ACCIDENT REPORT

Report on the investigation of

the capsize and foundering of

the fishing vessel

Ocean Way FR349

100 miles north-east of Tynemouth

on 2 November 2014

resulting in three fatalities

MAIB
MARINE ACCIDENT INVESTIGATION BRANCH

VERY SERIOUS MARINE CASUALTY REPORT NO 23/2015 NOVEMBER 2015

Extract from

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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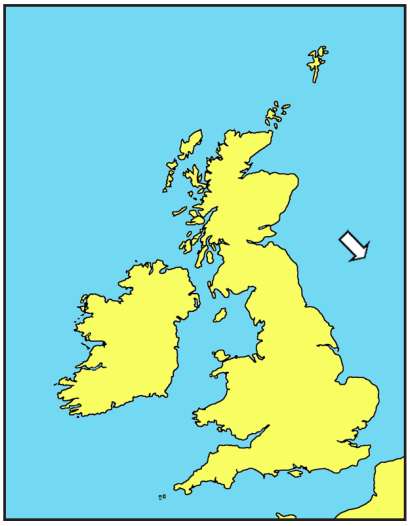
GLOSSARY OF ABBREVIATIONS AND ACRONYMS

AIS	Automatic Identification System
ARCC	Aeronautical Rescue Co-ordination Centre
CM	Consultative Marine
CPR	Cardiopulmonary resuscitation
DAO	Duty Area Officer
DNSARO	Duty National Search and Rescue Officer
EMSA	European Maritime Safety Agency
EPIRB	Emergency Position Indicating Radio Beacon
ETA	Estimated time of arrival
GNSS	Global Navigation Satellite System
HRU	Hydrostatic Release Unit
kt	knot
kW	kilowatt
LCB	Longitudinal Centre of Buoyancy
LCG	Longitudinal Centre of Gravity
LEOSAT	Low Earth Orbiting Satellite
LOA	length overall
LUT	Local User Terminal
m	metre
MCA	Maritime and Coastguard Agency
MF	Medium Frequency
MHz	Megahertz
MMO	Marine Management Organisation
MRCC	Maritime Rescue Co-ordination Centre
MSIS	Marine survey instructions to surveyors
nm	nautical mile

RL	Registered Length
ROV	Remotely Operated Vehicle
SAR	Search and Rescue
Sitrep	Situation report
SMC	Search and Rescue Mission Co-ordinator
SOP	Standard Operating Procedure
t	tonne
UKFVC	United Kingdom fishing vessel certificate
UKMCC	United Kingdom Mission Control Centre
UTC	Universal Co-ordinated Time
VHF	Very High Frequency
VMS	Vessel Monitoring System
VTS	Vessel Traffic Services

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

SYNOPSIS



At 1056 on 2 November 2014, the 17.07m fishing vessel *Ocean Way*, a trawler with a crew of five, capsized and sank 100 nautical miles off the north-east coast of England. Two of its crew were rescued and the body of the skipper was recovered but the remaining two crewmen were not found.

Ocean Way had been running before a very rough sea with water washing regularly onto its main deck when the skipper alerted the crew, who were in the vessel's communal cabin below deck that the vessel was capsizing. Four men escaped from the vessel and two of them managed to climb onto the upturned hull before the vessel sank a short time later. The two men then clung to two lifebuoys, which were the only lifesaving equipment to float free from the vessel after the sinking.

At 1058 a transmission from *Ocean Way*'s Emergency Position Indicating Radio Beacon (EPIRB) was received but this did not give the vessel's position. At 1145 the position of the EPIRB was confirmed and at 1155 a helicopter was tasked to proceed to that position. Two survivors were located at 1354 and the skipper's body was recovered a short time later. The search for the two missing men continued until 2330 but neither were found.

The MAIB investigation included an underwater survey of the wreck and from the evidence obtained it was concluded that the vessel had broached and capsized in heavy following seas when its stability had been reduced by the adverse effect of retained water on deck.

The MCA has taken action to:

- Ensure that fishing vessels with marginal stability are tested by inclining.
- Equip Maritime rescue co-ordination centres with updated computer equipment that provides access to fishing vessel positional data.
- Review its staff training for the handling of distress incidents.

The Marine Management Organisation and Marine Scotland have taken action to provide the MCA with contemporaneous positional information for UK fishing vessels in distress.

A recommendation has been made to the MCA designed to ensure that EPIRBs carried on UK registered fishing vessels are equipped with an integral Global Navigation Satellite System (GNSS) receiver to improve the time taken to identify the position of a vessel in distress.

SECTION 1 - FACTUAL INFORMATION

1.1 PARTICULARS OF *OCEAN WAY* AND ACCIDENT

SHIP PARTICULARS	
Vessel's name	*Ocean Way*
Flag	United Kingdom
Classification society	Not applicable
IMO number/fishing numbers	FR 349
Type	Twin rig stern trawler
Registered owner	Ocean Way FR LLP, Fraserburgh
Manager(s)	Ocean Way FR LLP, Fraserburgh
Construction	Steel
Year of build	1974
Length overall	17.07m
Registered length	14.97m
Gross tonnage	80
Minimum safe manning	Not applicable
Authorised cargo	No
VOYAGE PARTICULARS	
Port of departure	North Shields, Tyne and Wear, England
Intended Port of arrival	North Shields, Tyne and Wear, England
Type of voyage	Commercial fishing
Cargo information	No cargo
Manning	5
MARINE CASUALTY INFORMATION	
Date and time	2 November 2014, 1056
Type of marine casualty or incident	Very Serious Marine Casualty
Location of incident	100nm north-east of Tynemouth, England
Place on board	Not applicable
Injuries/fatalities	1 fatality, 2 missing
Damage/environmental impact	Vessel lost/ no environmental impact
Ship operation	On passage
Voyage segment	Mid-water
External & internal environment	Daylight; wind: SSW Force 6; sea state: very rough, good visibility
Persons on board	5

Ocean Way

1.2 BACKGROUND

Ocean Way was built in 1974 by Herd and MacKenzie, in Buckie, Scotland. Originally named *Wavecrest,* it was one of 11 similar twin rigged stern trawlers that were constructed with a forward whaleback and open aft deck. All of the vessels were subsequently fitted with shelter decks, some of which were made weathertight. *Wavecrest* was fitted with an open shelter deck in 1980.

In 2006, the vessel's name was changed to *Ocean Way* when purchased by a partnership that included James Noble, its skipper, who lost his life in the accident.

In order to maximise its principal catch of prawns and white fish, *Ocean Way* operated out of Fraserburgh, Scotland during the summer months and North Shields, England in the winter months.

1.3 NARRATIVE

On 29 October 2014, while on passage from Fraserburgh to North Shields, the vessel's engine room bilge alarm activated when a fresh water pipe split, allowing water to leak into the bilges. The crew repaired the defective pipe and the vessel arrived in North Shields without further incident on 31 October.

James Noble joined *Ocean Way* the following day when he took over from the vessel's other skipper. With the assistance of the four Filipino crewmen he prepared the vessel for sea, filling the fuel and fresh water tanks and topping up the ice in the fish hold.

At 2038 on 1 November, *Ocean Way* departed from North Shields and a north-easterly course was set towards the Gut fishing grounds about 120 nautical miles (nm) from the port.

1.3.1 The passage to the Gut

The skipper remained in the wheelhouse as the sole watchkeeper until he was relieved by one of the crew at 0200 the following day. He then went below to rest in the communal cabin **(Figure 1)**. At 0500 the watchkeeper temporarily left the wheelhouse to check the engine room, where he pumped out the bilges. On his way back to the wheelhouse he noticed that water was being shipped on the main deck under the shelter. He did not consider this to be unusual.

At 0600 another crewman took over the bridge watch until 0900 when the skipper returned to the wheelhouse. At 0943 the skipper completed a series of internet text message exchanges with friends ashore in which he reported that the wind had decreased overnight but there was a residual swell on the vessel's starboard quarter.

At 1000 *Ocean Way*'s skipper held a medium frequency (MF) radio conversation with the skipper of another fishing vessel, which had fished the Gut on the previous day but had moved further inshore due to the adverse weather forecast. The skipper told him that *Ocean Way* was coping well with the conditions and was 30nm from the Gut, where he expected the vessel to arrive at 1500.

At 1051, a routine automatic transmission of data[1] from *Ocean Way*'s vessel monitoring system (VMS) was received at the Marine Scotland fisheries monitoring centre in Edinburgh. This data gave the vessel's identification, course (051°), speed (7 knots[2] (kts)) and position (55° 48.49' north 001° 08.60' east).

1.3.2 The accident

At 1056, the four Filipino crew, who were in the communal cabin, suddenly heard the skipper shout "Quick, get out, the boat is sinking". No alarms were heard at that time.

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[1] The data was sent every 2 hours to Marine Scotland, from *Ocean Way* and all other Scottish registered fishing vessels over 12m in length, in accordance with the requirements of European and Scottish fisheries legislation.

