Report on the investigation of

the grounding and subsequent foundering of

fv *Kerloch* (J235)

at Crow Rock, off Linney Head, Wales

on 20 February 2010

Marine Accident Investigation Branch
Mountbatten House
Grosvenor Square
Southampton
United Kingdom
SO15 2JU

Report No 12/2010
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The MAIB has investigated this accident with the co-operation and assistance of the States of Jersey. The Flag State's contribution to this investigation is acknowledged and gratefully appreciated.

Extract from

The United Kingdom Merchant Shipping

(Accident Reporting and Investigation)

Regulations 2005 – Regulation 5:

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

NOTE

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

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All reports can be found on our website:
www.maib.gov.uk

For all other enquiries:
Email: maib@dft.gsi.gov.uk
Tel: 023 8039 5500
Fax: 023 8023 2459

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Annex B MCA leaflet *Fatigue in Seafarers*, May 2007

Annex C Extract from Seafish *Fishing Vessel Safety Folder*, May 2007

Annex D Extract (pp. 22, 26, 54-57) from MCA booklet *Fishermen's Safety Guide*, January 2008

Annex E MGN 414 (F) Fishing Vessels – Domestic and Overseas Management Beyond European Waters

Annex F MGN 313 (F) Keeping A Safe Navigational Watch on Fishing Vessels

Annex G MGN 267 (F) The Location and Stowage of Liferafts and Emergency Positioning Radio Beacons (EPIRBs) on UK Registered Fishing Vessels

Annex H MAIB flyer to fishing industry highlighting lessons learned from this accident

GLOSSARY OF ABBREVIATIONS, ACRONYMS AND TERMS

AIS	-	Automatic Identification System
ALB	-	All weather lifeboat
BA	-	British Admiralty
C	-	Celsius
Circ	-	Circular
DSC	-	Digital Selective Calling
EC	-	European Communities
EPIRB	-	Emergency Position Indicating Radio Beacon
EU	-	European Union
fv	-	fishing vessel
GMDSS	-	Global Maritime Distress and Safety System
GPS	-	Global Positioning System
GT	-	Gross Tonnage
HRU	-	Hydrostatic Release Unit
ILO	-	International Labour Organization
IMO	-	International Maritime Organization
kW	-	kilowatt
LOA	-	Length Overall
LSA	-	Life Saving Appliances
m	-	metre
‘Mayday Relay’	-	An emergency code word used internationally as a distress signal in voice radio communications and transmitted on behalf of a vessel in distress.
MCA	-	Maritime and Coastguard Agency
MF	-	Medium Frequency

MFA	-	Marine & Fisheries Agency
MGN	-	Marine Guidance Note
MHPA	-	Milford Haven Port Authority
MMO	-	Marine Management Organisation
MOB	-	Manoverboard
MoU	-	Memorandum of Understanding
MRCC	-	Maritime Rescue Co-ordination Centre
MSC	-	Maritime Safety Committee
MSN	-	Merchant Shipping Notice
nm	-	nautical mile
ODAS	-	Ocean Data Acquisition System
RNLI	-	Royal National Lifeboat Institution
RSW	-	Refrigerated Sea Water
RYA	-	Royal Yachting Association
Seafish	-	The Sea Fish Industry Authority
SI	-	Statutory Instrument
SOLAS	-	International Convention for the Safety of Life at Sea
STCW	-	International Convention on Standards of Training, Certification and Watchkeeping for Seafarers 1978, as amended
UK	-	United Kingdom
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 1725 on 20 February 2010, the Jersey-registered crabber *Kerloch* (J235) was returning to port when she ran aground on Crow Rock, off the Pembrokeshire coast. The vessel began to sink rapidly and all four crew donned their lifejackets, then deployed and got into the liferaft. The crew were recovered from their liferaft by another fishing vessel and subsequently transferred to the Angle ALB and then ashore. There were no injuries and no pollution.

The accident occurred during the hours of daylight when the skipper fell asleep in his chair. A watch alarm was reported to be functional in the wheelhouse, but was ineffective. During the week before the accident, the crew had been working up to 18 hour shifts while fishing the grounds off Lundy Island. Although each crew member normally took a navigational watch as the vessel steamed back to port, the skipper elected to take the entire watch; he thought the deckhands seemed tired, and he felt fresh.

The safety legislation for Jersey-registered fishing vessels lags behind the equivalent EU and UK regulations, with key modern safety concepts such as risk assessments and safety awareness training currently not required.

As a consequence of this accident, various actions have been taken, including:

- The States of Jersey intends to continue the ongoing update of its legislation for Jersey-registered fishing vessels to align the safety and training requirements with those for UK fishing vessels.
- The UK operators of *Kerloch* now ensure that crew on vessels they manage hold the required statutory certification.
- Cosalt International Ltd. has reinforced its reminder process for the servicing of hire liferafts, and will ensure that all customers sign an agreement confirming their statutory obligations.
- The MAIB has published a safety flyer for circulation to the fishing industry, which details the lessons learned from the accident.

A recommendation has been made to the States of Jersey to expedite the current update of the regulatory framework applicable to Jersey-registered fishing vessels. Recommendations have also been made to the manager and operators of *Kerloch*, which promote adherence to best practice guidance available in the UK.

SECTION 1 - FACTUAL INFORMATION

1.1 PARTICULARS OF *KERLOCH* AND ACCIDENT

Vessel details

Registered owner	:	Privately owned by a Jersey national
Manager	:	Privately managed by a Jersey national
Flag	:	Jersey
Type	:	Crabber
Built	:	1959 at Cameret, France
Construction	:	Wooden
Length overall	:	17.54m
Registered length	:	15.45m
Gross tonnage	:	78
Engine power and/or type	:	179kW produced by a Moteurs Baudoin P6 M26 engine

Accident details

Time and date	:	1725 on 20 February 2010
Location of incident	:	51º 36.72' N 005º 03.28' W at Crow Rock, off Linney Head, Wales
Persons on board	:	4
Injuries/fatalities	:	None
Damage	:	Vessel lost

1.2 BACKGROUND

Kerloch was a Jersey-registered vivier[1] crabber, as depicted at **Figure 1**. Operating out of Milford Haven **(Figure 2)**, she typically spent 2 to 3 days working the fishing grounds off Lundy Island, in the Bristol Channel, prior to returning to port to land, refuel and take on stores. The vessel normally then returned immediately to the fishing grounds.

Image courtesy of Trawler Photos

Figure 1



Kerloch

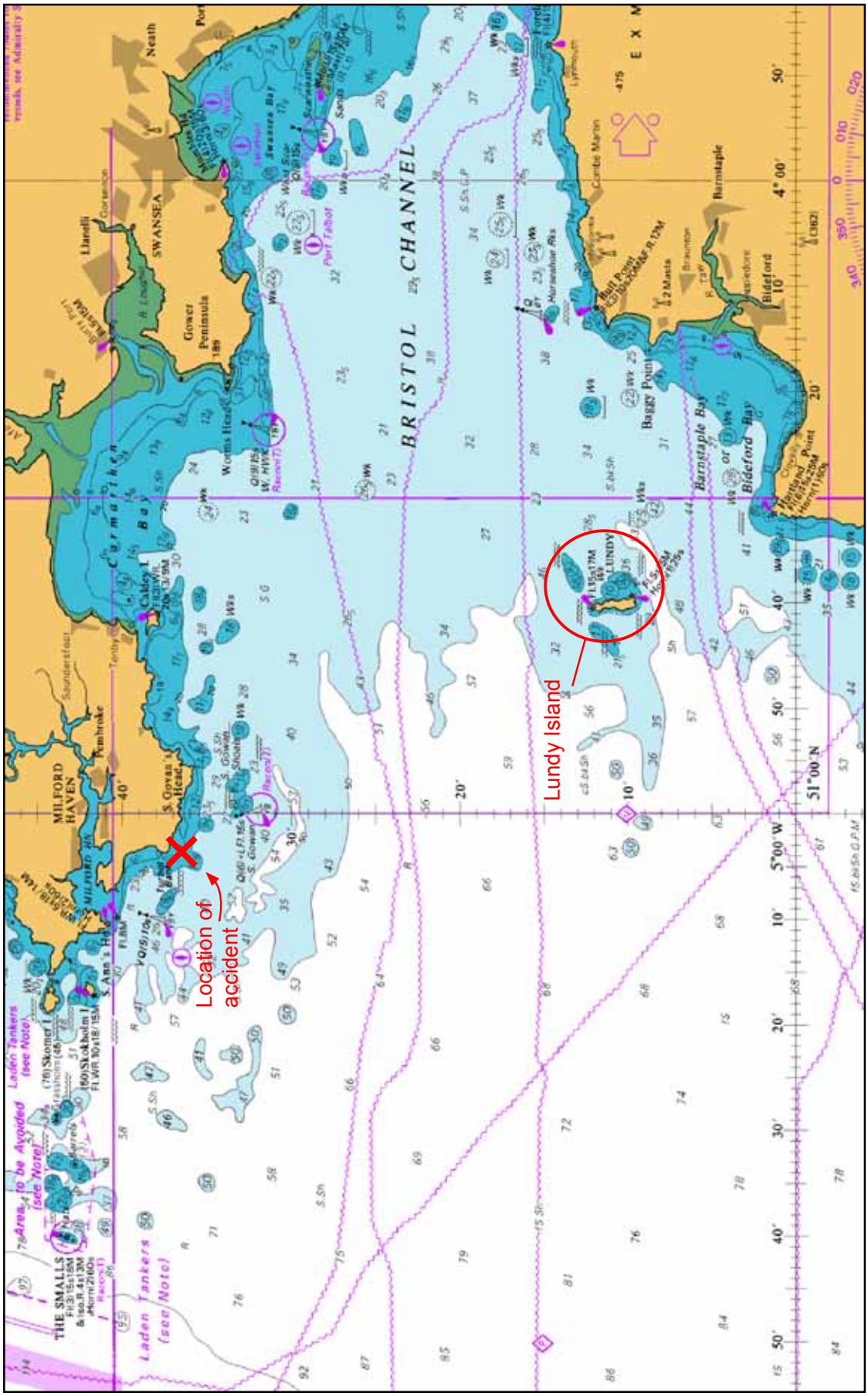
The crew typically worked on board *Kerloch* for between 4 and 6 weeks, before taking a couple of weeks off. However the vessel had stopped crabbing in late December 2009 prior to entering a boatyard in January 2010 to undertake minor maintenance and repairs. Her departure was delayed awaiting a suitable tide, and she finally re-entered service on 29 January. A couple of trips were successfully completed before she had to return to the yard for a week to replace her main generator. She re-commenced crabbing on 12 February.

