ACCIDENT REPORT

Report on the investigation of

the man overboard from the stern trawler

Copious (LK 985)

resulting in one fatality

approximately 30 nautical miles south-east of the Shetland Isles

on 18 February 2021

MAIB
MARINE ACCIDENT INVESTIGATION BRANCH

VERY SERIOUS MARINE CASUALTY REPORT NO 3/2023 JUNE 2023

The United Kingdom Merchant Shipping

(Accident Reporting and Investigation)

Regulations 2012 – Regulation 5:

"The sole objective of the investigation of an accident under the Merchant Shipping (Accident Reporting and Investigation) Regulations 2012 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 14(14) of the Merchant Shipping (Accident Reporting and Investigation) Regulations 2012, 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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GLOSSARY OF ABBREVIATIONS AND ACRONYMS

60 N	-	60 North Fishing (Shetland) Ltd
H&S Regulations	-	The Merchant Shipping and Fishing Vessels (Health and Safety at Work) Regulations 1997
ILO 188	-	International Labour Organization Work in Fishing Convention No. 188
IMO	-	International Maritime Organization
LHD	-	L.H.D Limited
LR	-	Lloyd's Register
m	-	metres
MCA	-	Maritime and Coastguard Agency
MGN	-	Marine Guidance Note
MGN 280 (M)	-	Small Vessels in Commercial Use for Sport or Pleasure, Workboats and Pilot Boats – Alternative Construction Standards
MGN 570 (F)	-	Fishing Vessels: Emergency Drills
MGN 571 (F)	-	Fishing Vessels: Prevention of Man Overboard
MOB	-	man overboard
MSF	-	Marine Safety Form
MSIS	-	Marine Survey Instructions for the Guidance of Surveyors
MSN	-	Merchant Shipping Notice
MSN 1770 (F)	-	The Fishing Vessels Code of Safe Working Practice for the Construction and Use of 15 metre length overall (LOA) to less than 24 metre registered length (L) Fishing Vessels (withdrawn)
MSN 1870 (M + F)	-	The Merchant Shipping and Fishing (Personal Protective Equipment) Regulations 1999
MSN 1872 Amndt 1 (F)	-	The Code of Safe Working Practice for the Construction and Use of Fishing Vessels of 15m Length Overall to less than 24m Registered Length (Amendment 1)
N	-	newton
nm	-	nautical mile
PFD	-	personal flotation device
PPE	-	personal protective equipment
RNLI	-	Royal National Lifeboat Institution
Seafish	-	Sea Fish Industry Authority

SFA	-	Shetland Fishermen's Association
SMS	-	Safety Management System
STCW Convention	-	International Convention on Standards of Training, Certification and Watchkeeping for Seafarers, 1978, as amended
UTC	-	Universal Coordinated Time

TIMES: all times used in this report are UTC unless otherwise stated.

Image courtesy of David Meek (marinetraffic.com)

Copious

SYNOPSIS

At about 0300 on 18 February 2021, a deckhand fell overboard from the twin rig stern trawler *Copious* approximately 30 nautical miles south-east of the Shetland Islands. The deckhand was conscious, wearing a lifejacket and was quickly brought alongside the vessel. However, the crew's attempts to recover the casualty back on board were unsuccessful. He was unresponsive when recovered from the water by a coastguard helicopter and pronounced dead on arrival at hospital.

The deckhand fell overboard while standing on the aft bulwark as he was attempting a repair to the trawl gear. There was no attempt to stop and consider the repair and the activity was not effectively risk assessed or mitigated. He lost his life because he was not recovered back on board before succumbing to the effects of cold water incapacitation. When he lost consciousness in the water, his incorrectly worn lifejacket did not hold his airways clear of the water and he drowned. The man overboard recovery equipment on board *Copious* was not supplemented by the training and equipment necessary for the recovery of an unconscious person.

Since the accident, the owners of *Copious* have replaced the vessel with a new, larger vessel incorporating upgraded safety features. They have also introduced an online safety management system including a risk-based approach to working practices on board, such as working at height. Additional man overboard equipment has been purchased that provides an efficient means of recovering an unconscious person and the crew have been provided with new, higher buoyancy inflatable lifejackets, as well as immersion suits for emergency use. The Maritime and Coastguard Agency has amended its guidance to surveyors to consider the following during fishing vessel surveys and inspections:

- the recovery of unconscious casualties in man overboard procedures and drills; and
- the correct use of personal flotation devices, especially the use of crotch straps.

No recommendations have been made the owners of *Copious* in light of the actions that they have taken. A recommendation has been made to the Maritime and Coastguard Agency to amend regulations to require fishing vessels to have an efficient means to recover an unconscious person from the water that is demonstrable during surveys and inspections.

SECTION 1 - FACTUAL INFORMATION

1.1 PARTICULARS OF *COPIOUS* AND ACCIDENT

VESSEL PARTICULARS	
Vessel's name	*Copious*
Flag	UK
Classification society	Not applicable
IMO number/fishing numbers	LK 985
Type	Twin rig stern trawler
Registered owner	60 North Fishing (Shetland) Ltd
Manager(s)	60 North Fishing (Shetland) Ltd
Construction	Steel
Year of build	2006
Length overall	18.98m
Registered length	16.49m
Gross tonnage	145.0
Minimum safe manning	Not applicable
Authorised cargo	Fish
VOYAGE PARTICULARS	
Port of departure	Lerwick, the Shetland Islands
Port of arrival	Lerwick, the Shetland Islands
Type of voyage	Fishing
Cargo information	Fish
Manning	6
MARINE CASUALTY INFORMATION	
Date and time	18 February 2021 at about 0300
Type of marine casualty or incident	Very Serious Marine Casualty
Location of incident	Approximately 30nm south-east of Sumburgh, the Shetland Islands
Place on board	Aft main deck
Injuries/fatalities	1 fatality
Damage/environmental impact	Not applicable
Ship operation	Hauling nets
Voyage segment	Mid-water
External & internal environment	Wind Beaufort force 5 to 6; following swell 3.5m; sea temperature approximately 7°C
Persons on board	6

1.2 BACKGROUND

Copious was a purpose-built twin rig stern trawler configured to trawl with three towing wires. The two outer wires towed the trawl doors that held the mouth of the nets open while the middle towing wire towed the clump weight, which was a large weight with a central wheel designed to keep the trawl nets on the seabed **(Figure 1)**.

The towing wires came off the winch that was in the forward part of the main deck. They passed up through the deckhead on to the upper deck and ran aft to the gantry and then outboard. The middle towing wire ran under the wheelhouse **(Figure 2)**. The weight of the trawl was transferred to a banana bar **(Figure 3)** when trawling. This consisted of a curved lubricated bar across the central section of the stern, on which ran a block **(Figure 2** and **3)**. After the nets and towing wires had been fully payed out, the banana bar wire running through this block connected to the outer towing wires, depending on the required depth of trawl. The middle towing wire consisted of two sections of wire (hereafter referred to as the vessel-side and net-side sections), joined by a link. As the middle towing wire was payed out, the banana bar chain was connected to this link, which included the use of a hammerlock[1] **(Figure 4)**. The towing wires were payed out further once the banana bar wire and chain were connected, which caused the towing wires to slacken on the vessel-side of the connections and the weight of the fishing gear to be taken on the banana bar.

For illustrative purposes only: not to scale

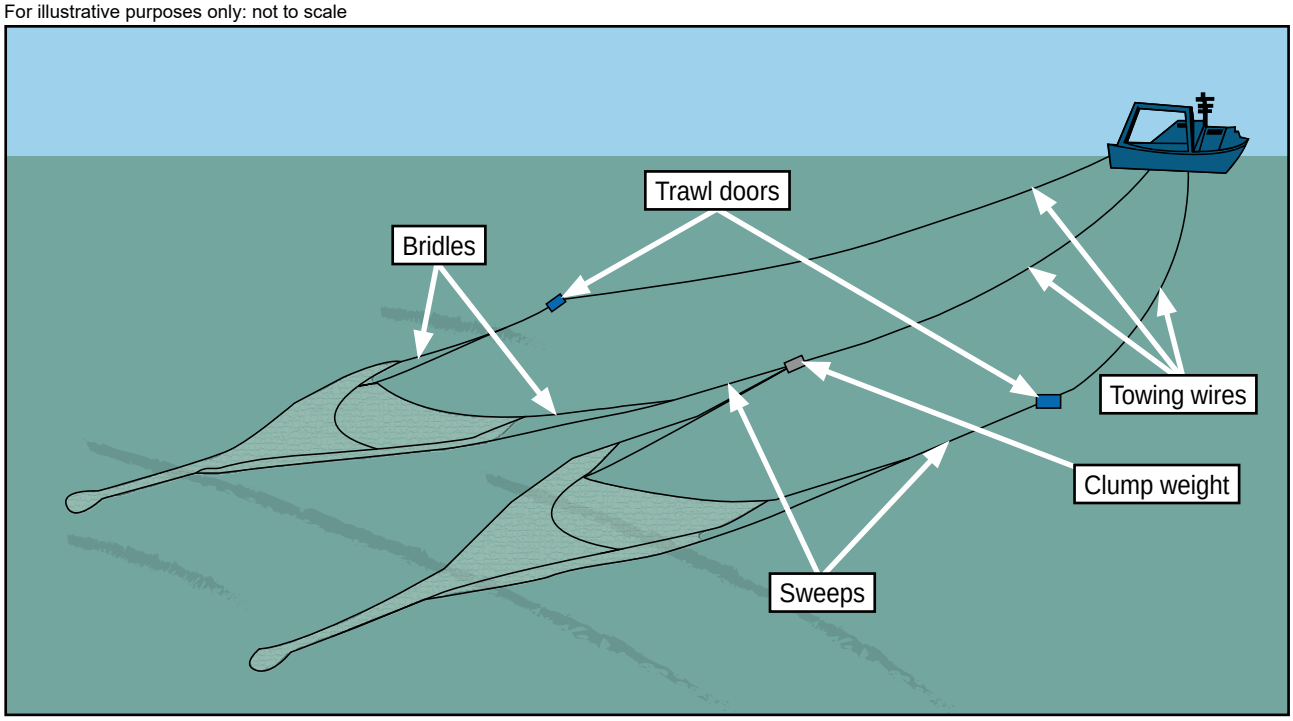

Figure 1: Twin rig stern trawler arrangement

[1] A hammerlock is a coupling link designed to connect two wires or chains together.