[2] A knot is a measure of speed, it measures nautical miles per hour

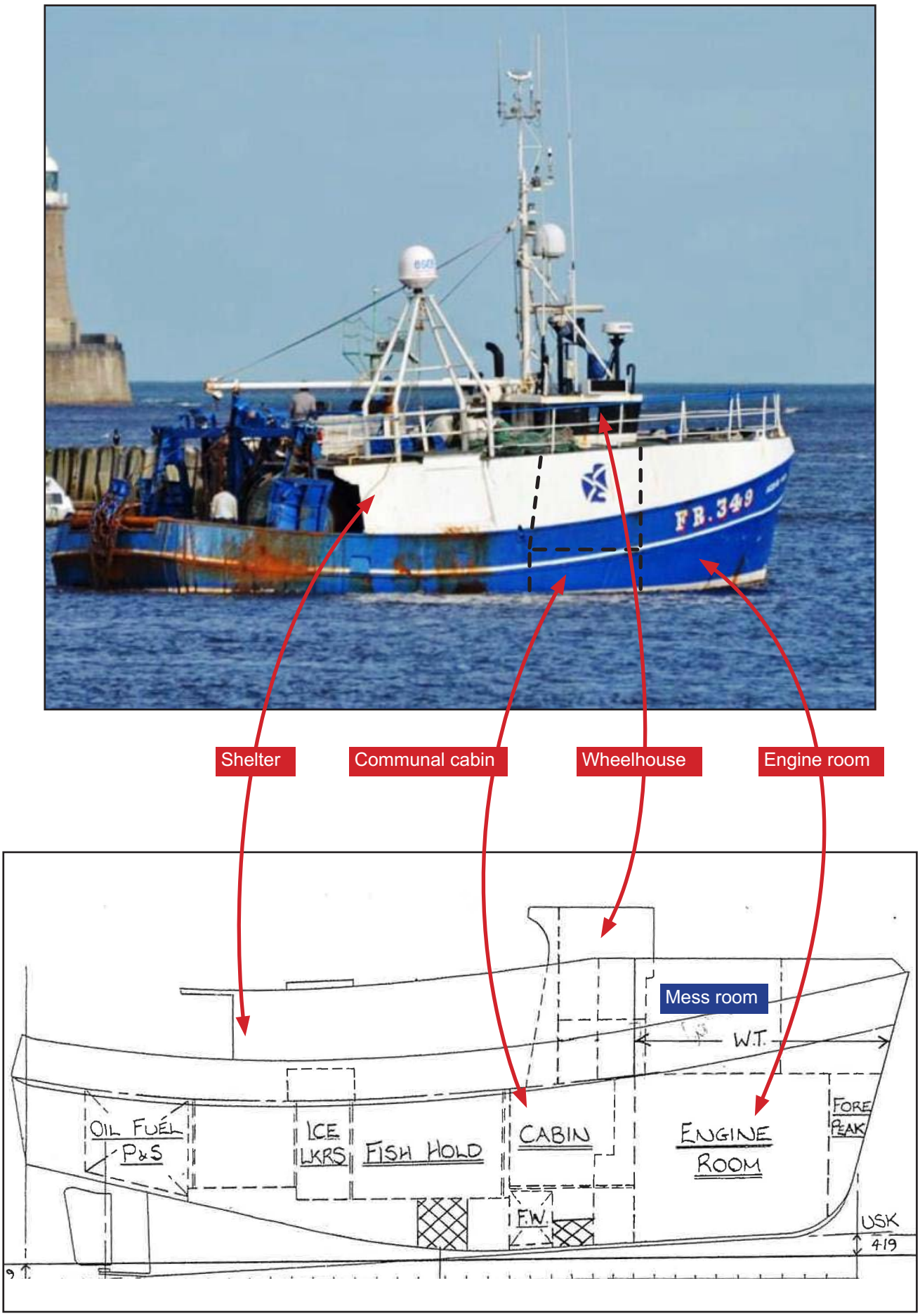

Figure 1: *Ocean Way* - general arrangement

Two crewmen climbed out of the cabin, through the mess room and onto the main deck before climbing onto the top of the shelter via a vertical ladder on the starboard side of the accommodation **(Figure 2)**. The vessel was capsizing to port as they reached the top of the ladder and the men helped each other over the rails onto the starboard side of the hull and into the water.

Image courtesy of Graham Buchan Innes/Marine Traffic.com

Figure 2: *Ocean Way* - location of hatch at the top of the vertical ladder from the main deck

The two crewmen drifted towards the stern of the capsized vessel and climbed onto the upturned hull, which was about 1 metre clear of the water.

Once out of the water the two crewmen saw the skipper and another crewman, Junito Antonio, in the water and called out to them, encouraging them to swim towards the vessel. However they received no response. There was no sign of the fifth crewman, Michael Pulpul. None of the men had managed to don lifejackets or warm clothing during the abandonment, and the two crewmen on the upturned hull were wearing only tee shirts and shorts.

The two crewmen huddled together for warmth, and remained on the hull for about 30 minutes before the vessel began to sink by the stern, at which point they jumped into the water.

After the vessel sank, two lifebuoys and a bottle of mineral water floated to the surface close to the men. They tied the lifebuoys together and used the water to hydrate and clear their mouths of the diesel oil that was all around them on the surface of the water, and they then prayed for rescue.

1.3.3 Emergency Position Indicating Radio Beacon alert

At 1058 a transmission from *Ocean Way*'s Emergency Position Indicating Radio Beacon (EPIRB) was received at the UK's Local User Terminal (LUT) at Combe Martin, via a geostationary satellite **(Annex A)**. This signal, which gave the vessel's identification but contained no positional information, was relayed to the United Kingdom Mission Control Centre (UKMCC) at Kinloss, Scotland.

At 1101 an operator at UKMCC informed the Maritime Rescue Co-ordination Centre (MRCC) in Falmouth that a transmission had been received from the EPIRB registered to *Ocean Way*.

At 1104 MRCC Falmouth was informed of the receipt of a second transmission from *Ocean Way*'s EPIRB, via a low earth-orbiting satellite, which had been received by a French satellite tracking station. This transmission gave an unresolved[3] position for the EPIRB of 55° 48.72' north, 001° 09.12' east.

MRCC Falmouth consulted the Integrated Maritime Data Environment[4] (IMDatE) database **(Annex B)**, maintained by the European Maritime Safety Agency (EMSA) for further positional information. From this database historic information of the vessel's position, course and speed was obtained from its Automatic Identification System[5] (AIS) transmissions.

At 1115 MRCC Falmouth contacted MRCC Humber and advised them that a 'detect only' beacon alert (meaning an alert with no confirmed positional information) had been received from *Ocean Way.* MRCC Humber was also advised that the last available positional data for the vessel, obtained from the IMDatE database, indicated that the vessel was south-south-east of Holy Island **(Figure 3)**.

MRCC Humber checked its equipment, confirmed that the vessel's AIS signal was not visible and began calling *Ocean Way* on very high frequency (VHF) and MF radio channels.

At 1117 MRCC Humber contacted the Amble lifeboat, which was at sea on a training exercise, and requested that they monitor their radio direction finder for possible EPIRB transmissions on 121.5MHz[6]. The lifeboat crew were advised that they were the nearest asset in the search for *Ocean Way*.

At 1119 MRCC Humber telephoned the Port of Tyne's Vessel Traffic Services (VTS) to ascertain if *Ocean Way* was in port; confirmation was given that it was not, but that it had been alongside at North Shields on 1 November.

At 1120 Amble lifeboat crew informed MRCC Humber that they had detected a 121.5MHz transmission south of the lifeboat's position, which they were requested to investigate.

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[3] Unresolved position: if an EPIRB is not fitted with integral GNSS its position cannot be resolved (confirmed) until its transmission has been detected by a number of satellites the data from which is combined to provide a reliable position for the beacon (**Annex A** refers). Search and Rescue (SAR) agencies will not normally begin a search until the resolved position of an EPIRB is known.

[4] IMDatE is a technical framework that collects and combines data from EMSA's maritime applications and other external sources to provide more comprehensive and configurable services to users.

[5] AIS transmits information on a vessel's position, course and speed on VHF frequencies, which limit the range of the signal to approximately 40nm.

[6] 121.5MHz is the homing frequency transmitted by 406MHz EPIRBs to assist detection by SAR authorities.

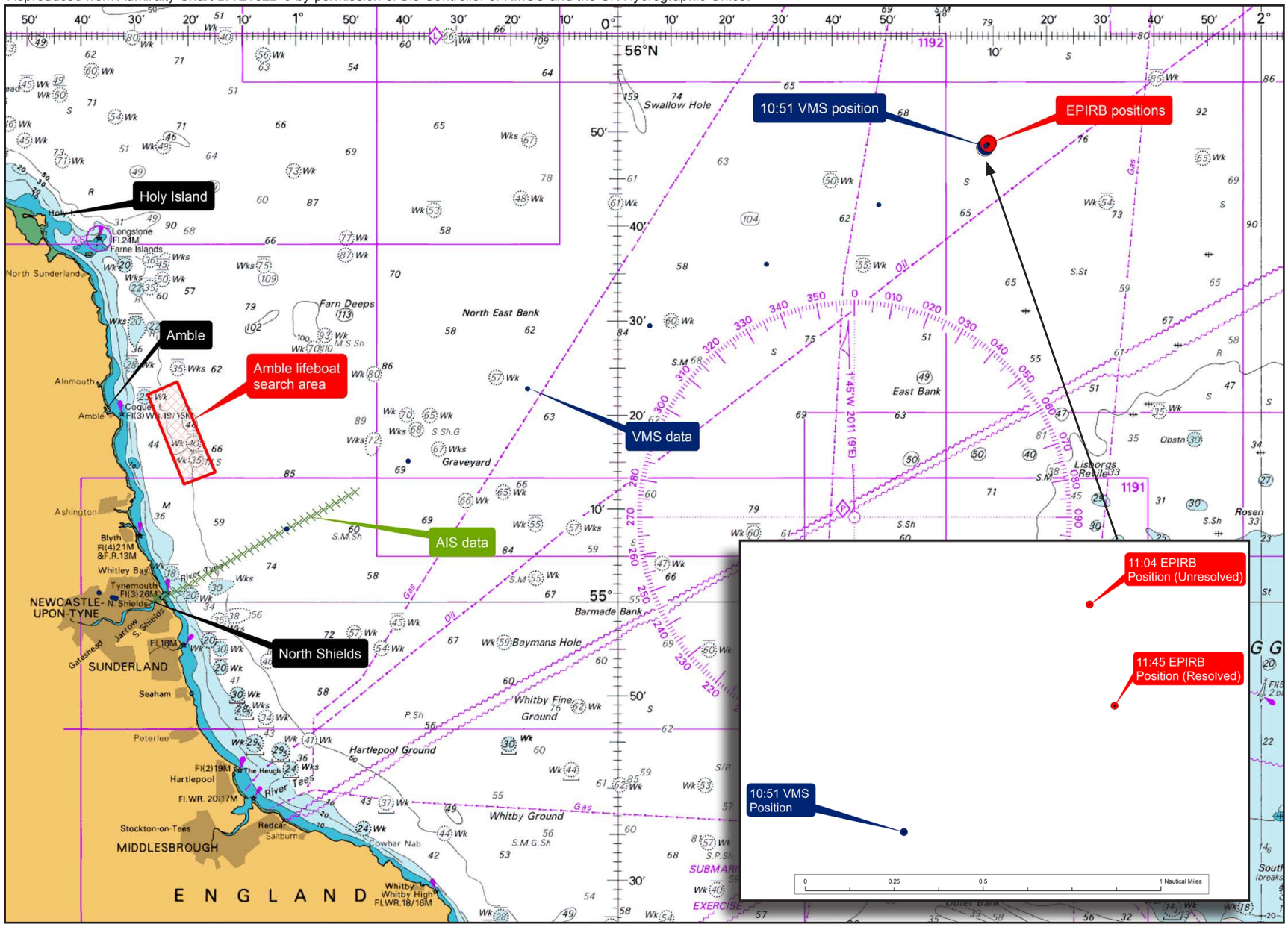

Figure 3: Accident location and related positional information

At 1124 MRCC Falmouth telephoned MRCC Humber to advise that one of the possible EPIRB positions was: 55° 48.72' north, 001° 09.12' east. It was pointed out that this was "further out than first thought" and "quite a way out" into the North Sea **(Figure 3)**. MRCC Humber acknowledged the information stating "she is about 90 miles off".

At 1131 MRCC Humber spoke to the skipper of the fishing vessel *Success* and was informed that *Ocean Way* had left port at about 2000 the previous evening, heading for the Gut, about 120nm offshore. The skipper stated that he had exchanged internet text messages with James Noble at 0913 that morning.