The general arrangement of the vessel is at **Figure 3**.

[1] Vivier – derived from the French verb, vivre to live; a system which circulates oxygenated refrigerated sea water (RSW) in order to keep shellfish alive and in good condition.

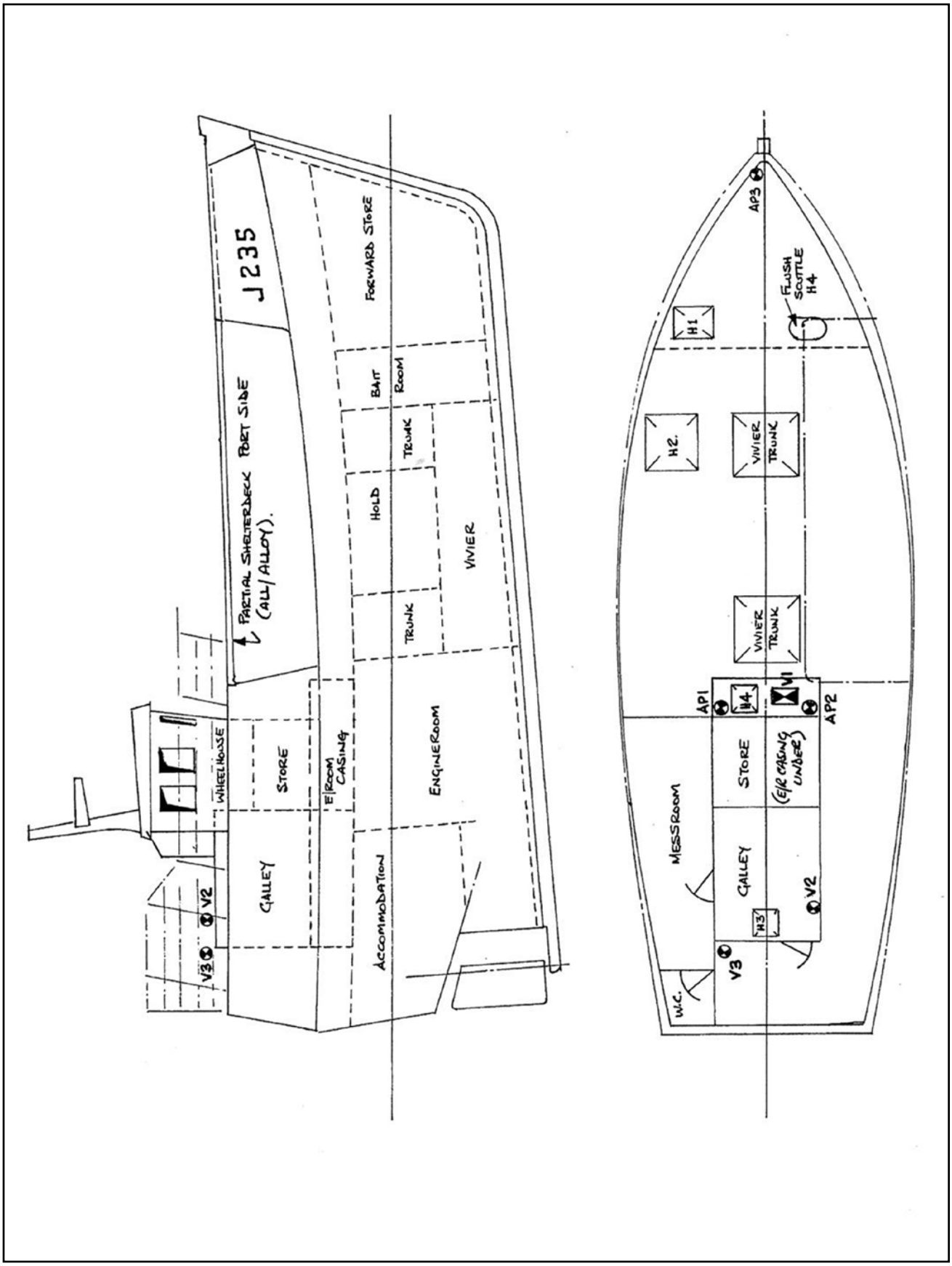
Reproduced from Admiralty Chart BA 1123 by permission of
the Controller of HMSO and the UK Hydrographic Office

Figure 2



Extract from chart BA 1123 showing Bristol Channel area

Figure 3



General Arrangement plan of *Kerloch*

1.3 ENVIRONMENTAL CONDITIONS

The wind was north-easterly Force 2-3, with slight seas and good visibility. High water was predicted for 2144 at Milford Haven, with sunset at 1742.

1.4 NARRATIVE OF ACCIDENT

1.4.1 Details of accident

Kerloch departed Milford Haven on 12 February 2010 to re-commence crabbing operations off Lundy Island. On board were the skipper and three deckhands. The vessel returned on the morning of 15 February to land her catch of crabs and re-store, before heading back out to the fishing grounds later that day.

Three more days were spent potting and, as for the previous trip, they worked for up to 18 hours at a time, with the skipper in the wheelhouse operating the winch and the crew on deck. All four would then each take a 1.5 hour watch in the wheelhouse overnight, before restarting work in the early hours of the morning.

At 2300 on 18 February, the skipper decided to head back to Milford Haven to land the catch. The skipper kept watch on his own from 0200 on 19 February until they arrived alongside at 0700.

Departing Milford Haven at 1100, the skipper steamed the vessel out of the estuary, and handed the watch over at around 1230, before taking lunch and then getting some sleep. He took over the watch again at 1700.

Kerloch arrived in the vicinity of Lundy Island at about 1800, but the skipper's intention of immediately re-commencing potting was thwarted by the strong tidal streams in the area. There was no option but to wait until the early hours of the morning for the tide to ease. The skipper came off-watch at around 1900, had dinner, and then went to bed. During the evening, the three deckhands each took a watch, and the skipper came on-watch at around midnight.

The skipper called the three deckhands at 0130 on 20 February and they started potting at 0200. It was a cold morning, and the skipper had the heater on in the wheelhouse to compensate for the open window, which allowed him to communicate with the three deckhands on deck. Other than a brief stop for breakfast at around 0600, they worked straight through until 1200 when it was noted that the vessel was running low on fresh water due to a leak in the water pump hose.

Rather than proceed to a nearer port in North Devon the skipper decided to go back to Milford Haven, which also allowed them to land the catch. *Kerloch* left the fishing grounds at around 1230, and the skipper elected to take the watch for the entire trip back; he perceived that the three deckhands were tired, having been working on deck since the early hours of the morning. He, however, felt fresh. After completion of some tasks on deck, the deckhands had lunch and then went to bed at around 1400.

The passage towards Milford Haven was initially uneventful, and one that the skipper had completed many times before. No passage plan had been prepared, and it was not the practice on board to do so. The skipper monitored progress from his seated position on the starboard side of the wheelhouse, making use of the Olex chart plotter system and radar. Although the skipper always created a new courseline on the plotter for the deckhands to follow when they were taking steaming watches, he never used this facility himself. He instead preferred to monitor the relative bearing and distance to a waypoint, in this case marked near to the mouth of the estuary, making occasional adjustments to the autopilot course to steer.

The vessel continued to make good progress at around 7 knots, with the watch alarm system reported to be functioning as normal, alarming every 5 minutes. Although the heater was by now switched off, none of the windows were open and the afternoon sun was helping to keep the wheelhouse warm.

The skipper recalled passing St. Gowan lightbuoy, about 5 miles south-east of Linney Head, but at some point later he fell asleep. He was next aware of being woken up at 1725 as he was thrown from his chair by the impact of the vessel grounding on Crow Rock.

The Milford Haven Port Authority (MHPA) Vessel Traffic Services (VTS) radar system recorded images of the vessel from 1708 onwards **(Figures 4a**, **4b**, **4c** & **4d)**. The vessel remained outside the port limits at all times, and was therefore not being actively monitored by VTS.

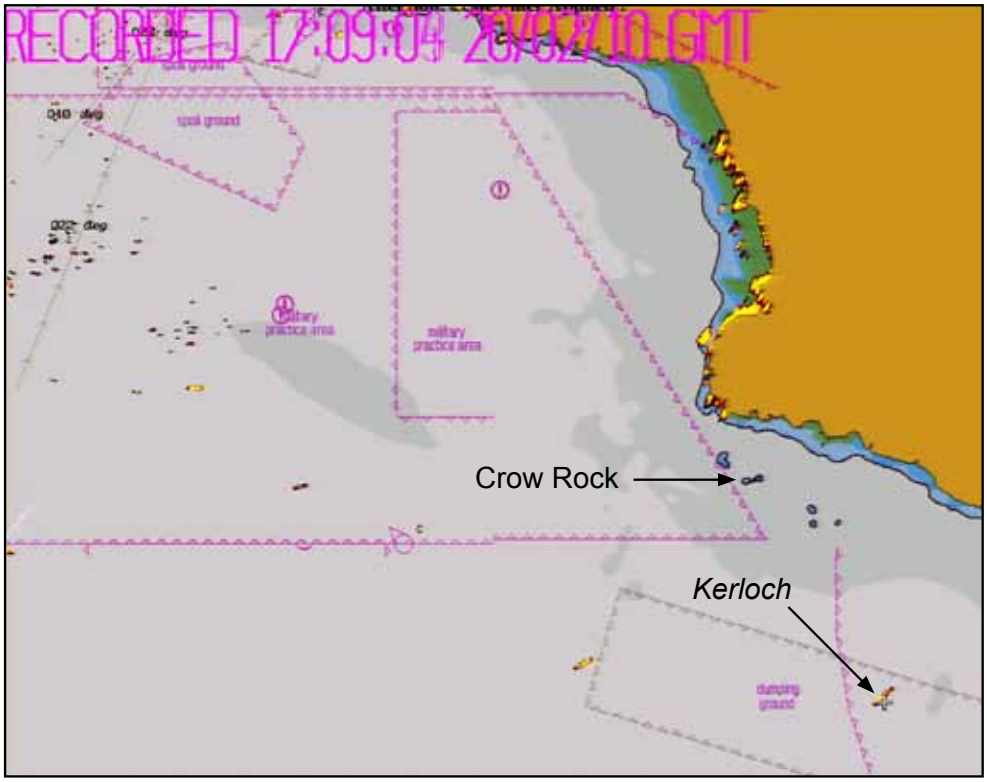
Kerloch immediately and rapidly developed a large bow trim, and the skipper shouted to the crew below to get up as it was clear that the vessel was starting to sink.