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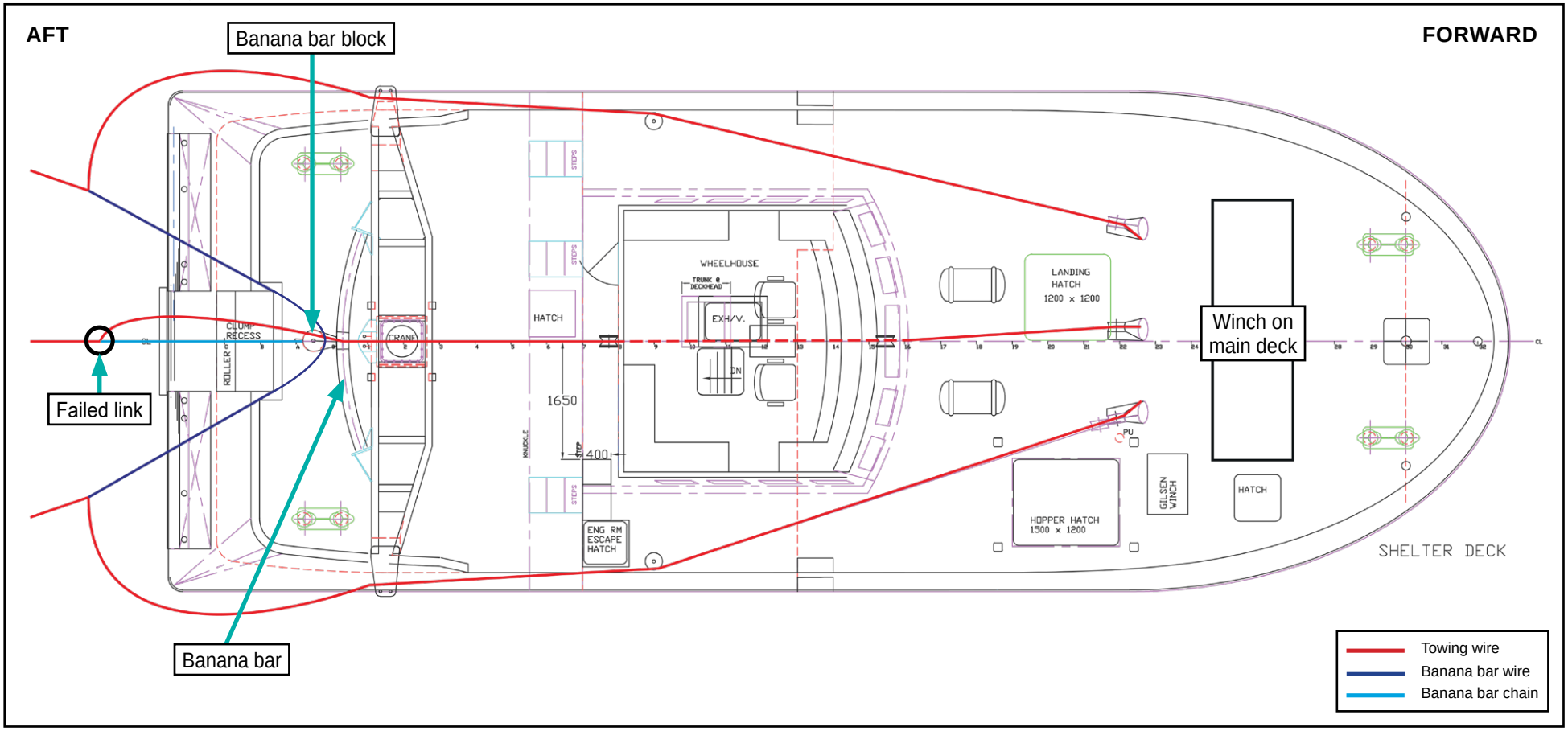

Figure 2: Plan diagram of towing wires on *Copious*'s upper deck

Figure 3: Banana bar arrangement on *Copious*

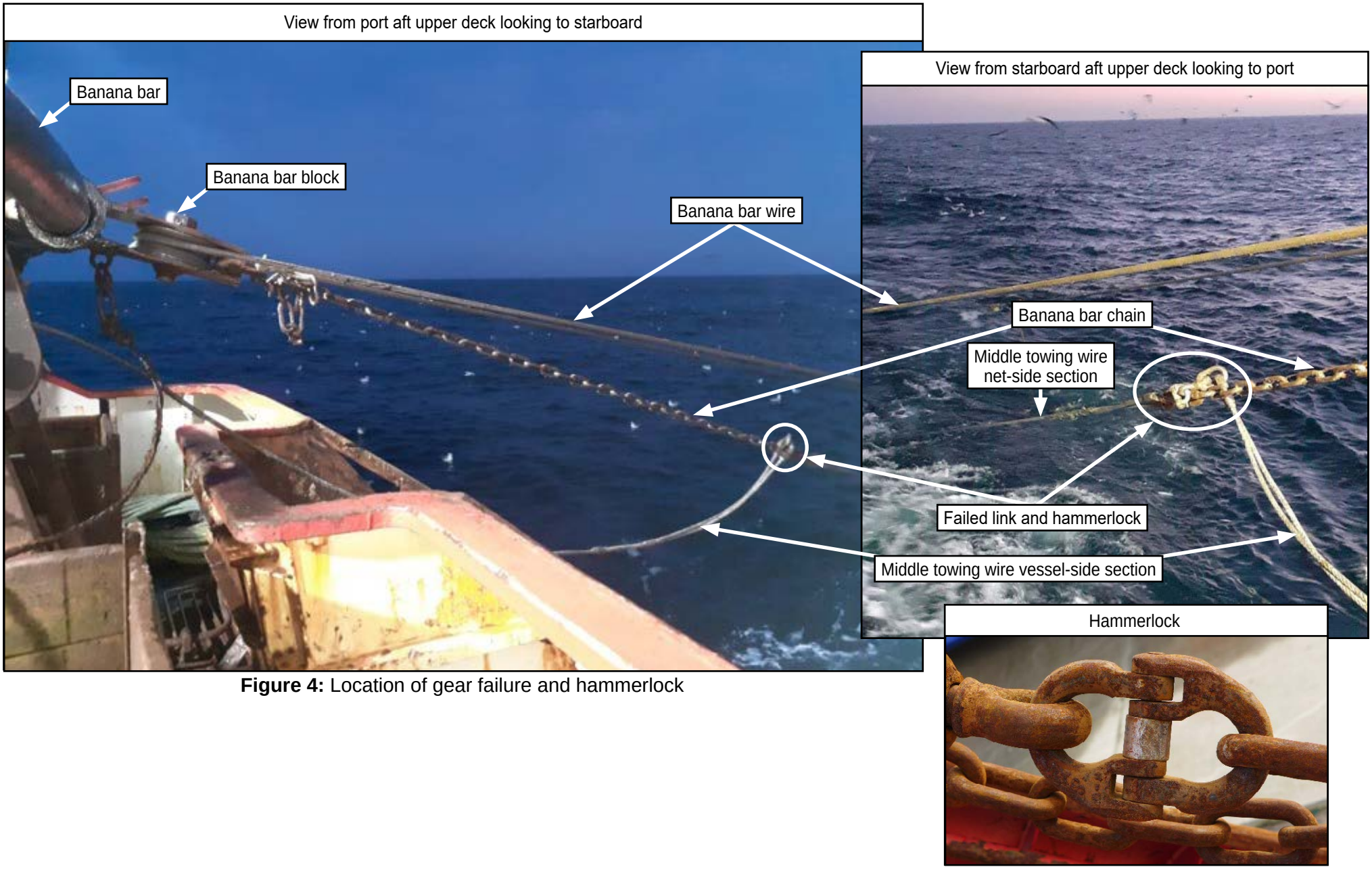

Figure 4: Location of gear failure and hammerlock

1.3 NARRATIVE

On Tuesday 16 February 2021 *Copious* was alongside its berth in Lerwick, the Shetland Islands, where the crew had landed their previous catch, replenished ice stocks, and carried out some routine maintenance and housekeeping.

At 2200 that evening, *Copious* departed for the fishing grounds, which were approximately 30 nautical miles (nm) to the south-east **(Figure 5)**. This gave the crew a chance to rest on the passage. At around 0500 the next day, the nets were shot away for the first time and three trawls were completed. At around 2230, and having recovered the third trawl, the nets were set again before the crew processed the catch and went to rest.

At about 0300 on 18 February 2021, the watchkeeper on *Copious* called the skipper and crew from their bunks as they approached the end of the trawl. The skipper took over in the wheelhouse as the crew donned their oilskins, rigger boots, and auto-inflate lifejackets and headed to their positions on deck. The wind was a Beaufort force 5 to 6 and there was a 3.5m following swell. The sea temperature was approximately 7°C.

After disconnecting the outer towing wires from the banana bar wire, the crew attempted to winch up the slack on the middle towing wire, expecting the weight to come off the banana bar chain and enable them to disconnect it. When this did not happen and the loose end of the middle towing wire started to be recovered, the deckhand, Edison Lacaste, noticed that the hammerlock connecting the vessel-side section of the middle towing wire to the link **(Figure 4)** had failed and gave a hand signal to stop the winch. The skipper came out of the wheelhouse to see what was happening and, without prompting, the deckhand made his way from the port quarter of the upper deck down to the main deck **(Figure 6)**, where he asked for a shackle to be passed down to him. The skipper did not discuss the repair with the crew but passed him a shackle and then turned around and pulled more of the slack from the middle wire to facilitate the repair.

The crew member on the main deck, whose role it was to place the guide poles[2] into the stern bulwark **(Figure 7)**, had seen the deckhand arrive on the main deck and turned around to restow the guide pole he was holding so he could offer his assistance. The deckhand stepped up onto the stern bulwark with the shackle in his hand and asked the crew member to hold the back of his lifejacket. However, as the crew member and skipper both turned back around from their respective tasks, they saw the deckhand lose balance and fall overboard.

The skipper ran back to the wheelhouse to take the engine out of gear. When he returned to the stern, he saw that the deckhand's lifejacket had inflated. He threw a mooring line that was kept on the port quarter into the water and instructed the deckhand to wrap it around himself, but the deckhand was panicking and pulled the slack from the line into the water as he tried unsuccessfully to climb the rope.

The remaining crew had by now made their way onto the upper deck and, together with the skipper, managed to pull the deckhand round to the recessed ladder **(Figure 8)** on the port side of the vessel by using the other end of the mooring rope. The skipper then climbed down the ladder to try and calm the panicking deckhand and help him climb the ladder. The deckhand managed to grab a rung of the ladder with both hands, but the large swell took him away. The crew manoeuvred the

[2] Guide poles are used in trawling to guide the nets onto the net drums as they come over the aft bulwark. They do this by funnelling the net down to a width that is less than that of the net drum, and so remove the need to do this manually.