Concurrently, Amble lifeboat crew informed MRCC Humber that they were proceeding towards a 121.5MHz beacon transmission, which coincided with a radar target about 12nm from the lifeboat.

At 1133 MRCC Falmouth enquired if MRCC Humber would accept transfer of co-ordination for the incident, which Humber agreed to do. Co-ordination was transferred without a search and rescue (SAR) situation report (Sitrep) or completed handover form, and there was no discussion between the search and rescue mission co-ordinators (SMCs) regarding the transfer.

At 1139 MRCC Humber broadcast a "Mayday Relay" message, which stated that "a distress beacon signal has been detected on 406MHz at 02/1133 UTC, indicates distress within 3nm of 55° 48' north 001° 09.0' east". MRCC Humber repeated this transmission a number of times on distress frequencies and electronic systems.

At 1145 a further transmission from *Ocean Way*'s EPIRB was received at UKMCC via a low earth-orbiting satellite, which gave a resolved position for the beacon of 55° 48.56' north, 001° 09.19' east **(Figure 3)**.

MRCC Humber informed Amble lifeboat at 1148 that the distress position was 100nm offshore and asked if they were still receiving a 121.5MHz signal. The lifeboat crew confirmed that they were receiving a signal that was not on a constant bearing, 33nm to their north. The crew were instructed to stop the search and return the lifeboat to its station.

At 1150 the skipper of *Success* informed MRCC Humber that he had not been able to make contact with *Ocean Way* via the internet messaging service. He stated that this was very unusual and that he was very concerned for the vessel.

1.3.4 Search and Rescue

At 1155 MRCC Humber tasked a rescue helicopter, callsign R128, to proceed to the location of the EPIRB signal in position 55° 48.72' north, 001° 09.12' east.

The Aeronautical Rescue Co-ordination Centre (ARCC)[7] advised MRCC Humber that R128, which was based at Leconfield, Yorkshire and had been on exercise in Bridlington Bay, would have to refuel at RAF Boulmer, Northumberland before proceeding to the distress position. The rescue helicopter normally based at RAF Boulmer, the closest base to the distress position, had earlier been deployed to an emergency in the Lake District.

[7] ARCC is responsible for co-ordination of the tasking and operation of search and rescue aircraft in the United Kingdom.

At 1216 the master of *Maersk Laser*, an oil platform support vessel, contacted MRCC Humber in response to the "Mayday Relay" message, which he had received by Navtex[8]. He advised that his vessel was heading east, 40nm north-north-east of the distress position and was available to assist if required. The master was requested to call *Ocean Way* on VHF radio and, if nothing was heard, to continue on passage.

R128 arrived at RAF Boulmer at 1245 to refuel and departed at 1259. Its estimated time of arrival (ETA) at the distress position was given as 1342. MRCC Humber provided R128 with details of the search pattern of the distress area, and with details of *Ocean Way* and the number of persons on board.

At 1255 ARCC informed MRCC Humber that the resolved position of *Ocean Way*'s EPIRB was 55° 48.55' north, 001° 09.68' east. ARCC enquired if there were any vessels in that area that could undertake a surface search and were advised there were none.

At 1332 R128's crew reported to MRCC Humber that they had detected a 121.5MHz homing signal, and were instructed to proceed towards its location.

At 1343 R128's crew reported that they had sighted persons in the water, and at 1354 recovered two survivors from position 55° 48.95' north 001° 09.85' east. The helicopter winchman reported that sea conditions during the rescue were: "a lot of white waves, with swell waves of 6 metres (m) high in a very rough to high sea state". The survivors were displaying symptoms of hypothermia but recovered once they had warmed up in the helicopter.

During this period MRCC Humber received numerous telephone calls from the co-owner of *Ocean Way* and from close friends of the skipper asking for news regarding the search.

At 1412 the SMC at MRCC Humber briefed the MCA's duty press officer and the Northumberland police control duty manager on the SAR mission.

At 1423 ARCC informed MRCC Humber that the crew of R128 had recovered a third person from the water and were administering Cardiopulmonary resuscitation (CPR), although the person appeared to be deceased. They also advised that there was a large area of diesel oil on the surface of the water in the area.

At 1434 ARCC informed MRCC Humber that the crew of R128 were continuing to perform CPR on the third person recovered. However, the helicopter's paramedic assessed that the person had probably been deceased for 30-60 minutes.

At 1441 ARCC informed MRCC Humber that R128 was returning to shore to take the casualties to hospital. It also reported that a Norwegian helicopter, call sign Rescue 1, based at a North Sea oil field, would arrive at the distress position at 1515 to continue searching the area for the missing men.

At 1502 another rescue helicopter, call sign R131, was tasked to assist the search and refuelled and departed RAF Boulmer at 1550.

[8] Navtex (navigation telex) is an international automated medium frequency direct-printing service for delivery of navigational and meteorological warnings and forecasts, as well as urgent marine safety information to ships.

At 1533 R128 landed the casualties at the Wansbeck hospital, Ashington, Northumberland. The helicopter crew had continued to perform CPR on the third person for the duration of the flight, and this was continued by hospital staff until 1550 when he was declared deceased. This person was later identified as James Noble, the skipper of *Ocean Way*.

The SMC at MRCC Humber liaised with the coastguard's duty national search and rescue officer (DNSARO) and duty area officer (DAO) regarding the progress, scope and duration of the search for the missing crew. Coastguard procedures indicated that there was a survivability time of 15 hours for persons in the water in the prevailing conditions, and it was agreed that the search would be continued for as long as possible.

At 1615 R128 returned to RAF Boulmer, but its crew were unable to participate further in the search as the winchman required medical attention following contact with diesel oil when recovering the men from the water.

At 1620 the crew of R131 reported that they had recovered *Ocean Way*'s EPIRB from the water as it had been causing interference in communications with the crew of the Norwegian helicopter Rescue 1. The crew later advised that they were returning to base as their winchman had also been contaminated by diesel oil when recovering the EPIRB.

At 2028 MRCC Humber received a call from the duty officer at the Marine Management Organisation (MMO) advising them of the VMS transmission that had been received from *Ocean Way* at 1051 **(section 1.3.1)**.

The search of the area by helicopters Rescue 1 and R131, which had returned to the area with a replacement crew, continued without success until 2330.

1.4 ENVIRONMENTAL CONDITIONS

Temperatures:

Sea: 11.6°C, Air: 12.8°C

1.4.1 Observation by *Maersk Laser* [9]

Made at 1200 (when the vessel was 40nm north-north-east of the distress position)

Wind: SSW – Force 6 (22-27kts), Sea state: 6 (4-6m), southerly swell.

Visibility: good.

1.4.2 UK Meteorological Office weather hindcast

The UK Meteorological Office marine weather hindcast report for *Ocean Way*'s final passage **(Annex C)** concluded that: "*Ocean Way endured a rough passage as she headed north eastwards into the North Sea. Southerly or south-southwest winds of Force 6 or 7 with gusts of 43kts were possible during the early hours of 2 November and gusts of 31kts towards the end of the voyage. Wind direction veered to the southwest from 0900.*

[9] *Maersk Laser* was approximately 37nm north of *Ocean Way* at the time of the accident

The significant wave height was in the moderate or rough category throughout the voyage. Individual maximum waves, measured from trough to crest could have reached 5.6m during the period 0100 to 0700. Towards the end of the voyage, 1000-1100, an individual maximum wave could have reached 4.7m.

In addition, Ocean Way would have been impacted by a wind wave astern (to starboard) of peak period 8 seconds, and abeam (to starboard) by an increasing primary swell of peak period 8 or 9 seconds. Also during the latter stages, 1000 to 1100, a SSW then S going current would have opposed the SSW to SW wind wave, causing steeper waves than normal."

1.5 CREW

There were five crewmen on board *Ocean Way* at the time of the accident:

The skipper, James Noble, was 45 years old and had been a co-owner of the vessel for 8 years. He had been a fisherman for almost 30 years and had attended all the mandatory fishing industry training courses. Postmortem examination results confirmed that his death was due to drowning.

The remainder of the crew were Filipino nationals, who were experienced fishermen and had completed all the mandatory fishing industry training courses. The two missing men, 38 year old Michael Pulpul, and 34 year old Junito Antonio, had been with the vessel for 7 and 2 years respectively.

The two survivors were 28 and 38 years old. The younger man had been with the vessel for 6 years and the other had joined 5 months before the accident.

The crew remained on board for a 10-month contract, returning to the vessel after a period of 2 months' leave.

1.6 GENERAL DESCRIPTION OF VESSEL

Ocean Way was a steel hulled twin rig trawler with twin bilge keels and a transom stern. The shelter, located aft of the wheelhouse, ran the full width of the vessel and housed the two trawl winches and a processing area where the crew sorted and cleaned the catch.

There were two net drums, located close aft of the shelter. On the deck, close to the transom, there was a *Hercules* watertight hatch lid for access to the aft store, in which mooring ropes and spare gear were kept.

1.6.1 Engine room

The engine room was located forward and below the main deck, accessed via a door off the alleyway that ran beside the mess room on the starboard side.

Ocean Way's main engine was a Caterpillar 3406 that developed 215kW at 1800rpm and turned a fixed four bladed propeller housed in a nozzle.

1.6.2 Bilge alarms

Two bilge alarms were fitted in the engine room bilges and one in the fish room bilge. The alarms were connected to an audible/visual alarm panel located in the wheelhouse.

1.7 WRECK SURVEY

To assist its investigation, the MAIB commissioned a survey of the wreck using a remotely operated vehicle (ROV), equipped with a video camera and a manipulator arm, which was operated from a dynamically positioned surface vessel.

The wreck of *Ocean Way* was found at a depth of 70m, upright and lying on an easterly heading on a flat sandy seabed.

The ROV survey provided information on the following:

1.7.1 Liferafts

Ocean Way carried two liferafts, which had not floated to the surface after the accident. The hydrostatic releases attached to the cradles of both liferaft canisters were observed to have activated correctly. The liferaft painters were still attached to the cradles and both led across the top of the shelter and through the hatch that the survivors had opened when escaping from the main deck **(Figure 4)**.

Although the liferaft canisters were not seen during the ROV survey it was concluded that once out of their cradles the canisters had floated into the shelter deck area of the inverted vessel.

1.7.2 Freeing ports[10] and bulwark openings

Three freeing ports were located on each side of *Ocean Way*'s main deck, which were examined as follows:

Port Side

- Forward and aft freeing ports appeared to have been welded shut with a slot cut into their lower section.

- Centre freeing port appeared to be a hinged plate, but attempts to move it using the ROV's manipulator arm were unsuccessful **(Figure 5)**.

