

Report on the investigation of  
a fatal accident to the skipper of fishing vessel

***Ronan Orla***

3 miles north-east of Porth Dinllaen

north Wales

on 30 March 2014



**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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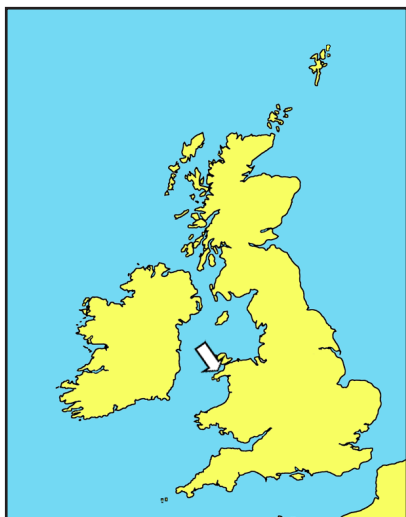
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## GLOSSARY OF ABBREVIATIONS AND ACRONYMS

ALB	-	All-weather lifeboat
DSC	-	Digital selective calling
EPIRB	-	Emergency position indicating radio beacon
FISG	-	Fishing Industry Safety Group
GMDSS	-	Global Maritime Distress and Safety System
GPS	-	Global positioning system
GRP	-	Glass-reinforced plastic
IMO	-	International Maritime Organization
LOLER	-	The Merchant Shipping and Fishing Vessels (Lifting Operations and Lifting Equipment) Regulations 2006
m	-	metre
MCA	-	Maritime and Coastguard Agency
MGN	-	Marine Guidance Note
mm	-	millimetre
MSN	-	Merchant Shipping Notice
N	-	Newton
PFD	-	Personal flotation device
PUWER	-	The Merchant Shipping and Fishing Vessels (Provision and Use of Work Equipment) Regulations 2006
RNLI	-	Royal National Lifeboat Institution
SAC	-	Special area of conservation
Seafish	-	Sea Fish Industry Authority
UTC	-	Universal Co-ordinated Time
VHF	-	Very high frequency
VMS	-	Vessel monitoring system

**TIMES:** all times used in this report are UTC+1 unless otherwise stated

## SYNOPSIS



At about 1100 on 30 March 2014, the owner/skipper of the 9.98m scallop dredger *Ronan Orla* was fatally injured when he became entangled on the starboard warping drum of the vessel's winch. The skipper was operating the vessel single-handedly and was attempting to recover his dredge gear on board when the accident happened. About 4 hours later, the crew of another scallop dredger noticed that *Ronan Orla* appeared to be in trouble. They came alongside *Ronan Orla* and a crewman climbed on board and stopped the winch. It was apparent that *Ronan Orla*'s skipper was deceased.

The skipper died because he was unable to disentangle himself or stop the winch before succumbing to his injuries. The MAIB investigation was unable to determine conclusively

the mechanism by which the skipper was pulled onto the rotating winch drum. However, the most likely cause was the snagging of one of the shoulder straps on his bib and brace trousers. The investigation identified several underlying contributory factors; these included:

- *Ronan Orla* and its equipment had not been adequately maintained, and its winch was in a dangerously poor condition.
- It was unsafe to operate *Ronan Orla* as a scallop dredger single-handedly.
- The winch had not been fitted with the safety devices required by UK legislation and recommended by the International Maritime Organization, the Maritime and Coastguard Agency and industry bodies.

Had an emergency stop been fitted, the skipper might have been able to stop the winch; had the winch control lever been designed to return to its stopped position when released, the accident would have been prevented.

The skipper was well qualified and had many years' experience working as a crewman on well-run scallop dredgers where strong safety cultures had been promoted. It is possible that his desire to own and operate his own vessel outweighed any concerns he might have had over his personal safety. However, the poor material state of *Ronan Orla* indicated that financial constraints rather than a lack of safety awareness prevented him from employing a crewman and maintaining his vessel properly.

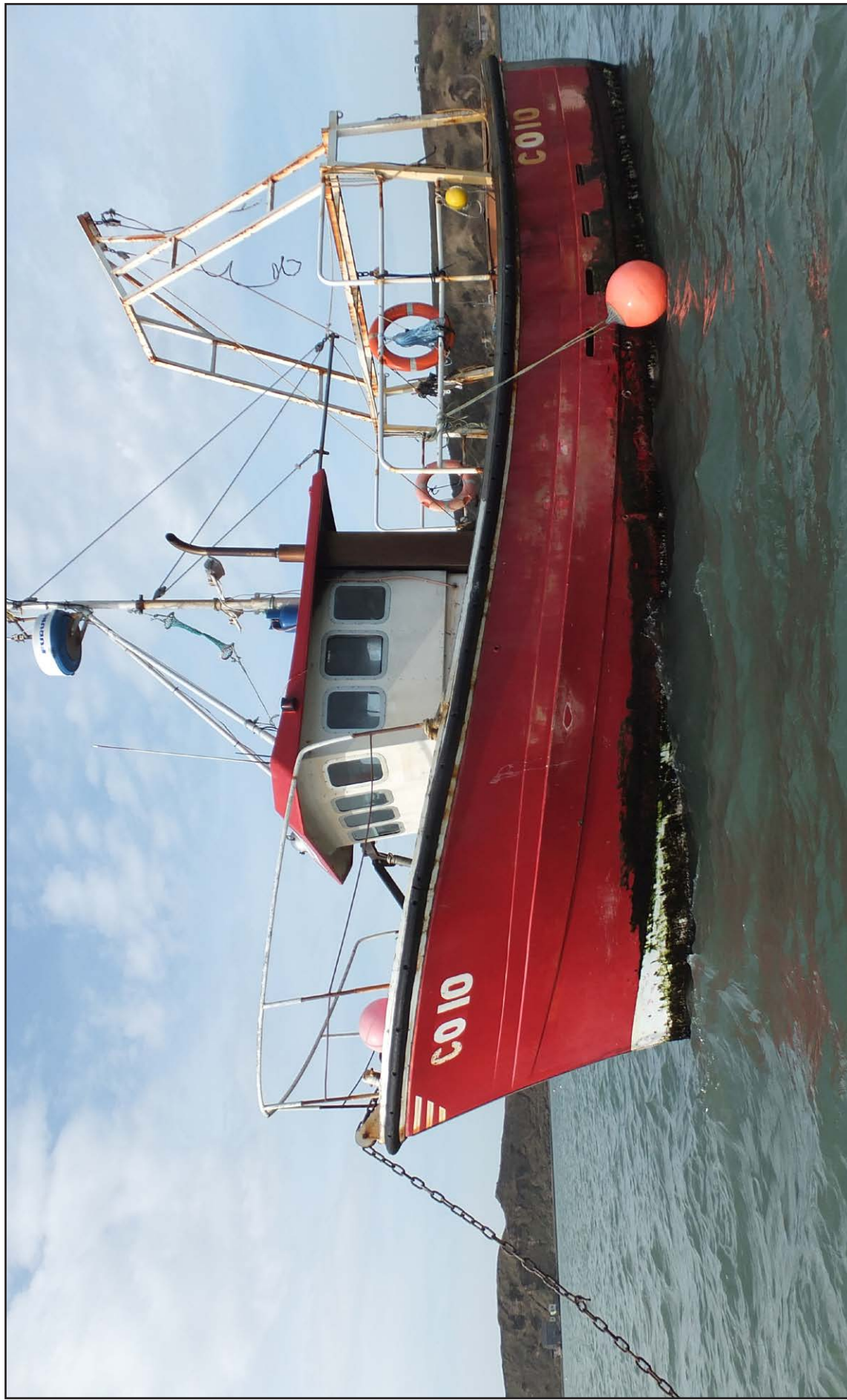
The recently published MAIB report into a serious accident that occurred on board the fishing vessel *Wanderer II* ([Report No 6/2015](#)) makes several recommendations that address safety issues identified in this report. However, recommendations have been made to the Maritime and Coastguard Agency and Seafish, which seek to ensure that fishing vessel owners are compelled to send copies of the mandatory self-certification assessments to the Regulator, and the increased risks associated with lone working and single-handed operations are emphasised in safety awareness training courses.

## SECTION 1 - FACTUAL INFORMATION

### 1.1 PARTICULARS OF *RONAN ORLA* AND ACCIDENT

SHIP PARTICULARS	
Vessel's name	<i>Ronan Orla</i>
Flag	UK
Vessel number	CO10
Type	Fishing vessel
Registered owner	Privately owned
Construction	Glass-reinforced plastic
Year of build	1988
Length overall	9.98m
Gross tonnage	9.14
VOYAGE PARTICULARS	
Port of departure	Porth Dinllaen, Wales
Port of arrival	Porth Dinllaen, Wales
Type of voyage	Coastal
Cargo information	Scallops
Manning	One
MARINE CASUALTY INFORMATION	
Date and time	30 March 2014, approximately 1100
Type of marine casualty	Very Serious Marine Casualty
Location of incident	Approximately 3nm north-east of Porth Dinllaen, Wales
Place on board	Main deck
Fatalities	1
Damage/environmental impact	None
Ship operation	Scallop dredging
Voyage segment	Fishing
External & internal environment	Easterly wind, Beaufort force 2-3; good visibility; calm sea; low swell
Persons on board	One





Ronan Orla

## 1.2 NARRATIVE

At about 0645 on 30 March 2014, Gareth Jones, the owner and skipper of *Ronan Orla* (hereafter, the skipper) boarded his vessel at its mooring in Porth Dinllaen Bay, north Wales, and set off single-handed to the scallop dredging grounds north-east of the Lleyn Peninsula (**Figure 1**). About 45 minutes later, the skipper shot away his fishing gear and began to dredge the seabed in a north-easterly direction. After approximately 1 mile, he turned the vessel to starboard and brought it onto a south-westerly heading.

Having dredged for about an hour, the skipper hauled in his first catch of the day and then re-shot his gear. According to his fishing log, his first dredge yielded 1¼ bags of scallops, and his second, 1¾ bags. At about 0955, the skipper shot his gear away for a third time, and at about 1054 he began hauling in his third catch (**Figure 2**).

At some point during the recovery of the dredge gear the skipper became caught on the starboard warping drum of *Ronan Orla*'s winch. Unable to stop the winch, he became entangled on the rotating drum and suffered multiple injuries, which were fatal.

At 1348, two of the skipper's friends who were walking along a beach north-east of Nefyn, recognised *Ronan Orla* in the distance and photographed it (**Figure 3**). About an hour later, *Ronan Orla* was spotted by the skipper and crewman of the scallop dredger *Integrity*. They were heading west towards Porth Dinllaen point and noticed that *Ronan Orla* was not moving and appeared to be anchored in place by its dredge gear hoisting wire (**Figure 3**). They quickly realised that something was wrong and headed *Integrity* towards the stationary vessel.

When they got closer, the crewman realised that the skipper's body was caught on the rotating winch drum.

At about 1510, *Integrity* was manoeuvred alongside *Ronan Orla* and its crewman jumped across and stopped the winch. He then went inside the wheelhouse and declutched the winch's hydraulic pump. In shock from what he had seen, the crewman grabbed *Ronan Orla*'s radio handset and called for help. The call was answered by the skipper of a small potting boat operating in the area. A couple of minutes later, *Integrity*'s skipper alerted the coastguard to the situation and reported that *Ronan Orla*'s skipper was dead.

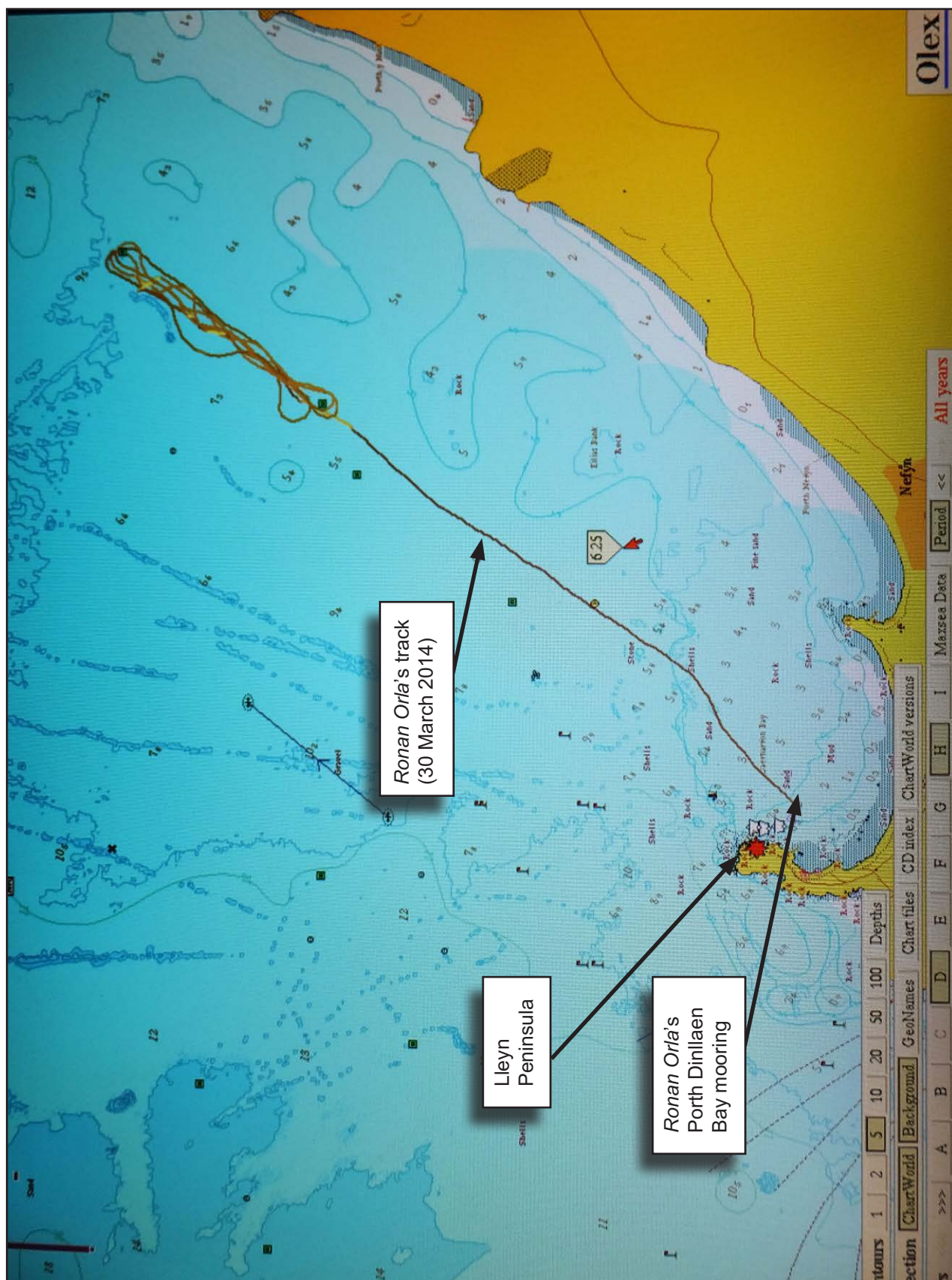
The coastguard immediately tasked Porth Dinllaen's Royal National Lifeboat Institution (RNLI) all-weather lifeboat (ALB) and the search and rescue helicopter (R122) from Anglesey to attend. *Integrity*'s crewman returned to his vessel and *Integrity* began to circle *Ronan Orla*.

