

Report on the investigation of  
the grounding of  
**fv *Brothers***  
with the loss of two lives  
off Eilean Trodday  
on  
1 June 2006

Marine Accident Investigation Branch  
Carlton House  
Carlton Place  
Southampton  
United Kingdom  
SO15 2DZ

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**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**

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# CONTENTS

	Page
<b>GLOSSARY OF ABBREVIATIONS AND ACRONYMS</b>	
<b>SYNOPSIS</b>	<b>1</b>
<b>SECTION 1 - FACTUAL INFORMATION</b>	<b>3</b>
1.1 Particulars of <i>Brothers</i> and the accident	3
1.2 Background information	4
1.3 Narrative	4
1.4 Environmental conditions	10
1.5 Description of the boat and her equipment	10
1.6 Diving surveys	13
1.7 Certification, training and experience of the crew	15
1.7.1 Certification and training	15
1.7.2 Experience	15
1.8 Confidential Position Reporting System (CPRS)	15
1.9 MOB Guardian	16
1.10 Electronic Position-Indicating Radio Beacon (EPIRB)	17
<b>SECTION 2 - ANALYSIS</b>	<b>18</b>
2.1 Aim	18
2.2 The circumstances surrounding the loss of <i>Brothers</i>	18
2.3 The possibilities for survival	19
2.4 Confidential Position Reporting System (CPRS)	21
2.5 Comparison between emergency reporting equipment	23
2.6 Fatigue	24
2.7 The coastguard search and rescue operation	26
2.8 Action in the event of a grounding	27
2.9 Previous incidents	27
<b>SECTION 3 - CONCLUSIONS</b>	<b>29</b>
3.1 Safety issues	29
<b>SECTION 4 - ACTION TAKEN (OR TO BE TAKEN)</b>	<b>31</b>
<b>SECTION 5 - RECOMMENDATIONS</b>	<b>32</b>
Annex 1 Wreck Prohibition Notice 1/2006	
Annex 2 MSN 1467 (F) Emergency Position-Indicating Radio Beacons, Float Free Arrangements for Liferafts and Lifejackets on Fishing Vessels	
Annex 3 RNLI Fishing Safety - Hydrostatic Release Unit (HRU) Installation Guide	
Annex 4 MGN 267 (F) The Location and Stowage of Liferafts and Emergency Positioning Radio Beacons (EPIRBs) on UK Registered Fishing Vessels	
Annex 5 MSN 1732 (M+F) Mandatory Registration of Emergency Position Indicating Radio Beacons (EPIRBs)	
Annex 6 MSN 1779 (M+F) Changes in the Requirements to SOLAS Chapter IV: Radio Communications	
Annex 7 MSN 1786 (F) Application of the Fishing Vessels (Working Time: Sea-fishermen) Regulations 2004	

## **GLOSSARY OF ABBREVIATIONS AND ACRONYMS**

BST	-	British Summer Time (UTC +1 hour)
COIR	-	Central Operations and Information Room
CPRS	-	Confidential Position Reporting System
EPIRB	-	Emergency Position-Indicating Radio Beacon
GPS	-	Global Positioning System
HRU	-	Hydrostatic Release Unit
kW	-	Kilowatts
MCA	-	Maritime and Coastguard Agency
MGN	-	Marine Guidance Note
MOB	-	Man Overboard
MRCC	-	Maritime Rescue Co-ordinating Centre
MSN	-	Merchant Shipping Notice
“Pan Pan”	-	A call of “Pan Pan” is a very urgent message concerning the safety of a ship or persons on board who do not require immediate assistance.
RAF	-	Royal Air Force
RIB	-	Rigid-hulled inflatable boat
RNLI	-	Royal National Lifeboat Institution
SAR	-	Search and Rescue
SARIS	-	Search and Rescue Information System
UTC	-	Universal Co-ordinated Time

## SYNOPSIS



The Banff registered stern trawler *Brothers* BF138 sailed from Gairloch with a 2-man crew at about 0225 on the morning of 1 June 2006. At about 0520 the vessel grounded and then sank off Eilean Trodday, a small uninhabited island off the north coast of Skye. No “Mayday” message was broadcast.

The skipper’s father called the emergency services, reporting the vessel overdue that evening after the families were unable to contact either the skipper or crewman by telephone.

Over the next 36 hours an extensive air and sea search which involved numerous resources, including helicopters, a nimrod aircraft, lifeboats, fishing boats and auxiliary coastguard search teams, was carried out. Just before midday on 3 June a local fishing boat reported that the missing boat had been found on the seabed just off Eilean Trodday. A short while later they reported that a quick search of the wreck by a local diver had failed to find any sign of the trawler’s crew.

The search for the missing crew was continued during that day and the following day. It was called off 4 days after the boat had sailed from Gairloch.

The body of the crew member was found on the north-west coast of the Scottish mainland on 18 June, 17 days after the vessel had sunk. However the skipper was still missing at the time of writing this report (January 2007).

It is believed the vessel probably grounded due to one of the crew falling asleep in the wheelhouse, which allowed the vessel to sail past her intended fishing grounds and onto the shore at Eilean Trodday. Both crew would have been suffering the effects of fatigue brought on by a number of long days at work, with only short, broken sleep periods. Both crew had also drunk some alcohol before the vessel left the harbour.

These factors combined to cause the accident but, during the course of the investigation, the MAIB discovered some other issues which, though not causal factors, nevertheless, provided lessons to be learned by the organisations and individuals involved.