All three crew men arrived in the wheelhouse, just as the skipper was making his way out of the aft emergency escape window **(Figure 5)**, he having decided that there was insufficient time to activate the vessel's DSC radio alert. The skipper also forgot to collect a hand-held VHF radio, located by the escape window. The deckhands immediately followed him out the window, and all four mustered on the port side of the shelterdeck top in the vicinity of the vessel's two liferafts and dedicated lifejacket stowage **(Figure 6)**. No attempt was made to remove the EPIRB from its mount on the starboard side of the mast.

They each donned a lifejacket **(Figure 7)**, then the skipper and one of the crew jettisoned the 8-man liferaft canister and started to deploy the painter. As the vessel continued to sink by the bow the crew became anxious about the time it was taking for the raft to activate, due to the length of painter that had to be pulled from the canister. However, the liferaft finally inflated upright **(Figure 8)**, and the painter was then cut. One of the deckhands held onto the cut end, while the other two deckhands, then the skipper, jumped onto the liferaft, before boarding himself.

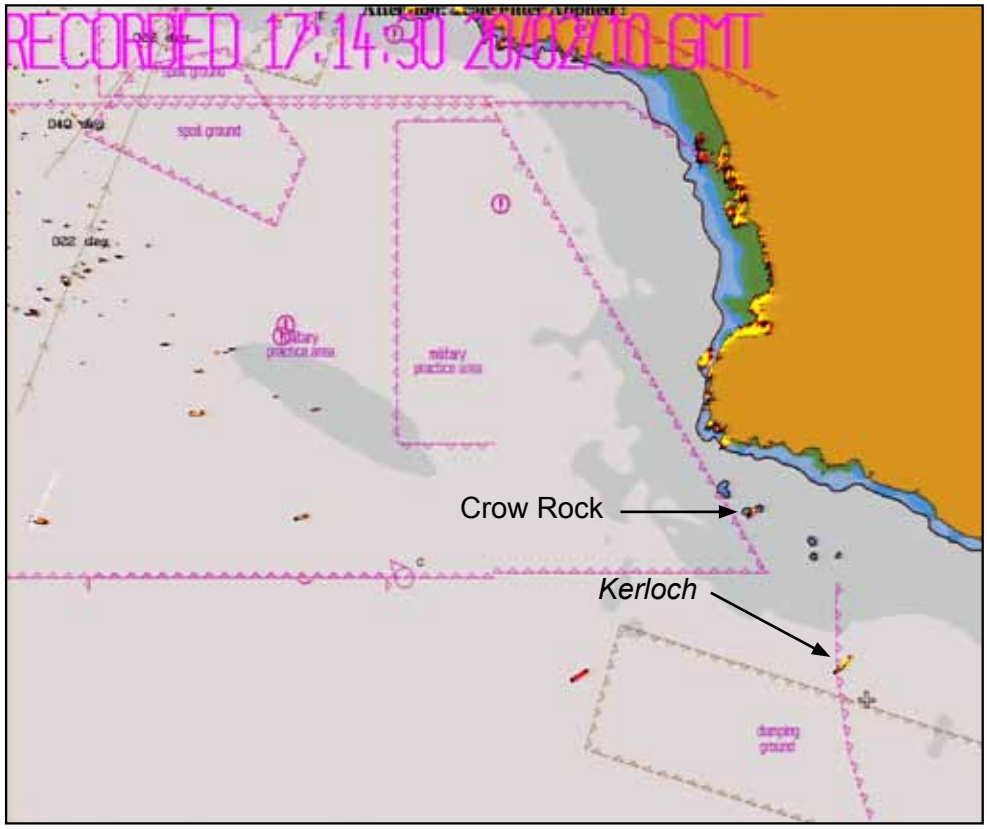
Shortly afterwards, *Kerloch* sank by the bow, disappearing from the MHPA radar at 1739 as the crew, concerned they might be dragged down, paddled the liferaft clear.

Figure 4a



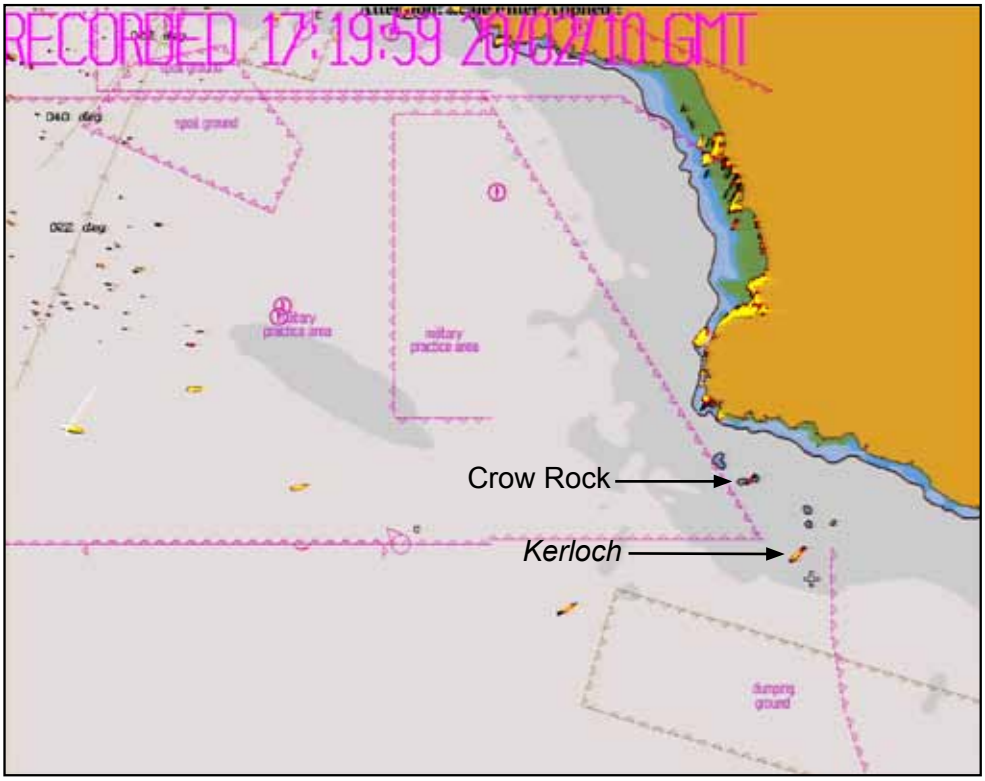
Screen capture from Milford Haven Port Authority (MHPA)
Vessel Traffic Services (VTS) radar showing area of accident at 1709

Figure 4b



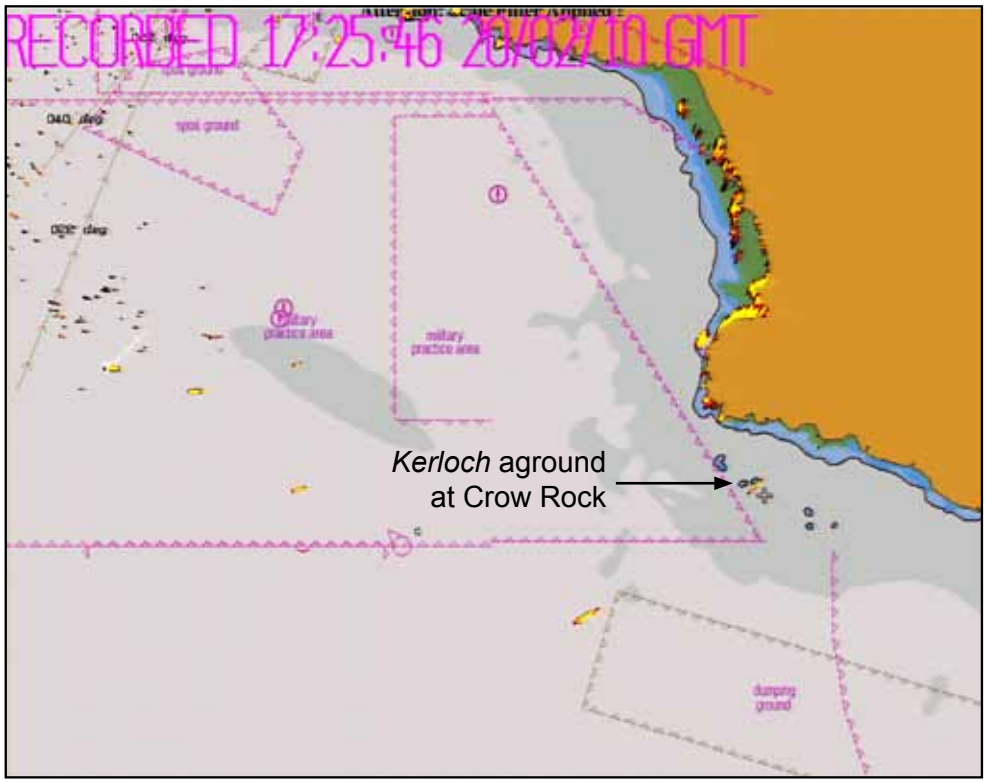
Screen capture from Milford Haven Port Authority (MHPA)
Vessel Traffic Services (VTS) radar showing area of accident at 1714

Figure 4c



Screen capture from Milford Haven Port Authority (MHPA)
Vessel Traffic Services (VTS) radar showing area of accident at 1719

Figure 4d



Screen capture from Milford Haven Port Authority (MHPA)
Vessel Traffic Services (VTS) radar showing area of accident at 1725