When R122 and the ALB arrived, some of the RNLI crew boarded *Ronan Orla*. At the request of the RNLI crew, *Integrity*'s crewman re-boarded the vessel and stopped its engine and isolated its battery supply.

At about 1550, R122's winchman was lowered to *Ronan Orla*. Shortly after, he confirmed to the coastguard that the skipper was deceased. The RNLI crew used bolt cutters to cut the vessel free of its dredge gear and the ALB towed *Ronan Orla* back to its mooring in Porth Dinllaen Bay.

Later that evening, with the police on board, several members of the ALB crew released the skipper from the warping drum. The post-mortem report gave the skipper's cause of death as 'multiple injuries'.











**Figure 3:** Photograph of *Ronan Orla* taken from a beach at 1348

### 1.3 ENVIRONMENTAL CONDITIONS

At the time of the accident the wind was easterly force 2 to 3, the sea state was calm with a low swell and the visibility was good.

The depth of water where *Ronan Orla* was dredging was about 16m. The seabed was mainly stony ground with areas of slate from the remains of the local slate industry.

### 1.4 RONAN ORLA

#### 1.4.1 General

*Ronan Orla* was built in 1988 of glass-reinforced plastic (GRP) construction and was powered by a six cylinder Ford Otosan 6.2 litre marine diesel engine. Its length overall was 9.98m and its hull had a standard Cygnus 33 design. The vessel had an aft main working deck and a wheelhouse towards the bow. Below deck it had a forward cabin, an engine compartment and a fish hold.

The working deck was covered by heavy duty strips of rubber matting. This was intended to protect the deck and assist when shooting pots. The matting was not secured in place.

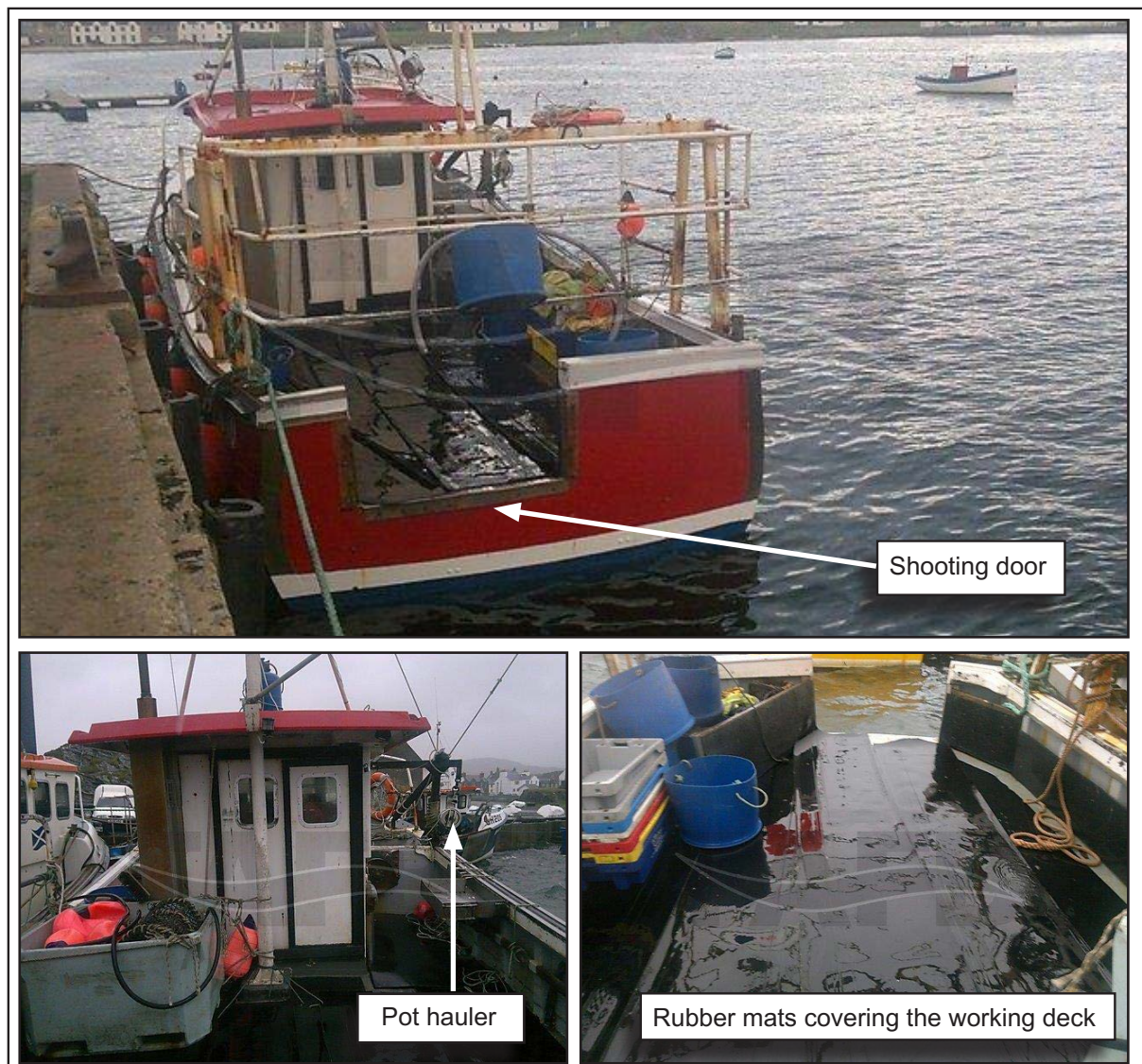
The wheelhouse was equipped with a range of navigation and track plotting equipment including a Furuno radar, Simrad autopilot, Furuno GPS navigator, Koden echo sounder, Olex chart plotter, a digital selective calling (DSC)<sup>1</sup> enabled very high frequency (VHF) radio and a standard marine VHF radio.

#### 1.4.2 Modifications made to *Ronan Orla*

Previously based in the Isle of Islay, Scotland, *Ronan Orla* had been used as a potting vessel (**Figure 4**) and operated with a Category A<sup>2</sup> under 10m shellfish licence. The skipper purchased *Ronan Orla* and its licence with the help of a bank loan in March 2012 and sailed it to Porth Dinllaen. Initially, the skipper used *Ronan Orla* as a potter to fish for whelks, but was commercially unsuccessful.

<sup>1</sup> A DSC enabled VHF radio allows the operator to transmit a substantial amount of critical information, including the vessel's position, to the coastguard and nearby vessels in an emergency by the pressing of a button and without the need for voice communication.

<sup>2</sup> A Category A shellfish licence authorises vessels to fish for all available stocks.



**Figure 4:** *Ronan Orla* rigged as a stern shooting potter



Consequently, during the latter part of 2012 he carried out modifications that allowed him to use *Ronan Orla* to dredge for scallops during the 2012/2013 and 2013/2014 scallop dredging seasons<sup>3</sup>. Although modified to operate as a stern towing scallop dredger, *Ronan Orla* was still capable of being operated as a stern shooting, side hauling potter.

The modifications carried out for scallop dredging included the fitting of a mild steel A-frame (Figure 5) on top of the vessel's aft gantry and the installation of a dredge gear hauling winch. The A-frame, fabricated by a local mechanic, significantly increased the gantry height. This allowed the skipper to rig a high-level dredge gear

<sup>3</sup> The scallop dredging season ran between 1 November and 30 April.



Figure 5: *Ronan Orla*'s modified gantry

hoisting block directly above the transom. The winch was purchased second-hand via a fishing community website and was fitted by the skipper with the help of a friend.

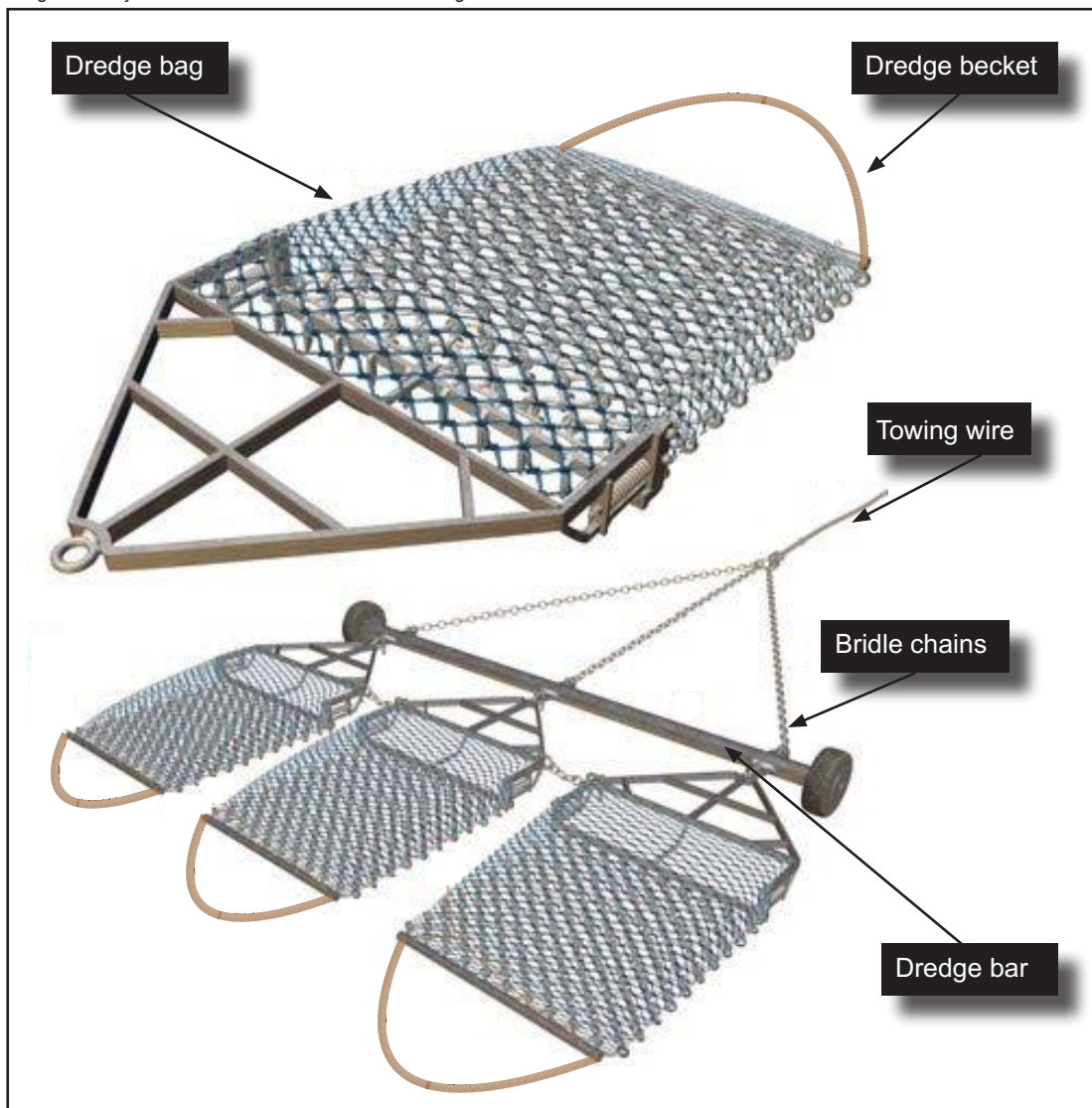
There was no evidence found to suggest that the modifications were assessed against any recognised construction standards, or that any potential adverse effects on the vessel's stability or its safe operation were formally considered. The Sea Fish Industry Authority<sup>4</sup> (Seafish) provided a set of construction and outfit standards for small fishing vessels but there was no requirement for existing vessels undergoing modification to meet those standards.

### 1.4.3 Fishing gear

The dredge gear (**Figure 6**) comprised a 2.5m long dredge bar with wheels at each end, a chain bridle, and three steel mesh dredge bags. The dredge gear was connected to a 10mm diameter towing wire, and was shot and recovered over the stern using the winch. The gear was recovered on board with the aid of a 16mm diameter hoisting wire and a pull-down rope.

<sup>4</sup> A Non-Departmental Public Body set up by the Fisheries Act 1981 to improve efficiency and raise standards across the UK's seafood industry.