[10] A freeing port is an opening, sometimes fitted with a hinged plate or other closure, in the lower part of a vessel's bulwark to allow water to be shed from the deck and prevent it from being trapped on board.

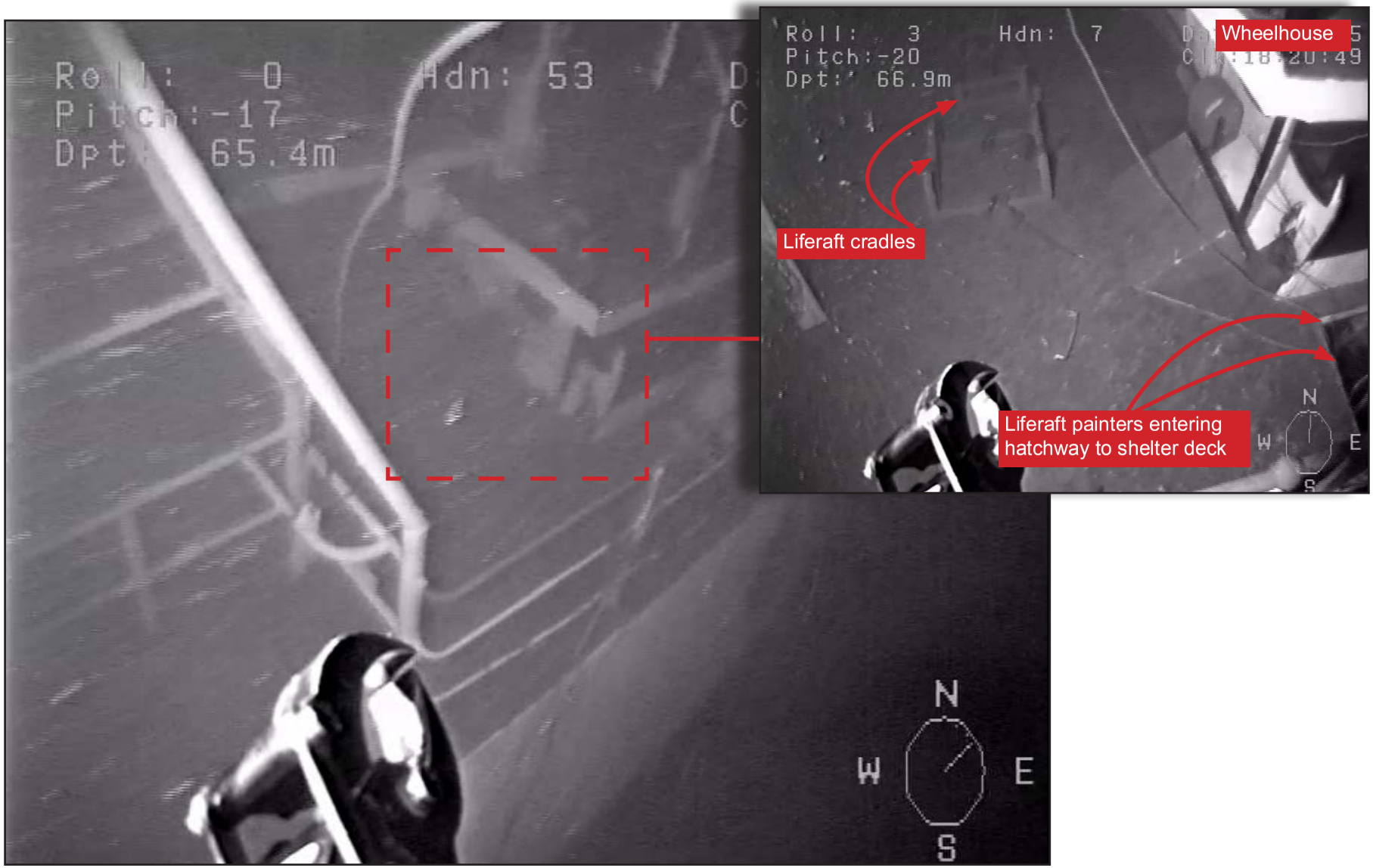

Figure 4 (and inset): ROV survey - showing the location of both liferaft painters

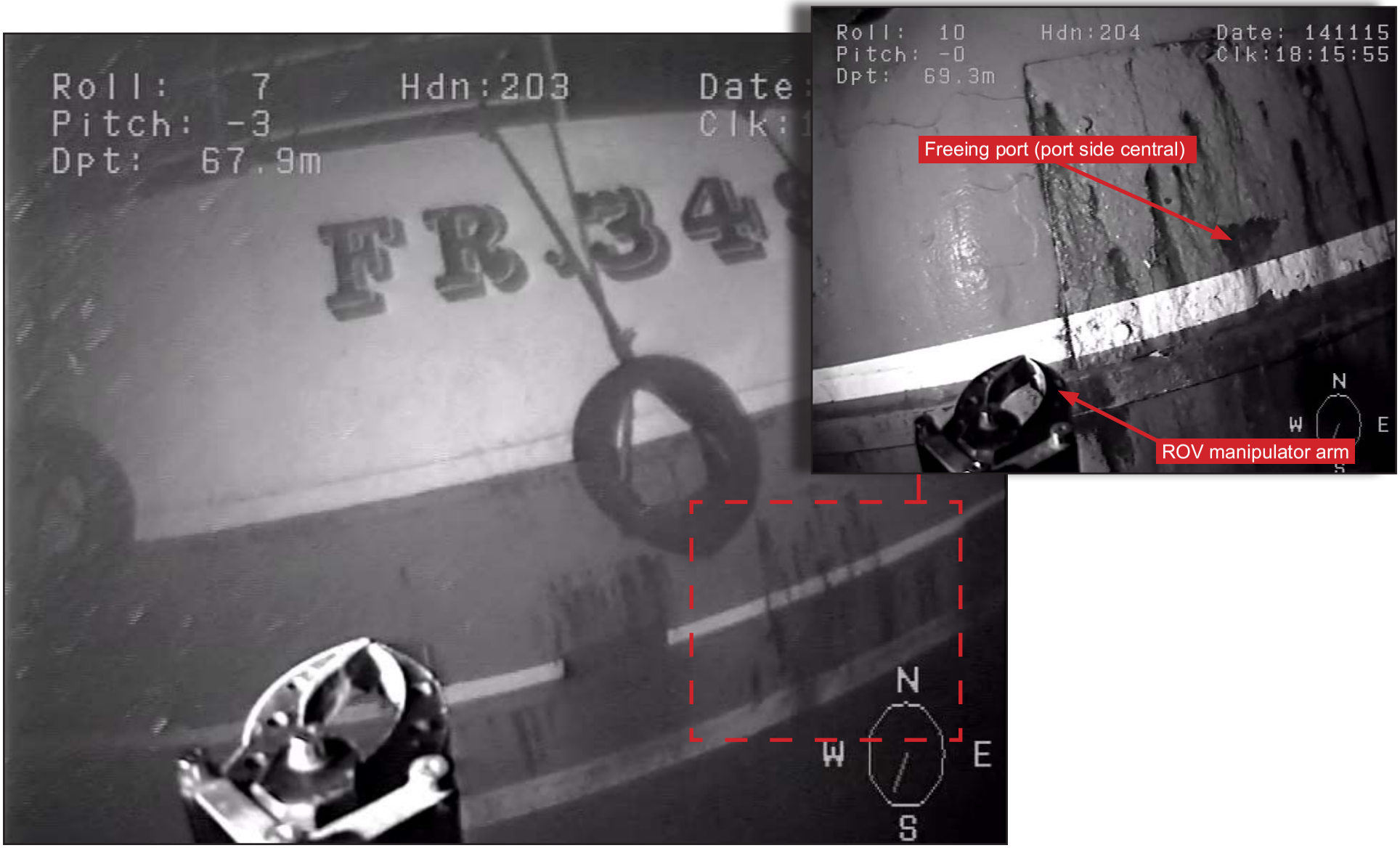

Figure 5 (and inset): ROV survey - showing checks made on freeing port operation

Starboard side

- Forward freeing port was a hinged plate that moved when pressed by the manipulator arm.
- Centre freeing port was observed to be partially open with strands of rope visible and was assumed to have been operational at the time of the accident.
- Aft freeing port appeared to have been welded shut with a slot cut into its lower section.

1.7.3 Rudder position

The rudder position was observed to be hard a port **(Figure 6)**.

Figure 6: ROV survey - rudder found hard-a-port

1.7.4 Aft deck hatch

The aft deck hatch, which provided access to the aft store, was found closed and secured by a *Hercules* watertight lid **(Figure 7)**.