Image courtesy of Trawler Photos

Figure 5



Photograph of *Kerloch* showing aft emergency escape window

Image courtesy of www.worldfishingtoday.com / Ole Skjold

Figure 6



Photograph of *Kerloch* showing liferafts and dedicated lifejacket stowage

Figure 7



Photograph of lifejackets used during abandonment from *Kerloch*

Figure 8

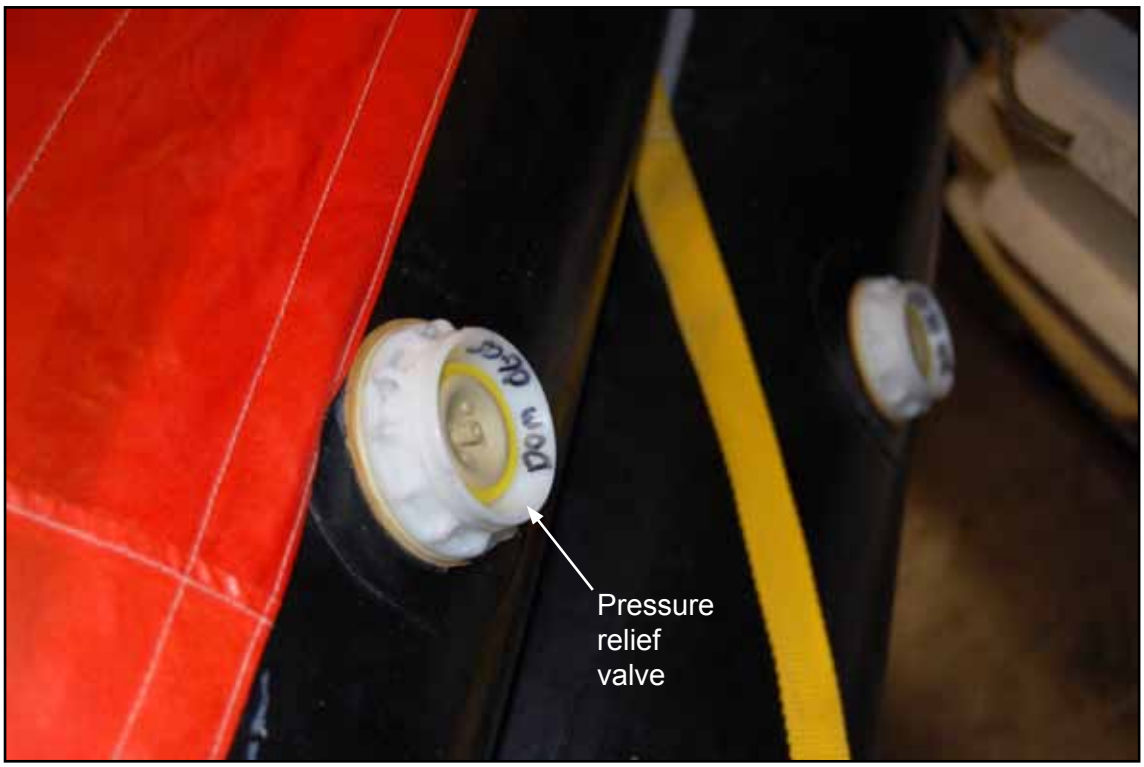


Photograph of liferaft used during abandonment from *Kerloch*

1.4.2 Post-accident narrative

The liferaft remained safely afloat following the sinking, although the sound of escaping air caused some of the crew to again become anxious, thinking that a leak had developed. The noise was later attributed to a pressure relief valve **(Figure 9)**.

Figure 9



Photograph showing pressure relief valve on liferaft

One of the deckhands released a red flare, just before the skipper made a 999 call by mobile phone which was transferred to Milford Haven Maritime Rescue Co-ordination Centre (MRCC) at 1742. The flare was observed by the skipper of a small potting vessel, fv *Dolly Ann*, which was about 1.5nm south of Linney Head. He contacted the MRCC as the 999 call was being taken, and confirmed that he would immediately proceed to the scene.

Meanwhile, *Kerloch*'s skipper informed the MRCC that the vessel had sunk at Crow Rock, and that he and the three crew were in the liferaft. The MRCC watchkeeper used the mobile phone connection to provide the skipper with reassurance, advice and regular updates until *Dolly Ann* arrived on scene at 1758.

By 1804 *Dolly Ann* had recovered all four crew and their liferaft and was proceeding towards Milford Haven. At 1821 the crew of *Kerloch* transferred to the Angle ALB, which arrived alongside at 1843, where they were met by the coastguard sector manager and an ambulance. All four were checked and found to be well; no alcohol or drug testing was conducted.

The canister for the other liferaft on board floated free shortly after the vessel sank, and the liferaft later inflated. However, the vessel's EPIRB did not activate until more than 3 days later, in the early hours of 24 February; EPIRB signals were detected from 0143 until 1947, but the unit could not be recovered.

1.5 CREW DETAILS

1.5.1 Skipper

The skipper was a Guernsey national, with 12 years of fishing experience, the majority of which was gained on crabbing vessels. He had worked largely on vessels operating out of Guernsey, but had spent 4 years in Grimsby and most of the year prior to the accident in Milford Haven. His first experience as skipper was gained as relief during this latter period on the crabber *Cesca* for around 6 to 7 months. He joined *Kerloch* as crew in December 2009, then as permanent skipper when she re-entered service in January 2010. He was employed on *Kerloch* on a share basis[2], as were the vessel's three deckhands.

At the time of the accident, the skipper had been experiencing some anxiety due to personal problems, and was missing his family back in Guernsey. His bunk, which was placed athwartships, was considered not particularly comfortable for sleeping, especially when the vessel rolled.

The skipper did not hold a certificate of competency, nor was he required to do so, but he had completed RYA courses in Diesel Engine Maintenance, VHF radio and GMDSS. It is reported that he had also completed an RYA Sea Survival course in May 2001, and fire-fighting and first-aid courses for fishermen in February and March 2002 respectively, in Guernsey. He did not possess certificates for these courses, and neither the RYA nor the Sea Fish Industry Authority (Seafish[3]) held applicable records. However, such records have only recently begun to be collated; there was no Guernsey requirement at that time for fishermen's safety training courses.

1.5.2 Deckhands

All three deckhands on board *Kerloch* were UK nationals.

The first was an experienced fisherman, having worked for 18 years on various UK crabbers. He completed Seafish courses in Basic Sea Survival, Basic First Aid and Basic Fire Fighting & Prevention in 1998, and had joined *Kerloch* in late January 2010.

The second deckhand was an occasional fisherman; he had just over a year's experience on fishing vessels, including a month on *Kerloch*, which he joined in late 2009. He had completed Seafish courses in Basic Sea Survival, Basic First Aid and Basic Fire Fighting & Prevention in 2005.

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[2] Instead of receiving a fixed salary, 'share' fishermen remuneration is calculated on the basis of the profit from each catch. As such, they are not considered to be 'employees' for tax purposes.

[3] Seafish is a Non Departmental Public Body sponsored by the four UK government fisheries departments and funded by a levy on seafood. As part of its remit, it provides vocational and safety training to the industry through its network of affiliated Group Training Associations.

The third deckhand joined *Kerloch* on 12 February 2010 for his first ever experience on a fishing vessel. He had not completed any fishermen's safety training courses.

1.6 OWNERSHIP, MANAGEMENT AND OPERATION OF VESSEL

1.6.1 Vessel history

Kerloch was built in 1959 at Cameret in France and originally operated under the French flag as a tuna fishing vessel, before coming onto the Jersey register in 1980. In 1987, a Jersey fisherman took ownership of the vessel. He sold *Kerloch* in 2002, but continued to act as the vessel's manager, and he remained the manager when the vessel was again sold on, in 2008. He managed the vessel up until the date of the accident even though *Kerloch* did not visit Jersey after 2002.

1.6.2 Current ownership arrangement

In April 2009, *Kerloch* again changed ownership, when a former fisherman became the vessel's registered owner. A Jersey national, but domiciled in Alderney, he was the brother-in-law of the vessel's manager. He had no day-to-day involvement with running the vessel.

At the same time, the new registered owner entered into an agreement to sell the vessel to interests in the UK under a private mortgage arrangement over a 5-year period. The States of Jersey administration was not aware of this transaction.

During the ongoing transfer of ownership, the UK group effectively became the vessel's operators, assuming responsibility for her operation, including the manning, maintenance and safety management. Although *Kerloch* was to be the first vessel that they would own, one of the group had 31 years' experience as a fisherman, including 17 years as skipper, on various vessels around the UK and Guernsey, and he took on the role of skipper. He had completed Seafish courses in Basic Sea Survival, Basic First Aid, Basic Fire Fighting & Prevention and Safety Awareness; he did not hold a certificate of competency.

In June 2009 the skipper and his wife became managers for a local company which operated three UK-registered crabbers, and was in the process of flagging in a fourth crabber from the Guernsey register. The skipper stopped being *Kerloch*'s permanent skipper, to concentrate on the new role, but continued to act as relief skipper. All of the vessels were operated in a similar manner, with crew switching between vessels as required.

1.6.3 Management of vessel

Kerloch's Jersey-based manager had minimal involvement with her operation, other than maintaining crew lists and liaising with the Jersey administration and its appointed surveyors. He had not been on board the vessel for at least 8 years.

1.6.4 Onboard operations

Ultimate responsibility for onboard operations was devolved largely to the skipper, although the UK operators visited the vessel when she was in port. No onboard training or drills were conducted, despite a requirement under Jersey legislation to conduct training once a month. A risk assessment had not been conducted for the vessel, nor was one required.

1.7 GENERAL DESCRIPTION OF VESSEL

1.7.1 Vessel layout

The vessel's wooden hull originally incorporated an exposed main deck, but during the 1990s a forward whaleback was added. The main deck was then further enclosed with a partial aluminium shelter, incorporating a large starboard side opening, forward of which was the hydraulic pot hauler winch.

The layout is depicted at **Figure 3**, and shows the central vivier tank for storing the live catch, aft of the bait room and forward store. The bulkheads below main deck were wooden, and not considered watertight.

The engine room was located aft of the vivier tank, and housed the main generator and a 179kW Moteurs Baudoin P6 M26 engine, driving a single propeller. Aft of the engine room was the main cabin, while the skipper's bunk was beneath the wheelhouse, which could only be accessed internally. The aft wheelhouse window above the chart table acted as an emergency escape route.

1.7.2 Wheelhouse equipment

Kerloch had a standard array of navigational equipment, including Olex and MaxSea chartplotters, a Furuno radar, echosounder and satellite compass, two Furuno GPS units, an MF radio and two VHF radios, one of which provided DSC/GMDSS capability, and a hand-held VHF radio.

Although the echosounder did not have an alarm facility, the radar offered the capability to employ guard zones; however, this feature was never used. The vessel was not required to have AIS, and did not have a unit fitted.

A watch alarm was connected to the Navitron autopilot system and was reported to be functional. It sounded every 5 minutes, and could be stopped from the wheelhouse chair by leaning forward and pressing a button. The alarm was audible only within the wheelhouse, and incorporated two flashing red lights and a beeping sound that became louder if not cancelled.

As *Kerloch* was over 15m LOA and registered in the British Isles with a UK fishing licence, she was required to automatically provide positional data every 2 hours to the Marine & Fisheries Agency (MFA)[4] via a Vessel Monitoring System

[4] During the course of this investigation, the work of the MFA was incorporated into the Marine Management Organisation (MMO), a new executive non-departmental public body.

(VMS); in the event of a VMS failure, 4-hourly manual position reports could be provided. On 10 December 2009 *Kerloch*'s VMS stopped transmitting and no manual reports were submitted. Although the MFA informed the vessel's registered owner of the problem in writing on 21 December, the vessel's UK operators were unaware of the problem at the time of the accident.