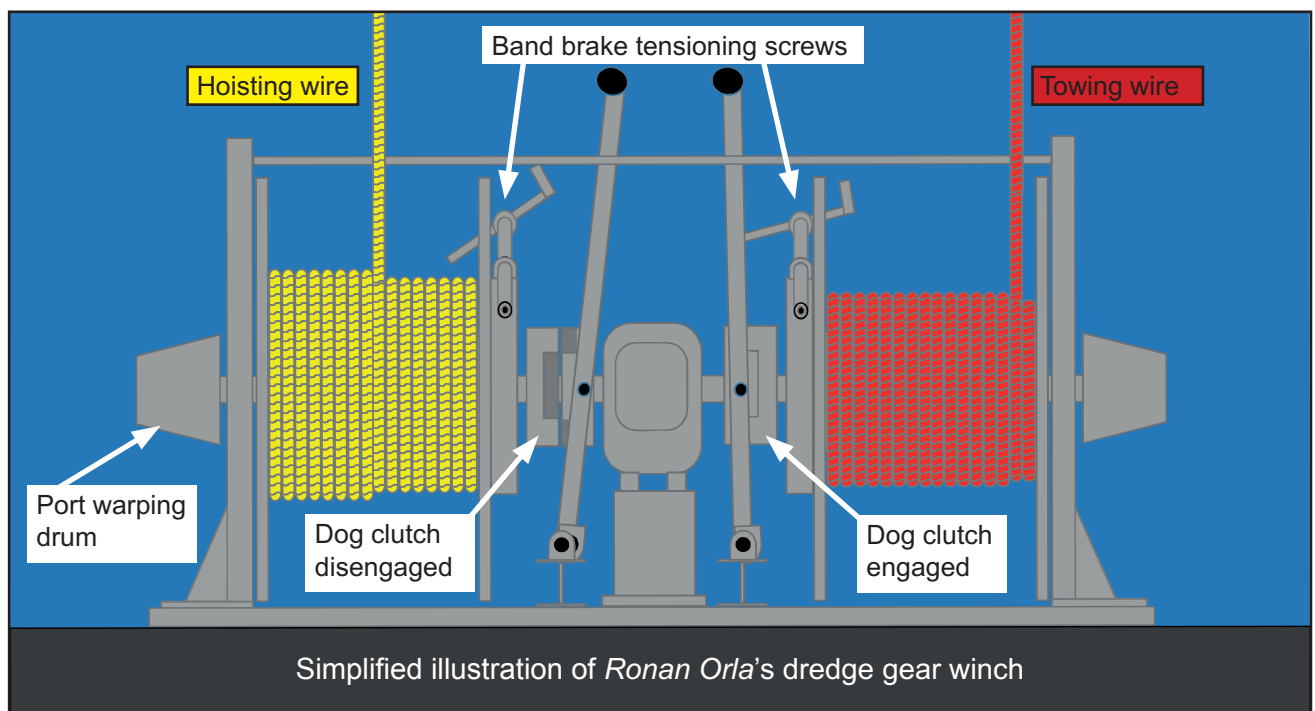
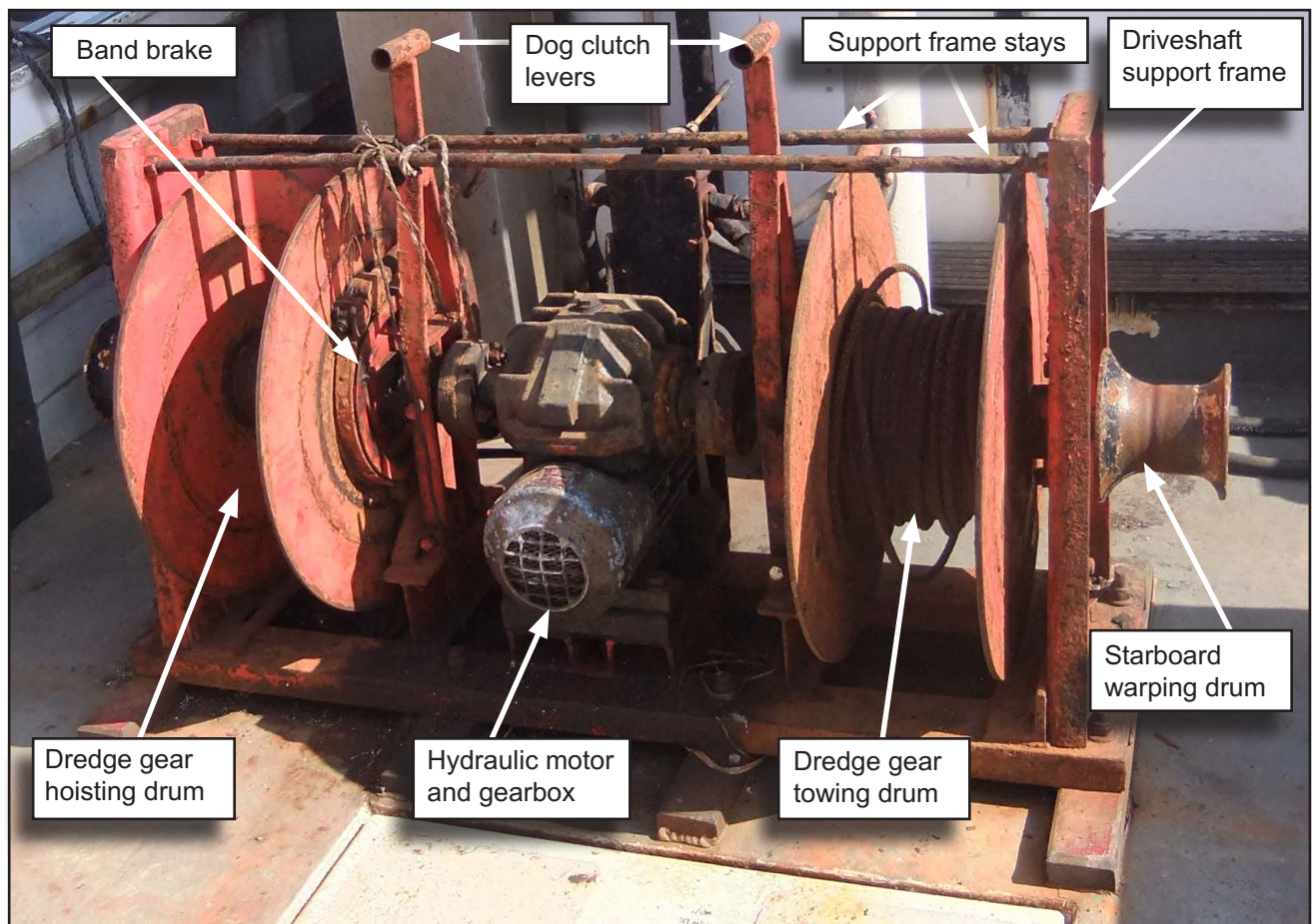
Image courtesy of Seafish Guide to Commercial Fishing Gear and Methods of Use



**Figure 6:** Example of the type of dredge gear carried on board *Ronan Orla*



The winch (**Figure 7**) was positioned towards the forward end of the working deck, slightly to port of the vessel's centreline. It was powered by an engine- driven hydraulic pump, which could be clutched-in and clutched-out from the wheelhouse. The winch had two main hauling drums and two warping drums. The hauling drums

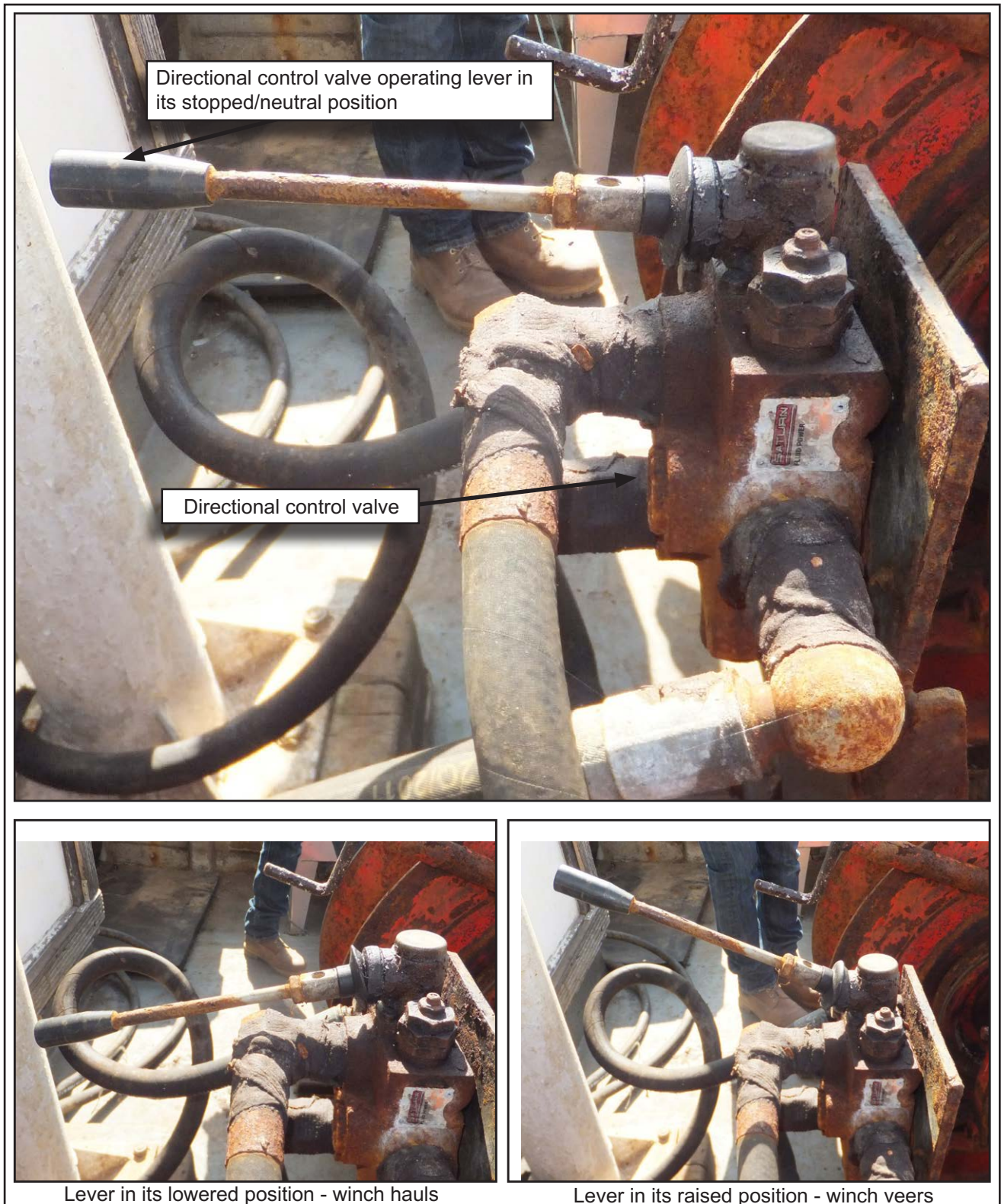


**Figure 7:** Ronan Orla's hydraulic powered dredge gear hauling winch



could be independently engaged and disengaged using manually operated dog clutches. When declutched, the drums could be held in position by the application of independent hand tensioned band brakes. The warping drums could not be declutched, and rotated constantly whenever the winch was running.

The winch was operated using a directional control valve (**Figure 8**) that was positioned centrally at the forward end of the winch. To haul in the wires on the winch hauling drums, the manually-operated control valve lever had to be lowered



**Figure 8:** Winch directional control valve and its operating lever

from its horizontal stopped/neutral position. To veer<sup>5</sup> the wires, the control lever had to be lifted. The control lever was fitted with a detent that held the valve in either of its fully open positions to allow hands-free operation.

One end of the towing wire was wound onto the starboard hauling drum (towing drum). The other end was rove through the gantry's centrally rigged low-level towing block (**Figure 5**) and attached to the dredge gear. The dredge gear hoisting wire was wound onto the barrel of the port hauling drum (hoisting drum); its free end was rove through the high-level hoisting block at the top of the gantry A-frame.

#### 1.4.4 Recovering the dredge gear

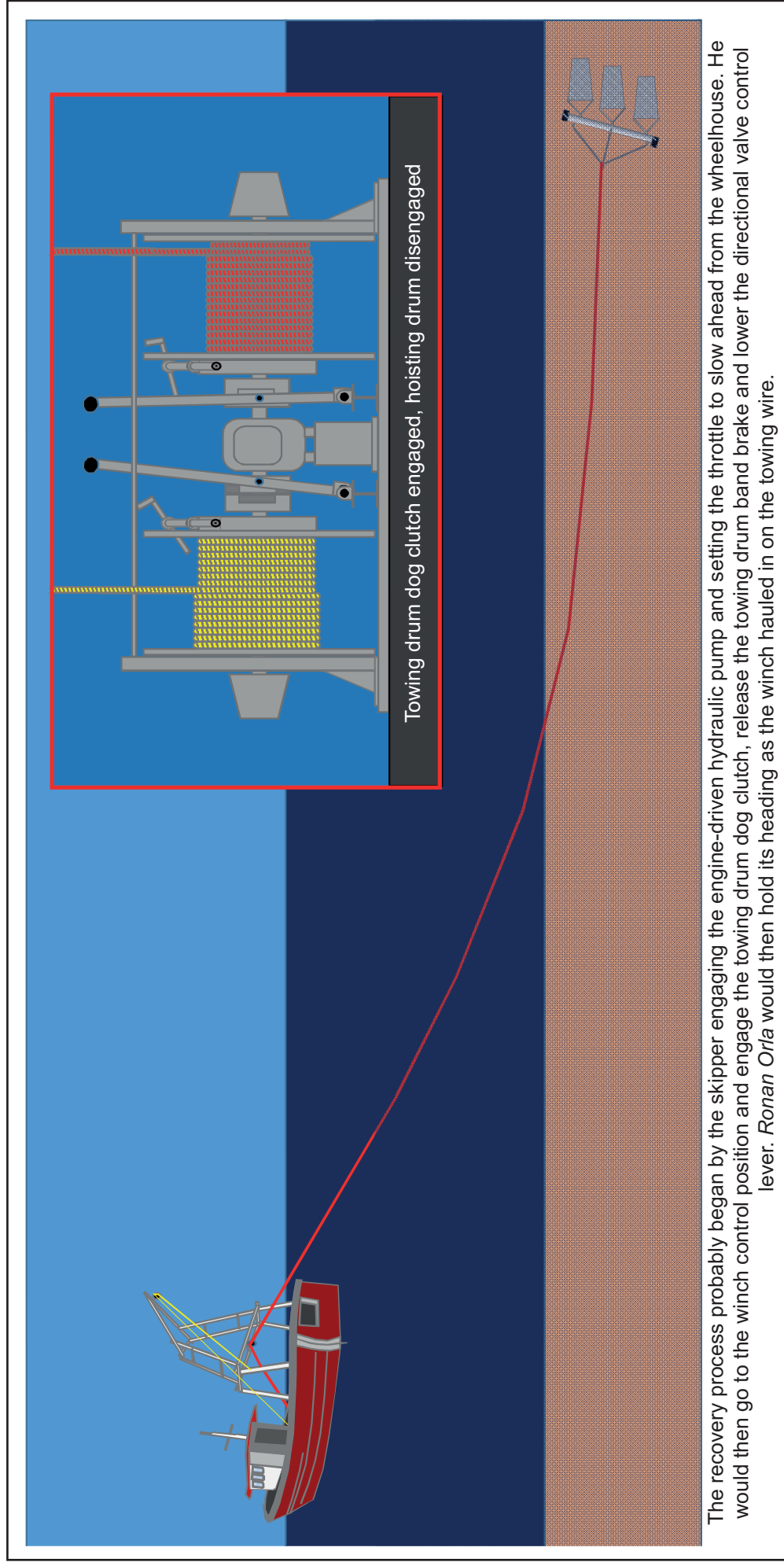
When towing the dredge gear, the hauling winch would have been stopped and the band brake applied to the towing drum (both dog clutches would probably have been disengaged). To haul in the dredge gear and recover it on board, the skipper would have had to use both the towing and hoisting drums, and the starboard warping drum. Although the exact technique used to recover *Ronan Orla*'s gear is unknown, the skipper would probably have:

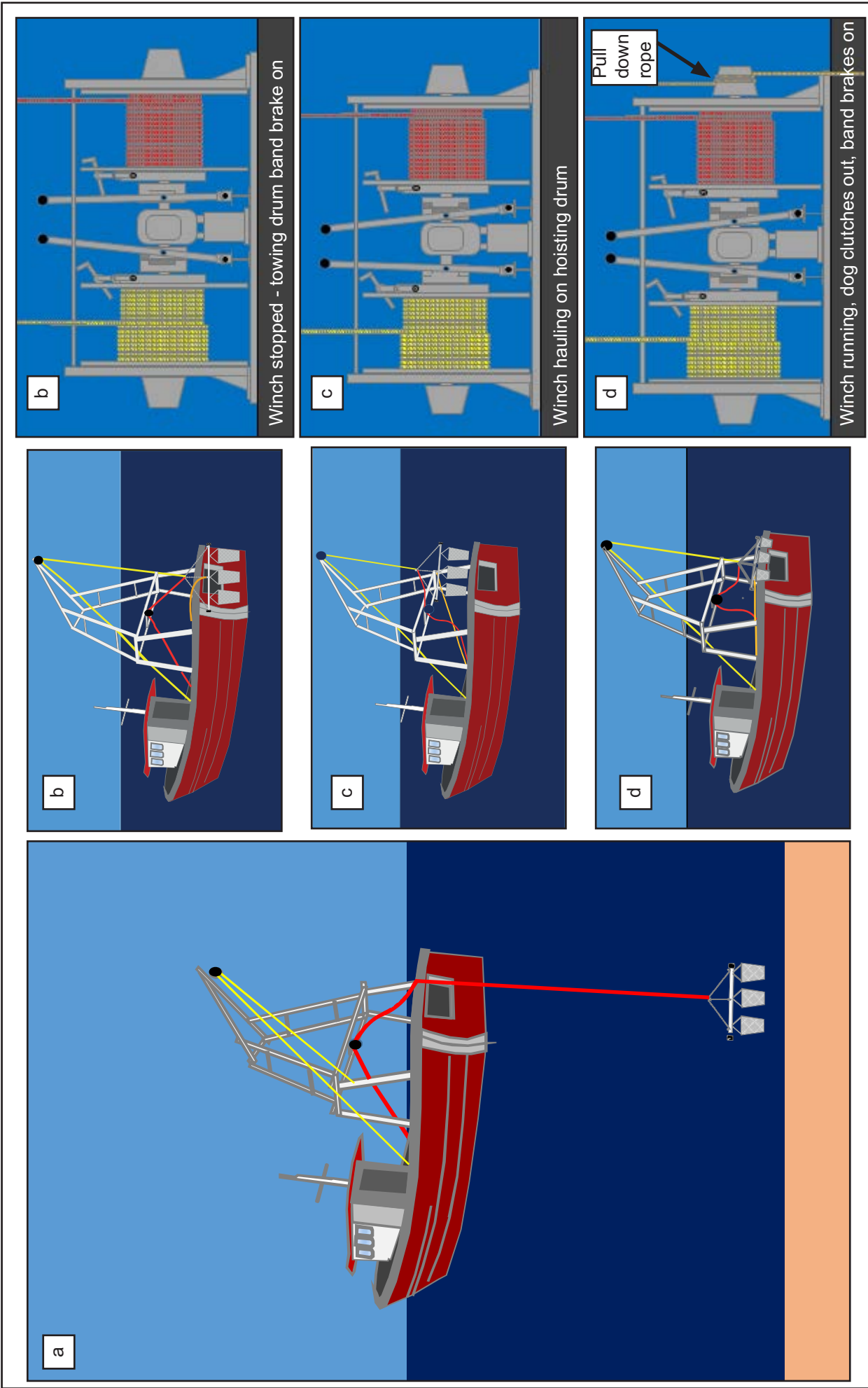
1. Set the engine throttle to reduced power ahead and engaged the hauling winch hydraulic pump (from the wheelhouse).
2. Proceeded on deck and engaged the towing drum dog clutch.
3. Slackened off the towing drum band brake, lowered the directional control lever and began hauling in the towing wire (**Figure 9**).
4. Once the dredge gear cleared the seabed (**Figure 10a**), disengaged the propeller (*Ronan Orla* would then have drifted on the wind and tide).
5. When the dredge gear reached the transom, stopped hauling and applied the towing drum band brake (**Figure 10b**).
6. Walked aft and connected the hoisting wire hook to the dredge gear bridle and the pull-down rope to the dredge gear bar (**Figure 10b**).
7. Disengaged the towing drum dog clutch.
8. Engaged the hoisting drum dog clutch.
9. Slackened off the hoisting drum band brake, and hauled in on the hoist wire until it took the weight of the dredge gear.
10. Stopped hauling and slackened off the starboard band brake to allow the towing wire to pay out.
11. Hauled in on the hoist wire until the dredge bags reached the transom gunwale (**Figure 10c**).
12. Stopped hauling and applied the hoisting drum band brake.
13. Disengaged the hoisting drum dog clutch.

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<sup>5</sup> Veering a winch pays out the wire from the drum.







**Figure 10:** Dredge gear recovery procedure - lift dredges inboard

14. Put two or three turns of the pull-down rope on the starboard warping drum.
15. Started the winch and began to apply tension on the pull-down rope.
16. As the dredge gear bar began to swing inboard, slackened off the port band brake to pull the dredge bar onto the deck (**Figure 10d**).
17. Stopped the winch.
18. Went aft and, with the help of a tipping rope, emptied the contents of the dredge bags onto the deck.

The skipper is likely to have re-shot his gear and set a course on his autopilot for the next dredge before processing his catch. According to *Ronan Orla*'s fishing log, the skipper was hauling his gear at about 75-minute intervals on the morning of the accident (1 hour towing the gear and between 10 and 15 minutes to shoot and haul).

## 1.5 THE SKIPPER/OWNER

The skipper, Gareth Jones, was British and was 36 years old. Prior to owning and skippering *Ronan Orla* he had worked as a crew member on board fishing boats for over 20 years. He had started his career on his father's non-commercial boat and at the age of 17 progressed onto commercial vessels. The skipper worked for many years on board the local scallop dredgers *Our Heritage* and *Harmoni*.

The skipper had attended a 2-day bridge watchkeeping course, a 2-day engine room watchkeeping course, a 1-day stability awareness course, and held an under 16.5m fishing vessel skipper's qualification and a GMDSS radio certificate. He had also attended the mandated fishing vessel safety training courses<sup>6</sup>. Awareness of the dangers when operating single-handed was not a subject covered in his formal training courses.

The skipper fished 3 to 5 days per week depending on the weather conditions, and regularly worked long hours, often from 0600 to 2000. He was making the repayments of the loan he took out to buy his vessel and meeting his day to day living costs. However, it was understood that he was struggling to operate *Ronan Orla* at a profit and intended to review his financial situation at the end of the 2013/2014 season. Although he had occasionally employed a crewman when whelk fishing he nearly always worked *Ronan Orla* single-handed. Locally, this was uncommon and the skipper had been advised by various members of the local fishing community not to work alone.

## 1.6 CLOTHING

A few days before the accident, the skipper had obtained two new sets of *Guy Cotten* waterproof clothing (**Figure 11**). The clothing comprised a 'Vareuse' isotope smock and a pair of bib and brace trousers. The trousers had an outer layer of 'Nylpêche' fabric, that had a high degree of resistance to tearing and abrasion.

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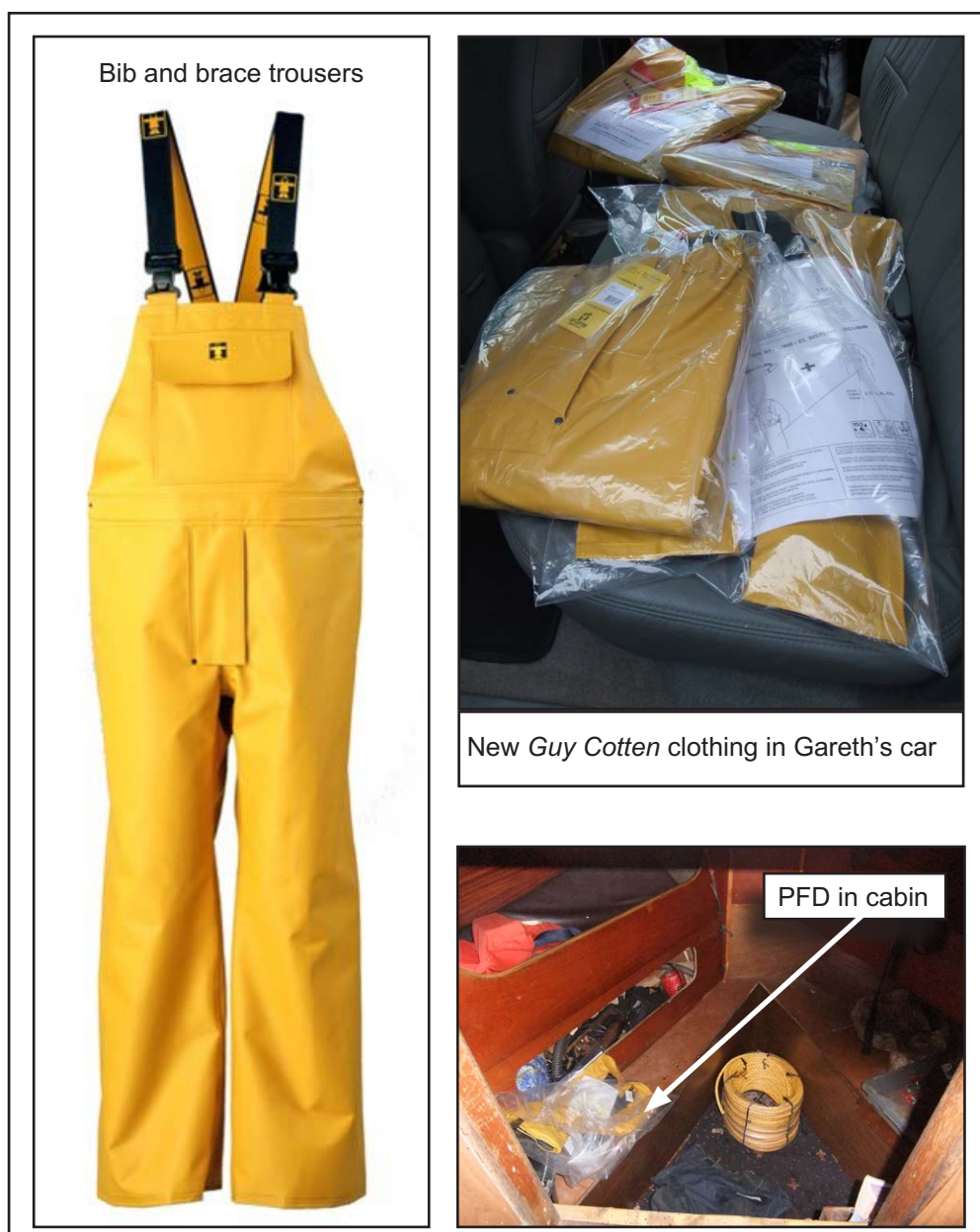
<sup>6</sup> Basic sea survival; basic fire-fighting; basic first-aid; and safety awareness and risk prevention.

The combination included a 'Secubib' 150N<sup>7</sup> personal flotation device<sup>8</sup> (PFD), which could be attached to the shoulder straps for use under the smock. The shoulder straps were connected to the waist band at the rear of the trousers by a single plastic clip and to the bib at the front of the trousers by two plastic quick release chest clips. The straps were elasticated and their length could be adjusted using the chest clips.

At the time of the accident, the skipper was wearing jeans and several layers of thermal clothing under a pair of his new *Guy Cotten* bib and brace trousers. He was also wearing a pair of new yellow fishermen's wellington boots. The skipper did not wear the *Guy Cotten* smock or the PFD. The PFD was left in its packaging and stowed in the forward cabin (**Figure 11**).

<sup>7</sup> Newton's of buoyancy

<sup>8</sup> Personal Flotation Devices are divided into the following two main classes: those that provide face up in-water support to the user regardless of their physical condition (lifejackets); and those that require the user to make swimming and other postural movements to keep their face out of the water (buoyancy aids).



**Figure 11:** Foul weather bib and brace trousers



After the accident, the skipper's bib and brace trousers were found to be tightly wound around the warping drum. As the trousers were carefully wound off the drum, it was noted that the shoulder straps were the last part of the garment to be released. They had been stretched tight and had formed many turns on the drum.

## 1.7 POST-ACCIDENT INSPECTIONS AND SURVEYS

### 1.7.1 General

*Ronan Orla* was examined on several occasions after the accident, and a whole vessel condition survey was conducted by a marine surveyor on behalf of the skipper's family. The inspections and surveys found the overall material condition both of the vessel and its winch to be poor.

Externally, the hull was covered in a considerable amount of marine growth below the waterline and its zinc sacrificial anodes were heavily wasted. Deep grooves were found in the GRP hull below the waterline at the bottom edge of the transom (**Figure 12**). The grooves were so deep that light could be seen passing through the GRP from inside the hull when the vessel was lifted out of the water.



**Figure 12:** Damage caused to the hull by the towing wire

The upper part of the transom had suffered a considerable amount of damage and several ad-hoc repairs had been carried out (**Figure 13**). A steel plate with steel bars welded to it had been bolted to the top of the bulwark in an attempt to protect it from the dredge gear. Other identified shortfalls included:





Figure 13: Ad-hoc repairs to damaged transom bulwark

- The fish hold hatch cover did not have a watertight seal.
- No provision had been made to close the stern shooting door.
- The mild steel gantry was corroded.
- The liquid petroleum gas stove in the wheelhouse and its flexible gas hose were found to be in a dangerous condition.
- The main engine cooling water and fuel oil systems were piped with flexible plastic hose that was not fireproof. Neither system had remote closing valves fitted.

### 1.7.2 The dredge gear winch

The previous owner of the winch had purchased it second-hand and had never used it. It had remained in his garage for 10 years during which time no repairs had been undertaken. Apart from the 'Opperman' gearbox manufacturer's identification plate, there was no other manufacturer's nameplate and its nominal wire pull<sup>9</sup> was unknown.

In December 2013, *Ronan Orla's* skipper renewed the towing drum band brake lining. The new linings were manufactured by a local engineering firm, but the skipper rebuilt the band brake arrangement himself. The hoisting drum band brake lining was not renewed.

During the initial post-accident inspection of the hauling winch, both dog clutches were found to be disengaged. The hoisting drum band brake appeared to be on, but its tensioning screw was not fully applied. The towing drum band brake was off. The hoisting drum's dog clutch lever appeared to be secured in the disengaged position by a rope (**Figure 14**). When disengaged, the clearance between faces of the hoisting drum dog clutch was minimal. A plank of wood (**Figure 15**) was found wedged between the outboard flange of the hoisting drum and the winch drive shaft support frame. Several grooves were found to have been worn into the face of the wooden plank. A chunk of the outer rim of the starboard warping drum had broken away (**Figure 16**), but this damage had been caused prior to the skipper purchasing the winch.