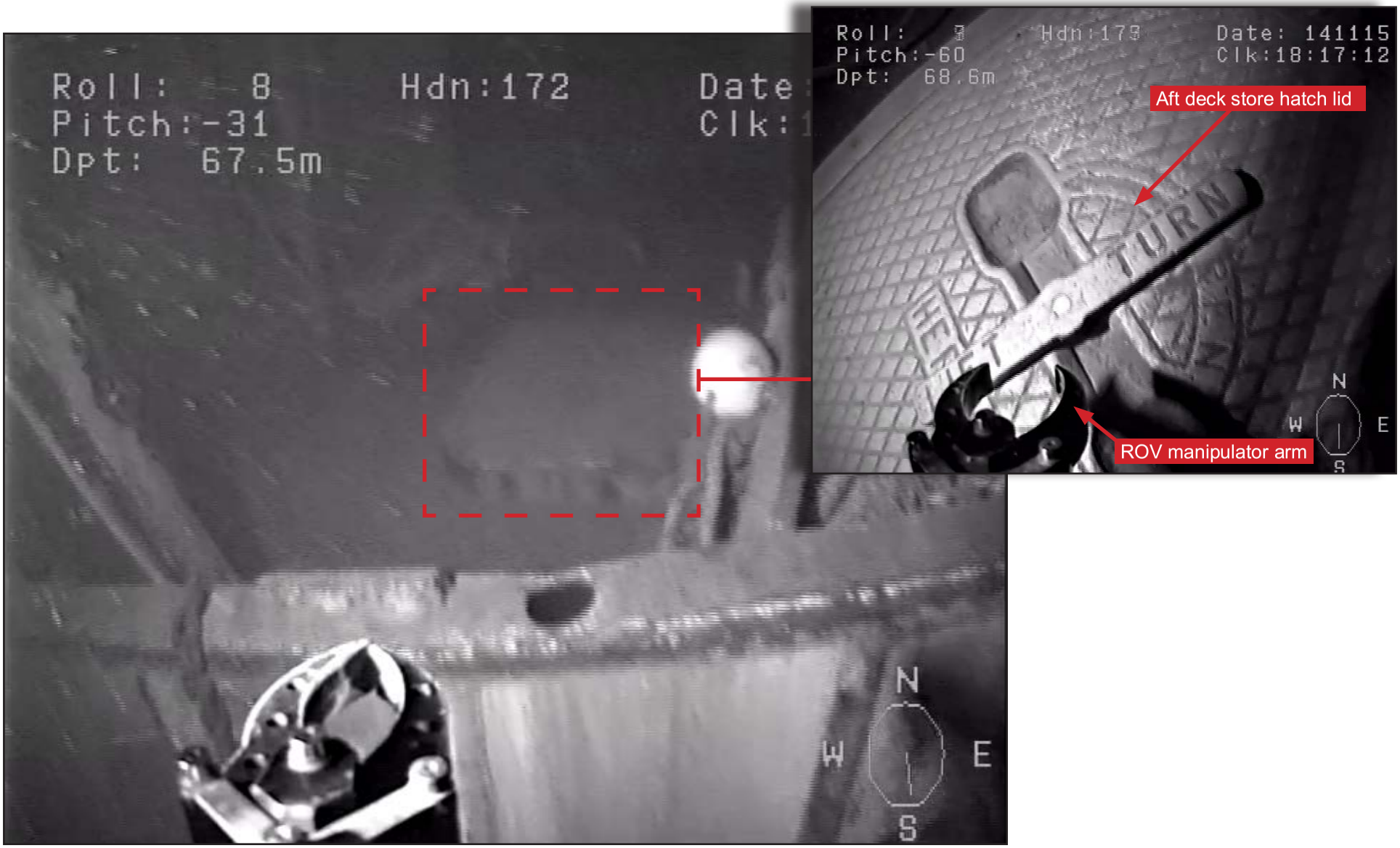

Figure 7 (and inset): ROV survey - aft deck Hercules hatch

1.7.5 Hull

The visible portion of the vessel's hull was inspected by the ROV and no damage or defects were observed.

1.8 REGULATORY REQUIREMENTS

The UK government's maritime regulator, the MCA, issued statutory certification relating to the construction and maintenance of fishing vessels. MCA staff conducted the majority of surveys of fishing vessels under 24m length. On successful survey fishing vessels were issued with a UK fishing vessel certificate (UKFVC) which was valid for 5 years, unless otherwise stated.

The statutory requirements for fishing vessels such as *Ocean Way* were contained in the MCA's Merchant Shipping Notice (MSN) 1770, titled '*The Fishing Vessels Code of Safe Working Practice for the Construction and Use of 15 metre length Overall (LOA) to less than 24metre registered length (RL) Fishing Vessels'*. This is referred to hereafter as the 15-24m Code[11].

The 15-24m Code was given statutory force by The Fishing Vessels (Safety of 15-24 Metre Vessels) Regulations 2002 (SI 2002:2001) which entered force in November 2002. The provisions of the 15-24m Code superseded the Fishing Vessels (Safety Requirements) Rules 1975 which had applied to *Ocean Way* when the vessel was built.

1.8.1 Stability

The 15-24m Code required that approved stability information be provided for various conditions of service and that this should be kept on board in a stability book for the skipper's reference.

The operational conditions required to be included in the stability book included:

- Lightship
- Departure for fishing grounds
- Arrival at fishing grounds.

1.8.2 Freeboard

The 15-24m Code required that in all foreseeable operating conditions a vessel's freeboard[12] should meet stability criteria, provide appropriate safety to the crew and prevent entry of water into enclosed spaces.

1.8.3 Freeing ports

The 15-24m Code specified a minimum freeing port area on each side of fishing vessels on which bulwarks on weather parts of the working deck formed wells.

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[11] MSN 1770 (F): https://www.gov.uk/government/publications/msn-1770-15-to-24-metre-fishing-vessels-construction-and-use

[12] Freeboard: height that the outboard edge of a vessel's deck is above the waterline

The freeing ports were required to be of a specific area relative to the length of the vessel and arranged along the length of the bulwark such that the deck was freed of water "*most rapidly and effectively*".

Ocean Way's Record of Particulars **(Annex D)** stated that there were four freeing ports, of hinged plate construction, on each side of the vessel with a total area of 1.14m².

When the vessel was built, without a shelter, the minimum area of freeing port capacity required, in accordance with the Fishing Vessels (Safety Provisions) Rules 1975, was 0.84m². After the shelter was fitted, this figure was changed to 0.88m², which was the value shown in the vessel's Record of Particulars at the time of the accident **(Annex D)**.

Reference to recent photographs of the vessel, confirmed by the ROV survey, showed that there were three freeing ports on each side, some of which were not hinged plates, with an estimated total area of 0.63m².

1.9 REQUIREMENTS AND GUIDANCE FOR THE CONDUCT OF STATUTORY SURVEYS AND INSPECTIONS

In February 2013 the MCA issued its surveyors with guidance on the application of the stability and freeboard requirements of the 15-24m Code in Marine Survey Instructions to Surveyors (MSIS) 27[13].

MSIS 27 Chapter 3 gave guidance on the permitted changes to a vessel's lightship weight as follows:

3.2.5.2 At each renewal survey a stability assessment is required to ensure that the vessel remains compliant with the approved stability book. This is normally carried out by means of a lightship survey.

3.2.5.3 A lightship survey uses the measured fore and aft draughts at which the vessel is floating to estimate the "as found" weight of the vessel and its longitudinal centre of gravity (LCG) [assuming that LCG = LCB, the longitudinal centre of buoyancy - an approximation which is accepted for lightship surveys]. The lightship is then calculated from the "as found" condition by deducting the deadweight items recorded during the survey. The calculated lightship is then compared with the latest approved lightship in the current stability book to determine the percentage change that has occurred. If it is found that the changes to lightship weight and/or LCG are more than MCA's prescribed limits (suggesting that the vertical centre of gravity has also changed, adversely affecting the vessel's stability) an inclining test should be carried out. Only a full inclining experiment can locate the vertical centre of gravity, accurately defining the vessel's stability.

3.2.5.4 A 2% change in lightship weight (or 2 tonnes, whichever is the greater change) and/or a 1% change in lightship LCG are the MCA's set limits for accepting a lightship survey report as validating compliance with approved stability book.

[13] https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/292310/chapters_3_-_stability___freeboard-2.pdf

3.2.5.6 For fishing vessels marginally in excess of the stability criteria surveyors should strongly recommend to consultants and owners that an inclining test should be carried out in preference to a lightship survey at the renewal survey irrespective of any known changes to the weight or weight distribution. In this context "marginally in excess" is defined as having any single stability criterion with a compliance margin of less than 105% in any of the loading conditions in the approved SIB.

1.10 SURVEY AND INSPECTION HISTORY (FROM 2000)

Ocean Way's Consultative Marine (CM) files provided information on the vessel's certification, survey and lightship tonnage history, a summary of which is presented as follows:

Table 1. History of survey and inspection (details from 2000 due to a lack of information prior to that time)

Date of Survey/ Inspection	Survey/Inspection details
6 September 2000	Inclining test carried out. Vessel failed to meet all the required criteria.
March 2001	9.6t of ballast added below the cabin and a new stability book was approved by MCA. An internal MCA file entry noted: "*Option of making the shelter watertight was not pursued as the small deck area available and positions of net drums and winches in the working area does not offer a workable solution. The design of the vessel has always presented problems to meet stability criteria and the present condition probably is the limit of development possible. The data from the inclining is verified and the hydrostatic data submitted shows a very close correlation with the previously approved book. The verification of criteria shows small margins but in condition 2 (depart port) the GZ at 30° is deficient. As discussed this marginal failure should be accepted"*
20 March 2001	MCA letter to owner re stability books: "*Books have been approved even though condition 2 does not meet the criteria in all respects. You will note that a minimum righting lever of 0.2m is required at an angle of 30°* or more. *The table shows that the GZ at 30° = 0.197m. The curve is very flat in this condition and all other conditions are within the limits."*
22 July 2004	Vessel surveyed and UKFVC issued
23 July 2004	MCA informed that 9.6t ballast fitted in March 2001 had been dumped from vessel shortly after the 2001 survey. Additional ballast to be fitted to keel
18 August 2004	Inclining test carried out.
16 December 2004	MCA stability unit request clarification of location of ballast on vessel
5 May 2005	Stability book approved

Date of Survey/ Inspection	Survey/Inspection details
18 May 2007	MCA was advised by consultants that the following works had been undertaken: replacement engine fitted, an oil fuel tank had been created in fore peak void, a new hydraulic system had been fitted and 1.52t of ballast added. A revised 'depart for grounds' stability condition was submitted which showed the area under GZ curve between 30° and 40° was 0.033metre.radians (minimum required was 0.030metre.radians)
6 June 2007	Record of Minor Alterations related to the works undertaken in May 2007 was accepted by MCA
9 June 2009	UKFVC survey undertaken & UKFVC issued to 28/01/2012 (short term due to uncertainty of hull thickness measurements)
9 July 2009	Consultants undertake lightship check following installation of a deck crane and note that vessel has "slim margins" of stabil-ity and recommend that the owners fit additional ballast
29 October 2009	MCA approve Record of Minor Alterations following work in July 2009 and installation of additional ballast.
25 January 2012	UKFVC (short term) issued (a number of short term certificates were issued due to concerns about the vessel's hull plate thickness which were proved to be unfounded following a review of its files in September 2014)
16 April 2012	UKFVC survey - 16 defects observed including starboard side freeing port jammed – all rectified and UKFVC issued to July 2014
25 April 2013	Guard ship survey carried out, 20 deficiencies found including defective fish hold bilge alarm – all rectified
25 June 2014	UKFVC survey 28 deficiencies found, including freeing ports on starboard side jammed – rectified UKFVC (short term) issued to August 2014
11 August 2014	Lightship stability check carried out. UKFVC (short term – awaiting calculations) issued to 27 November 2014

1.10.1 Lightship calculations from 2004

Table 2. Lightship calculations from 2004

Lightship checks Date	Weight (tonnes)	Longitudinal centre of gravity	Vertical centre of gravity
2004 (inclining test)	85.28	8.155m	2.496m
2007	88.30	8.268m	2.483m
2009	91.0	8.208m	2.453m
2014	89.2	8.052m	

No reference was made to the forward fuel tank in the vessel's stability information following its conversion from a void space in 2007.

1.11 LOSS CONDITION STABILITY AND FREEBOARD

1.11.1 Stability

The vessel's stability at the time of the accident was assessed with a computer model using the estimated weight of fuel, ice, fresh water, stores, fishing gear and crew on board **(Annex E)**.

In view of the report of water on deck, the vessel's stability was also assessed assuming varying amounts of trapped water on deck within the vessel's bulwarks.

The results of the assessment indicated that with approximately 6.54t of water on deck the vessel's stability was degraded to the point where there was little righting moment left to resist the forces of the wind and waves.

This amount of water (6.54t) equated to a uniform layer 0.29m deep lying on the vessel's exposed deck area.