Reproduced from Admiralty Chart 1239 by permission of HMSO and the UK Hydrographic Office

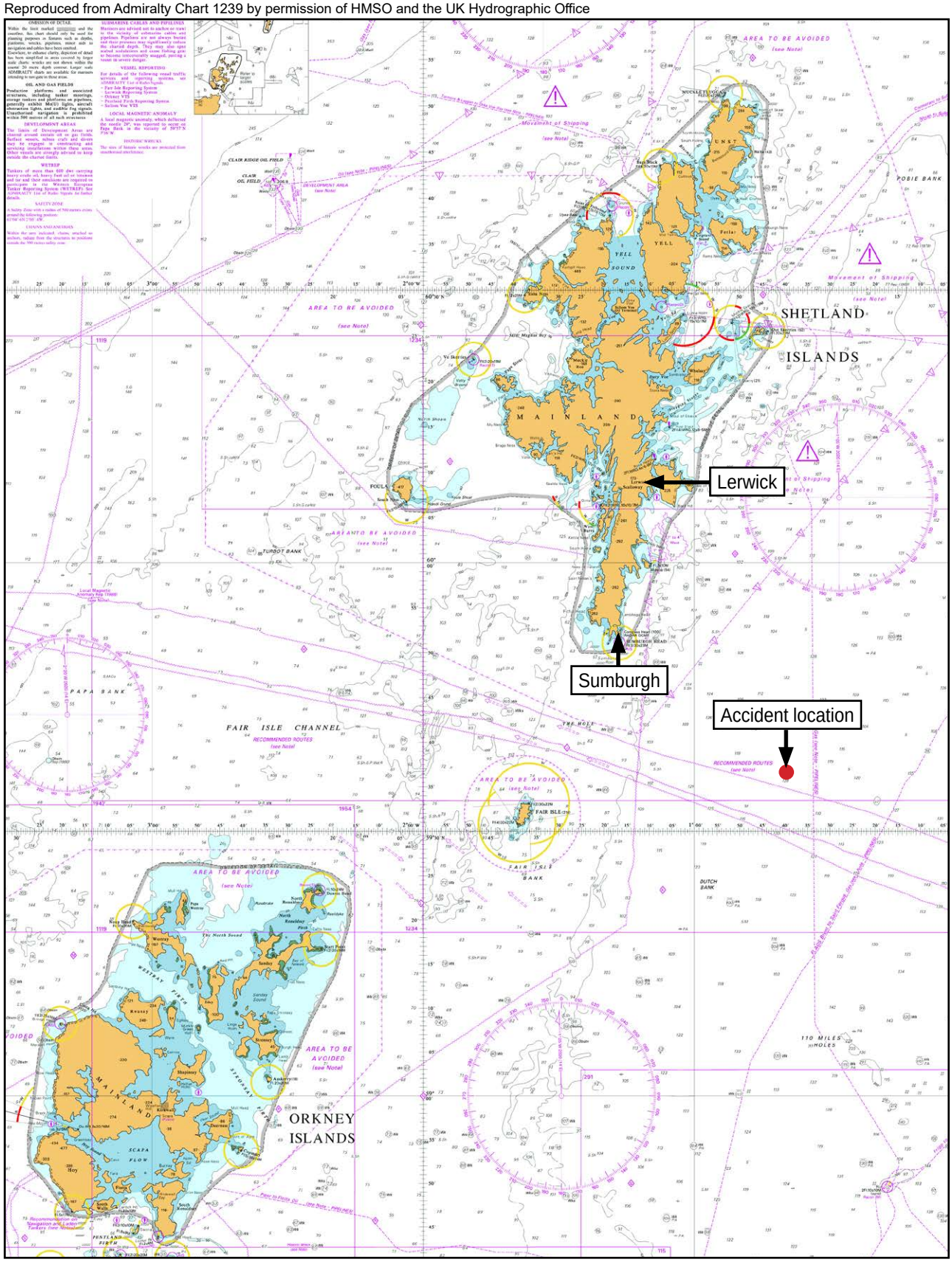

Figure 5: The accident location

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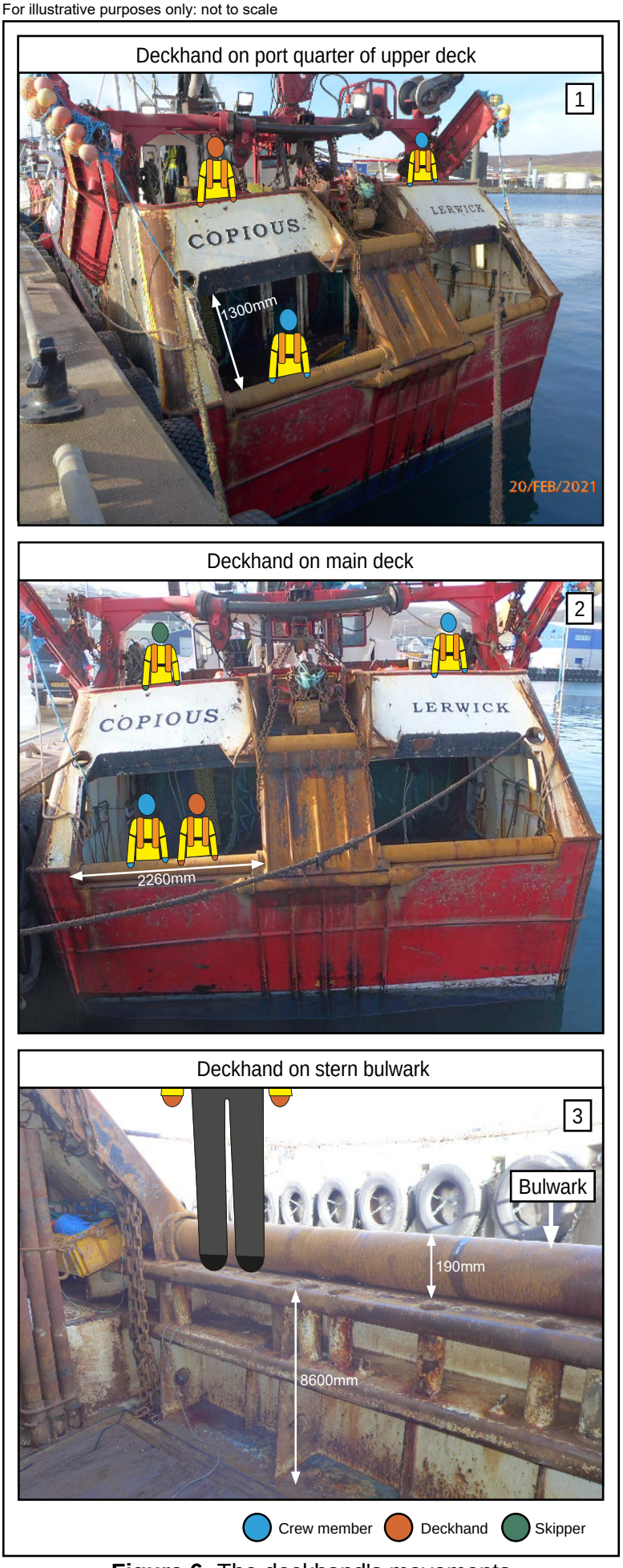

Figure 6: The deckhand's movements

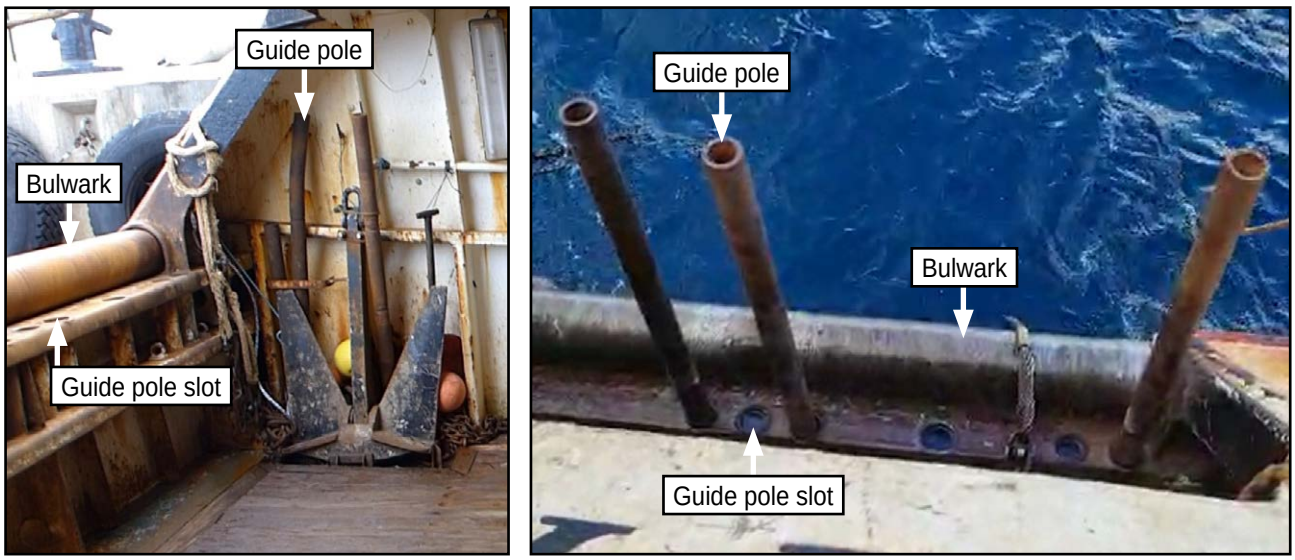

Figure 7: The guide poles and guide pole slots

Image courtesy of David Meek (marinetraffic.com)

Figure 8: The recessed ladder

deckhand back to the ladder for a second time using the mooring rope, but he was becoming increasingly incapacitated, and the swell once again took him away from the side of the vessel. The crew observed the deckhand's lifejacket ride up around his head as his body became limp.

The skipper climbed back up the ladder to go to the wheelhouse and, at 0319, he transmitted a "Mayday" distress call on the very high frequency radio. Simultaneously, the crew fetched the Markusnet man overboard (MOB) recovery system from its stowed position on the starboard side of the wheelhouse and threw a lifebuoy to the deckhand. The lifebuoy landed next to the deckhand, but he made

no attempt to grab it. The vessel's engineer made several attempts to try and catch the deckhand with a grappling hook and, after approximately 10 minutes, it caught the hood on the deckhand's oilskins and the engineer started pulling him towards *Copious*. The hook then slipped off the deckhand's hood and the skipper made the decision not to try again in case the lifejacket was either damaged or dislodged, which would cause the deckhand to be lost.

Shortly afterwards, *Reliance III*, a fishing vessel responding to the "Mayday" arrived on scene but, on the instruction of *Copious*'s skipper, made no attempt to recover the deckhand as he wanted to preserve the buoyancy of the lifejacket until the coastguard arrived so as not to risk losing the deckhand. Both fishing vessels held position and illuminated the deckhand with their searchlights while awaiting the arrival of the rescue asset.

Approximately 50 minutes after the deckhand had fallen overboard, Coastguard rescue helicopter R900 arrived on scene. At 0400, the deckhand was recovered from the water by the helicopter's winchman and flown straight to Lerwick where a waiting ambulance transferred him to Gilbert Bain Hospital. At 0515, despite the medical attention he had received, the deckhand was declared deceased.

At approximately 1030, *Copious* and its remaining crew arrived back in Lerwick.

1.4 THE CREW

1.4.1 General

The six crew on board *Copious* comprised of two UK nationals, both from the Shetland Islands, one Ghanaian and three Filipinos. All of the crew had completed the mandatory training required to serve on a UK registered fishing vessel[3]. The Filipinos had been employed on *Copious* for several years. The Ghanaian was 4 months into his first contract on board the vessel.

Crew who were joining *Copious* would usually be assigned a position on deck that a departing crew member had vacated and, depending on their previous experience, the skipper and engineer would show them what this role entailed. The crew held their assigned deck positions for the duration of their contract and were expected to inform either the skipper or engineer of any operational issues that needed to be resolved. The crew also carried out watchkeeping duties.

1.4.2 The deckhand

Edison Lacaste was a 45-year-old Filipino national who had recently renewed his International Convention on Standards of Training, Certification and Watchkeeping for Seafarers, 1978, as amended (STCW Convention) qualifications – personal survival techniques, firefighting, first aid and personal safety and social responsibility – in Manila, Philippines. In 2015, he also completed the Seafish safety awareness course at the North Atlantic Fisheries College, Shetland. He held additional qualifications in marine engineering and welding.

[3] New entry fishermen must complete basic safety courses in sea survival, elementary first aid; firefighting and health and safety. Fishermen with two years' experience must also complete a one-day mandatory safety awareness course run by the Sea Fish Industry Authority (Seafish).

The deckhand had worked on *Copious* for 5 years, serving 10-month contracts with 2 months' leave, and had re-joined the vessel after a period of leave around 2 weeks before the accident. His principal duties on board this contract were to tend to the port side towing wire from the upper deck and work the port side net drum from the main deck before gutting and packing the catch. He also carried out occasional welding jobs and undertook watchkeeping duties.