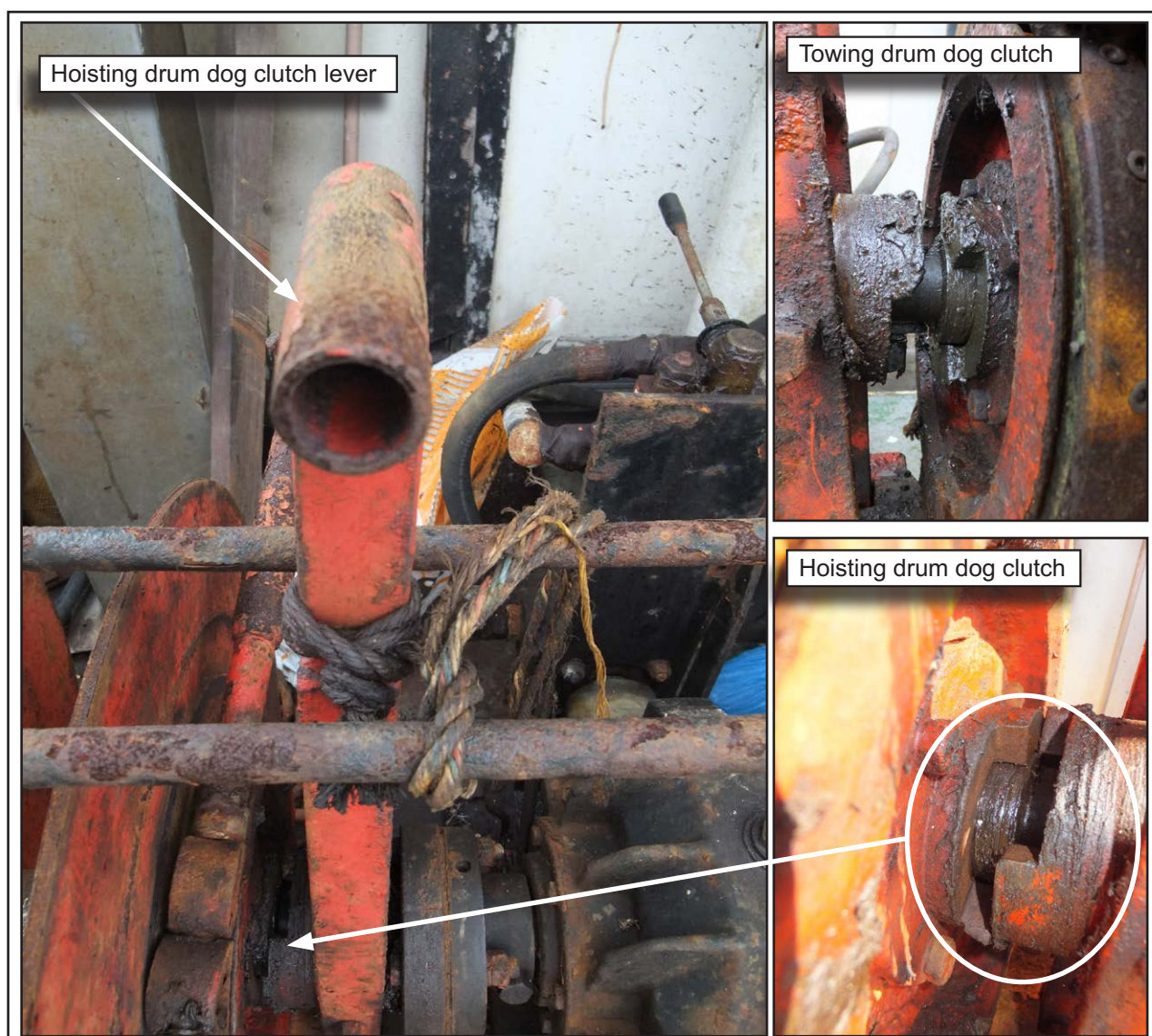
A more detailed survey of the winch was later carried out by MAIB inspectors and an independent engineering firm. The survey found that:

- The winch drum bearing bushes had worn and there were significant levels of play between the hauling drums and the winch drive shaft.
- The port and starboard dog clutch teeth were heavily worn (**Figure 14**) and during operational trials one of the dog clutches unintentionally disengaged.
- There were numerous cracks in the band brake linings.
- The hoisting drum band brake had varying thicknesses of brake lining material and, when fully applied, there were gaps of up to 0.6mm between the drum and band brake lining. When the winch was operated with the brake fully tensioned, the drum rotated.

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<sup>9</sup> The maximum wire tension when the winch is hoisting at the nominal winch speed





**Figure 14:** Towing and hoisting drum dog clutches in disengaged position and hoisting drum dog clutch lever

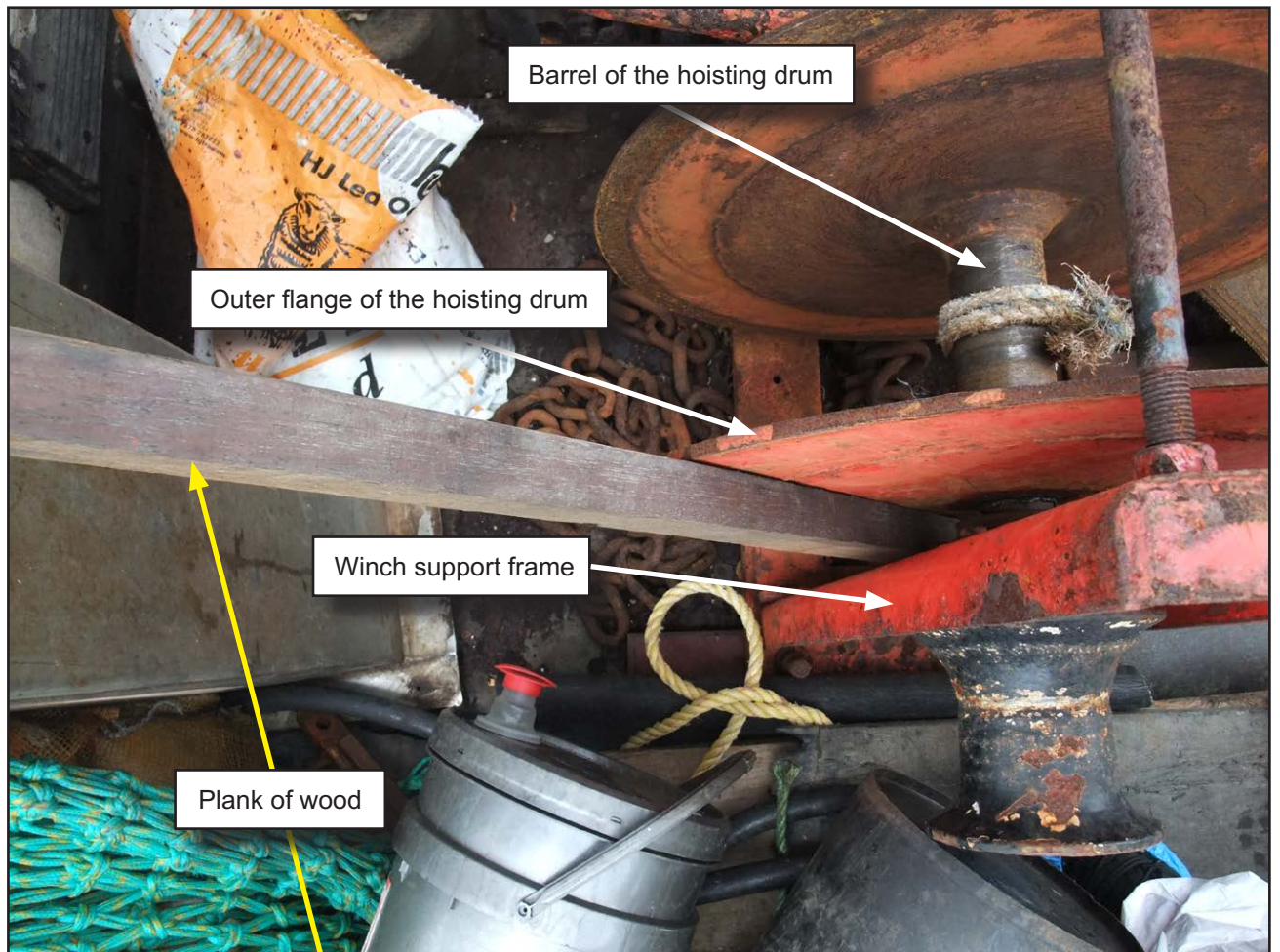
- There were also partial clearances between the starboard band brake lining and the winch drum.
- Several of the winch's holding down bolts were loose.

### 1.7.3 Dredge gear

During the recovery of *Ronan Orla* its dredge gear was cut free and left on the seabed. The dredge gear hoisting wire had fully paid out and had been pulled from the barrel of the hoisting drum. Its free end had snagged in the hoisting block on top of the A-frame, which caused the vessel to be anchored in place by the dredge gear. The dredge gear pull-down rope was not found on board. The tipping rope was found in its stowed position, hanging from a hook on the stern gantry.

Attempts were later made to locate and recover the gear in order to establish the contents of the dredge bags and weigh the gear. However, the dredge gear could not be located.





**Figure 15:** Plank of wood wedged between the hoisting drum flange and the winch support frame





Figure 16: Damaged outer rim of the starboard warping drum

## 1.8 THE CODE OF PRACTICE FOR THE SAFETY OF SMALL FISHING VESSELS

### 1.8.1 General overview

*Ronan Orla* was required to comply with The Fishing Vessels (Code of Practice for the Safety of Small Fishing Vessels) Regulations 2001, as amended (the Code). The aim of the Code was to improve the safety of fishing vessels of less than 15 metres length overall, and to raise the safety awareness of all those involved with the construction, operation and maintenance of such vessels. To comply with the Code, *Ronan Orla*'s skipper/owner was required to, inter alia:

- *carry safety equipment on the vessel appropriate to its length and construction;*
- *complete, or arrange for the completion of, an assessment of the health and safety risks arising in the normal course of work activities or duties on the vessel in accordance with the provisions of the Merchant Shipping and Fishing Vessel (Health and Safety at Work) Regulations 1997;*
- *certify annually that the vessel complied with the Code, by declaring that the safety equipment had been properly maintained and serviced in accordance with manufacturers' recommendations and that an appropriate and up to date health and safety risk assessment had been completed; and*
- *seek advice from the MCA when changing, repositioning or adding equipment, e.g fishing gear, winches or shelters*
- *present the vessel for inspection by the Maritime and Coastguard Agency (MCA) in accordance with the provisions of the Code.*

The full text of the regulations is set out in Merchant Shipping Notice (MSN) 1813 (F)<sup>10</sup>.

### 1.8.2 Safety equipment

The Code required vessel owners to ensure that their vessels carry a stipulated set of safety equipment. The minimum amount of safety equipment required was dependent on the vessel's length and construction, and was listed in a set of checklists contained in Annexes 1.1 – 1.6 to MSN 1813 (F).

*Ronan Orla* did not carry all the safety equipment listed in MSN 1813 (F) (**Annex A**) and most of the equipment inspected after the accident was found to be either in a dangerous condition or out of date. Of note:

- The liferaft<sup>11</sup>, which had been stowed forward of the winch on the port side of the main deck, was lying under several coils of rope and folded canvas sheets. The instructions on its canister were illegible.
- The lights on the vessel's lifejackets were out of date.

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<sup>10</sup> MSN 1813 (F) – The Fishing Vessels Code of Practice for the Safety of Small Fishing Vessels.

<sup>11</sup> Due to its registered length, *Ronan Orla* was not required to carry a liferaft. However the carriage of a liferaft with a float free release mechanism is recommended by the MCA in MSN 1813 (F).



- All fire extinguishers on board were overdue their service period.
- The engine room did not have a bilge water high level alarm and the cabin was not equipped with bilge pumping capability.
- No pyrotechnics, signal lamp or fog horn were found on board.
- The vessel name on the emergency position indicating radio beacon (EPIRB)<sup>12</sup> was incorrect (**Figure 17**).

<sup>12</sup> Due to its registered length, *Ronan Orla* was not required to carry an EPIRB. However, the carriage of an EPIRB is recommended by the MCA in MSN 1813 (F).



**Figure 17:** Manually activated EPIRB stowed in *Ronan Orla*'s wheelhouse

### 1.8.3 Risk assessments

The Merchant Shipping and Fishing Vessels (Health and Safety at Work) Regulations 1997 require employers to make a suitable and sufficient assessment of the risks to the health and safety of workers arising in the normal course of their activities and duties. It is not a requirement that risk assessments are written down, however the MCA strongly recommends that they are.

A range of safety publications and guidance on various regulations applicable to the vessel was found on board *Ronan Orla* (**Figure 18**), but no documented risk assessments were found.

### 1.8.4 Annual self-certification

*Ronan Orla*'s owner (the skipper), or another competent person employed by him, had to complete the annual self-certification process within 1 month of the anniversary of the vessel's registration.

On completion of the annual checks, the skipper was required to sign a self-certification declaration (**Annex B**) confirming that *Ronan Orla* complied with the Code. A copy of the declaration was required to be held on board for inspection purposes. In common with the majority of the industry, no self-certification declarations were found on board *Ronan Orla*.

### 1.8.5 Maritime and Coastguard Agency inspections

The owner was required to present *Ronan Orla* to the MCA for inspection on first registration and at intervals not exceeding 5 years from the date of the last inspection. The MCA had the powers to inspect the vessel at any time to check its compliance with Code requirements.

In June 2012, the MCA inspected *Ronan Orla* and renewed its small fishing vessel inspection certificate (at the time *Ronan Orla* was rigged as a potter). This was valid for 5 years (subject to annual self-certification). The inspection identified five minor deficiencies that the owner was required to rectify. These included the fitting of lights onto the vessel's lifejackets and checking the identity of the EPIRB.

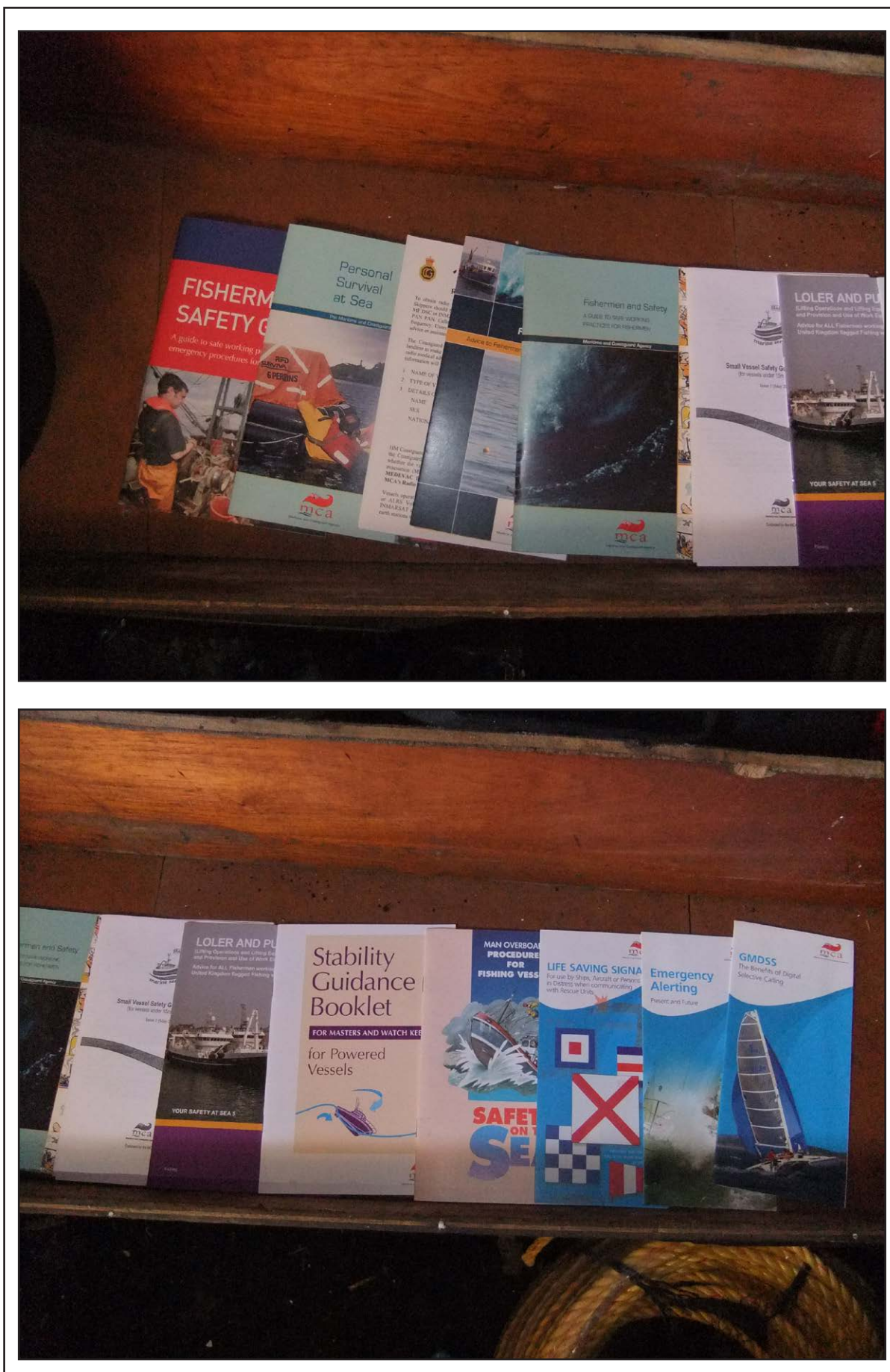
There is no record that the skipper notified the MCA when *Ronan Orla* was modified to carry out scallop dredging, and the vessel was not inspected following the change that involved adding the winch and raising the gantry.