1.7.3 Safety equipment

The life saving apparatus (LSA) carried on board *Kerloch* included:

- Six lifejackets (in a dedicated stowage on the shelterdeck top).
- One 8-man RFD Surviva liferaft with hydrostatic release unit (HRU); on hire from Cosalt International Ltd., last serviced 28 January 2009.
- One 6-man RFD Surviva liferaft with HRU; on hire from Cosalt International Ltd., last serviced 26th June 2009.
- One McMurdo Type 404 EPIRB with HRU, mounted in a stowage on the starboard side of the mast **(Figure 10)**. The battery replacement due date was 09/2009.
- One Pains Wessex Manoverboard (MOB) 360 lifebuoy marker, expiry date 01/2009.

Figure 10



Photograph of *Kerloch* showing EPIRB mounted on mast

The LSA carried was in excess of the requirements mandated by the States of Jersey, which required only one liferaft and did not require an EPIRB to be carried. However, the EPIRB battery and MOB Lifebuoy Marker were both out of date, with the EPIRB still registered with the previous owner. The 8-man liferaft used during the abandonment was overdue its annual survey. Cosalt International Ltd. had not issued a reminder to the hirers that the service was due, despite the company's policy to do so.

1.7.4 Survey and Inspection record

Kerloch was last surveyed by R & J Maritime Limited on behalf of the States of Jersey on 13 May 2008. A Jersey Fishing Vessel Certificate was issued on 2 October 2008, valid for 5 years until 23 September 2013. A small number of deficiencies were identified and recorded as rectified by the then owner. Due to her age of build, the vessel was granted a number of exemptions. This included a waiver from the requirement to be fitted with watertight bulkheads, subject to the vivier pump bilge suction being maintained.

In 2006, the vessel was the subject of an MCA targeted inspection in Padstow, which identified 26 deficiencies, 24 of which required rectification before the vessel could sail. Three of the defects related to items required by the MCA, but not applicable to a Jersey-registered fishing vessel; a Radio Operator's certificate and MOB retrieval system were identified as requiring immediate attention, while a risk assessment was to be completed within 1 month.

1.8 STATES OF JERSEY FISHING VESSEL LEGISLATION

1.8.1 Background

Jersey is constitutionally a British Crown dependency, which passes its own laws and regulations via its legislative assembly, the States of Jersey. Although a member of the British Isles, Jersey is not part of either the UK or European Union (EU), and is thus not subject to UK or EU legislation, although the assembly can choose to adopt elements of either.

The States of Jersey operates a maritime register as part of the Red Ensign Group, with the registry administered by the States of Jersey's Economic Development Department, which is also responsible for maritime policy and regulation. The harbourmaster, on behalf of the minister, has responsibility for administering the legislative compliance of Jersey-registered fishing vessels, including their survey and inspection.

Prior to the loss of *Kerloch*, the Jersey fishing fleet comprised around 150 vessels under 12m in length, and only five over 12m vessels, with the majority of the latter based and operated in UK waters and rarely visiting Jersey. The over 12m fleet had reduced in recent years, in particular following a review of the ownership and eligibility of some vessels to remain on the Jersey register.

1.8.2 Fishing vessel ownership and registration requirements

The requirements for registering a fishing vessel in Jersey are stipulated in the Shipping (Registration) (Jersey) Regulations 2004. These essentially require both the legal and beneficial owners of *Kerloch* to be individuals ordinarily resident in Jersey, or a corporate body incorporated in Jersey. Although exceptions to the former may be granted, with regard to the time an individual might have previously resided in Jersey and their involvement in the Jersey fishing industry, the owner of the majority interest in the vessel should be resident or have a place of business in Jersey. If the latter conditions are not satisfied, a representative person, who is resident in Jersey, or a corporate body incorporated in Jersey, should be appointed for the vessel.

Notwithstanding the above, a Jersey-registered fishing vessel must:

- be managed from within Jersey
- have her operations controlled and directed from within Jersey; and
- have any charterer, manager or operator of the vessel meet the ownership requirements detailed above.

Article 63(3) of the Shipping (Jersey) Law 2002 places some liability on a vessel's manager for its safe operation, but the legal responsibility of operators for fishing vessel safety compliance is currently not clearly defined. The registration regulations also require that a vessel's registered owner must, as soon as practicable, provide details to the registrar of any transfer or transmission of ownership, and surrender the certificate of registry.

The equivalent legislation for registering a fishing vessel under the UK flag is enacted in The Merchant Shipping (Registration of Ships) Regulations 2003, and is similar in principle to the Jersey registration regulations.

1.8.3 Fishing vessel safety requirements

The safety requirements for a Jersey-registered fishing vessel are specified in the Shipping (Jersey) Law 2002 and Shipping (Fishing Vessels Safety Provisions) (Jersey) Order 2004. The latter was first introduced in 1988 and outlines the primary safety regulations; it is effectively a copy of the UK's Fishing Vessels (Safety Provisions) Rules 1975, as amended up to 1981 (1975 Rules).

The 1975 Rules have been further amended on various occasions since 1981. In 2002 the UK requirements for vessels between 15m length overall (LOA) to less than 24m registered length were superseded by The Fishing Vessels (Safety of 15-24 Metre Vessels) Regulations 2002. The full text of these regulations was issued in 2002 as a Code of Safe Working Practice, summarised in Merchant Shipping Notice, MSN 1770 (F).

Various differences exist between the statutory requirements for Jersey and UK-registered fishing vessels; the principal variations relevant to this accident for a vessel of *Kerloch*'s age and length are detailed in **Table 1**:

	Jersey	UK
Requirement	**Shipping (Fishing Vessels Safety Provisions) (Jersey) Order 2004**	**The Fishing Vessels (Safety of 15-24 Metre Vessels) Regulations 2002**
Annual self-certification by owner/delegated representative	Not required.	Required.
Risk assessment	Not required[5].	Required.
Watertight Bulkheads	Wooden vessels to have a wooden bulkhead or solid & substantially constructed bulkhead between fish hold and rest of vessel.	Arrangement on existing vessels acceptable provided arrangement remains efficient in service.
Float free satellite EPIRB	Not required.	Required. Crew should be familiar in its operation. The power source should be replaced whenever necessary, at least before its expiry date.
Hand-held VHF radio	Not required.	Required. Crew should be familiar in its operation.
Drills	Monthly. Skipper should ensure all crew are trained in LSA and know where the equipment is stowed.	Monthly. Skipper should ensure all crew are trained in LSA and know where it is stowed. Drills should ensure crew thoroughly understand and are exercised in the duties they have to perform, and include flooding drills. Details of all completed drills should be recorded.

Table 1 – Comparison of relevant Jersey and UK statutory requirements

[5] A risk assessment is however required for young people (aged 16-18) in accordance with the Shipping (Employment of Young People) (Jersey) Order 2007. This would not have been applicable for the crew of *Kerloch* at the time of the accident.

Although the safety provisions stipulate that a Jersey-registered fishing vessel should carry copies of UK Merchant Shipping Notices (MSNs), the States of Jersey does not issue any guidance of its own specific to fishing vessels.

1.8.4 Fishing vessel safety training requirements

The training requirements for crew on Jersey-registered fishing vessels are stated in the Shipping (Fishing Vessels – Safety Training) (Jersey) Order 2004. It makes no distinction between new entrant and experienced fishermen, and requires a fisherman to either:

- be a certificated deck or engineering officer
- hold certificates confirming completion of Seafish courses in Basic Sea Survival, Basic First Aid and Basic Fire Fighting & Prevention
- hold certificates confirming completion of training courses equivalent or superior to the three Seafish courses listed above
- be exempted by States of Jersey from the above requirements.

No exemption had been applied for or granted to any of the crew of *Kerloch*.

The safety training requirements for UK-registered fishing vessels are summarised in Marine Guidance Note, MGN 411 (M+F)[6]. From 1 January 2005, all new entrant fishermen were required to complete the Seafish Basic Sea Survival course prior to starting work, and Seafish courses in Basic Fire Fighting & Prevention, Basic First Aid and Basic Health & Safety within 3 months.

The UK also requires experienced fishermen, defined as having worked for 2 years or more, to attend a 1-day Seafish Safety Awareness & Risk Assessment course. Neither this course nor the Health & Safety course was required or available in Jersey at the time of the accident.

Neither the skipper of a UK-registered fishing vessel, nor a Jersey-registered fishing vessel of less than 16.5m registered length is required to hold a certificate of competency. However, voluntary bridge watchkeeping courses are available, potentially leading to a skipper's certificate for under 16.5m vessels.

1.8.5 Survey and inspection regime

Although the harbourmaster administers the legislative compliance of under 12m Jersey-registered fishing vessels, the survey and inspection regime of the over 12m fleet is delegated to consultant surveyors. From 2001, this function was formally delegated to R & J Maritime Limited, but in June 2009 MECAL (Jersey) Ltd[7] was appointed as surveyors of Jersey fishing vessels under the amended Shipping (Jersey) Law 2002 and the 2004 safety provisions.

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[6] MGN 411 (M+F) superseded MGN 404 (M+F) in March 2010.

[7] MECAL (Jersey) Ltd is a branch of MECAL Ltd, a UK-based and MCA-approved Certifying Authority, and was already the appointed survey organisation for Jersey-registered commercial vessels up to 150 registered tons.

MECAL (Jersey) Ltd surveyors are able to inspect any Jersey-registered fishing vessel at any time to confirm compliance with the 2004 safety provisions, and have all the powers of a ministry inspector under the 2002 Shipping Law. There is no record of any targeted or random inspections having been conducted by MECAL (Jersey) Ltd or R & J Maritime Limited.

The owners of Jersey-registered vessels are encouraged by the harbourmaster wherever possible, to meet UK standards, over and above the lesser Jersey statutory requirements. This was evident on *Kerloch*, which carried an EPIRB, hand-held VHF radio and additional liferaft. However, other UK requirements, such as a risk assessment and a record of drills, were not available on board.

UK MCA surveyors now witness onboard emergency drills conducted by UK-registered fishing vessel crew at the time of survey; there is currently no equivalent requirement for Jersey-registered fishing vessels.

1.8.6 States of Jersey legislation developments

In recognition of the outdated nature of the States of Jersey fishing safety legislation and a number of recent incidents, law drafting time was secured in 2009 to update the Shipping (Fishing Vessels Safety Provisions) (Jersey) Order 2004. It is intended that the existing provisions for vessels up to 24 metres will be replaced with requirements that will be equivalent to the UK Codes for fishing vessels; the drafting time had not been utilised by the time of this report's publication.