The deckhand's death certificate stated that the cause of death was due to complications of immersion in water.

1.4.3 The skipper

The skipper was a 36-year-old UK national and a career fisherman. He had been the skipper on board *Copious* since 2007 and co-owned 60 North Fishing (Shetland) Ltd (60 N), which owned *Copious* and its sister vessel *Prolific*. The skipper worked a 2-week rotation with his relief. He held a Class II Certificate of Competency, which he had completed in 2014.

1.5 *COPIOUS*

1.5.1 History and ownership

Built in 2006 by Parkol Marine Engineering in Whitby, *Copious* was the first of two vessels constructed for 60 N. The second vessel, *Prolific*, also operated out of Lerwick. Both were primarily used to trawl for whitefish around the Shetland Islands and mainly landed their catches into Lerwick and Cullivoe. The vessels made occasional winter trips to the south coast of England.

At the time of the accident, company ownership of 60 N was shared between 3 active skippers of either *Copious* or *Prolific*, including the skipper of *Copious* at the time of the accident, and L.H.D Limited (LHD).

LHD acted as a fishing agent for vessels based in Shetland and Orkney and was an original shareholder in 60 N from the build of *Copious* and *Prolific*. It had made similar investments in other Shetland vessels. LHD's health and safety input on board *Copious* had been limited to assisting with the rectification of defects after Maritime and Coastguard Agency (MCA) surveys or inspections.

1.5.2 Safety management and risk assessment

The Merchant Shipping and Fishing Vessels (Health and Safety at Work) Regulations 1997 (H&S Regulations)[4] required that fishing vessel owners risk assess their vessels' working operations and review the assessments at regular intervals. *The Code of Safe Working Practice for the Construction and Use of Fishing Vessels of 15m Length Overall to less than 24m Registered Length* (Amendment 1) (MSN 1872 (F))[5] incorporated this requirement and stated:

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[4] Advice on the practical implementation of the regulations was contained in Marine Guidance Note (MGN) 587 (F) INTERNATIONAL LABOUR ORGANIZATION WORK IN FISHING CONVENTION (no.188), Health and safety: responsibilities of fishing vessel owners, managers, skippers and fishermen.

[5] The Fishing Vessels Code of Safe Working Practice for the Construction and Use of 15 metre length overall (LOA) to less than 24 metre registered length (L) Fishing Vessels (MSN 1770 (F)) was replaced by MSN 1872 (F) on 17 October 2017, as amended on 21 November 2018. MSN 1770 (F) came into force on 23 November 2002, prior to the building of *Copious*.

A risk assessment is intended to be a careful examination of the vessel's procedures or operations which could cause harm, so that decisions can be made as to whether adequate control measures are in place to reduce those risks to an acceptable level or whether more shall be done.

The risk assessments for *Copious* were kept in a hard copy Seafish Fishing Vessel Safety Folder[6] **(Figure 9)**, which was intended to assist skippers and owners in developing a safety management system (SMS) on board their vessels.

The Seafish safety folder on board *Copious* was completed in March 2013 and reviewed every year. The hazard of leaning over the rail to reach for gear had been identified in the *fouled gear/gear mending* section of the standard risk assessment form. The likelihood of occurrence was rated 1 – very unlikely – and the level of harm was rated 2 – harmful **(Figure 10)**. The mitigation was recorded as *lone worker avoided in situation*. There were no risk assessments in place for working at height.

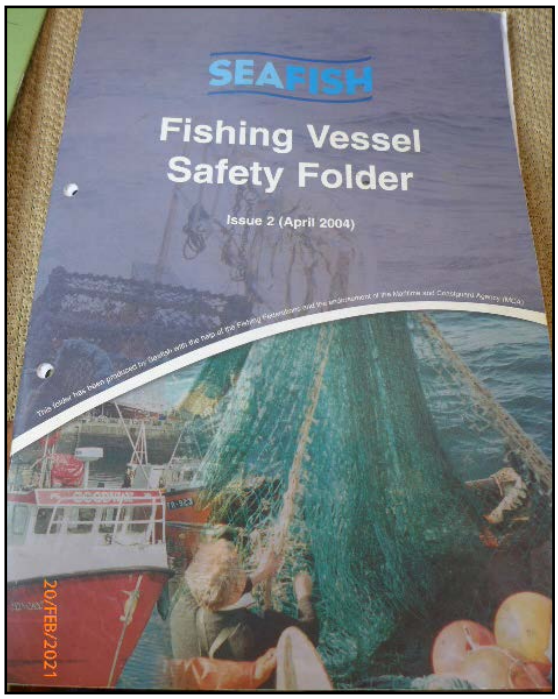

Figure 9: Seafish safety folder on board *Copious*

The MOB procedure for location and recovery was stated as:

Once casualty has been located one member of crew is to keep casualty in sight while the others get liferings to get casualty back to vessels side, where the recovery net (located rear of wheelhouse) is used to recover casualty if required. Searchlight used to locate casualty and watch casualty at night. [sic]

Image courtesy of *Copious*'s skipper

How likely that harm may occur (L)		How harmful (H)	
1	Very unlikely	1	Slightly harmful
2	Unlikely	2	Harmful
3	Likely	3	Very harmful

Risk Factors (L x H)		
1	-	No action is needed
2	-	Can be tolerated, but make sure that it does not become worse
3/4	-	Take action but subject to it being reasonable and sensibly possible
6	-	Must be attended to, you must reduce the risk
9	-	Cannot be accepted and work/activity must not continue

Figure 10: Seafish safety folder risk matrix

1.5.3 Drills

MOB drills were undertaken every 2 months on board *Copious*, with the most recent taking place a month before the accident. Most of these drills were carried out alongside with the crew that were available at the time. It was normal practice to throw a life ring over the side of the vessel and then deploy the Markusnet. There were occasions when the drill would be a tabletop discussion of the actions to take in the event of an MOB.

[6] See section 1.7.2 of this report.

1.5.4 Hours of work management

The Fishing Vessels (Working Time: Sea-fishermen) Regulations 2004, as explained in MSN 1884 (F)[7], required all fishers to rest for a minimum of 10 hours in any 24-hour period and 77 hours for each 7 days. Under Regulation 7(4), daily hours of rest for workers were to be divided into no more than two periods, one of which must be at least 6 hours in length, and the interval between consecutive rest periods was not to exceed 14 hours.

Regulation 13 allowed exceptions to this requirement provided that the reason for the exception was in line with guidance in The Fishing Industry Code of Practice on Working Time Standards (MSN 1884 (F) Annex 1):

> *It is recognised that there are constraints on strict application of limits on working time which arise from the nature of fishing, for example weather, tidal conditions and daylight hours. Other external factors will also influence intended working patterns, such as seasonal fishing quota and working days constraints.*

Owners or skippers did not need to apply for individual exceptions that fell within this code of practice.

Trawls on *Copious* lasted between 5 and 6 hours on average, during which time the crew sorted, gutted, and packed the previous catch before resting. Usual rest periods were around 3 or 4 hours. Compensatory rest periods were taken when heading to and from the fishing grounds and when alongside after unloading the catch. Trips on *Copious* were usually around 3 or 4 days with periods in port dictated by refuelling, restocking and maintenance needs. This was in line with MCA guidance.

The accident took place at around 0300 and as such within a period known as the window of circadian low[8].

[7] ILO Working Convention (No. 188): Working Time – Application of the Fishing Vessels (Working Time; Sea-fishermen) Regulations 2004 as amended (ILO 188).

[8] Independent of other factors, fatigue is most likely and, when present, most severe, in the early hours of the morning, coinciding with the strongest drive for sleep. This period typically occurs between the hours of 0300 and 0500 and is commonly referred to as the window of circadian low (International Maritime Organization Maritime Safety Committee Circ. 1598 Section 20.27, Page 9). Further information can be found at https://www.sleepfoundation.org/circadian-rhythm

1.5.5 Working practices – trawl door pennant recovery

One example of an onboard working practice that required a crew member to work outboard of the transom opening was during the trawl door pennant recovery. Once the towing wires had been heaved in and the trawl doors were stowed alongside the vessel, the trawl door pennant had to be recovered from the main deck in order to pass the sweeps **(Figure 1)** onto the net drum. The normal practice on board *Copious* was for the crew member on the main deck to climb onto the aft bulwark **(Figure 11)** and, using a guide pole **(Figure 7)** for support, lean around the corner, outboard of the vessel, to recover the pennant. Although the deckhand did not always carry out this duty himself, it is almost certain that he would have witnessed it happening.

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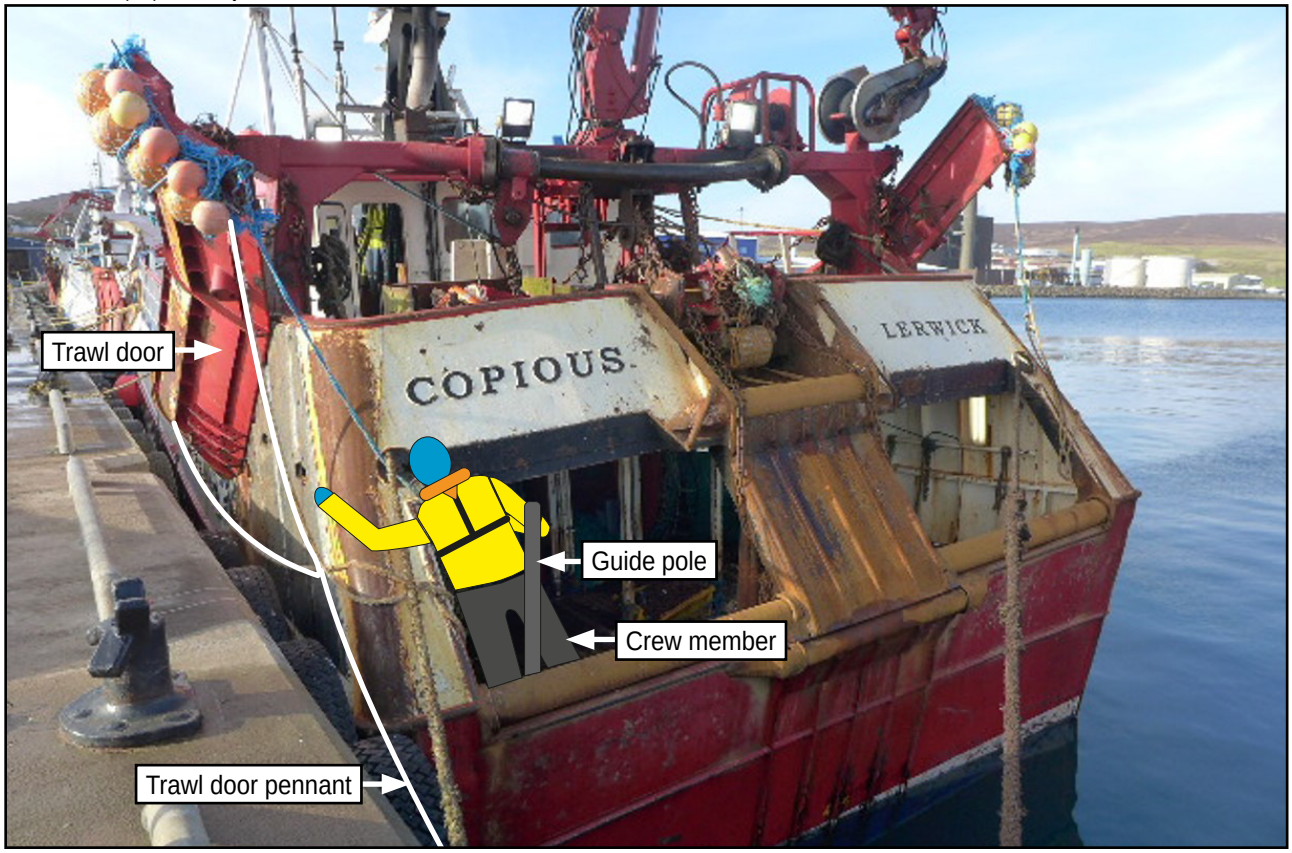

Figure 11: Position of crew member when recovering the trawl door pennant

1.6 LIFEJACKETS AND MAN OVERBOARD RECOVERY EQUIPMENT

1.6.1 Auto-inflate lifejackets and crotch straps

Each crew member was issued with a Crewsaver 150N auto-inflate lifejacket for working on deck **(Figure 12)**. The lifejackets were purchased new in April 2019 but had not been serviced as required in April 2020 due to the owner's reported confusion surrounding the required service periodicity.