## 1.9 OTHER RELEVANT REGULATORY REQUIREMENTS

### 1.9.1 Provision and Use of Work Equipment

The Merchant Shipping and Fishing Vessels (Provision and Use of Work Equipment) (PUWER) Regulations 2006 place the onus of responsibility on an employer to ensure that all work equipment made available to workers is suitable for its intended purpose and is safe to use. These regulations also apply to a self-employed fisherman in respect of work equipment that he provides for use and uses himself, or provides for use by another person.





**Figure 18:** Safety publications and regulatory guidance booklets held on board *Ronan Orla*

PUWER requires that work equipment exposed to conditions causing deterioration liable to result in dangerous situations is inspected at suitable intervals to ensure that its integrity is maintained and any deterioration detected and remedied in good time. In the case of *Ronan Orla*'s winch, this inspection period was 3 months<sup>13</sup>. No winch inspection records were found on board *Ronan Orla*.

Regulation 19 of PUWER requires owners to provide one or more readily accessible emergency stop controls for work equipment containing moving parts that could constitute a risk to the health and safety of anybody using it or in the vicinity of it. The emergency stop control should override any main operating controls. The winch on board *Ronan Orla* was not fitted with any emergency stop controls.

### **1.9.2 Lifting equipment**

The Merchant Shipping and Fishing Vessels (Lifting Operations and Lifting Equipment)(LOLER) Regulations 2006 apply to equipment that is used '*to lift a load*'. LOLER requires that the equipment installation is inspected by a competent person after installation and before being put into service to ensure that it is both safe to operate and capable of operating safely.

Lifting equipment, such as *Ronan Orla*'s towing and hoisting blocks, lifting hooks and wires, and gantry, should also be thoroughly examined by a competent person at least every 12 months. No lifting equipment inspection records were found on board *Ronan Orla*.

## **1.10 INDUSTRY GUIDANCE**

### **1.10.1 General**

The Code in MSN 1813(F) contained generic information and guidance but did not address specific issues such as single-handed operations. In order to help inform fishing vessel owners and skippers of best practice and methods of mitigating hazards and reducing risk, a variety of guidance and information was provided by the International Maritime Organization (IMO), the MCA and the fishing industry.

### **1.10.2 Guidance provided by the IMO**

The IMO provided international guidance on safety and health practice for fishermen, and safety and health requirements for the construction and equipment of fishing vessels in its *Code of Safety for Fishermen and Fishing Vessels 2005*.

Part B of the IMO's Code provided information on the design, construction and equipment of fishing vessels with a view to promoting the safety of the fishing vessel and safety and health of the crew. Chapter 6 covered the protection of crew and paragraph 6.7 discussed deck machinery. Of note the IMO guidance recommended that, where possible, winch control handles should:

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<sup>13</sup> Guidance on the application of Merchant Shipping and Fishing Vessels (Provision and Use of Work Equipment) Regulations 2006 and the Merchant Shipping and Fishing Vessels (Lifting Operations and Lifting Equipment) Regulations 2006 to Fishing vessels issued by MCA in 2007.

*Be arranged to return to the stop position when released and be provided, where necessary, with a suitable locking device in the stop/neutral position, to prevent accidental movements or displacement or unauthorized use. In general, winches and hauling equipment for fishing gear should be fitted with safety devices designed to prevent accidents.*

The IMO guidance also advised that winch safety devices should also ensure that an emergency stop would be activated if a person is pulled towards a winch or other hauling equipment.

### **1.10.3 Marine Guidance Notices**

The MCA's Marine Guidance Note (MGN) 415 (F), *Fishing Vessels: The Hazards Associated with Trawling, Including Beam Trawling and Scallop Dredging* was published in 2010. The guidance provided on the safe operation of fishing vessels engaged in scallop dredging included:

- *All loose gear must be restrained and secure;*
- *All winch operators must be trained and experienced and the same person must not control the winch and be tipping the dredge at the same time;*
- *Emergency buttons must be within easy reach of operators so they do not have to reach them over machinery;*
- *Hauling and lifting gear must be inspected and maintained;*
- *Newly acquired vessels or those with structural alterations should have their stability appraised;*

In addition, the MGN warned owners and skippers to:

*Be aware of the additional risk from use of dog clutch type winches. Dog clutch winches should always be de-clutched when fishing as they cannot be disengaged when under load.*

In February 2014, the MCA issued MGN 502 (F)<sup>14</sup>, providing a revised Code of Practice for small fishing vessels. It contained additional safety recommendations that had taken into account safety issues previously identified in MAIB investigation reports. For example, based on the numbers of fishermen who had died after falling overboard, fishermen were recommended to wear PFDs or lifelines while working on open decks.

The revised Code was voluntary when issued but was expected to become mandatory by early 2016. Nevertheless, owners of small fishing vessels were encouraged to use the revised Code to prepare for MCA inspections, annual self-certifications and use of their vessels.

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<sup>14</sup> MGN 502 (F) - The Code of Practice for the Safety of Small Fishing Vessels - standards which can be used to prepare for your MCA inspection.



#### 1.10.4 The Fishermen's Safety Guide

The *Fishermen's Safety Guide*, originally written by the MCA in 2008, was endorsed by the UK Fishing Industry Safety Group (FISG). The guide provided a broad range of advice in respect of fishing safety and its aim was to provide guidance and promote safety awareness to all.

Section 4 of the guide warned of the dangers associated with operating unguarded winches and warping drums. In particular, it emphasised the need to ensure clothing, especially cuffs and gloves, were kept well clear of a warping drum, and warned: *if your hands are too close, a sudden surge can drag you into the turning drum.*

#### 1.10.5 The Small Vessel Safety Guidance Booklet

*The Small Vessel Safety Guidance Booklet (for vessels under 15m overall length)*, was produced by Seafish and endorsed by the MCA in 2007. It contained a series of questions that owners and operators of such vessels should consider when assessing the safety of their fishing operations. The booklet posed the following relevant questions:

***Unguarded Winch/Warp Runs:*** *Is the winch adequately guarded, if a person fell against the moving winch would they be safe? A hand rail or a simple guard could be sufficient to prevent someone being caught up in the winch. Is there a danger from the moving warps? Could a frayed wire snag on oilskins and pull a hand or foot into the sheave? Can you prevent such risks by a guard or barrier?*

***Worn Components & Gear:*** *Is the winch and other equipment in good order? Are the brakes, clutches, guiding on gear and controls still effective? Are the winch rollers and deck sheaves in good condition and also the hanging blocks and shackles? Worn equipment and gear may fail unexpectedly causing injury.*

***Emergency Stops:*** *Is there a provision to stop the winch or other machinery in an emergency from a position other than normal controls? Consider the operations and the layout on your vessel and decide if an additional emergency stop in a suitable position is needed.'*

### 1.11 LOCAL FISHING INDUSTRY

#### 1.11.1 Overview

The UK scallop fleet, operating around the coasts of England, Scotland and Wales, is subject to differing regulations depending upon which country's coastline they are fishing. This has encouraged fleets to take advantage of the different rules by migrating around the UK coastline. Pressure to frequently shift fishing grounds has been further increased by the introduction of a range of Special Areas of Conservation (SAC) around the UK, thereby reducing the number of sites previously available to scallop dredgers.

Scallop fishing has been established within Cardigan Bay and other parts of Wales for over 30 years. Most of the prime scallop beds are within Cardigan Bay's SAC, which was designated in 2002. At the time of the accident, the scallop dredging industry in Wales was regulated through *The Scallop Fishing (Wales) (No.2) Order 2010* and *The Scallop Dredging Operations (Tracking Devices) (Wales) Order 2012*.

The regulatory controls over scallop dredging did not restrict the size of scallop catches and the number of scallop dredging permits issued was not limited in number. According to Welsh Government statistics<sup>15</sup>, between 2005 and 2008 there was a significant increase in the weight of scallops landed (from 248 tonnes to 3836 tonnes), and the number of vessels that use the fishery in Wales (from 6 to 18 Welsh vessels, and 8 to 60 vessels from the rest of the UK). In 2009, 75% of the Cardigan Bay SAC was closed to scallop dredging due to concerns over the rapid growth of the scallop fishery.

The 2010 Order placed restrictions on the length of the dredging season, the size of scallop caught, and the number of dredges permitted at specified distances from the coast. This was intended to limit the larger, more nomadic vessels to deeper waters and enable the smaller, local dredgers to continue to operate the remaining inshore grounds. In 2013, the local scallop fishery around Porth Dinllaen comprised four local vessels. On occasion, up to a further 19 nomadic scallop dredgers had operated in the area.

The 2012 Order required any British fishing vessel that had scallop dredge gear on board to have a vessel monitoring system (VMS) tracking device installed and to transmit the required information every 10 minutes whilst at sea. *Ronan Orla* was equipped with a VMS.

### **1.11.2 Sea fishery officer inspections**

To ensure compliance with the Welsh Orders, sea fishery officers had powers to board fishing vessels and inspect them, their fishing gear and documentation, and examine their catch. On 11 March 2014, *Ronan Orla* was boarded by sea fishery officers as part of a routine inspection, and was one of 13 vessels inspected that day. The brief visit found that the skipper had caught 16 bags of scallops, and that the VMS was working correctly.

## **1.12 PREVIOUS AND SIMILAR ACCIDENTS**

### **1.12.1 *Ronan Orla***

The MAIB accident information database contains one previous record of an incident involving *Ronan Orla*.

On 30 June 2013, *Ronan Orla* lost propulsion when its main engine suffered fuel starvation. The skipper was unable to resolve the problem because the main engine's fuel pump bleed screw had seized and sheered. The skipper alerted the coastguard and an RNLi lifeboat was tasked to tow *Ronan Orla* back to its mooring. The skipper later rectified the problem and returned to the fishing grounds the following day.

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<sup>15</sup> 8 October 2009, Minister of Rural Affairs, Welsh Government

### 1.12.2 *Wanderer II*

On 19 November 2013, a young crewman on board the scallop dredger *Wanderer II* trapped his hand in a rotating warping drum during fishing operations. He was attempting to make a rope surge on the drum when his gloved hand became pinched between the rope and the drum. Fortunately the other deckhand saw what had happened and stopped the winch. Although he was quickly freed from the winch by his crewmates and airlifted to hospital, he lost his hand. The accident was investigated by the MAIB and a report<sup>16</sup> was published.

### 1.12.3 *Our Boy Andrew*

On 24 March 2011, the single-handed skipper of the 10m stern trawler *Our Boy Andrew* was pulled on to its rotating net drum and sustained fatal injuries. The MAIB investigation report<sup>17</sup> concluded that a drawstring toggle on the storm hood of the skipper's jacket had become entangled in the net as it was being hauled on board. Evidence indicated that the skipper had then reached towards the operating control lever to stop the net drum. He was unable to do so, and died as a result of injuries to his upper body.

The investigation referred to the recommendations made to the MCA in two earlier accidents<sup>18</sup>, which were to:

1. *Extend the current guidance published in the Fishermen's Safety Guide to cover the additional safety considerations needed for single-handed operations. This should, as a minimum, include:*
  - a. *The additional workload that single-handed operation imposes on the individual.*
  - b. *Advice on how to mitigate the additional hazards of operating fishing equipment single-handedly, including: guarding of dangerous machinery; positioning of operating controls; the need for working areas to be safely separated from hazards such as revolving drums and back-ropes; and the provision of emergency stops.*
  - c. *Additional measures that can be taken to deal with emergency situations, such as: use of automated man overboard alarm systems, including remote engine shut-off where appropriate; positioning of emergency equipment so that it is easily accessible; and, the wearing of appropriate personal protective equipment such as personal flotation devices and/or safety harnesses and the carrying of rescue knives or similar cutting tools.*
2. *Through its chairmanship of Fishing Industry Safety Group, work with the wider fishing sector to ensure that means are established to engage with and educate fishermen in the methods of recognising and mitigating the occupational hazards of professional fishing.*

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<sup>16</sup> MAIB Report No.06/2015 – *Investigation of a serious injury to a crewman on board Wanderer II, 1 mile south-east of Waia Island, Outer Hebrides, 19 November 2013.*

<sup>17</sup> MAIB Report No. 23/2011 – *Report on the investigation of a fatal accident to the skipper of fishing vessel Our Boy Andrew 9 miles east of Eddystone Rocks on 24 March 2011.*

<sup>18</sup> The loss overboard of the skippers from the fishing vessel *Discovery* on 9 October 2010 and *Breadwinner* on 20 January 2011.

In April 2013, the MCA undertook to add an addendum to the Fishermen's Safety Guide highlighting the dangers of single-handed operations. Its draft addendum included:

*Single Handed Operations;*

*Dangerous by nature, clearly there is nobody to raise the alarm when things go wrong. The single hander should consider the risks... A risk assessment here is essential because once all the risks are identified, solutions can be applied.*

**Carry out a risk assessment!** Think about the following:

- *What can go wrong?*
- *Have you told someone where you are intending on going and when you expect to be back?*
- *Are you wearing your Personal Flotation Device (PFD) whilst on deck...will you float for long enough to be rescued?*
- *Do you wear an MOB EPIRB (e.g. RNLI Guardian/PLB)?*
- *If you have gone over the side, can you get back on board? (Ladders or rope stops around the boat to aid boarding if you fall into the water)?*
- *Is there any way of stopping the vessel if you go over?*
- *Can you stop machinery remotely? Are the emergency stops accessible from your main place of work?*
- *Can you free yourself from gear? (Rescue knife on belt)?*
- *Have you removed as much of the risk as possible before you leave port? Non-slip decks. No bights of rope. Bulwark height. VHF radio checked etc.*
- *Are you able to keep a good lookout?*

#### **1.12.4 Danielle**

On 6 June 2006, a deckhand on board the UK-registered scallop dredger *Danielle* became trapped by a rope that was being used on a winch warping drum. He sustained serious arm and chest injuries and was evacuated by RNLI lifeboat and ambulance to hospital, where subsequently his arm had to be amputated.

