.1 Mara Ltd has:

- Supplied 150 Newton automatic inflation lifejackets to all crew for use when shooting and hauling nets. The wearing of this PPE is now mandatory on board *Osprey III* during such operations.
- Fitted a MOB recovery system on board the vessel.
- Programmed a practical drill of the MOB system for all crew to become familiar with the equipment and to check onboard procedures for MOB recovery.

8.3 FOLLOWING THE ACCIDENT ON *OPTIK*:

8.3.1 The Maritime and Coastguard Agency has:

- Inspected and detained the vessel for numerous breaches of the Code.

8.3.2 The skipper/owner of *Optik* has:

- Retired from fishing.

8.3.3 The skipper and crew of *Orianne* have:

- Resumed the donning of constant wear lifejackets when working on deck.

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[10] Which came into being on 1 April 2010 after the Marine and Fisheries Agency ceased to exist.

8.4 AS A RESULT OF THE MAIB ANALYSIS OF UK FISHING VESSEL SAFETY 1992 – 2006:

8.4.1 The Sea Fish Industry Authority has:

- Commenced a project to produce an Industry Advisory Note on Potting Safety as recommended, with the intention of broad dissemination to the fishing industry.

- In collaboration with the Department for Transport, confirmed its intention to make an application to the European Fisheries Fund (EFF) for financial assistance to enable provision of refresher training in the four mandatory training courses for fishermen.

- Commenced a review designed to improve the MOB elements of its safety awareness training course.

8.4.2 The Maritime and Coastguard Agency has:

- Proposed a research project to review international safety initiatives and present an analysis of international lifejacket initiatives with the aim of incorporating changes into the Code

8.5 THE MARINE ACCIDENT INVESTIGATION BRANCH

An Accident Investigation into the loss of a crew member from the fv *Maggie Ann* in 2009 made recommendations to the MCA to:

- Expedite its current work on the use of personal flotation devices and personal locator beacons in the UK fishing industry.

- Ensure emergency drills, including manoverboard drills, plus instruction and guidance on how to conduct risk assessment and improve safety awareness, are undertaken to a consistent standard by surveyors and inspectors of fishing vessels throughout the UK.

COMMENT AND RECOMMENDATION

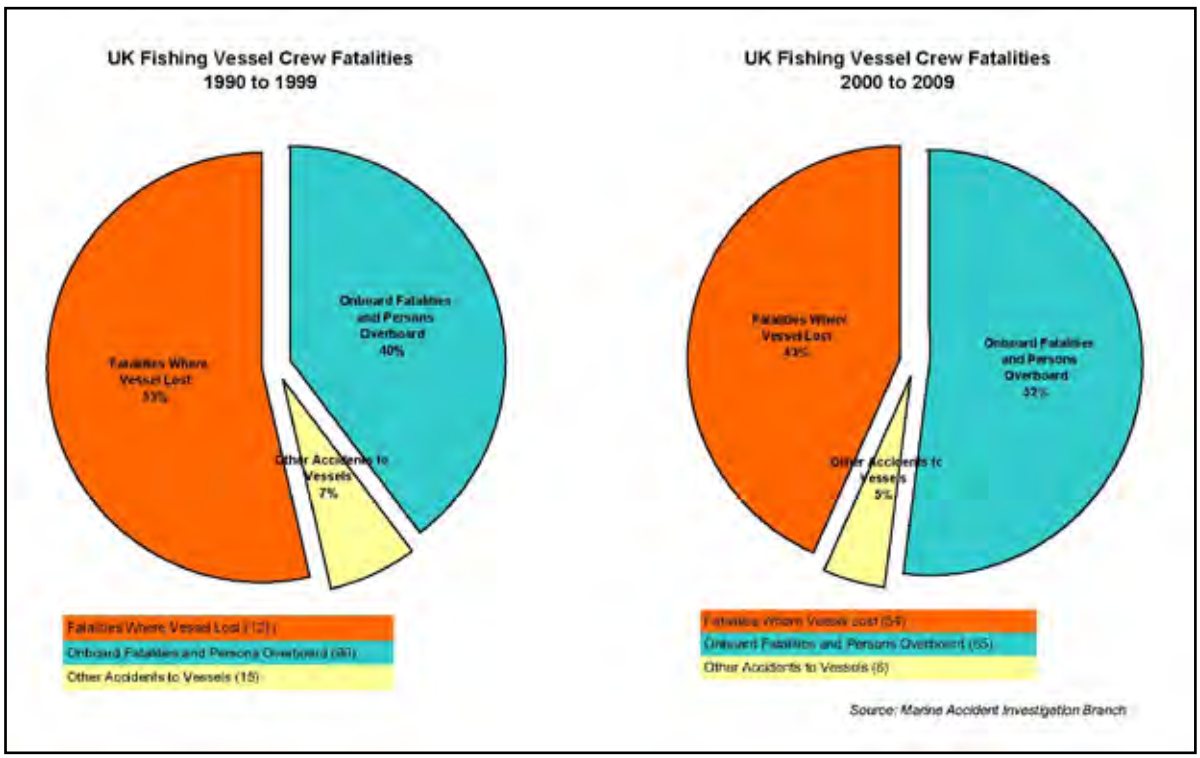
COMMENT

The belief that “fishing is a dangerous occupation” is not an acceptable excuse for failing to implement safe practices that would save lives. Such excuses have long been ruled out in mining, the construction industry and other previously dangerous industries in the UK. The “dangers of the sea” have been causal in very few of the fishing fatalities that the MAIB has investigated in recent years, and other countries have had a more proactive approach to reducing fatalities in their fishing industries.