1.9 FATIGUE AND HOURS OF WORK/REST IN THE FISHING INDUSTRY

1.9.1 States of Jersey legislation and guidance

Although Article 77(1) of the Shipping (Jersey) Law 2002 states that:

> *The Minister may by Order prescribe maximum periods of duty and minimum periods of rest for seamen employed in Jersey fishing vessels.*

no such order or guidance currently exists regarding hours of work/rest and the management of fatigue on Jersey-registered fishing vessels.

1.9.2 UK legislation and guidance

In the UK, developments in working time legislation for the fishing industry have largely been driven by the European Directives 1993/104/EC (Working Time Directive) and 2000/34/EC (Horizontal Amending Directive).

The Fishing Vessels (Working Time: Sea-fishermen) Regulations 2004 (the Regulations) were introduced to implement these directives so far as they apply to fishermen. Guidance on their application is provided in MSN 1786 (F) **(Annex A)**.

The Regulations apply only to workers, and not share fishermen, and require employers to take reasonable steps to ensure a worker's working time:

> *shall not exceed an average of 48 hours for each 7 days, averaged over a 52 week reference period (or the period elapsed since starting work for an employer)*.

Workers are "*entitled to adequate rest*" with minimum rest periods of:

- *10 hours in any 24-hour period, and*
- *77 hours in any 7-day period.*
- *…divided into no more than two periods, one of which shall be at least 6 hours in length…*

The Regulations allow exceptions to these requirements to be granted by the Secretary of State for objective and technical reasons or reasons concerning the organisation of the work, provided that appropriate consultation has taken place and the exception will protect the health and safety of workers.

Although individual exceptions may be granted, class exceptions for specific fisheries are also available, based on factors outlined in the Fishing Industry Code of Practice on Working Time Standards, annexed to MSN 1786 (F).

The code is recognised and commended by the three main UK fishermen's federations, and suggests that share fishermen should regard its working hours limits as useful benchmarks to avoid excessive hours. It also notes that the activity pattern of most fishing vessels allows:

> *considerable scope for compensatory rest and relaxation when the vessel is steaming to and from the fishing grounds, between operations and when the vessel is in port.*

The specific exception for crabbers states:

> *Compensatory rest is available in periods steaming to and from the grounds. It is uncommon for hauling to continue through the hours of darkness. Compensatory rest is often available on the basis of crew rotation. Due to extreme weather conditions it is not uncommon for this class of vessel to lose up to 120 working days per year.*

Although the regulations also require employers on fishing vessels to keep hours of work/rest records for 2 years, the MCA currently does not enforce the requirements, due principally to the exemption afforded to share fishermen.

Specific guidance on managing fatigue was issued by the MCA in May 2007, with the publication of the leaflet *Fatigue in Seafarers* **(Annex B)**, applicable not only to fishing vessels, but also merchant vessels and yachts.

1.9.3 International developments

The International Labour Organization (ILO) formulates international labour standards in the form of Conventions and Recommendations. These set minimum standards of basic labour rights, including fair working conditions.

In June 2007, a new ILO Convention No. 188 (ILO 188), Work in Fishing, was adopted, along with the accompanying Recommendation No.199. ILO 188 establishes minimum international standards for the fishing sector, covering issues such as risk assessment, manning, hours of rest and enforcement.

Significantly, the Convention applies to all "fishers" and vessels engaged in commercial operations. This therefore removes the current exemptions in EU and UK health and safety legislation for share fishermen.

Article 13 requires States to adopt laws, regulations or other measures requiring fishing vessel owners to ensure that:

- *their vessels are sufficiently and safely manned for the safe navigation and operation of the vessel and under the control of a competent skipper;*
- *fishers are given regular periods of rest of sufficient length to ensure safety and health.*

Article 14 requires a minimum safe manning level for over 24m vessels, as well as stipulating minimum hours of rest of not less than the "*10 hours in any 24-hour period/77 hours in any 7-day period*." Although exemptions may be granted, the article specifies that such exemptions must be "*temporary*" and that compensatory periods of rest must be taken "*as soon as practicable*." Indirect reference is made to a schedule of hours of rest, although not specifically stated as required. The convention also provides provision for inspections on foreign fishing vessels, if a complaint or evidence is received of non-compliance with ILO 188.

In May 2008 it was decided that EU Member States should endeavour to ratify ILO 188 as soon as possible, and preferably before 31 December 2012. The UK currently intends to fulfil this obligation.

1.10 RELEVANT UK FISHING VESSEL SAFETY GUIDANCE

1.10.1 Risk assessments

As detailed at **Table 1**, a risk assessment is required for UK-registered fishing vessels in accordance with The Merchant Shipping and Fishing Vessel (Health and Safety at Work) Regulations 1997 and MGN 20 (M+F).

In order to help fishermen complete a written risk assessment, Seafish published a Fishing Vessel Safety Folder, which includes a series of template forms for various types of fishing vessel. In May 2007, the folder was updated to include assessment of hazards associated with wheelhouse operations, including "falling asleep on watch". The relevant extract is at **Annex C**.

1.10.2 Fishing vessel safety guidance

In January 2008, the MCA issued a *Fishermen's Safety Guide* which provides guidance on safe working practices and emergency procedures for fishermen. It provides limited guidance on fatigue and the use of watch alarms, and offers advice on drills and abandonment procedures **(Annex D)**.

1.10.3 Management of fishing vessels

Although no specific guidance was available at the time of the accident regarding effective management of locally operated UK fishing vessels, MGN 414 (F) **(Annex E)**, which superseded MGN 336(F) in July 2010, now provides useful best practice guidance on domestic as well as overseas management.

1.10.4 Navigational best practice on fishing vessels

MGN 313 (F) contains guidance on maintaining a safe navigational watch on fishing vessels **(Annex F)**. Some of the key advice includes:

- All voyages should be planned, with the vessel's position checked by all available means.
- Sufficient rest should be taken before a watch.
- Ensure watchkeepers remain alert by moving around frequently and ensuring good ventilation.
- A watch alarm should be fitted on vessels where lone watches are likely, and should alert the watchkeeper as well as other crew.

1.10.5 Location and stowage of EPIRBs

MGN 267 (F) **(Annex G)** provides advice on locating and installing EPIRBs to reduce the likelihood of entrapment during automatic deployments.

The guidance notes that EPIRBs should be sited to ensure that they can float free regardless of the vessel's attitude, and that if the unit is placed on one side of the vessel, then the likelihood of correct deployment is much reduced.

1.11 SIMILAR ACCIDENTS

MAIB has recorded 335 grounding accidents involving over 15m UK-registered fishing vessels during the period 1992 to 2009, resulting in 30 vessel losses and 15 fatalities. Forty-five of the accidents were attributed to sleepiness or fatigue.

Some notable fishing vessel grounding accidents investigated by the MAIB, where fatigue was considered to be a likely contributory factor, include:

Betty James Grounded and lost (no injuries) – 10 July 2000

The vessel landed in the evening, and sailed at 0015 after the crew returned from a pub. The watchkeeper fell asleep at about 0140; the watch alarm, although working, failed to wake him, and the vessel grounded at 0230.

Lomur Grounded (no injuries) – 14 June 2001

The vessel grounded on approaching harbour after the skipper fell asleep. He had only slept for 7 hours in the preceding 3 days and was alone in the wheelhouse. The watch alarm was not effective in averting the accident.

Primrose Grounded (no injuries) – 15 June 2001

The vessel arrived in port to land at 2100, then sailed shortly after midnight. The watchkeeper fell asleep at around 0230 and the vessel grounded at about 0320.

Our Nicholas Grounded and lost (no injuries) – 24 July 2001

The vessel landed her catch, then set sail at 2300 after the crew returned from a pub. The skipper went to bed and left two deckhands in the wheelhouse. Both fell asleep, and the vessel grounded on rocks.

Brothers Grounded and lost (two fatalities) – 1 June 2006

The vessel sailed at about 0225 and grounded at about 0520, then sank. No “Mayday” message was broadcast, and it is believed the vessel probably grounded due to one of the crew falling asleep in the wheelhouse after a number of long days at work, with only short periods of broken sleep.

Oceana Grounded (no injuries) – 9 May 2008

This 10m prawn trawler grounded while returning to harbour when her skipper fell asleep at the helm. The vessel suffered extensive hull damage.

Niamh Aine Grounded and lost (no injuries) – 22 March 2009

This 18.3m vivier crabber ran aground and was lost while returning to port at the end of a 6-day trip. The crew had been working at least 18 hours per day as well as sharing the night watches. The skipper sat in the wheelhouse chair, reset the watch alarm, located close to the chair, and fell asleep.

SECTION 2 - ANALYSIS

2.1 AIM

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

2.2 FATIGUE

2.2.1 Overview

The issue of fatigue has long been recognised as a problem for fishermen, in an industry renowned for long working hours and commercial pressures. The crabbing industry, like many other sectors, has been hard hit by rising costs and lower market prices, which have conspired to encourage fishermen to work harder and longer to keep vessels profitable. Likewise, the trend for self-employed crew, with their earnings effectively based on a share of the catch, contributes to a culture of long working hours and limited rest.

Ironically, it was the favourable conditions on the day that in part contributed to the accident. It was a clear afternoon, the wheelhouse was warm with no through ventilation, the sun was low in the sky, and the sea slight. Such conditions encouraged the skipper to fall asleep in the comfort of his chair.

The effects of fatigue do not only manifest themselves in an increased risk of falling asleep, but also a greater propensity for slowed reactions, lapses and mistakes in decision-making. Indeed, it is probable that the skipper's flawed decision to navigate the vessel all the way back to port himself, although admirable in terms of looking after the crew's welfare, might have been, in part, attributable to fatigue.

2.2.2 Quantity and quality of rest

Analysis of the skipper's sleep pattern over the 2 days prior to the accident indicated a moderate risk that he was fatigued; examination of the 3 days before that, however, revealed a more deep-rooted problem. Working 18-hour shifts, he would have had at best around 4 hours sleep each day, potentially broken by the rotating 1.5 hour overnight watches. Even the day before the accident, when he could have had up to 9 hours sleep in total, this would have necessarily been divided up into three separate periods.

Such a routine would have failed to comply with the EC working time directives, had they been applicable to a Jersey-registered fishing vessel. The shifting watch pattern would also have led to sufficient disruption of the skipper's natural circadian rhythm to prevent him obtaining adequate quality of rest. This would have been further compounded by a degree of personal anxiety, and the effect of an athwartships bunk on a rolling vessel.