The deckhand had been "tipping" each scallop dredge individually, using several turns of rope around the warping drum on the port side of the winch house, when a riding turn developed. While attempting to stop the winch and clear the riding turn, the deckhand slipped on the recovered dredging gear lying on the deck. His left hand became caught in the rope between the winch head and the framework beneath, and he subsequently did two backwards somersaults around the warping drum and framework. On both occasions he was unable to reach the stop lever, and it was only once his left arm had broken and his shoulder was dislocated that he was able to stop the winch and avoid being dragged around it a third time.



## SECTION 2 - ANALYSIS

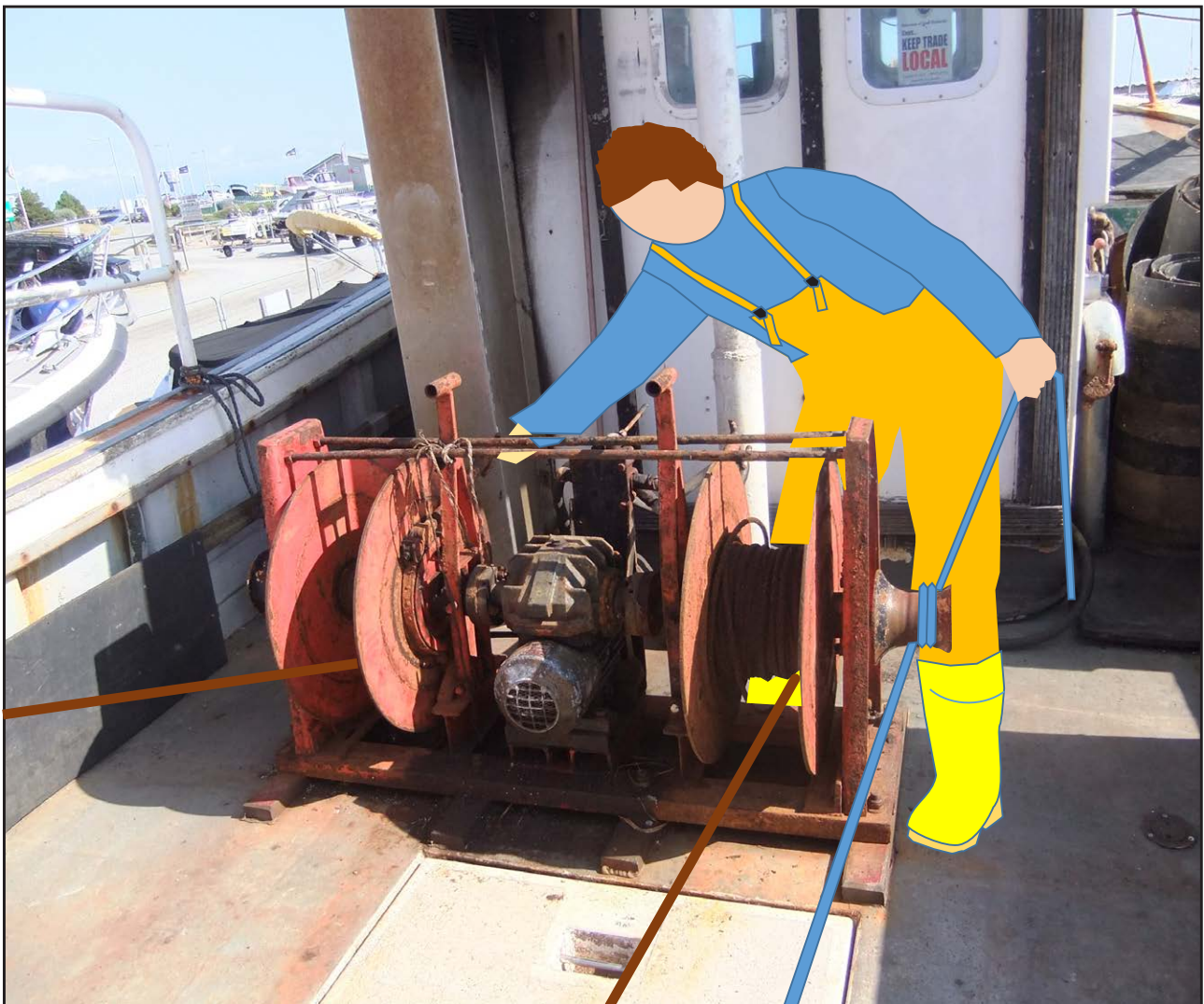
### 2.1 AIM

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

*Ronan Orla's* skipper died from multiple injuries because he became entangled on the starboard warping drum of the vessel's winch and was unable to stop the winch rotating or disentangle himself.

It was evident that the accident occurred as the skipper was attempting to recover and tip the dredge gear following the third tow of the day. The method used by the skipper to recover the dredges was complex, requiring him to operate the band brake on the port hauling drum while simultaneously backing up the pull-down rope on the starboard warping drum (**Figure 19**). To do this required him to work in dangerous proximity to the rotating winch. The process was made more difficult, and significantly more hazardous, by the poor material condition of the winch, specifically



**Figure 19:** Simultaneous tensioning of pull-down rope and release of hoisting drum band brake



the worn state of the port hauling drum's dog clutch and brake. Once caught on the warping drum, the skipper could not reach the winch control and the vessel was not equipped with emergency stop buttons.

## 2.3 TIME OF THE ACCIDENT

According to the timings recorded in *Ronan Orla*'s fishing log, the skipper shot away the gear for a third time at about 0955. He would then have processed his catch on deck while towing his gear. *Ronan Orla*'s chart plotter data (**Figure 20**) indicated that the skipper completed his third dredge and began to recover his gear at about 1054.

After a couple of minutes hauling in on the towing wire, the vessel began to drift west under the influence of the prevailing easterly breeze. This was almost certainly the point at which the dredge gear lifted off the seabed and the skipper disengaged the propeller. At about 1100, *Ronan Orla* stopped drifting west and started to drift in a south-easterly direction. This was probably because the dredge gear had returned to the seabed and arrested the effects of the wind.

The electronic evidence indicated that the accident occurred between 1055 and 1100. The vessel's recorded track indicated that the dredge gear continued to pay out over time to the point where the vessel became anchored in the position where it was later found.

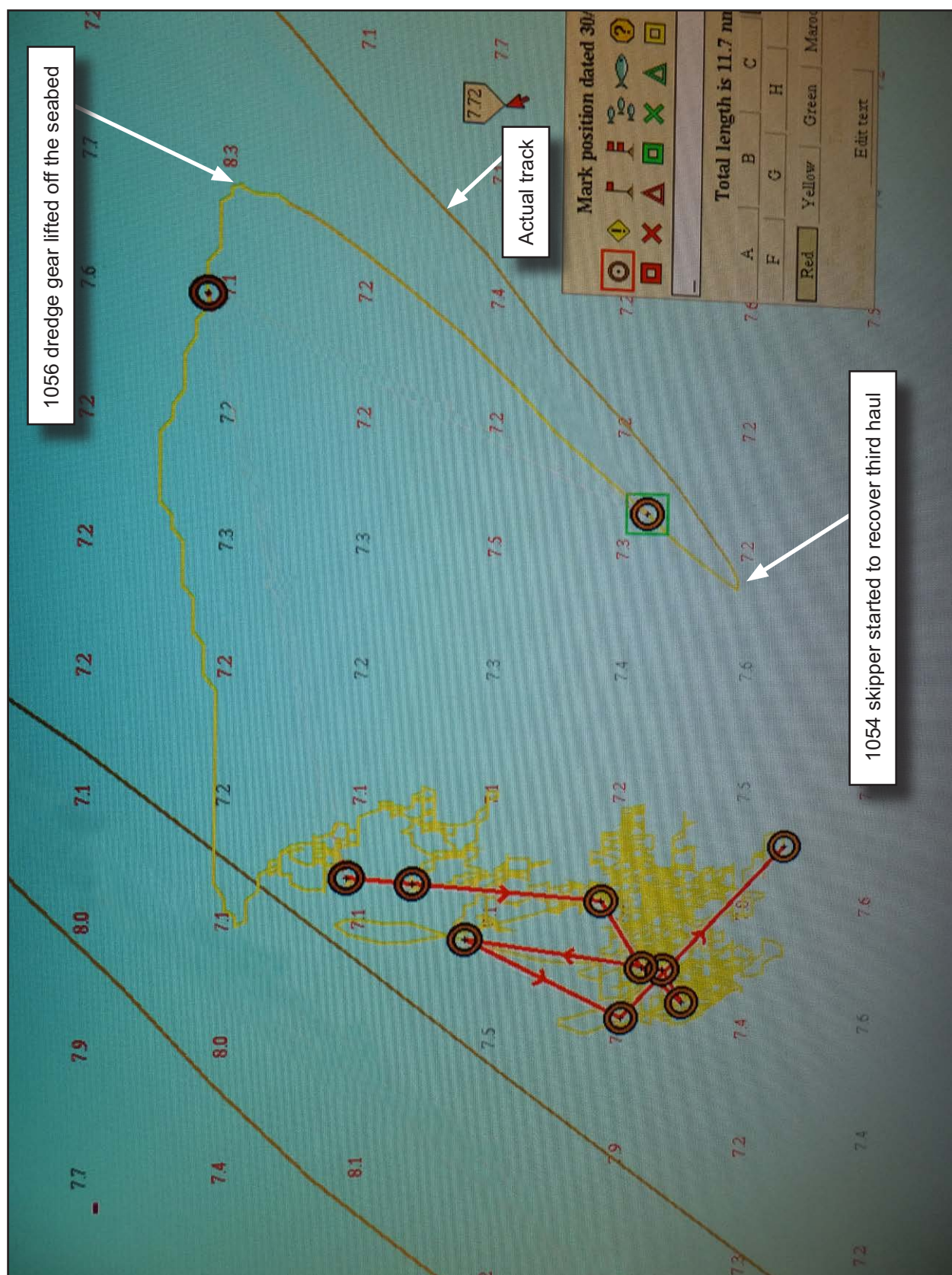
## 2.4 CIRCUMSTANCES AT THE TIME OF THE ACCIDENT

When the crewman of *Integrity* boarded *Ronan Orla*, it was anchored to the seabed by its dredge gear hoisting wire (**Figure 3**), its engine was running, and the pull-down rope was missing. The winch's directional control valve was in its hauling position, the warping drums were rotating and its towing and hoisting drums were declutched and stationary. The hoisting drum band brake was loosely applied and the towing drum band brake was released.

This evidence suggests that the skipper had recovered the dredge to the vessel's transom where he attached the hoisting wire and the pull-down rope. There was no indication that the dredge was recovered inboard and the weight of the dredge gear, and therefore the load acting on the winch, is unknown. However, it was apparent that the gear had been released unintentionally and the hoisting wire had payed out until the dredge reached the seabed and 'anchored' the vessel.

It cannot be known whether inadvertent release of the hoisting wire led to the skipper being pulled onto the warping drum, or if the wire released after the accident, but any of the following could account for the dredge gear returning to the seabed:

- the port dog clutch suddenly disengaged while the dredge bar was being hoisted clear of the transom;
- the port band brake suddenly or gradually failed while the gear was suspended by the hoisting wire; or,
- the skipper was pulled or fell onto the winch drum while he was in the process of releasing the hoisting drum band brake.



**Figure 20:** Ronan Orla's track recorded on its Olex chart plotter during the third haul of the day

## 2.5 MECHANISM OF ENTANGLEMENT

At the time of the accident, *Ronan Orla*'s skipper was wearing a new pair of waterproof bib and brace trousers, which were found to be tightly wound around the warping drum when his body was released from the winch. The last part of the trousers to be wound off the warping drum was the shoulder straps. Without witnesses, the investigation was unable to determine conclusively the exact mechanism by which the skipper became entangled on the warping drum. The evidence strongly indicated that one of the elasticated shoulder straps from his bib and brace trousers had snagged on the warping drum and pulled him onto it.

If the bib and brace trousers had been worn correctly, and the straps been adjusted and secured properly, the risk of snagging would have been low. However, had one of the shoulder straps come loose from its chest buckle, or if one or both had not been worn correctly, a significant snagging hazard would have been introduced.

Despite the evidence strongly suggesting that the most likely cause of the accident was the snagging of one of the shoulder straps on the skipper's bib and brace trousers, several other scenarios were also considered. These included: the skipper's foot or arm became caught in a bight of the pull-down rope; his trouser leg or boots snagged on the damaged outer rim of the warping drum; and he slipped, tripped or stumbled onto the rotating drum.

In order to recover the dredge gear inboard, the skipper would have had to position himself (**Figure 19**) so that he could simultaneously release the hoisting (port) drum band brake and tension the pull-down rope on the starboard warping drum.

Whatever the mechanism by which he became caught on the warping drum, the reason he became caught was that he was working in close proximity to the rotating machinery. The obvious risk posed by working so close to the moving warping drum was exacerbated by the snagging hazard posed by its damaged rim.

## 2.6 MATERIAL CONDITION OF *RONAN ORLA* AND ITS EQUIPMENT

### 2.6.1 General

The general condition of *Ronan Orla* and its equipment, and the standard of housekeeping on board at the time of the accident, were poor. The rubber matting that covered the working deck was loose, uneven and ill-fitting, and there was a range of other tripping and snagging hazards on the deck. The steel gantry was corroded and there was no indication that it or its lifting blocks had been examined or tested in accordance with the requirements set out in LOLER. The redundant shooting door at the stern of the vessel was open and there was no method of closing it.

The extent of the damage caused to the bulwark above the transom by the dredge gear, and the standard of previous repairs, had almost certainly reduced the structural strength of the hull at the stern of the vessel. The open shooting door would have added to any loss in structural strength and presented an unnecessarily high risk of falling overboard. The depth and number of grooves cut into the GRP hull along the bottom edge of the transom by the towing rope presented an imminent risk of flooding.



### 2.6.2 The hauling winch

When the dredge gear winch was inspected and tested after the accident several significant defects were found. Notably: its hoisting drum band brake lining was severely degraded and could not hold the drum when the brake was fully applied; the dog clutches were damaged; there was excessive play between the hauling drums and the winch drive shaft; and a large chunk of cast steel had broken away from the outer rim of the starboard warping drum.

The rope found tied to the winch frame support stays appeared to have been used to help hold the hoisting drum dog clutch lever in the engaged and/or disengaged position. The wooden plank found wedged between the hoisting drum flange and the winch's outer housing was either being used to limit the axial movement of the hoisting drum on its drive shaft, or as a braking lever to help control the release of the hoisting wire.