Post-accident examination of the deckhand's lifejacket found that the waist strap was set to 52 inches with no evidence of adjustment on the buckle. The deckhand's waist measurement was recorded as 32 inches during the postmortem examination. The crotch strap had been taped up at the back of the lifejacket, in common with all the working lifejackets found on board *Copious* immediately after the accident.

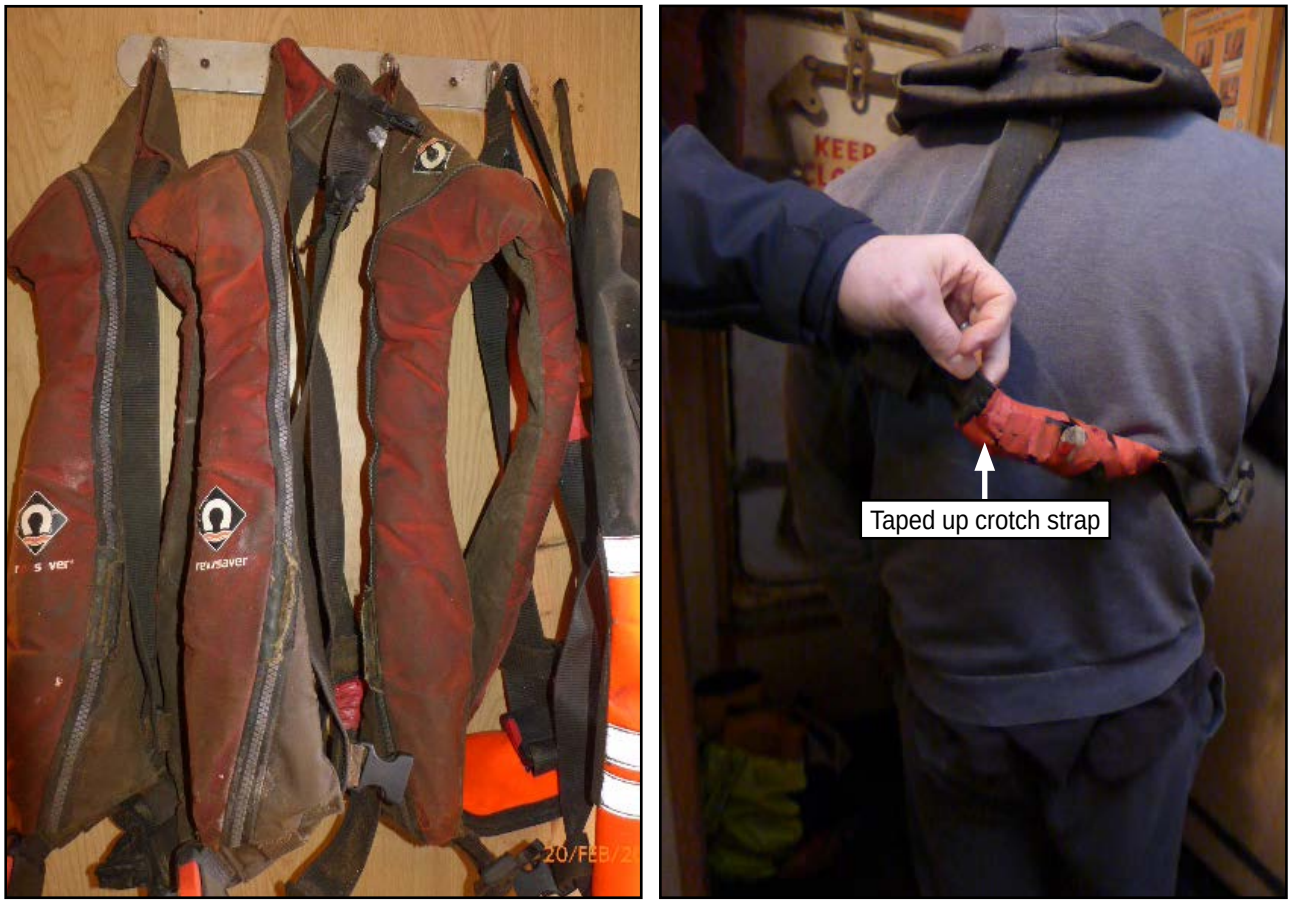

Figure 12: Lifejackets on board *Copious* and a taped up crotch strap

1.6.2 Sea survival

Seafish provided a basic sea survival course for commercial fishers, which conformed with STCW Convention requirements. It was mandatory for all commercial fishers to have completed this course before going to sea.

The Seafish basic sea survival course specification required both demonstration of and participation in the use of an inflatable lifejacket. The deckhand had completed this course.

1.6.3 Man overboard recovery equipment

Copious was equipped from build with a Markusnet MS.10 **(Figure 13)** to assist with the recovery of a person from the water. The MS.10 designation meant the equipment was designed to be used on board vessels with a freeboard of up to 10m and enabled a casualty to be hoisted from the water by either two people or a crane while the casualty was sitting, standing or lying horizontal.

The Markusnet was a Lloyd's Register (LR)[9] approved system that comprised of a webbing net, lifting lines, floats and a throw line with a rescue/safety loop attached. The device was housed in a moveable storage container and was capable of being deployed by one person. If the person in the water was incapable of assisting in their own recovery, then an in-water rescue would need to be carried out by the crew, one of whom would need to enter the water with a safety line attached to the vessel and wearing a survival suit. A survival suit was not carried on board *Copious*, as it was not a mandatory piece of equipment. No safety line was carried on board which was designated for use with the Markusnet.

Image courtesy of Markus Lifenet Ltd

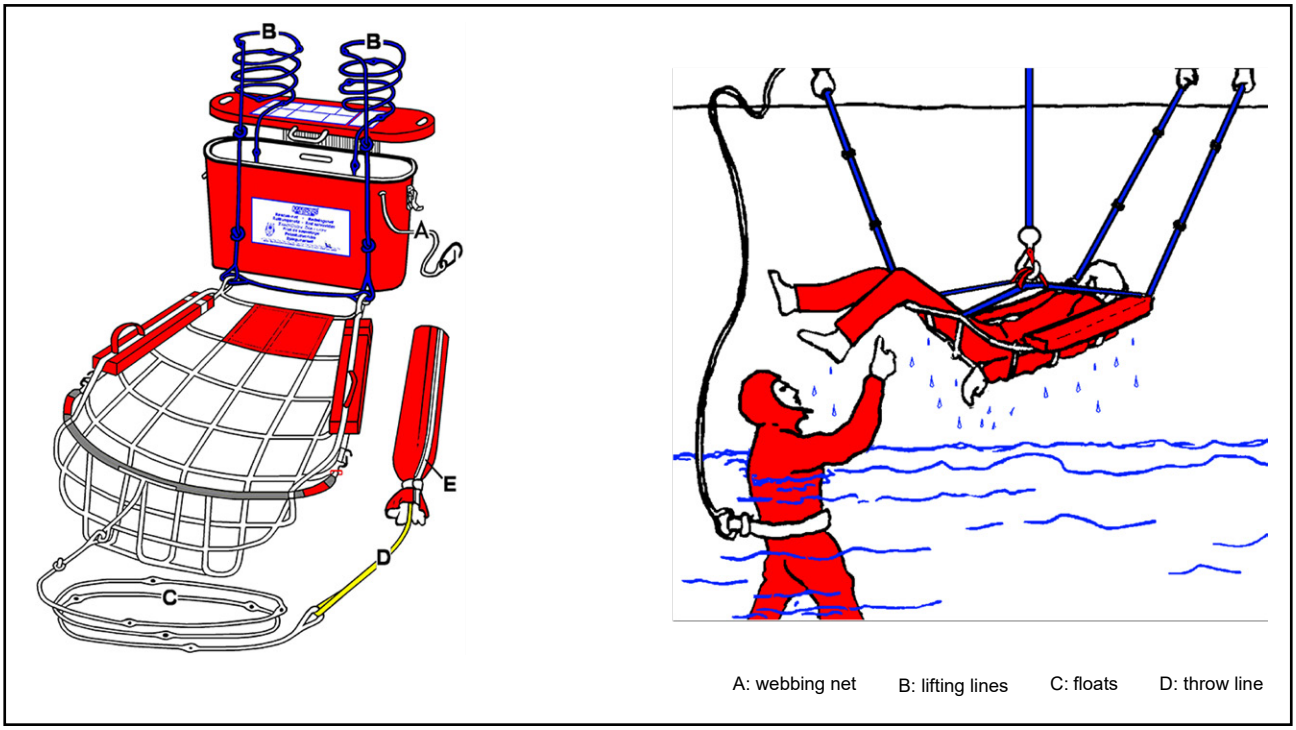

Figure 13: The Markusnet, including the use of a rescue swimmer for the recovery of an unconscious casualty

1.7 REGULATIONS AND GUIDANCE

1.7.1 Responsibility

MGN 587 (F) Amendment 1 *Health and safety: responsibilities of fishing vessel owners, managers, skippers, and fishermen* provided guidance on the application of the H&S Regulations.

[9] An LR Type Approval demonstrates that a product conforms to recognised industry quality standards, International Conventions and/or the LR Rules, through a process of independent design review, sample testing and verification of production controls. In this case, Type Approval did not include that the Markusnet met a performance standard.

About the fishing vessel owner, it stated that:

> *3.1 The fishing vessel owner… has overall responsibility to ensure that the skipper is provided with the necessary resources and facilities to comply with the Regulations. The fishing vessel owner should set the health and safety policy for the vessel so that the skipper is clear what is expected.* [sic]

On the responsibilities of the skipper it went on to affirm that (bold emphasis below as per MGN 587 (F)):

> *3.3 While the fishing vessel owner always has overall responsibility, it is recognised that if they are not onboard their fishing vessel, they may have limited control of day to day activities. The Regulations provide that responsibility for health and safety also rests with any person who is in control of any particular matter. This will most likely be the skipper in respect of day to day running of the vessel.*
>
> *3.4 The* **skipper** *therefore has responsibility for the safety of fishermen on board the vessel and the safe operation of the vessel. In fulfilling their responsibility the MCA expects skippers to* (among other things) –
>
> *a) Provide supervision to ensure that fishermen work safely at all times;*
>
> *b) Manage fishermen in a manner which respects safety and health, including fatigue.*

To comply with the H&S Regulations the principle of a *coherent approach to management of the vessel, taking account of health and safety at every level of the organisation*[10] needed to be applied. MGN 587 (F) strongly recommended that fishing vessels remaining at sea for more than 72 hours put an SMS in place to deliver this coherent approach. It went on to reference the SafetyFolder (see section 1.7.2) as an appropriate tool for further guidance. The usual fishing pattern for *Copious* involved the vessel being away from port for more than 72 hours at a time.