2.2.3 Risk assessment

Although UK-registered fishing vessels are required to have a risk assessment, this was not a requirement for Jersey-registered vessels. If such an assessment had been conducted for *Kerloch,* using the Seafish Fishing Vessel Safety Folder, the hazards associated with wheelhouse operations, in particular with lone watchkeepers and fatigue, would have been assessed.

Suitable control measures might have included a limitation of the hours worked, which would not only have reduced the likelihood of a watchkeeper falling asleep through fatigue, but also led to improved decision-making and increased overall operational efficiency.

In more profitable times, manning levels are often increased to help spread the work burden and boost productivity. With increased personnel on board, crew are not only better rested, but also potentially available for two-man wheelhouse watches. Some vessels have been known to employ a retired fisherman as a "night watchman" to keep the navigational watch overnight while the regular crew get uninterrupted rest – a simple and relatively cheap solution to fatigue management.

2.2.4 Watch alarm

A further control measure to address the consequence rather than cause of fatigue would have been to ensure there was an effective watch alarm in the wheelhouse. It was reported that *Kerloch* did have an operating watch alarm fitted, which sounded every 5 minutes, although some doubts were raised over its effectiveness, in particular how loud it was. Radar coverage confirmed the vessel headed directly towards Crow Rock for nearly 20 minutes at 7 knots **(Figure 11)**. The fact that the skipper fell asleep in the wheelhouse, and remained asleep until the grounding, confirms that the watch alarm was ineffective.

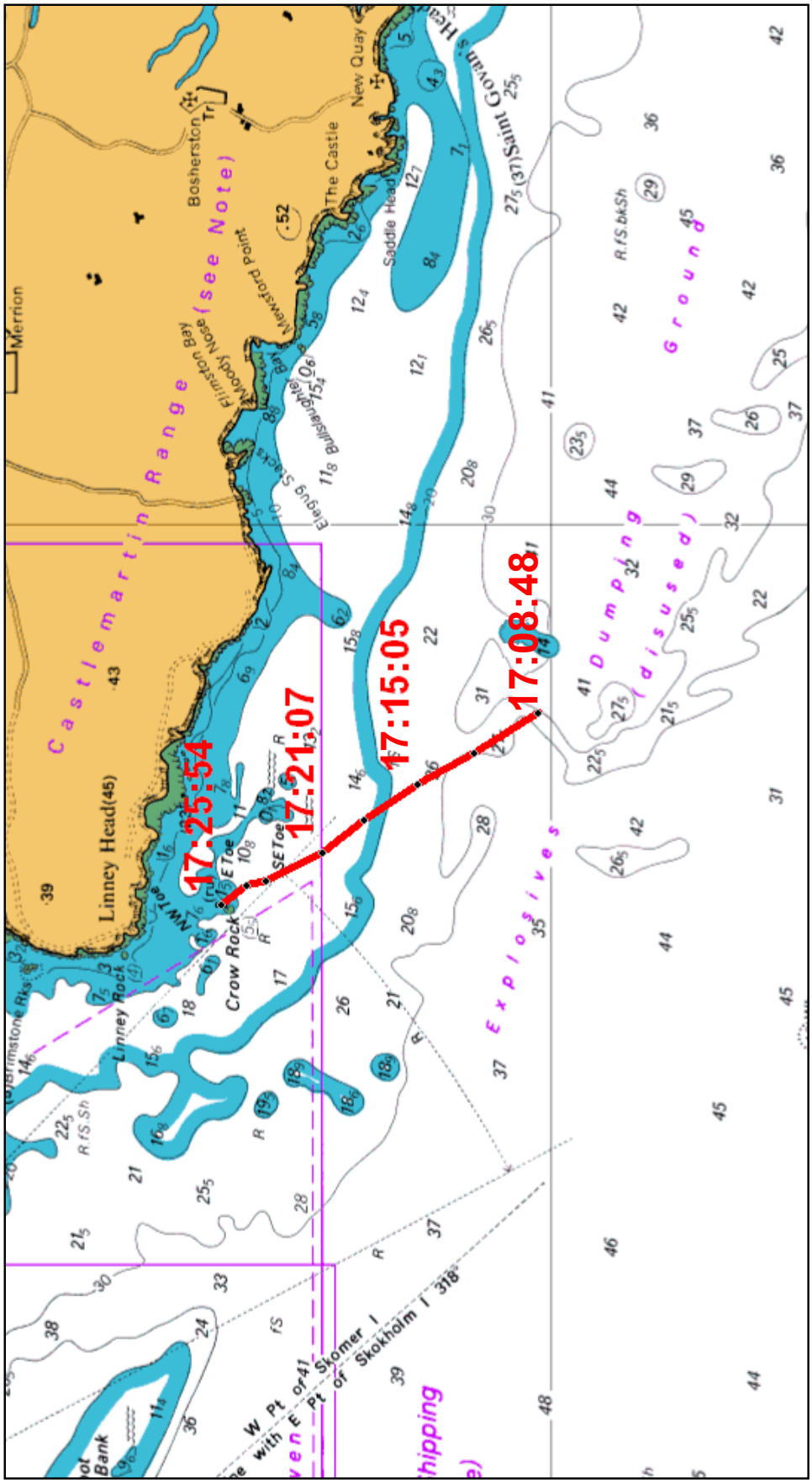
Kerloch's watch alarm was audible only in the wheelhouse. If it had also sounded down below when not cancelled in a timely fashion, as recommended in MGN 313 (F) for UK fishing vessels, then at least there would have been a chance of one of the other crew waking and averting the accident.

The location of the watch alarm is also an important consideration if it is to be effective. On *Kerloch*, the alarm could be cancelled without having to leave the wheelhouse chair, which limits its usefulness compared to a system requiring regular movements out of the chair.

From January 2011, SOLAS chapter V/19 will be amended to require merchant vessels of 150 GT and over, and all passenger ships, to have a bridge watch alarm complying with IMO performance standards. These require the alarm to first warn the bridge watchkeeper, then other crew members if, for example, the former becomes incapacitated. This amendment will not apply to fishing vessels.

Reproduced from Admiralty Chart BA 1478 by permission of the Controller of HMSO and the UK Hydrographic Office

Figure 11



Representation of track of *Kerloch* from 1708 onwards, based on approximate positions identified from MHPA VTS radar

2.2.5 UK Fishing Industry Code

The normal practice on board *Kerloch* was for each of the crew to take a watch as the vessel steamed to and from the grounds, thus offering all on board the opportunity for some rest. This concurs with the advice promoted in the UK Fishing Industry Code of Practice on Working Time Standards. If the crew had all taken a watch as the vessel returned to port, the chance of any one of them falling asleep would have been reduced.

As *Kerloch* was a Jersey-registered fishing vessel, the crew were not required to comply with The Fishing Vessels (Working Time: Sea-fishermen) Regulations 2004 for UK fishing vessels. Had the periods of rest taken by the crew prior to the accident complied with these regulations, then the likelihood of fatigue leading to the vessel's loss would have been significantly reduced.

One of the major limitations of the UK's working time legislation and guidance is the current exclusion of share fishermen from the requirements. The fishing industry code on Working Time Standards suggests that self-employed crew should regard the limits in the regulations as useful benchmarks to avoid working excessive hours. It is the "share fishermen" exemption which, in particular, results in the working time legislation being neither effectively applied by industry nor enforced by the MCA.

2.2.6 Future developments

The forthcoming ratification of ILO 188 by the EU and the UK before 2013 will address the "share fishermen" issue, as this convention will apply to all fishermen, regardless of their contractual employment status. ILO 188 not only includes requirements for hours of work/rest, but also risk assessments and the ability for Flag States to conduct inspections on visiting foreign vessels. The convention will potentially have a big impact on the fishing industry, and may provide a catalyst for the development of practical solutions to problems such as fatigue.

Given Jersey's position outwith the UK and EU, the EC working time directives do not apply to Jersey-registered fishing vessels. MSN 1786 (F) and the industry code, although required to be carried by a Jersey vessel, are not enforceable. Despite the Shipping (Jersey) Law 2002 allowing for minimum rest periods to be prescribed for Jersey fishing vessels, this has not been enacted. The introduction of ILO 188 will provide an impetus to do so.

The MCA is to conduct a study entitled "Challenging attitudes and behaviours in commercial fishing". The outcome of this research is to be implemented in 2011, and should lead to practical guidance on issues such as fatigue management.

2.3 MANAGEMENT AND OPERATION OF *KERLOCH*

Kerloch was one of a small number of over 12m fishing vessels on the Jersey register. Like many of these vessels, she was not being operated out of Jersey, nor had she been for some time, and had UK-based registered owners between 2002 and 2009. The States of Jersey registration regulations allowed for this, but only if the vessel was being managed or operated out of Jersey. This was normally the case, with the Jersey-based owner prior to 2002 acting as manager right through to the time of the accident. However, in reality the manager had limited operational involvement with the vessel.

In 2009, the new registered owner, a Jersey national domiciled in Alderney, bought the vessel, but was not involved in her operation and immediately began to transfer ownership via a private mortgage arrangement to UK interests. They effectively became the vessel operators, and assumed responsibility for virtually all aspects of its operation, including its safety management. The States of Jersey administration was unaware of this situation.

If *Kerloch* had been operating under a safety regime similar to that in place under current UK legislation, the higher safety requirements, including the need for risk assessment and limits on working hours, would have helped prevent this accident.

The ownership and operator arrangement contributed to some aspects of the vessel's safety management not being effective. The EPIRB was wrongly registered with the previous registered owner, and its battery had expired, while the vessel's VMS system had not been operating for over 2 months. Although the MFA had written to the registered owner, the UK operators were unaware of the problem, and MFA procedures did not effectively follow up the matter.

The MOB lifebuoy marker was likewise out of date, while the liferaft used was overdue its annual survey. Although Cosalt International Ltd. should have issued a reminder to the hirer, there still remained an obligation on the vessel's owner or operator to ensure safety equipment was in date.

Problems also existed with the crew's safety training certification. The skipper did not hold certificates for courses that it is reported he had completed, and one of the deckhands, although new to fishing, had not undergone any safety training. None of the crew had completed the Seafish Safety Awareness course, required in the UK but not in Jersey. Following this accident the UK operators immediately took positive steps to ensure that the crew on the vessels they manage hold the required certification.

Relevant guidance regarding the effective management of UK fishing vessels is provided in MGN 414 (F), while MGN 313 (F) provides guidance on navigational practice, including passage planning and monitoring, and ensuring watchkeepers remain alert. The grounding could have been avoided had the skipper properly planned and maintained a safe track.

2.4 EMERGENCY PREPAREDNESS

Although the crew were able to safely abandon, various examples of unsafe practice were evident, highlighting not only the importance of emergency preparedness, but also again the need for training.