*Ronan Orla*'s skipper had recently renewed the brake lining material on the starboard band brake but chose not to do the same with the port one. This was probably due to financial constraints as the evidence strongly indicated that operating the hoisting drum had been problematic. The winch was purchased second-hand and was installed by the skipper. There were no survey and inspection records for the winch, and its condition when first fitted is unknown. What is clear is that it was in an extremely poor state of repair at the time of the accident.

### 2.6.3 Safety equipment

*Ronan Orla* did not carry the mandated level of safety equipment. The equipment that was on board had not been maintained and was not readily accessible for use in an emergency. Furthermore, the deficiencies identified during the MCA inspection in 2012 had not been rectified.

The carriage of an EPIRB and liferaft, although recommended by the MCA, was not mandatory. The ones found on board *Ronan Orla* had almost certainly been purchased by a previous owner, but following the vessel's change of ownership no efforts had been made to maintain them in a serviceable condition. The vessel name on the EPIRB was incorrect, and coils of rope and canvas sheets had been piled up on top of the liferaft. Had *Ronan Orla* capsized or sank, the liferaft might not have successfully deployed and, as the skipper did not routinely wear a PFD while working on deck, his chances of survival in such an incident would have been low.

## 2.7 STANDARD OF VESSEL MODIFICATIONS

The installation of the winch and the modifications made to the aft gantry allowed the skipper to shoot and recover his dredge gear over the transom. However, the impact of the modifications on the vessel's stability, operation and structural strength was not formally assessed. As *Ronan Orla* was built before 2007 there was no requirement to comply with any recognised construction standards when the conversion took place in 2012 (paragraph 1.4.2). Furthermore, there was no requirement for the modifications to be approved by the MCA unless they affected the vessel's stability.

The modifications to the vessel to change the mode of fishing were not conducted in accordance with relevant guidance. Specifically, the winch operating handle could be set to veer or haul, allowing the operator to move away from the controls, contrary to IMO guidance (paragraph 1.10.2), and there were no emergency stops fitted, contrary to PUWER Regulation 19 (paragraph 1.9.1), MGN 415 (F) (paragraph 1.10.3) and the Seafish Small Vessel Safety Guidance Booklet (paragraph 1.10.5). Had the winch control complied with IMO guidance, this accident could have been prevented, and had an emergency stop been fitted the skipper might have been able to stop the winch before he succumbed to his injuries.

There is no requirement for owners of small fishing vessels to notify the MCA of an intention to conduct modifications, nor is there a mechanism by which such modifications are inspected and approved before the vessel returns to service. Had such an inspection regime been in place, it is possible that the shortcomings identified above would have been recognised and the skipper directed to rectify them before sailing.

It is also notable that the modifications made to *Ronan Orla* to enable the vessel to carry out scallop dredging were not carried out with single-handed operation in mind. Had *Ronan Orla*'s owner / skipper taken time to assess the activities involved in deploying and recovering dredges single-handedly prior to carrying out modifications to his vessel, he could have taken steps to reduce or totally remove many of the hazards he subsequently faced.

## **2.8 ANNUAL SELF-CERTIFICATION**

MSN 1813 (F) section 3.5, reiterated in MGN 502, requires fishing vessel owners to carry out annual self-certification to confirm that safety equipment has been suitably serviced, is compliant with the relevant checklist for the vessel's size, and that a health and safety risk assessment has been completed. However, MAIB inspectors often discover that annual self-certifications either have not been completed or are not available for inspection. A requirement for the owner's annual self-certification to be forwarded to the regulator annually could serve two purposes. Firstly, the requirement to complete the declaration would prompt many fishing vessel owners to review the state of their vessel and its equipment before signing to state it is in good order. Secondly, any failure to receive a self-certification declaration could be used by the regulator to trigger a targeted inspection of the vessel concerned. In such an event, an opportunity would arise for changes or modification to the vessel to be identified, and actions taken in accordance with the Codes to ensure the operation remains compliant and safe.

## **2.9 SINGLE-HANDED OPERATIONS**

### **2.9.1 Hazards associated with lone working**

Prior to owning *Ronan Orla*, the skipper had no experience of working single-handed. As a single-handed fisherman, he had no-one monitoring his activities and no-one to assist him or raise the alarm when the accident happened.

The hazards associated with lone working in any job or industry are well recognised and need to be thoroughly risk assessed. The likelihood of an accident when a person is carrying out an activity alone is substantially increased; but more importantly, the consequences are often much more severe.

The dangers of single-handed operation in an already hazardous industry, and the foreseeable fatal outcomes when things go wrong are regularly highlighted in MAIB reports. However, the course specification for mandatory safety awareness training does not specifically include the risks posed to single-handed operations. Careful consideration of the tasks to be conducted and the likely hazards can result in systems of work being developed that considerably reduce or even remove many of the risks faced.

### **2.9.2 Operating *Ronan Orla* single-handed**

Regardless of the number of controls and safety barriers that might be put in place following a risk assessment, some vessels are not suitable for single-handed operations and some tasks may be too difficult or dangerous to be carried out alone. It was apparent that operating *Ronan Orla* alone was an extremely hazardous thing to do; a point that other experienced fishermen had made to the skipper.

Working in close proximity to unguarded rotating machinery on a slippery and cluttered deck presented a dangerous working environment. Working long hours and having to navigate the vessel and maintain a lookout, while operating the winch and processing the catch, further increased the risks being taken.

Had the skipper employed a crewman, the day to day operation of *Ronan Orla* would have been much less hazardous. What might have started as a simple snagging incident, could quickly have been prevented from escalating by the prompt intervention of a crewman.

It was unsafe to operate *Ronan Orla* single-handedly as a scallop dredger. The simultaneous working of its dredge gear, the need to maintain a safe navigational watch and the poor material condition of the vessel presented too many hazards.

## **2.10 SAFETY CULTURE AND FINANCIAL PRESSURES**

*Ronan Orla*'s skipper had initially operated the vessel as a potter to fish for whelks, but this proved unprofitable so he modified it to dredge for scallops. The scallop season lasted 6 months and the skipper had to land a sufficient quantity of scallops in that time to meet the repayments of his loan and support himself financially for the rest of the year. Competition from other local and migrant fishing vessels made this difficult and forced the skipper to work longer hours in order to make the necessary levels of profit.

*Ronan Orla*'s skipper was well qualified and had many years' experience working as a crewman on well-run fishing vessels where strong safety cultures had been promoted. He knew how a fishing vessel should be run and almost certainly would have wanted to operate *Ronan Orla* in a safe and effective manner. However, there was no evidence to suggest that the skipper had risk assessed his operation or inspected his safety equipment in accordance with the requirements set out in MSN 1813 (F). Furthermore, the material condition of *Ronan Orla* and its safety equipment, and the skipper's decision not to wear a PFD while working on deck, indicated that personal safety was not a priority.

It is possible that the skipper afforded safety a low priority because he was unconcerned for his own safety and he had no responsibility to provide a safe working environment for others. However, his lack of investment in *Ronan Orla*'s



conversion and subsequent upkeep, including mandatory safety items, indicate that he was struggling to make money and that any expenditure that did not directly contribute towards fishing was afforded a low priority. Essential repairs to the winch were not being undertaken and the general deterioration in the condition of the vessel meant that a serious accident would eventually be inevitable.

## SECTION 3 - CONCLUSIONS

### 3.1 SAFETY ISSUES IDENTIFIED DURING THE INVESTIGATION WHICH HAVE BEEN ADDRESSED OR HAVE RESULTED IN RECOMMENDATIONS

1. *Ronan Orla's* skipper, who was operating single handedly, was fatally injured because he became entangled on one of the vessel's dredge gear winch drums and was unable to stop the winch rotating or disentangle himself. [2.2]
2. The skipper was attempting to recover his dredge gear on board when the accident happened. [2.4]
3. The MAIB investigation was unable to establish conclusively the mechanism by which the skipper was pulled onto the winch. However, the evidence strongly indicated that one of the elasticated shoulder straps from his weatherproof trousers had snagged on the warping drum. [2.5]
4. *Ronan Orla* and its safety equipment had not been properly maintained, and its winch was found to be in an extremely poor material state. [2.6.1, 2.6.2, 2.6.3]
5. *Ronan Orla* did not carry the mandated level of safety equipment. [2.6.3]
6. Had the winch been fitted with an emergency stop the skipper might have been able to stop the warping drum rotating before he succumbed to his injuries. [2.7]
7. Had the winch control lever been designed to return to its stopped position when the handle was released, the accident would have been prevented. [2.7]
8. It was unsafe to operate *Ronan Orla* and its winch single-handed. [2.9.2]
9. Had the skipper employed a crewman, the likelihood of him suffering fatal injuries would have been significantly reduced as the crewman could have been able to intervene quickly to stop the winch and raise the alarm. [2.9.2]
10. It was apparent that the skipper's desire to operate his own vessel outweighed any concerns he might have had over his own personal safety. [2.10]
11. There were indications that financial constraints, rather than a lack of experience or safety awareness, induced the skipper to work single-handed and prevented him from maintaining his vessel and its equipment in a safe condition. [2.10]

## SECTION 4 - ACTION TAKEN

### 4.1 MAIB ACTIONS

The **Marine Accident Investigation Branch** has:

Issued the following recommendations to the Maritime and Coastguard Agency and the Fishing Industry Safety Group that are relevant to the accident in Report No 6/2015 *Investigation of a serious injury to a crewman on board Wanderer II, 1 mile south-east of Waiy Island, Outer Hebrides, 19 November 2013.*

The Maritime and Coastguard Agency is recommended to:

- |          |  |
|----------|--|
| 2015/109 | Review and amend MGN 415 (F) to include guidance on the safe operation of winch warping drums.   |
| 2015/110 | <p>In developing the revised Code of Safe Working Practice for the Construction and use of 15 metre length overall to less than 24 metres registered length Fishing vessels, ensure that the safe operation of winches is properly considered, including that:</p> <ul style="list-style-type: none"><li>• Hauling and hoisting gear shall be controlled by a dedicated winch operator;</li><li>• The winch operator shall give exclusive attention to that task and not carry out any other tasks while operating the equipment;</li><li>• Appropriate safety devices, including emergency stop facilities, are within easy reach of personnel using the equipment.</li></ul> |

Such provision should be applied to all vessels constructed, and all existing vessels that are substantially structurally or technically modified, from the date the revised Code is introduced.

The Fishing Industry Safety Group is recommended to:

- |          |  |
|----------|--|
| 2015/111 | Publicise the dangers of fishing vessel deck machinery and promote safe working practices by the production and promulgation of multi-media training aimed at deckhands. |
|----------|--|

### 4.2 ACTIONS TAKEN BY OTHER ORGANISATIONS

The **Maritime and Coastguard Agency** has:

Undertaken to add guidance and information on the particular dangers associated with single-handed operations in its publication, *The Fishermen's Safety Guide*.



## SECTION 5 - RECOMMENDATIONS

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

2015/129      Amend Marine Guidance Note 502(F) The Code of Practice for the Safety of Small Fishing Vessels to require owners of under 24m fishing vessels to submit copies of their annual self-certification declarations to the regulator.

The **Sea Fish Industry Authority** is recommended to:

2015/130      Include the additional hazards and increased risks associated with lone working and single-handed operations in its safety awareness training course syllabus.

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

Code of Practice for the Safety of Small Fishing Vessels Annex 1.4: Checklist of requirements  
– Decked Vessels of Less Than 10m Registered Length

## ANNEX 1.4

### CODE OF PRACTICE FOR THE SAFETY OF SMALL FISHING VESSELS: CHECK LIST OF REQUIREMENTS

Equipment need not be MCA approved provided it is fit for its intended purpose.

#### DECKED Vessels of less than 10m Registered Length

"Decked vessels" means a vessel with a continuous watertight weather deck that extends from stem to stern and has positive freeboard throughout, in any condition of loading the vessel.

Item	Remarks/compliance	Expiry/Service Date
Lifejackets - 1 per person		
2 Lifebuoys (1 with 18m buoyant line attached) <u>or</u> 1 Lifebuoy (fitted with 18m buoyancy line) +1 Buoyant Rescue Quoit		
3 Parachute Flares		
2 Hand-held Flares		
1 Smoke Signal (buoyant or hand held)		
1 Multi-purpose Fire Extinguisher (fire rating 5A/34B)		
Gas Detector		
1 Fire Blanket (light duty) in galley or cooking area (if applicable)		
Smoke Alarms		
1 Fire Pump + Hose <u>or</u> 1 Fire Bucket and lanyard		
1 Multi-purpose Fire Extinguisher for oil fires (fire rating 13A/113B)		
VHF Radio – fixed (DSC) or hand held		
For distress and urgency communications, it is recommended that VHF DSC is fitted. Coastguard Maritime Rescue Co-ordination Centres maintain a listening watch only on VHF Channel 16 via loudspeaker. The primary means of distress and urgency alerting should be via VHF DSC.		
Bilge Pump		
Bilge Level Alarm		
Navigation Lights & Sound Signals		
Anchor and cable/warp		
Compass		
Waterproof Torch		
Medical Kit		

Note: The checklist represents the minimum safety equipment requirements. Owners should in addition to the above consider carrying additional safety equipment. A radar reflector is recommended for vessels constructed of wood or glass reinforced plastic (GRP) and vessels with no significant steel upper works or masts. Carriage of a liferaft with release mechanism and EPIRB are also recommended.



Code of Practice for the Safety of Small Fishing Vessels Annex 2: Owners' Annual  
Self-Certification form

## ANNEX 2

### THE FISHING VESSELS (CODE OF PRACTICE FOR THE SAFETY OF SMALL FISHING VESSELS) REGULATIONS 2001

ANNUAL SELF CERTIFICATION (Owner to verify and sign in spaces below that vessel continues to comply with the requirements of the Code and retains a copy on board for inspection)

Name of Owner .....

Address of Owner .....

.....

.....

Name of Vessel.....

RSS No.....

Length Overall .....

Registered Length .....

Date of Registration .....

Hull Identification No.....

Mode(s) of Fishing .....

Port letters and number.....

I HEREBY CERTIFY, in respect of the above named vessel, that:

- i. The safety equipment has been checked in accordance with the attached checklist;
- ii. Such safety equipment carried is in accordance with the requirements of the Code;
- iii. Such safety equipment has been properly maintained and serviced in accordance with manufacturers' recommendations;
- iv. Where applicable a risk assessment\* of work activities and duties has been completed in accordance with the Merchant Shipping and Fishing Vessels (Health and Safety at Work) Regulations 1997;

\*The health and safety risk assessment is written - Yes/No (delete as appropriate)

1<sup>st</sup> Signature of Owner ..... Date.....

2<sup>nd</sup> Signature of Owner ..... Date.....

3<sup>rd</sup> Signature of Owner ..... Date.....

4<sup>th</sup> Signature of Owner ..... Date.....

5<sup>th</sup> Signature of Owner ..... Date.....