1.7.2 Safety management

Seafish fishing vessel safety folder

To assist owners and skippers with the safe management of their vessels Seafish developed the fishing vessel safety folder. The folder was originally only available as a hard copy and included checklists, templates and forms for the owner/skipper to complete. The areas covered included, but were not limited to, emergency drills, risk assessments, equipment records and vessel stability.

In 2019, Seafish stopped production of the hard copy version of the folder and directed commercial fishermen to the SafetyFolder[11] online tool.

[10] H&S Regulations, Regulation 5(1)(e).

[11] https://www.safetyfolder.co.uk/

Online SafetyFolder

SafetyFolder was launched in 2012 by industry to assist with all aspects of an SMS. The functionality of the tool had been developed to make it easier to keep references to regulation up to date, and to make amendments and additions to procedures and risk assessments, as well as providing electronic backup. It also supported vessels with regulatory safety compliance, including ILO 188 requirements, risk assessment, crew training and certification records; and it provided reminders of when equipment servicing, certification and vessel maintenance were due.

1.7.3 Man overboard recovery

Requirements for commercial fishing vessels

Copious had been required to have a *means of recovering a person from the water* since build, in accordance with MSN 1770 (F). MSN 1872 (F) Amendment 1 also included this requirement, further referencing MGN 570 (F) *Fishing Vessels: Emergency Drills* and MGN 571 (F) *Fishing Vessels: Prevention of Man Overboard* as the documents that contained further guidance on how to achieve this, both of which were issued in October 2017.

MGN 571 (F) included, among other things:

- A general warning about the nature of commercial fishing increasing the risk of MOB and the risk of fatality;
- Guidance on the use of a safety harness and lifeline or personal flotation device (PFD) when carrying out work with a risk of falling overboard; and
- Guidance that work overside while underway should only be undertaken after a risk assessment has been completed and control measures put in place.

Requirements for commercial workboats

Copious was a commercial fishing vessel; however, there are similarities with workboats in terms of size and operation and comparison can also be made between the respective guidance and regulation.

The Workboat Code, Edition 2 – Amendment 1[12], which provided a code of practice for small workboats operating commercially in categorised waters, stated that:

> *An efficient means to enable recovery of an unconscious person from the water should be provided to the satisfaction of the Certifying Authority. Practical use of this equipment/means should be demonstrated to the Certifying Authority by the owner/skipper/Master at renewal/compliance examinations.* [sic]

1.7.4 Training and drills

MSN 1872 (F) stipulated the type, objective and frequency of emergency drills to be conducted and recorded on fishing vessels of the size of *Copious*. It stated that:

> *The skipper shall ensure that the crew are trained in the use of all lifesaving… equipment with which the vessel is provided*

[12] The Safety of Small Workboats and Pilot Boats – a Code of Practice. This is enabled by the Merchant Shipping (Small Workboats and Pilot Boats) Regulations 1998 SI 1998 No. 1609, as amended.

It went on to assert that:

> *crew thoroughly understand and are exercised in the duties which they have to perform with respect to the handling and operation of all life-saving…equipment.* [sic]

MSN 1872 (F) then directed the reader to MGN 570 (F) which further advised that if an MOB was not rescued within 5 minutes it was highly likely they would be either unable to help themselves or unconscious. It further listed areas to be considered when deciding how to rescue a person from the water, including:

- *Have a plan for recovering a conscious person;*
- *Have a plan for recovering an unconscious person;*
- *Have a means to get hold of and recover an unconscious person;*
- *Have equipment practical for the vessel;*
- *Know how to use the equipment you have on board;*
- *Practice using the equipment;*
- *Conduct and record man overboard drills to familiarise your crew with the procedures;*
- *Have a written down the plan and procedures for recovering the casualty for the benefit of the crew.* [sic]

1.7.5 Mandatory wearing of personal flotation devices

On the wearing of a PFD, MSN 1872 (F) stated that:

> *In accordance with the guidance in MGN 588 (F)*[13] *or any superseding document, unless measures are in place which eliminate the risk of fishermen falling overboard, all fishermen must be provided with and must wear, PFDs or safety harnesses. The measures eliminating the risk of Man Overboard must be documented in a written risk assessment. MGN 571 contains guidance on preventing Man Overboard.*

Including:

> *(v) A lifeline and harness attaching the person to the vessel may be worn, instead of or in addition to the PFD.* [sic]

The decision had already been taken on board *Copious* that all crew were to wear auto-inflate lifejackets when working on deck. This had been the case since 2007, when the skipper had taken over.

[13] MGN 588 (F) Compulsory provision and wearing of personal floatation devices on fishing vessels, was published in November 2018.

The Merchant Shipping and Fishing (Personal Protective Equipment) Regulations 1999 (MSN 1870 (M + F)) stated that:

> *The shipowner and employer must ensure so far as practicable that PPE*[14] *is used as instructed – e.g. that it is only used for the purpose for which it is designed, and that it is worn correctly.*

It went on to state that:

> *Seafarers and other workers should receive adequate and appropriate training so that they are aware of the risks against which the PPE is designed to protect them, how and when to use it, and how to look after it correctly.*

1.8 SURVEYS AND INSPECTIONS

Copious was last surveyed in December 2016, which resulted in the renewal of its Fishing Vessel Certificate. An intermediate inspection was subsequently conducted by an MCA surveyor in April 2019 and the skipper had signed to declare the completion of an annual self-assessment, the last having taken place in April 2020.

The MCA issued Marine Survey Instructions for the Guidance of Surveyors (MSIS) to support its surveyors during inspections and surveys. The MSIS were accompanied by various checklists, guidance and regulation references for the surveyors to follow when on site.

On MOB, MSIS 27 Chapter 11 – Drills, Prevention of Man Overboard and Musters – stated that:

> ***In discussing recovery equipment*** *some of the options for selecting equipment for recovery of a person from the water should be discussed with the skipper and crew.*

The accompanying aide-memoire for 15-24m fishing vessels at the time of the accident, Marine Safety Form (MSF) 5550, included a section to complete that prompted, *Conduct drills, including at least one MoB*. [sic]

Section 9.3.21 of MSIS 27 Chapter 9 – Protection of Crew – provided guidance on the requirements for when PFDs or a safety harness/lifeline should be worn. This was supported by MSF 5550, which tasked surveyors to *Encourage use of PFDs/ lifelines even where risk assessment says risk of MOB eliminated.* [sic]

1.9 COLD WATER IMMERSION

Immersion in water temperatures beneath 15°C can lead to death in one of three ways:

Cold shock response

On immersion in cold water the sudden lowering of skin temperature causes a rapid rise in heart rate, and therefore blood pressure, accompanied by a gasp reflex followed by uncontrollable rapid breathing. The onset of cold shock occurs immediately, peaking within 30 seconds, and lasts for 2 to 3 minutes. If the head

[14] Personal Protective Equipment.

goes underwater during this stage, the inability to hold breath will often lead to water entering the lungs in quantities sufficient to cause death. Cold shock response is considered to be the cause of the majority of drowning deaths in UK waters.

Cold incapacitation

Cold incapacitation usually occurs within 2 to 15 minutes of entering cold water. The blood vessels are constricted as the body tries to preserve heat and protect the vital organs. This results in restricted blood flow to the extremities, causing cooling and consequent deterioration in the functioning of muscles and nerve ends. Useful movement is lost in hands and feet, progressively leading to the incapacitation of arms and legs. Unless a lifejacket is correctly worn, death by drowning occurs because of impaired swimming.

Hypothermia

Hypothermia occurs when the human body's core temperature drops below 35°C (it is normally around 37°C), which can occur after 30 minutes dependent on circumstances. The body's core temperature can continue to drop after the casualty has been recovered from the water if rewarming efforts are ineffective.

1.10 SHETLAND FISHERMEN'S ASSOCIATION

1.10.1 General

The Shetland Fishermen's Association (SFA), which 60 N were members of, promoted the interests of its members in the pelagic[15], white fish and small boat fleets of the Shetland Islands.

The SFA worked with the North Atlantic Fisheries College, also based in the Shetland Islands, to provide training opportunities for established and prospective fishers.

The SFA website stated that:

> *All fishing vessels are encouraged by SFA to sign up to the online Safety Folder which is a free online resource that aims to support behavioural change to improve safety culture on board fishing vessels of all sizes.* [sic]

1.10.2 Safety mentor

Safety of fishers was a focus for the SFA. Its website stated that it worked *with government, regulators and charities to give fishing vessel owners, skippers and crew the support they need to get home safely*. The SFA had appointed a safety mentor, recruited from within the current Shetland fleet, to act as a liaison between the SFA and the fleet in the dissemination and implementation of new safety legislation and guidance. The role of safety mentor was informal and unpaid.

[15] Pelagic fish are species that live and feed away from the shore and seabed, examples of which are herring and mackerel.

1.11 SIMILAR ACCIDENTS

1.11.1 *Beryl* – man overboard

On 10 February 2015, a fisherman was carried overboard by a net from the twin rig stern trawler *Beryl* during routine shooting operations 21 nautical miles west-northwest of the Shetland Islands (MAIB report 26/2015[16]). The crewman was conscious, wearing a lifejacket and was quickly brought alongside the vessel. However, the crew's attempts to recover the casualty on board were unsuccessful. The crewman spent approximately 49 minutes in the water and was unresponsive when eventually recovered onto a rescue craft launched from a nearby offshore support vessel.

The investigation identified that the crew member was standing in an unsafe place, and that *Beryl*'s crew had not completed a practical MOB drill during their time on board and were unfamiliar with the recovery equipment.

Recommendations were made to the MCA, Seafish and the fishing federations, the intentions of which were to improve the likelihood of recovering people from the water by ensuring that the recovery systems carried by fishing vessels were suitable and that sufficient and realistic MOB drills were carried out on board.

As a result of the accident the owner of *Beryl* overhauled the vessel's MOB processes and drills and purchased appropriate recovery equipment.

1.11.2 *King Challenger* – man overboard

At about 0940 on 23 June 2016, a deckhand on the scallop dredger *King Challenger* fell overboard from a scallop tipping door (MAIB report 5/2017[17]). He was not wearing a lifejacket. The vessel was 12nm south-west of Scalloway, Shetland Islands and the sea temperature was 10.5°C. The deckhand was recovered back on board in less than 10 minutes. He was unconscious and showed no signs of life. The crew were unable to resuscitate him and, despite quick evacuation by air to a nearby hospital, he did not survive.

The MAIB investigation identified that:

- The crew regularly worked on open tipping doors without securing themselves with a lifeline or wearing a lifejacket.
- The deckhand was incapacitated within 4 minutes of falling into the cold water.
- The crew were unprepared for the rescue of an unconscious casualty from the water.

Following the accident, the owners of *King Challenger* prohibited their crews from climbing onto tipping doors without the use of a harness and lifeline. The owners were recommended to review the risk assessments for all their vessels, paying particular attention to the risks associated with maintenance tasks.