1.11.2 Freeboard

The stability book produced for *Ocean Way* following an inclining test in 2004, gave, inter alia, the vessel's '*departure for fishing grounds*' condition, which stated that its minimum freeboard aft was 0.654m.

1.12 BROACHING

The risk of vessels broaching in following seas is explained in an IMO publication: *Phenomena occurring in following and quartering seas* (IMO MSC.1/Circ.1228), which includes the following information:

A ship sailing in following or stern quartering seas encounters the waves with a longer period than in beam, head or bow waves, and principal dangers caused in such a situation are:

Surf-riding and broaching-to.

When a ship is situated on the steep forefront of a high wave in following or quartering sea conditions, the ship can be accelerated to ride on the wave. This is known as surf-riding. In this situation the so-called broaching-to phenomenon may occur, which endangers the ship to capsizing as a result of a sudden change of the ship's heading and unexpected large heeling.

The dynamic behaviour of a ship in following and quartering seas is very complex. Ship motion is three-dimensional and various detrimental factors or dangerous phenomena like additional heeling moments due to deck-edge submerging, water shipping and trapping on deck may occur in combination with the above mentioned phenomena, simultaneously or consecutively. This may create extremely dangerous combinations, which may cause capsize.

1.13 EPIRB OPERATION

1.13.1 Overview

An EPIRB is a beacon, designed for maritime use, that transmits distress signals to aid the location of vessels and persons in grave and imminent danger and who require immediate assistance.

The EPIRB can be activated manually, automatically on entering the water (immersion activated) or when floating free from the vessel (hydrostatic release activated). The latter was the type fitted on *Ocean Way*.

The EPIRB transmits a digitally encoded signal, on a frequency of 406MHz that can contain the following information:

- The beacon's country of origin.
- A unique 15-digit hexadecimal beacon identification number.
- Whether or not the beacon contains a 121.5-MHz homing signal transmitter.
- Location, if the beacon is equipped with an integrated global navigation satellite system (GNSS) receiver, (*Ocean Way*'s beacon was not).

1.13.2 Satellite tracking of an EPIRB

EPIRB 406MHz transmissions are received by satellites that form part of an international search and rescue system named COSPAS-SARSAT[14] **(Figure 8)**.

From the satellites, the beacon's data is sent to a LUT and then relayed to the UKMCC. Once the 406MHz transmission was received from *Ocean Way*'s EPIRB the UKMCC informed MRCC Falmouth, the UK SAR point of contact, which later notified MRCC Humber about the beacon alert.

1.13.3 Detect only and unresolved alerts

When the position of a transmitting beacon is not known with any degree of certainty, the received transmission is referred to as 'detect only' alert.

[14] COSPAS is an acronym for the Russian words "Cosmicheskaya Sistema Poiska Avariynyh Sudov," which translates to "Space System for the Search of Vessels in Distress;" SARSAT is an acronym for Search and Rescue Satellite-Aided Tracking

The position of *Ocean Way*'s EPIRB was classed as 'unresolved' when its transmission was first received by a low earth orbiting satellite (LEOSAT)[15]. Doppler effect produced two possible positions, A and B, on each side of the Doppler wave, which were transmitted by various LUTs to the UKMCC.

The A and B positions received by UKMCC at 1058 were 'detect only' as no positional information was given. The A and B positions received at 1104 **(Figure 9)**, were classed as 'unresolved' when notified to MRCC Falmouth at 1114. The first resolved position was received by UKMCC at 1145.

[15] LEOSAT: Low Earth Orbit satellites orbit the Earth 14 times a day and use the Doppler effect with satellite orbital ephemeris data to calculate the position of a beacon.

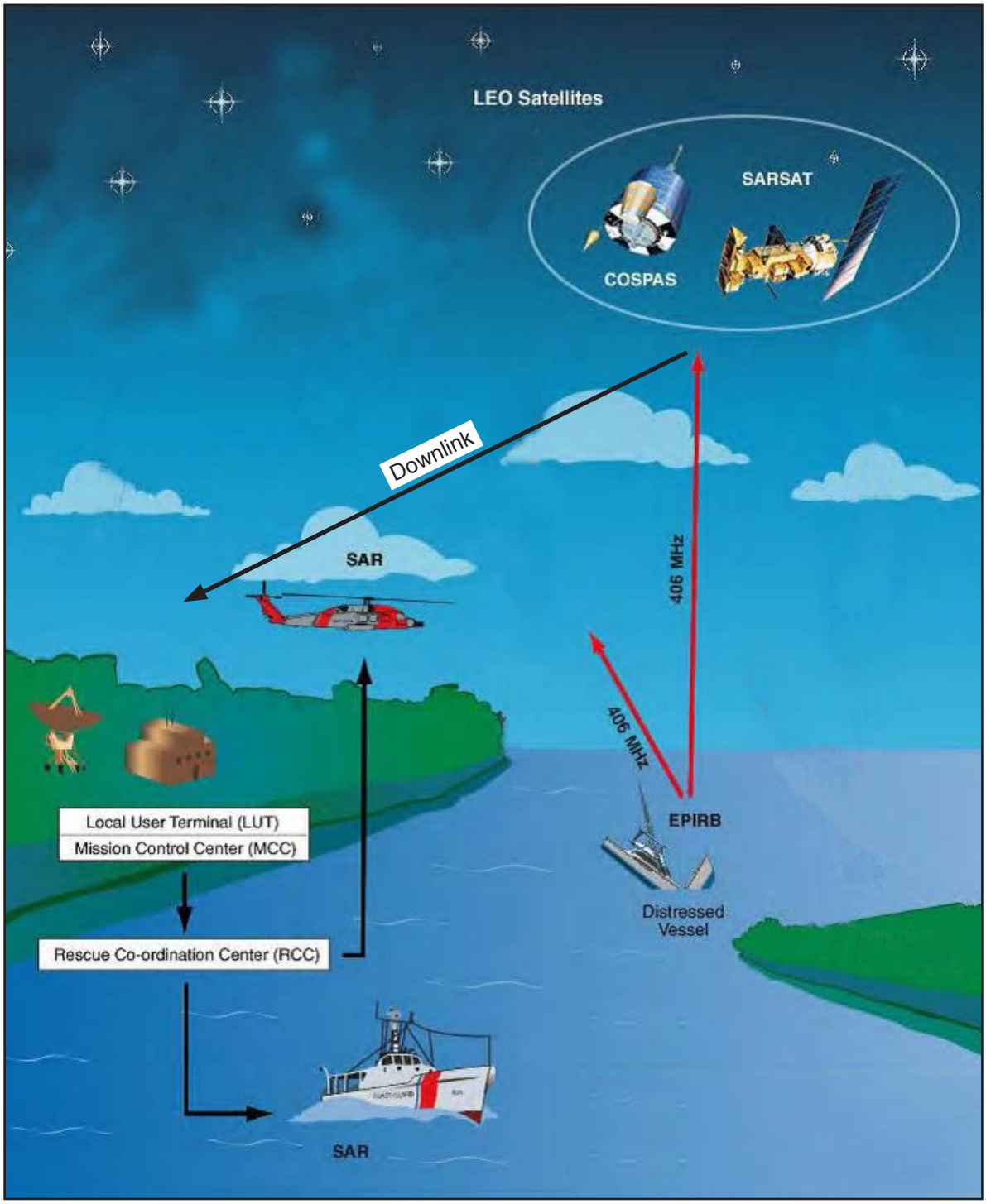

Image courtesy of COSPAS/SARSAT

Figure 8: Search and Rescue satellite system overview

Input file name : OCC$406_HISTORY
Output time : 03-Nov-14 56:04.3

Last Record Number Used : 8116
Last Update Time : 03-Nov-14 55:38.8

Decoded Beacon ID : UKM/SER/MAR 161410 0 0186/AH
Beacon ID (30 hex) : 4E86A4ED0400174B8CD09000000000

Rec Num	Rec Type	Sat ID	Lut ID	Beacon ID (15-hex)	4b ERR	B	CFW	%	DAY	TCA HR:MN:SC	Passes /Soln	Lat Dg	A Min	Lng Dg	A Min	Lat Dg	B Min	Lng Dg	B Min	#MP A/B	Pts	Dist (Km)	CTA (Dg)
5524	DTCT	G63	2273	9D0D49D A08002E9	8				306	10:58:31													
5525	DTCT	G62	2402	9D0D49D A08002E9	8				306	10:58:31													
5535	DTCT	S11	2573	9D0D49D A08002E9	4				306	10:58:31													
5543	SNGL	S11	2321	9D0D49D A08002E9	-9	4	5	50	306	11:04:06	1/1	59	35.44N	20	53.23W	55	34.03N	1	23.84E	0/0	3		-6.2
5552	CONFT	S11	2272	9D0D49D A08002E9	-9	4	0	96	306	11:04:05	1/1	55	48.72N	1	09.12E	59	37.20N	19	51.96W	1/1	27		6.1
5553	RJCT	S11	2272	9D0D49D A08002E9	-9	4	0	73	306	11:04:06	1/2	59	37.49N	19	52.53W	55	48.71N	1	09.13E	0/0	15	31.39	6.1
5557	DTCT	G62	2713	9D0D49D A08002E9	8				306	10:59:21													
5562	DTCT	G63	2322	9D0D49D A08002E9	8				306	11:15:25													
5581	DTCT	S12	2321	9D0D49D A08002E9	8				306	11:27:54													
5647	DTCT	G63	2322	9D0D49D A08002E9	8				306	11:39:12													
5649	DTCT	G63	2472	9D0D49D A08002E9	8				306	11:39:12													
5652	DTCT	G63	2322	9D0D49D A08002E9	8				306	11:43:25													
5656	DTCT	G63	2322	9D0D49D A08002E9	8				306	11:48:24													
5660	DTCT	G63	2322	9D0D49D A08002E9	8	3	0	95	306	11:51:44													
5663	MIR-B	S10	3031	9D0D49D A08002E9	-4	4	0	99	306	11:45:34	1/1	55	48.36N	1	09.48E	73	58.74N	117	15.48E	0/0	7		23
5664	AMBIG	S10	3031	9D0D49D A08002E9	-9				306	11:45:34	2/2	55	48.56N	1	09.19E	55	48.36N	1	09.48E	0/0	17	0.768	23
5666	DTCT	G63	2322	9D0D49D A08002E9	8				306	11:59:16													
5673	MIR-B	S13	2321	9D0D49D A08002E9	-9	2	0	85	306	11:55:45	1/1	55	49.18N	1	11.27E	63	50.08N	44	07.29W	0/0	13		12.3
5674	MULT	S13	2321	9D0D49D A08002E9	-9	4	0	99	306	11:55:45	3/3	55	48.67N	1	09.76E	55	49.18N	1	11.27E	0/0	16	2.461	12.3

Figure 9: *Ocean Way*'s EPIRB transmission history

1.13.4 *Ocean Way*'s EPIRB

The EPIRB installed on *Ocean Way* was a Standard Communications GME, type MT403FF **(Figure 10)**. This model was not fitted with an integral GNSS receiver.