Many of the safety issues listed in this report have been identified in previous MAIB investigations and, over time, a significant number of recommendations designed to improve safety and/or safety awareness within the fishing industry have been issued. Nearly all have been accepted but, in the case of those directed to the MCA, a significant number have yet to be implemented.

Between 1990 and 1999, the majority of fishing crew fatalities occurred when a vessel was lost. Since 2000 the majority of fatalities have been due to occupational accidents which have occurred on board the vessel, or as a consequence of fishermen falling or being dragged overboard as demonstrated by the three tragic cases detailed in this report **(Figure 25)**. This shift should be recognised and the focus of safety authorities should be adapted accordingly.

Figure 25



UK Fishing Vessel Crew Fatalities 1990 - 1999 and 2000 - 2009

There are already well defined industry rules and guidance that should prevent such accidents from occurring, yet the current regulatory regime does not ensure that existing rules are understood and implemented. Similarly, the MCA's policy towards improved fishing vessel safety appears to be reactive, rather than proactive. Although action, or at least a commitment to take action, is invariably delivered whenever the MAIB has issued a recommendation on this issue, there does not appear to be a holistic plan to improve fishing vessel safety.

Appreciation of risk is a key barrier in preventing accidents. In 2006, following an MAIB investigation into a serious injury to a crew member of the scallop dredger *Danielle*, the MCA affirmed its intention to extend a pilot scheme to engage with fishermen and assist with the production of meaningful risk assessments. However, this commitment has still not been taken forward. Indeed, even the pilot scheme has been discontinued.

Five years ago, the MAIB published another trilogy report which focused on accidents involving small fishing vessels in which the following observation was made:

> *If further tragic loss of life is to be avoided, the balance between self regulation and the roles 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*

Sadly, the above comment still has resonance in 2010. Between 1992 and 2009, the ratio of deaths occurring in the fishing industry has been many orders of magnitude greater than the level of comparable industries ashore **(Figure 26)**. Some industry observers argue that such comparisons have limited value because of the relatively small numbers of fishermen under scrutiny. However, an indisputable and telling statistic is that, throughout this period, the ratio of fishermen who have died has remained broadly constant, while other comparable industries ashore have all shown significant reductions in their fatality rates.

Figure 26

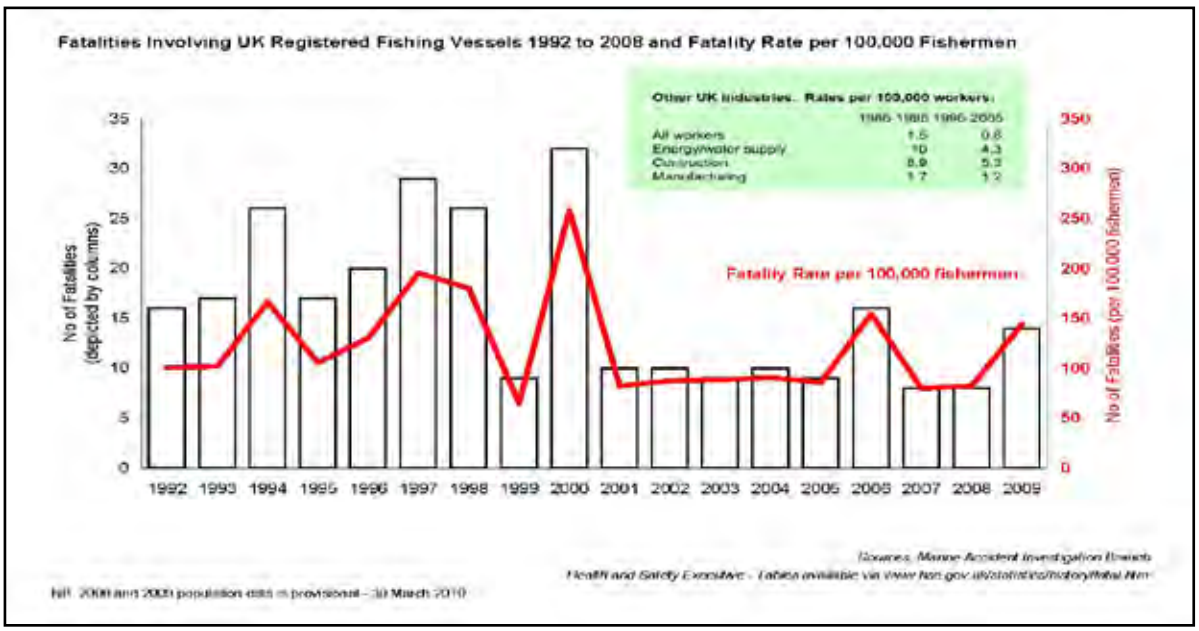


Chart of Fatalities Involving UK Registered Fishing Vessels 1992 - 2009 and Fatality Rate per 100,000 Fishermen

With significant improvements in safety achieved by other industries in the UK, it can no longer be acceptable for those with responsibility for safety within the fishing industry to collectively shrug their shoulders and accept that fishing is “a dangerous industry”. Nor is it appropriate simply to place the responsibility on every individual fisherman, when appropriate standards have not been indentified, safe operating procedures are not enforced and many fishermen have had little safety training.

If a change in the safety culture prevailing in the fishing industry is to be realised, and the rate of casualties reduced to a level commensurate with other UK industries, there needs to be a more holistic approach to how the mix of regulation, training and individual responsibility is taken forward. A plan of action, properly funded and with the overarching objective of improving future safety within the fishing industry, is urgently needed.

Recommendation

2010/112 **The Department for Transport is recommended to:**

Recognise the consistent and disproportionate rate of fatalities in the UK fishing industry and take urgent action to develop a comprehensive, timely and properly resourced plan to reduce that rate to a level commensurate with other UK occupations.

Marine Accident Investigation Branch

May 2010