[16] https://www.gov.uk/maib-reports/person-overboard-from-twin-rig-trawler-beryl-with-loss-of-1-life

[17] https://www.gov.uk/maib-reports/man-overboard-from-scallop-dredger-king-challenger-with-loss-of-1-life

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 OVERVIEW

The deckhand fell overboard because he was standing on the aft bulwark attempting to carry out a repair to the trawl gear. There was no attempt to stop and consider the repair and the activity was not effectively risk assessed or mitigated. The deckhand lost his life because he was not recovered back on board before he succumbed to the effects of cold water incapacitation. When he became unconscious in the water, his incorrectly worn auto-inflate lifejacket did not hold his airways clear of the water and he drowned. This section of the report will analyse the management of MOB risk on board *Copious*, including provisions for prevention and recovery, regulations and guidance and the health and safety responsibility of the vessel's owners.

2.3 FALLING OVERBOARD

2.3.1 Actions of the deckhand

The deckhand fell overboard while trying to reconnect the vessel-side section of the middle towing wire to the link connecting the banana bar chain to the net-side section of the middle towing wire. A hammerlock in the link connecting the vessel-side and net-side sections of the middle towing wire had failed; this therefore meant that the net-side section of the towing wire was extended astern from the banana bar chain with no connection to the winch.

The deckhand was considered a proactive and helpful member of the crew and it is highly likely that he was attempting to progress the required repair. He recognised that the hammerlock had failed and knew that a shackle was needed to reattach the loose end of the vessel-side section of the middle towing wire. It is likely that he believed he could reach this by stepping up onto the aft bulwark on the main deck; a practice that happened regularly on board when retrieving the trawl door pennant, so far without consequence. He asked the crew member on the main deck to hold the back of his lifejacket as he stepped up onto the bulwark, which was indicative of some appreciation that what he was doing was hazardous. However, with the vessel rising and falling in the large swell, the deckhand lost his balance and fell overboard before the crew member was able to stow the guide pole he was holding and turn round to grab the back of the lifejacket.

Although the deckhand had received sufficient rest hours in line with ILO 188 guidance, he would only have received intermittent rest during the four tows conducted on the day before the accident. The deckhand was used to this working pattern and had also had the opportunity to rest during the passage out to the grounds overnight on the 16-17 February. However, it is possible that the deckhand's decision-making was impaired by a combination of this sleep disruption and the fact that the task was being undertaken during a window of circadian low. It is considered likely that his decision to step onto the bulwark was influenced by the unsafe and common practice of stepping onto the aft bulwark to reach the trawl door pennant and his willingness to help resolve the situation.

2.3.2 Control of the repair

It was standard practice on board *Copious* for the crew to report issues with the vessel's operation to either the skipper or engineer, who would in turn give instruction or carry out the repair themselves. This method of task supervision seemed to work for a multinational crew, and it was impractical to train crew to deal with every challenge likely to be encountered. In this instance, the deckhand alerted the skipper to the breakdown of the gear as expected. The skipper came out of the wheelhouse to see what the problem was and recognised the issue, but there was no discussion about the problem or how the repair would be carried out. The skipper then passed the deckhand a shackle on request, but again there was no discussion about the repair or the deckhand's intentions.

The operation was not stopped, and the absence of dialogue meant that there was no opportunity for the crew to develop a shared mental model of the repair and their roles. Thus, each crew member acted in isolation.

It is likely that the skipper implicitly accepted the deckhand's intentions when he passed him the shackle and pulled more wire from the middle towing wire winch without question. The skipper did not see the deckhand on the aft bulwark until it was too late; however, it was his responsibility to ensure that the crew worked safely at all times. There were opportunities to stop the attempted repair, but these were not taken. This resulted in the deckhand carrying on and putting himself in a dangerous position with no effective additional control measures in place to stop him from falling overboard.

When presented with an abnormal situation, such as the failed hammerlock, it is vital that time is taken to carry out a dynamic risk assessment and then implement any identified additional control measures. This includes ensuring that a safe plan has been developed and communicated to the crew to build a shared mental model and allow the operation to be controlled and carried out safely.

2.3.3 Management of working practices and risk assessment

The owners of *Copious* were required to risk assess the vessel's operations and review these assessments regularly. The risk assessments on board *Copious* had been recorded in the Seafish safety folder proforma and were completed using the hard copy, which left no space to record any revisions to the assessments.

No risk assessments were in place for working at height and the risk factor calculated for the identified hazard of working over the side of the vessel did not represent the actual danger of falling overboard. The only mitigation for this hazard was that lone working would be avoided. However, this was inappropriate and fell short of the guidance that was widely available, for example that safety harnesses and lifelines should be worn when work is carried out where there is any risk of falling overboard, or when work is carried out in an exposed area in adverse weather. The consequences of falling overboard were well documented in MGN 570 (F) and MGN 571 (F); this included specific guidance on how to prevent a fall overboard when crew had to carry out emergency repairs that involved working over the side of the vessel or at height over the water. MSN 1872 (F) required that any hazardous operations were risk assessed and adequate control measures put in place to reduce those risks to an acceptable level.

The standard sections within the Seafish safety folder had been completed; however, the conduct of repairs that involved the hazard of working over the side of the vessel had not been adequately considered prior to the task being undertaken. Therefore, the skipper and crew were unprepared to safely carry out this activity.

2.4 MAN OVERBOARD RECOVERY

2.4.1 Attempted recovery

During the first few minutes of being in the water the deckhand, although panicking, was able to hold on to a mooring rope and also grab a rung of the recessed ladder. However, once the effects of cold water incapacitation took over he was totally reliant on the crew and was no longer able to assist in his own recovery.

The MOB drills that the crew had conducted included the immediate deployment of the life ring and the Markusnet MOB recovery system; however, the deckhand was unconscious before the life ring was thrown to him and the Markusnet was not used. The safe recovery of the deckhand was highly unlikely without the immediate deployment of a life ring or the Markusnet. When the deckhand drifted away from the vessel for a second time the Markusnet would only have been a viable recovery option if supplemented by a rescue swimmer, as per the manufacturer's instructions. However, none of the crew had undergone the training necessary to perform this role, and the equipment needed to support the use of the system in this way was not on board.

The MOB drills undertaken on board *Copious* had not been sufficiently effective to enable the full operation of the Markusnet to be adequately understood. Consequently, the crew were unable to take the appropriate actions in the event of a real MOB occurrence and their ability to safely recover the deckhand was significantly reduced.

2.4.2 Development and implementation of procedure and drills

Development

The MOB recovery guidance in MGN 570 (F) stated that unless a person is recovered within 5 minutes it is highly likely they will either be unable to help themselves or fall unconscious. MGN 570 (F) emphasised that any plan or procedure must consider the recovery of an unconscious casualty. In turn, an effective procedure would then help form the content of MOB drills. The crew of *Copious* regularly carried out such drills, which ranged from full crew involvement with the deployment of life rings and the Markusnet to a chat in the mess room with those available at the time. The drills replicated the procedure written in the Seafish safety folder. However, this procedure did not sufficiently consider the recovery of an unconscious casualty, and neither was this practiced during drills.

Implementation

Numerous MAIB investigations have found that MOB drills are not always conducted within the UK commercial fishing fleet and so it is encouraging that the crew of *Copious* did. However, when the opportunity arose to put the drills into practice, the attempt to recover the deckhand from the water bore no resemblance to the drilled procedure.

For a drill to be effective as a learning tool there needs to be an appropriate level of realism, which cannot always be achieved while alongside or during a tabletop exercise. Although not always convenient for the efficient commercial operation of a fishing vessel, time and effort must be applied to the simulation of a realistic drill scenario that considers the use of MOB training mannequins, rotation of crew positions (including the skipper) and, most importantly, conducting drills at sea. In the absence of this, the crew were unprepared when the deckhand became unresponsive.

2.4.3 Recovery equipment

Although not explicitly required in MSN 1872 (F), MGN 570 (F) stated that fishing vessels should have a plan and a means of recovering an unconscious person from the water. The manufacturer's instructions for the Markusnet MS.10 system on board *Copious* explicitly stated that a rescue swimmer was needed to float an unconscious casualty into the recovery net. To carry out this type of rescue safely the swimmer would need to be wearing a survival suit and designated safety line, neither of which were carried on board *Copious*, noting that fishing vessels of this size were not required to carry immersion suits. The use of the Markusnet to rescue an unconscious casualty had not been fully considered when it was selected for the vessel and the necessary supplementary equipment and training was not provided, leaving *Copious* without an effective means of recovering an unconscious casualty.

2.4.4 Lifejacket and training

The deckhand was wearing an auto-inflate lifejacket when he fell overboard, which inflated despite being overdue its annual service.

A properly worn lifejacket is designed to keep the airways of an unconscious person clear of the water and give them and their crewmates more time to carry out a successful rescue. Unfortunately, the waist strap on the deckhand's lifejacket was very loose and the crotch strap, although fitted to the lifejacket, was taped up and unused, which was also the case for the other lifejackets found on board. The incorrectly fitted lifejacket provided essential buoyancy in the early stages of the recovery attempt; however, the combination of the unworn crotch strap and loosely fitted waist strap allowed the lifejacket to ride up around the deckhand's face as he fell unconscious and therefore failed to keep his airways clear of the water.

MSN 1872 (F) required crew members to wear a PFD (or lifeline and harness) while working on deck, such as the auto-inflate lifejackets worn by the crew of *Copious*, unless the risk of falling overboard had been eliminated. The owners of *Copious* provided their crew with lifejackets and insisted on them being worn, but the importance of donning the lifejackets correctly and the use of crotch straps was not understood and so they were taped up and not available for use. In accordance with MSN 1870 (M + F), it was the responsibility of the owner and skipper of a fishing vessel to ensure that PPE was worn correctly, and that crew received appropriate training on how to do this.

Owners and skippers need to ensure that crew are fully conversant with the manufacturer's instructions on how to correctly wear PFDs provided to them for use while working on deck, and the risks if they do not.

2.5 SAFETY MANAGEMENT

2.5.1 Safety management system

Copious was regularly at sea for 72 hours or more and the MCA strongly recommended that vessels' owners demonstrated a coherent approach to health and safety at every level of the organisation in the form of an SMS. MGN 587 (F) provided guidance on an appropriate SMS tool with which to deliver a coherent approach and the industry had developed tools such as the original Seafish safety folder and the online SafetyFolder to help owners and skippers put this into practice.

The skipper of *Copious* had made efforts to fill out the relevant sections of the Seafish safety folder and had dutifully signed for annual reviews as required. However, some completed risk assessments had been ineffective in mitigating the identified risk, which was then reflected in incomplete written procedures, while other aspects of the operation had not been risk assessed at all.

The H&S Regulations required 60 N to have a coherent approach to health and safety management on board its vessels and at all levels of the organisation. The issues identified with the vessel's risk assessments and the fact that the MOB recovery procedure did not consider the recovery of an unconscious casualty suggest that there was room for improvement in the safety management on board *Copious*. This was further evidenced by the annual servicing of the auto-inflate having been missed, even if the lifejacket worn by the deckhand did inflate when he fell into the water. While the use of the SafetyFolder is not mandated, a bespoke tool like this greatly enhances the ability of owners to implement a clear health and safety policy throughout their operation.