The unit had been tested by an approved contractor in October 2014 when the operation of its hydrostatic release unit (HRU), expiry date July 2016, was also verified.

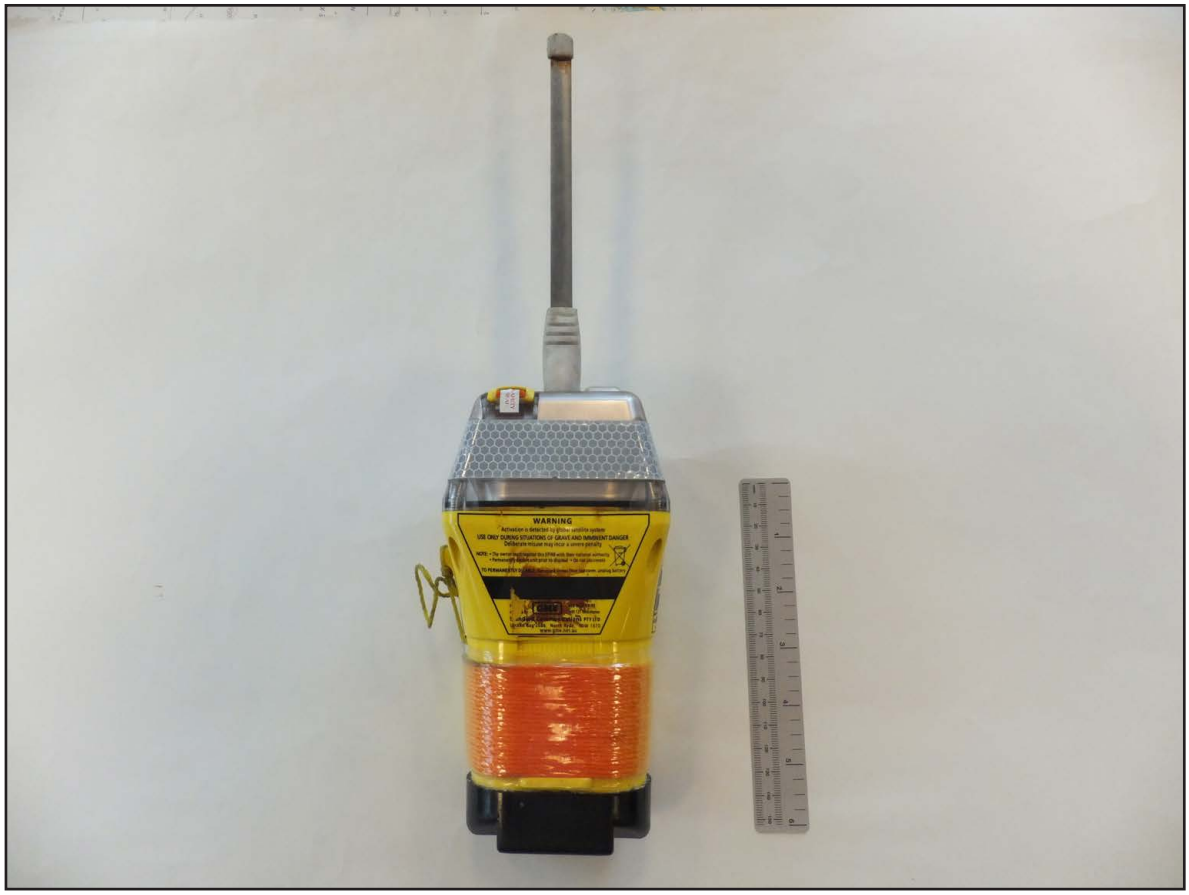

Figure 10: EPIRB fitted on *Ocean Way*

1.14 HM COASTGUARD PROCEDURES

1.14.1 EPIRB activation

The coastguard standard operating procedure (SOP) for an EPIRB activation stated that:

- "*An EPIRB activation is always a distress alert*".
- "*All alerts (from beacons) should be considered real and SAR action initiated and progressed until the alert is confirmed as false".*
- "*Detect only alerts provide Rescue Co-ordination Centres the opportunity to initiate SAR action earlier than might otherwise be possible*".

1.14.2 Transfer of co-ordination

The coastguard procedure for transfer of co-ordination **(Annex F)** stated that:

"If transfer of co-ordination between MRCCs is deemed necessary, it must be effected in an orderly manner. A fully completed SAR Sitrep should be sent from the old to the new co-ordinating station, copied to the Duty Area Officer(s). The Co-ordination Transfer Form format should be used as a guide to the information required in the SAR Sitrep.

Before any transfer is finalised, the respective SMCs are to discuss any outstanding issues, satisfy themselves that all relevant information has been transferred and ensure that there is no doubt about asset tasking."

1.15 IMMERSION IN COLD WATER

Sudden immersion in cold water (deemed to be water under 15ºC) can be fatal in the following ways[16]:

1. 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, peaks within 30 seconds and lasts for 2-3 minutes. Cold shock is considered to be the cause of the majority of drowning deaths.

2. Loss of dexterity and co-ordination. In cold water, cooling of the hands, arms and legs can result in loss of dexterity and co-ordination, resulting in loss of ability to swim or conduct survival tasks, such as firing a flare. The colder the water, the more rapid the loss of dexterity, with swimming ability being lost in as little as 10 minutes in water of 5ºC.

3. Hypothermia. Continued immersion in cold water causes body core temperature to reduce, leading to slowed mental function, unconsciousness and, eventually, death. The rate at which an individual will cool will vary depending on a number of factors, with survival time dependent on the rate at which core temperature is lost. Predictions vary, but in water of 5ºC survival time for a lightly clad individual is around 2 hours or less.

1.16 SISTER VESSELS

The owners of the two surviving sister vessels still fishing in UK waters were contacted after the accident. They confirmed that the shelter decks of their vessels had been previously made weathertight by the installation of a transverse bulkhead with watertight doors at the aft end of the shelter **(Figure 11)**.

1.17 PREVIOUS / SIMILAR ACCIDENTS

In November 2004, the fishing vessel *Jann Denise II* sank while returning to the port of North Shields. Its crew of two lost their lives. The MAIB investigation into the loss of the vessel[17] concluded, inter alia, that:

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[16] Golden, F and Tipton, M (2002). Essentials of Sea Survival. Human Kinetics: Leeds, UK

[17] https://assets.digital.cabinet-office.gov.uk/media/547c70b1ed915d4c0d0000c7/MAIB_Tri-Report.pdf

- Its inherent stability was marginal and was a major factor in the loss of the vessel.
- The loss occurred very quickly, since her skipper had insufficient time to transmit a “Mayday”.

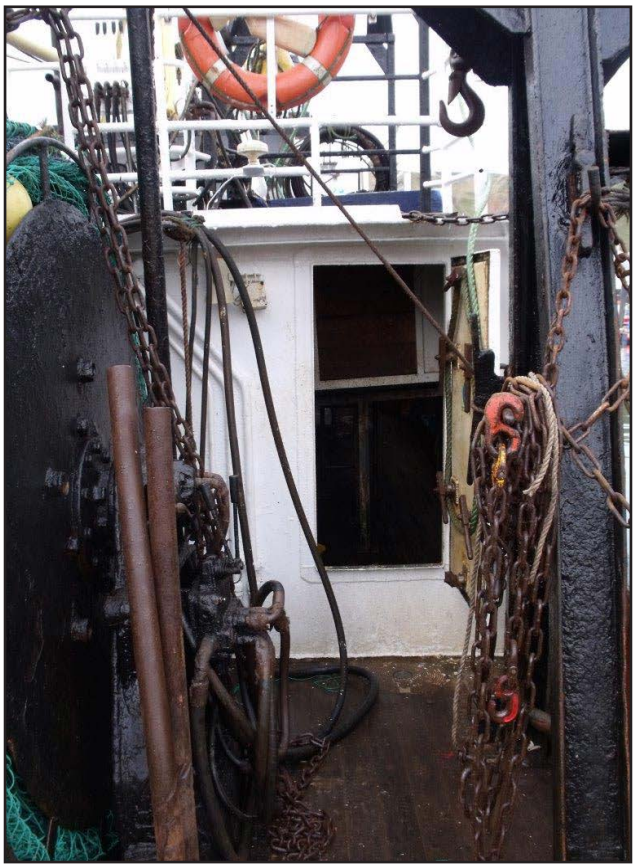

Figure 11: Weathertight shelter fitted on sister vessels

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 LOSS SCENARIO ANALYSIS

The investigation considered various scenarios for the vessel's sudden capsize including: broaching, swamping, internal flooding (pipework failure), hull failure, collision, downflooding (progressive) and movement of weights (internal).

No evidence was found to support the vessel's loss being caused by internal flooding, hull failure, collision, downflooding or by a sudden shift of weight inside the vessel. It is also not considered that this accident occurred as a result of swamping since the loss of stability resulting from water entrapment would have caused the vessel to capsize before sufficient water could be shipped to cause it to be swamped.

Ocean Way's freeing port capacity was found to be less than required by the 15-25m Code. It was calculated that with 0.29m of entrapped water on deck the vessel's stability and freeboard aft would have been significantly reduced.

The ROV survey of *Ocean Way* found the vessel upright on the seabed with its rudder hard to port. This suggests the autopilot had moved the helm to port to counter a significant change of heading to starboard, consistent with the vessel surf-riding and broaching to starboard immediately prior to its capsize.

It is probable that *Ocean Way* broached to starboard and capsized when its angle of heel exceeded the angle at which the vessel's maximum righting moment occurred which, due to trapped water on deck, was 24°.

2.3 *OCEAN WAY*'S SURVEY HISTORY

2.3.1 Marginal stability

In March 2001 a note in the vessel's CM file stated: "*The verification of criteria shows small margins* [of stability] *but in condition 2 (depart port) the GZ at 30° is deficient. As discussed this marginal failure should be accepted."*

Analysis of lightship checks undertaken between 2004 and 2014 **(Table 2)** showed a 4.6% increase in weight from 85.28t to 89.2t. MCA's Instructions to Surveyors, issued in 2013, required that when the changes to lightship weight exceeded 2%, an inclining test should be carried out.

Despite *Ocean Way*'s records indicating a history of marginal stability, the MCA made no recommendation to its owners to carry out an inclining test at the 2014 survey.

2.3.2 Freeing ports

It was not unusual for significant quantities of water to become entrapped on *Ocean Way*'s deck, as was the case before the accident. Due to its marginal stability, 6.54t of entrapped water would have been sufficient to make the vessel dangerously unstable.