No attempt was made to activate the DSC radio alert despite it being adjacent to the wheelhouse chair, nor was the hand-held VHF radio or EPIRB removed to assist with providing positional data once in the liferaft. It was indeed fortunate that the mobile phone used to make the 999 call had network coverage and battery power. Some of the crew became anxious about how long it was taking to deploy the liferaft painter, which was then cut and held onto before they had started to board the raft. If this had been inadvertently released, and the raft had drifted away, then the crew could have ended up in the water given the speed of the sinking. Once in the liferaft, there was again concern when a pressure relief valve began to operate.

Elements of best practice were evident on board, with lifejackets stowed in a dedicated container on deck adjacent to the liferafts, while the red flare deployed from the raft greatly assisted the post-accident response. However, the required monthly emergency drills were never conducted. If they had been, the crew's response to the accident might have been more assured.

2.5 DELAYED ACTIVATION OF EPIRB

The EPIRB failed to activate immediately after the vessel foundered. The unit eventually deployed 3 days later, and it seems most likely that a period of worsened weather following the accident helped to eventually dislodge the unit from the wreck, perhaps when the wreck itself moved. Although the battery had expired, the EPIRB successfully transmitted.

The unit, however, stopped transmitting before it could be recovered, and any evidence regarding its initial failure to deploy was lost. Although fitted in a proprietary stowage, apparently free of obstructions, the EPIRB was located on the side of the mast. MGN 267 (F) notes that such a location will reduce the likelihood of a correct deployment; the installation position needs to be carefully considered.

2.6 STATES OF JERSEY LEGISLATION

The principal fishing safety regulation in Jersey, the Shipping (Fishing Vessels Safety Provisions) (Jersey) Order 2004 was based on the UK's Fishing Vessels (Safety Provisions) Rules 1975, but has not been further updated beyond the 1980s. In practical terms, the requirements lag behind the equivalent UK and EU legislation by nearly 30 years. The situation regarding safety training is better, although there is no requirement for fishermen to attend a safety awareness course.

Key safety barriers, such as risk assessments, safety awareness training and EPIRBs are not required for Jersey-registered fishing vessels. Although there is informal encouragement for vessels to meet the latest UK safety standards, this is not enforceable. *Kerloch*, for example, exceeded the Jersey requirements in various areas, including the carriage of an EPIRB and two liferafts, but did not have a risk assessment.

In recognition of this situation, the States of Jersey secured law drafting time in 2009 to update the Shipping (Fishing Vessels Safety Provisions) (Jersey) Order 2004 with the requirements of the UK Codes of Safe Working Practices for vessels up to 24m in length; this had not been utilised at the time of this report's publication. The States of Jersey currently does not issue its own specific guidance for fishing vessels, but does require the carriage of MSNs and can make reference to other UK guidance. With the proposed alignment of Jersey and UK legislation, the currency and relevance of UK guidance to Jersey vessels will be enhanced.

Despite the variation between Jersey and UK fishing safety legislation, it is of note that there would have been little difference between the internal watertight bulkhead integrity requirements. Given that *Kerloch* was of wooden construction and built prior to the 1975 rules, similar exemptions would have been granted for bulkhead watertightness under either system. It is possible that fully watertight bulkheads, as required on a more modern vessel, might have slowed or even prevented the sinking.

Given the small number of over 12m Jersey-registered fishing vessels, mostly based in UK waters, the minister has delegated survey and inspection responsibility from the harbourmaster to UK-based consultant surveyors, MECAL (Jersey) Ltd., who conduct the full surveys and intermediate inspections required by Jersey legislation. Although MECAL could also undertake inspections at other times, *Kerloch* was not randomly inspected by MECAL, indicating that Jersey registered fishing vessels may not benefit from the same level of oversight that UK vessels generally receive. Drills are also not witnessed during surveys and inspections on Jersey vessels, as is now the case on UK vessels.

Although the legal responsibility of owners and skippers for the safety of a Jersey fishing vessel is clearly defined, in the absence of a specific management agreement, the responsibility of managers and operators for safety is not so apparent.

The causes and circumstances of this accident provide a compelling example of why the current review of States of Jersey legislation should seek to ensure that Jersey-registered fishing vessels operate to a safety standard at least as high as that applied internationally.

SECTION 3 - CONCLUSIONS

3.1 SAFETY ISSUES DIRECTLY CONTRIBUTING TO THE ACCIDENT WHICH HAVE RESULTED IN RECOMMENDATIONS

1. The warm wheelhouse with no through ventilation, the low sun in the sky, and the slight sea encouraged the skipper to fall asleep in the comfort of the wheelhouse chair. [2.2.1]

2. The watch routine would have failed to comply with the EC working time directives required for quality of rest, had they been applicable to a Jersey-registered fishing vessel in terms of quantity of rest. The shifting work pattern, compounded by personal anxiety and the effect of an athwartships bunk, prevented the skipper obtaining adequate quality of rest. [2.2.2]

3. Had a risk assessment been conducted for *Kerloch* using the Seafish Fishing Vessel Safety Folder, the hazards associated with lone watchkeepers and fatigue would have been assessed and suitable control measures, such as a limitation of the hours worked, might have been introduced. [2.2.3]

4. The fact that the skipper fell asleep and remained asleep until the grounding confirms that the watch alarm was ineffective. [2.2.4]

5. If the periods of rest taken by the crew of *Kerloch* prior to the accident had complied with the minimum rest periods set out in the UK in The Fishing Vessels (Working Time: Sea-fishermen) Regulations 2004, the likelihood of fatigue leading to the loss of the vessel would have been significantly reduced. [2.2.5]

6. Despite the Shipping (Jersey) Law 2002 allowing for minimum periods of rest to be prescribed for Jersey fishing vessels, this has not been enacted. [2.2.6]

7. The grounding could have been avoided had the skipper properly planned and maintained a safe track. [2.3]

8. Key modern safety concepts, such as risk assessments, safety awareness training and EPIRBs do not feature as requirements for Jersey-registered fishing vessels, and although there is informal encouragement for vessels to meet the latest UK safety standards, this is not enforceable. [2.6]

9. Jersey-registered fishing vessels based in UK waters may not benefit from the same level of oversight that UK vessels generally receive. [2.6]

10. Although the legal responsibility of owners and skippers for the safety of a Jersey fishing vessel is clearly defined, in the absence of a specific management agreement the responsibility of managers and operators for safety is not so apparent. [2.6]

3.2 OTHER SAFETY ISSUES IDENTIFIED DURING THE INVESTIGATION ALSO LEADING TO RECOMMENDATIONS

1. *Kerloch*'s ownership and operator arrangement contributed to some aspects of the vessel's safety management not being effective. [2.3]

2. Had monthly emergency drills been conducted on board *Kerloch*, the immediate response to the accident might have been more assured. [2.4]

3. The EPIRB was located on the side of the mast, which might have prevented it deploying correctly immediately following the vessel sinking. [2.5]

SECTION 4 - ACTION TAKEN

4.1 THE STATES OF JERSEY

- Has allocated law drafting time to update the Shipping (Fishing Vessels Safety Provisions) (Jersey) Order 2004, to replace the existing provisions for fishing vessels up to 24 metres in length with the requirements of the UK Codes of Safe Working Practices.

- Intends to utilise this law drafting time to extend the Shipping (Fishing Vessels – Safety Training) (Jersey) Order 2004 to require:
  - New entrant fishermen to complete the 1-day Basic Health & Safety training course.
  - Experienced fishermen to complete the 1-day Safety Awareness training course.
  - New skippers of fishing vessels of <16.5m registered length to hold a skipper's certificate appropriate to the vessel's area of operation in accordance with the UK's MGN 411 (M+F).
- Has drafted law amendments to improve the Jersey connection regarding eligibility for ownership.

- Intends to ensure that the island is able to adequately enforce the improvements to the safety provisions and training legislation with sufficient and continuing resources.

- Intends to write to all Jersey-registered fishing vessel skippers/owners/managers drawing attention to the advice, guidance and Codes of Safe Working Practices available for UK fishing vessels.

- Has conducted a review of the legal eligibility of the ownership of all four Jersey-registered fishing vessels not permanently based in Jersey.

- Has investigated amending its laws to make fishing vessel managers and operators, appointed in accordance with vessel registration requirements, have increased legal responsibility for vessel safety compliance.

4.2 THE MARITIME AND COASTGUARD AGENCY

- Intends to fulfil the EU obligation to ratify the ILO Convention No.188 before 31 December 2012, which introduces major changes to the applicability of fishing vessel health and safety legislation to all fishermen, regardless of their employment status.

- Has initiated a study entitled "Challenging attitudes and behaviours in commercial fishing", which aims to establish the most effective ways of communicating safety messages to the industry, including fatigue avoidance guidance, and intends to implement the outcome of this study in 2011.

4.3 THE UK OPERATORS OF *KERLOCH*

- Now ensure that crew on vessels they manage hold the required statutory certification.

4.4 COSALT INTERNATIONAL LTD.

- Has reviewed and reinforced its reminder process for the servicing of hire liferafts, and ensures that all customers sign a hire agreement stating that they abide at all times with any statutory requirements, and will make available equipment for statutory servicing when so required.

4.5 THE MARINE MANAGEMENT ORGANISATION

- Has rectified its procedures for the effective follow-up of VMS failures.

4.6 THE MARINE ACCIDENT INVESTIGATION BRANCH

- Has issued a flyer to the fishing industry highlighting the lessons learned from this accident **(Annex H)**.

SECTION 5 - RECOMMENDATIONS

The **States of Jersey** is recommended to:

2010/127 Expedite its current review and update of the regulatory framework and guidance applicable to Jersey-registered fishing vessels to:

- Ensure vessels meet a safety standard at least as high as that applied internationally and with regard to adjacent jurisdictions in respect of safety provisions and safety training, and which takes into account the requirements of ILO Convention No.188.
- Ensure managers and operators appointed in accordance with vessel registration requirements are fully aware of their roles and responsibilities.
- Ensure effective oversight of vessels not permanently based in Jersey.

The **manager of *Kerloch*** is recommended to:

2010/128 Refer to the best practice management guidance for fishing vessels promoted in the UK's MGN 414 (F), and apply these generic principles to any other fishing vessels that he may own or manage.

The **operators of *Kerloch*** are recommended to:

2010/129 Refer to the best practice management guidance for fishing vessels promoted in the UK's MGN 414 (F), and the working time limitations in MSN 1786 (F), and apply these generic principles to any fishing vessel that they may own, operate or manage.

Marine Accident Investigation Branch
October 2010

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