2.5.2 Administrative support

A fishing vessel owner had a legal responsibility under the H&S Regulations to ensure the skipper was provided with the necessary resources and facilities to comply with the regulations. *Copious* was owned by 60 N, of which all but one shareholder was an active skipper on board either *Copious* or *Prolific*. The other shareholder, LHD, had very little influence on the vessels' onboard operation and deferred to the knowledge of the skippers; however, LHD had permanent office-based staff and benefited from being agents for a sizeable Shetland fishing fleet. While the skipper of *Copious* had taken several steps towards compliance with the H&S Regulations and applicable guidance, additional support with risk assessment and emergency preparedness would have improved conformance in these areas. Given that owners are legally required to support their skippers, the provision of shore-based administrative assistance can be of particular benefit if there is the resource to do so.

The SFA had appointed a safety mentor on a part-time basis who provided the Shetland fishing fleet with a basic update of changes to legislation and safety learnings from industry. Local associations such as the SFA played an important role in encouraging and championing safety in the local fleet. Given that owners are legally required to support their skippers, the provision of shore-based administrative assistance can be of particular benefit if there is the resource to do so.

2.6 REGULATORY OVERSIGHT

2.6.1 Man overboard recovery systems

MCA surveyors had access to MSIS 27 and aide-memoire MSF 5500 during site inspections to assist them to correctly interpret the requirements set out in the regulations and guidance for MOB recovery systems. MSIS 27 required the surveyor to discuss the types of recovery equipment with the skipper and crew, but it was unclear that the vessel's recovery equipment should facilitate the recovery of an unconscious casualty or that an MOB drill should be conducted at every survey and inspection.

MSN 1872 (F) and the associated instructions to surveyors and aide-memoire at the time of the accident provided insufficient clarity on the recovery of an unconscious person in the water, unlike the requirements of the Workboat Code, Edition 2. As a result, the opportunities for surveys and inspections to identify shortfalls in MOB recovery equipment and procedures were not being optimised.

2.6.2 Lifejacket crotch straps

The deckhand was wearing an auto-inflate lifejacket that provided him with initial buoyancy when he went into the water. The crotch strap provided with the lifejacket, which was new in 2019, was not worn and instead remained taped up at the back of the lifejacket. The combination of the unworn crotch strap and loosely fitted waistbelt allowed the lifejacket to ride up, resulting in the deckhand's airways becoming submerged in the water when he became unconscious.

Copious was neither inspected nor surveyed in the time between the purchase of the new lifejackets and the accident but, had it been, MSIS 27 did not prompt for checks on the status of lifejackets and, in particular, the presence of crotch straps and their readiness for use.

Auto-inflate lifejackets were one version of a PFD that UK fishers could wear to meet the safety requirements when working on deck, and most models required crotch straps to be worn. However, no guidance or instruction existed for surveyors to check their readiness for use during survey and inspection.

SECTION 3 - CONCLUSIONS

3.1 SAFETY ISSUES DIRECTLY CONTRIBUTING TO THE ACCIDENT THAT HAVE BEEN ADDRESSED OR RESULTED IN RECOMMENDATIONS

1. The deckhand lost his balance and fell overboard because he was standing on the aft bulwark attempting a repair to the trawl gear. He lost his life because, when he became unconscious, his incorrectly worn lifejacket did not keep his airways clear of the water and he succumbed to the effects of cold water incapacitation and drowned before he could be recovered. [2.2]

2. The deckhand's decision-making is likely to have been influenced by the unsafe and common practice of stepping onto the aft bulwark to reach the trawl door pennant and his willingness to help resolve the situation. It is possible that his decision-making was also impaired by sleep disruption and that the task was being undertaken during a window of circadian low. [2.3.1].

3. There was no attempt to stop and consider the repair, which contributed to the deckhand being allowed to put himself into a hazardous situation. No effective additional control measures were in place to stop him from falling overboard and there was no shared mental model of the repair task and the roles of those involved. [2.2, 2.3.2]

4. No risk assessments were in place for working at height and the risk factor calculated for the identified hazard of working over the side of the vessel did not represent the actual danger of falling overboard. The skipper and crew were unprepared to carry out the task safely. [2.3.3]

5. The safe recovery of the deckhand was highly unlikely without the immediate deployment of the Markusnet MOB recovery system. [2.4.1]

6. The crew of *Copious* regularly carried out MOB drills, but neither these nor the related onboard procedure sufficiently considered the recovery of an unconscious casualty from the water. [2.4.2]

7. Time and effort must be put into realistic MOB drill scenarios, which should consider the use of MOB training mannequins, rotation of crew positions and, most importantly, conducting drills while at sea. [2.4.2]

8. The Markusnet MOB recovery system could assist the recovery of an unconscious casualty but only when supplemented with properly trained crew and additional equipment to enable them to safely enter the water, which *Copious* did not have. [2.4.3]

9. It is the owner and skippers' responsibility to ensure that all crew members are fully conversant with how to correctly wear any PFDs provided on board. [2.4.4]

10. While the use of the online SafetyFolder is not mandated as a means of providing an SMS, the use of a bespoke tool such as this greatly enhances the ability of owners to implement a coherent approach to health and safety at all levels of their operation and thus comply with the requirements. [2.5.1]

3.2 OTHER SAFETY ISSUES DIRECTLY CONTRIBUTING TO THE ACCIDENT

1. While the skipper of *Copious* had taken several steps towards compliance with the H&S Regulations and applicable guidance, additional support with risk assessment and emergency preparedness would have improved conformance in these areas. [2.5.2]

3.3 SAFETY ISSUES NOT DIRECTLY CONTRIBUTING TO THE ACCIDENT THAT HAVE BEEN ADDRESSED OR RESULTED IN RECOMMENDATIONS

1. MSN 1872 (F) and the associated instructions to surveyors and aide-memoire provided insufficient clarity on the requirement for vessels to have an effective means of recovering an unconscious person from the water. The opportunities provided during surveys and inspections to identify shortfalls in MOB recovery equipment and procedures were not being optimised. [2.6.1]

2. The available instructions and guidance did not provide prompts for surveyors to check for the presence of crotch straps on inflatable lifejackets, particularly the readiness of crotch straps for use, if applicable. [2.6.2]

SECTION 4 - ACTION TAKEN

4.1 MAIB ACTIONS

The **MAIB** has issued a safety flyer to the fishing industry **(Annex A)**.

4.2 ACTIONS TAKEN BY OTHER ORGANISATIONS

The **Maritime and Coastguard Agency** has:

- Published MGN 588 (F) Amendment 1 to introduce minimum acceptable performance levels for PFDs on fishing vessels, and stating that PFDs must be worn in accordance with manufacturers' instructions, including the use of crotch straps, where required to be fitted.

- Drafted new instructions to surveyors and updated aide-memoire MSF 5500 to include references to the checking of PFD readiness, including the presence of crotch straps in a usable condition; making crew aware of the dangers of wearing a PFD without the crotch strap being connected; and to further emphasise the recovery of unconscious casualties in man overboard procedures with equipment and during drills.

60 North Fishing (Shetland) Ltd has:

- Replaced *Copious* with a new larger vessel incorporating various upgraded safety features, including a deck layout which ensures visibility of all crew on deck and a larger number of crew to enable greater opportunity for rest.

- Started using the online SafetyFolder to assist in the implementation of its SMS, including:

    - a risk-based approach to the management of working at height;

    - amendment of the trawl door pennant recovery procedure so that the risk of falling overboard is reduced to a tolerable level;

    - training in the use and donning of inflatable lifejackets; and

    - servicing requirements for inflatable lifejackets.

- Purchased man overboard recovery equipment that provides an efficient means of recovering an unconscious person from the water.

- Sent its skippers on an in-water man overboard event funded by Seafish and run by the RNLI, in which participants experience going overboard in an environmental pool to gain greater appreciation of the risks and how to manage them.

- Conducted man overboard drills at sea with RNLI involvement and drills are carried out regularly with more focus on the recovery of an unconscious person using a man overboard mannequin to provide greater realism.

- Upgraded all inflatable lifejackets to 275N buoyancy.

- Provided immersion suits for all crew for use in MOB emergency or abandon ship situations.

- Installed safety harness clips for working at height at points of risk and fall arrestors have been fitted for use in poor weather.

- Provided additional life rings.

L.H.D Limited has:

- Purchased a man overboard mannequin that is kept at Mair's Quay in Lerwick for use by all fishing vessels to add realism to their man overboard drills.

SECTION 5 – RECOMMENDATIONS

The **Maritime and Coastguard Agency** is recommended to:

2023/102 Amend commercial fishing vessel regulations to ensure that there is an explicit requirement, in line with that in The Workboat Code Edition 2, for fishing vessels to have an efficient means to recover an unconscious person from the water that is demonstrable during surveys and inspections.

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

MAIB safety flyer to the fishing industry

MAIB

MARINE ACCIDENT INVESTIGATION BRANCH

SAFETY FLYER TO THE FISHING INDUSTRY

Fatal man overboard from the stern trawler *Copious* (LK 985), approximately 30 nautical miles south-east of the Shetland Islands, Scotland, on 18 February 2021

Image courtesy of David Meek (marinetraffic.com)

Copious

Narrative

On 18 February 2021, at night and in a 3m following swell, a deckhand drowned after falling overboard from the twin rig stern trawler *Copious* while he was attempting to repair the gear.

The deckhand had identified a failed hammerlock while hauling the nets and had climbed onto the aft bulwark on the vessel's main deck to attempt a repair. He lost his balance and fell overboard. The deckhand was conscious and wearing a lifejacket, which automatically inflated. Although he was quickly brought alongside the vessel, the crew's attempts to recover him back on board were unsuccessful. The crew had practised throwing a lifebuoy and deploying the man overboard recovery equipment during man overboard drills. However, the lifebuoy was thrown to the deckhand after he became unconscious, and the recovery equipment was left unused. The MAIB investigation found that *Copious* did not carry the required supplementary equipment for its man overboard recovery system to be used to safely recover unconscious casualties.

The deckhand's lifejacket was not being worn correctly and it did not keep his airways clear of the water when he succumbed to the effects of cold water incapacitation and fell unconscious. The deckhand was unresponsive when recovered from the water by a coastguard helicopter and he was pronounced dead on arrival at hospital.

Safety lessons

1. The deckhand stood on the aft bulwark without taking any safety precautions to prevent him falling overboard. Working over the side of the vessel, especially from a vulnerable position like a bulwark, should be avoided unless absolutely necessary. Essential tasks must be carefully considered, and control measures that reduce the risk of falling overboard to an acceptable level must be put in place and communicated to the crew.

2. The deployment of the man overboard recovery equipment was among the first actions taken during drills that had been practised on board. However, the recovery equipment was not deployed when the deckhand fell overboard, which significantly reduced his chances of recovery while still conscious. It is vital that realistic man overboard drill scenarios are practised to ensure an effective and prompt response in a real situation. The early deployment of the recovery equipment in this case would have significantly improved the deckhand's chances of recovery and survival.

3. There was little chance of recovering the deckhand back on board once he had fallen unconscious. This was because the crew were unaware that supplementary training and equipment were needed for the safe recovery of an unconscious casualty using the onboard man overboard recovery system. When selecting recovery equipment it is essential that its suitability for recovering unconscious casualties is considered.

4. The deckhand was wearing an auto-inflate lifejacket, which inflated when he fell overboard. Unfortunately, the waistbelt was very loose and the crotch strap had not been used, which meant that when he became unconscious it rode up around his face and he drowned. The manufacturer's instructions on how to correctly wear inflatable lifejackets should always be followed as this will afford both the casualty and their crew mates precious extra time during a recovery attempt.

This flyer and the MAIB's investigation report are posted on our website: www.gov.uk/maib

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