The ability of the freeing ports to clear water from the vessel's deck was reduced at the time of the accident as one of the ports was not working. However, the ROV survey and photographic evidence showed that *Ocean Way* had fewer freeing ports, which were smaller and of differing types, than indicated in the vessel's Record of Particulars.

The modifications made to the freeing ports, which reduced their capacity, were not identified during successive surveys of the vessel and the value shown on the vessel's Record of Particulars **(Annex D)** were incorrect as the figure of 0.88m^2 should have been the total area requirement for the vessel.

Had the capability of the freeing ports been maintained in accordance with statutory requirements, the amount of water trapped on the deck of *Ocean Way* and the consequent risk of capsize would have been reduced.

2.3.3 Shelter

In March 2001 an entry in *Ocean Way*'s CM file stated that "*the option of making the shelter watertight was not pursued as the small deck area available and positions of net drums and winches in the working area does not offer a workable solution".*

Following the accident, the owners of the two, UK registered, sister vessels still in operation confirmed that their shelter deck areas had been made weathertight several years prior to this accident. It is unfortunate that, as those vessels were also subject to the MCA survey regime, the then owners of *Ocean Way* considered it impractical to make the shelter deck area weathertight.

If *Ocean Way*'s shelter deck had been made weathertight the amount of water that could become entrained on deck would have been reduced, which would have significantly improved the vessel's ability to survive water being shipped onto its deck.

2.4 SEARCH AND RESCUE CO-ORDINATION

2.4.1 SAR response – summary of key times

The first alert from *Ocean Way*'s EPIRB was received in the UK at 1058, however the first SAR helicopter was not tasked until 1155. As the helicopter was already airborne, on exercise, it needed to refuel before deploying and it left RAF Boulmer for the distress position at 1259.

The helicopter arrived on scene at 1343 and recovered two survivors, both suffering from hypothermia, at 1354. The skipper was recovered at 1423 but was non-responsive; the bodies of the other crewmen were not found.

2.4.2 Initial notification to MRCC Humber

At 1115 MRCC Falmouth informed MRCC Humber that a 'detect only' alert had been received from *Ocean Way*'s EPIRB and that, based on information from the IMDatE database, the vessel was south-south-east of Holy Island **(Figure 3)**. However, this was in fact the final position obtained from the vessel's AIS at 2359 on 1 November, after which its AIS transmissions could no longer be received as *Ocean Way* proceeded further offshore.

It is likely that this initial, AIS based, positional information led the SMC at MRCC Humber to believe that the vessel was closer inshore. This cognitive bias would have been reinforced when, at 1120, the Amble lifeboat reported that it had detected an emergency beacon homing signal in the inshore area.

At 1124, MRCC Falmouth told MRCC Humber that the vessel was "further out than first thought", presumably based on unresolved positional information obtained from the EPIRB at 1104. At 1131 the skipper of *Success* reported to MRCC Humber that *Ocean Way* had left port the previous evening for the Gut "which was about 120nm offshore".

However, it is probable that, as a result of cognitive bias, the information that the vessel was further out was not given appropriate consideration by MRCC Humber, which delayed the focus of the search being placed towards the correct location.

2.4.3 Transfer of co-ordination

MCA procedures state that it is not normally desirable to change responsibility for the overall co-ordination of an incident in progress. However, when an EPIRB alert is resolved, MRCC Falmouth may formally pass co-ordination by sending a fully completed SAR Sitrep to the new co-ordinating station, copied to the Duty Area Officer(s). The respective SMCs are also required to discuss any outstanding issues before the transfer is finalised.

In this instance MRCC Humber accepted co-ordination of the incident at 1133 from MRCC Falmouth with no SAR Sitrep and without a formal handover between the relevant SMCs.

Had the transfer of co-ordination been undertaken in accordance with MCA procedures, the formal recording of the vessel's probable distress location might have enabled the earlier initiation of a SAR response.

2.4.4 "Mayday" broadcast and helicopter tasking

The first "Mayday Relay" broadcast was made by MRCC Humber at 1139; this gave the EPIRB's correct position. However, the first helicopter was not tasked until 1155.

MCA procedures state that all alerts from emergency beacons should be considered real and SAR action initiated and progressed until the alert is confirmed as false.

In this case, probably due to the initial reference to the vessel being south-south-east of Holy Island, the opportunity for an earlier helicopter tasking was missed.

2.4.5 Information technology equipment

MRCC Falmouth was equipped with computers capable of accessing the IMDatE database, which contained information received from both the vessel's AIS transmissions and VMS reports. MRCC Humber did not have this capability because its computer equipment was older. This situation hampered its ability to manage SAR missions.

It is essential that SMCs have access to appropriate information technology to enable the efficient management of SAR missions in the UK.

2.4.6 Vessel tasking

Maersk Laser, an oil platform support vessel with excellent rescue capability, contacted Humber MRCC at 1216 and offered its services. At that time the vessel was about 40nm from the distress position, which it could have reached in 3 hours.

However, Humber MRCC informed the vessel that its assistance was not required without assessing its ability to conduct and co-ordinate a surface search.

A surface vessel, particularly one with the capability of *Maersk Laser*, would have improved the efficiency of the search and, in this case, could have recovered the EPIRB, enabling the helicopters to remain on scene for a longer period.

2.5 ACCESS TO VMS INFORMATION

At 2028 MRCC Humber received a telephone call from the MMO duty officer that informed them of the position, course and speed of *Ocean Way* at 1051 that morning.

Had this information been available when the first EPIRB transmission was received at 1058, it would have enabled a far quicker tasking of helicopters to the accident location.

VMS information is a European requirement for fisheries management, however the data may be used for other purposes. Had contemporaneous VMS information been available to the MRCCs at the start of the incident, *Ocean Way*'s position would have been determined much earlier.

2.6 EPIRB OPERATION

The first transmission was received from *Ocean Way*'s EPIRB at 1058, and within a few minutes this information was relayed to MRCC Falmouth.

However, as the vessel's EPIRB was not fitted with integral GNSS capability, no positional information was available to the rescue services at that time.

Over the course of the next hour further transmissions from *Ocean Way*'s EPIRB were received by successive satellite passes, and the beacon's resolved position was received at UKMCC at 1145.

The first helicopter was tasked to proceed at 1155. Had *Ocean Way*'s EPIRB been fitted with integral GNSS there would have been less uncertainty regarding its position, which would have enabled the helicopter to be tasked about 50 minutes earlier.

2.7 SURVIVABILITY

Ocean Way capsized so rapidly that its crew did not have time to send a distress signal or don lifejackets before they were immersed. The sea water temperature was 11.6°C and so cold water shock was a primary danger. Key to surviving cold water shock is the ability to keep one's head above water and the airway clear, for which a lifejacket is normally considered essential.

The two survivors were able to stay close to the capsized vessel, and quickly climbed out of the water onto the upturned hull, from where they saw James Noble and Junito Antonio on the surface. However, the two men in the water appeared unresponsive, suggesting that they had either drowned as the vessel capsized or succumbed to the effects of cold water shock.

The intensity of the cold shock response is dependent on the rate of change of skin temperature.[18] By the time *Ocean Way* sank, forcing the survivors to re-enter the water, their skin temperature would have dropped significantly, reducing the rate of temperature change on re-entry and so reducing the effects of cold shock. Although the survivors were showing signs of hypothermia when rescued, they soon revived once they had been warmed up in the helicopter.

The delay in the initial tasking of a rescue helicopter to the distress location could, in other circumstances, have had serious implications for persons in the water. However, in this case it is considered unlikely that the delay affected the outcome of the rescue.

[18] Golden, F and Tipton, M (2002). Essentials of Sea Survival. Human Kinetics: Leeds, UK

SECTION 3 - CONCLUSIONS

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

1. The risk of a vessel broaching and capsizing in high following seas, especially in situations where water becomes entrapped on the deck is significant. [2.2]

2. Had the capacity of *Ocean Way*'s freeing ports been maintained in accordance with statutory requirements, the amount of water trapped on deck and the consequent risk of capsize would have been reduced. [2.3.2]

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

1. Despite the vessel's history of marginal stability, an inclining test had not been carried out for more than 10 years. [2.3.1]

2. The modifications made to *Ocean Way*'s freeing ports and the fact that they were not as indicated in its Record of Particulars was not identified during successive surveys of the vessel. [2.3.2]

3. If *Ocean Way*'s shelter deck had been made weathertight the amount of water that could become entrained on deck would have been reduced, which would have significantly improved the vessel's ability to survive wash-over. [2.3.3]

4. Although accurate positional information for the vessel became available, this was not initially recognised by the SAR authority due to its cognitive bias towards information that placed the vessel further inshore. [2.4.2]

5. It is important that procedures are followed to avoid essential information being overlooked when staff are engaged in demanding situations. The opportunity to task a rescue helicopter at an earlier stage of the incident was missed. [2.4.3, 2.4.4]

6. The efficient conduct of SAR missions would be more effective if all UK MRCCs were equipped with computer systems capable of gaining access to essential information from all available databases. [2.4.5]

7. The opportunity to task a vessel to the search area to co-ordinate surface SAR operations in that area was not taken. [2.4.6]

8. The availability of contemporaneous VMS information to MRCCs would prove of great value in identifying, locating and assisting fishing vessels in distress. [2.5]

9. If the vessel's EPIRB had been fitted with an integral GNSS it is probable that a helicopter would have been tasked about 50 minutes sooner. [2.7]

SECTION 4 - ACTION TAKEN

4.1 MAIB ACTION

The MAIB has:

Issued a safety flyer to the fishing industry **(Annex G)** to:

- Highlight the benefits of an EPIRB being fitted with an integral GNSS capability.
- Highlight the dangers of broaching in high following seas.

4.2 ACTIONS TAKEN BY OTHER ORGANISATIONS

The Maritime and Coastguard Agency has:

- Revised its instructions to surveyors to clarify the tolerance for increase in lightship weight of fishing vessels as a trigger for undertaking an inclining test.
- Revised its instructions to surveyors to ensure, during survey, that the capacity of freeing ports is as stated in the vessel's Record of Particulars **(Annex H)**.
- Included a requirement that EPIRBs be equipped with GNSS in proposed new Codes of Practice for the safety of fishing vessels.
- Ensured that the computer equipment in all MRCCs is capable of accessing vessels' positional information in a timely manner.
- Updated staff training provision to ensure appropriate consideration is given to the use of all resources when responding to requests for assistance.
- Reviewed its staff training in operational procedures to ensure the correct handover of incident co-ordination is followed in the future.

The Marine Management Organisation and **Marine Scotland** have:

Provided the MCA with live access to VMS information relating to the position, course and speed of UK registered fishing vessels in distress situations.

SECTION 5 - RECOMMENDATIONS

The Maritime and Coastguard Agency is recommended to:

2015/154 Take action to ensure that the EPIRBs required to be carried on UK registered fishing vessels are equipped with integral GNSS receivers.

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

Marine Accident Report

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