In the early stages of the emergency, a mistake was made at MRCC Stornoway in interpolating data taken from the skipper’s mobile phone records. Had this mistake not been made, it is possible that the boat might have been found sooner. However, the outcome for the crew would not have been improved.

A prototype confidential position reporting system (CPRS) was being tested on board *Brothers*, but the equipment failed to operate. The skipper might have been aware that the unit had a fault, but it was apparent that he was probably unaware that it had failed completely. This has raised concerns about the management of the system, which is operated principally by the Royal National Lifeboat Institution (RNLI).

In the event, even if the CPRS had worked, it probably would have made no difference to the outcome for the crew, because without any lifesaving aids, their likely survival times would have been measured in minutes rather than hours.

During the incident, one of the crew appears to have put the engine astern to pull the vessel off the rocks. This led to the vessel quickly flooding and sinking and has raised concerns regarding damage control training for fishermen.

The RNLI has taken further action to warn other CPRS users of the problems associated with malfunctioning units, and the MCA has taken action to improve SAR management in general, and the handling of mobile phone data in particular. The MAIB intends to publicise the problems associated with fatigue widely within the fishing industry.

Figure 1



*Brothers BF138*

## SECTION 1 - FACTUAL INFORMATION

### 1.1 PARTICULARS OF *BROTHERS* AND THE ACCIDENT

#### **Vessel details (Figure 1)**

Registered owner	:	Mr Neil Sutherland
Port of registry	:	Banff
Flag	:	United Kingdom
Vessel number		BF 138
Type	:	Stern trawler
Built	:	1990 Sandhaven
Construction	:	Wood
Length overall	:	9.90 metres
Gross tonnage	:	15.09
Engine power and/or type	:	187 kW – Gardner six cylinder diesel engine
Maximum speed	:	7 knots
Other relevant info	:	Vessel was rigged for prawn fishing

#### **Accident details**

Time and date	:	About 0520 on 1 June 2006
Location of incident	:	Off north-east coast of Eilean Trodday
Persons on board	:	Two
Injuries/fatalities	:	One fatality and one missing presumed dead
Damage	:	Vessel sank and was a constructive total loss

## 1.2 BACKGROUND INFORMATION

*Brothers* was one of a small number of single trawl vessels that seasonally fished out of Gairloch for prawns. On these vessels, fishing is carried out during daylight hours, and the fishermen work as much of the day as possible. As the fishing takes place in the summer, nets are usually shot at sunrise, at approximately 0400, and fishing continues until the sun sets at about 2100. The main fishing grounds are about 2 hours passage time from Gairloch.

## 1.3 NARRATIVE

(All times BST = UTC +1)

In the summer of 2006, *Brothers* was operating out of Gairloch, on the north-west coast of Scotland, fishing for prawns. The skipper had noticed a problem with the size of the vessel's catch in comparison to other similar local vessels, and on Wednesday 31 May the vessel returned to port early and he and the crewman replaced the net and trawl doors.

They completed the work at about midnight, at which time they went to meet other fishermen in a local public house.

The skipper of *Brothers* spoke to the skipper of *Franchise*, another prawn trawler, and it was agreed that, during the next day, the two boats would fish in close proximity so that the skipper of *Brothers* could gauge if his trawl was set up correctly, by comparing the catch quantity between the two boats. The skipper of *Brothers* also made it known to other people in the public house that on his next fishing trip, he only intended to carry out a single 4-hour tow because he needed to return to his home on the east coast of Scotland.

The crew of *Brothers* left the public house at about 0200 and the two vessels sailed from the port at about 0225 on the morning of 1 June. The skipper of *Franchise* saw *Brothers* astern of him as they left the loch at about 0230. *Franchise* was faster than *Brothers* and the two boats were soon separated.

On arrival at the intended fishing grounds, the skipper of *Franchise* looked around the horizon and saw no sign of *Brothers* and, deciding the other skipper must have changed his mind or gone to fish elsewhere, he shot his nets and began fishing as normal.

Later in the day, the wife of *Brothers*' skipper began trying to contact him via mobile phone, but without success. Although the mobile phone coverage in the fishing grounds was good, she was not unduly alarmed at not being able to contact her husband as she thought he might have already returned to port and begun driving in his van across the Highlands, where the mobile phone reception was poor.

By the evening of 1 June, the family had still not made contact with the skipper and they began to be concerned. The skipper's father contacted an RNLI employee and requested that he check to see if the vessel's Confidential Position Reporting System (CPRS) unit had given any warning of problems with the boat. The RNLI representative contacted the RNLI control room who informed him they had no indication of any alarms on the unit fitted on board *Brothers*.



The RNLI representative returned the call to the father telling him of the situation adding that, if he still had concerns, he should contact the emergency services. At 2148, the skipper's father dialled 999 and informed the coastguard that *Brothers* was overdue.

Stornoway Maritime Rescue Co-ordination Centre (MRCC) immediately put out calls for the vessel on all applicable radio frequencies and began checking the local ports to confirm the vessel had not diverted to one of them. It soon became apparent that the vessel was not safe or alongside, so they issued a small craft advisory warning.

Stornoway MRCC also contacted the RNLI Central Operations and Information Room (COIR) to determine if they were receiving signals from the on board CPRS unit. They confirmed they had not received any signals, and, a short while later, added they had received no signals from *Brothers* for at least 3 months.

From discussions with the harbourmaster of Gairloch and local fishermen, the MRCC staff established that *Brothers* had last been seen at about 0230 as she headed out of the port towards the fishing grounds. The coastguard officers also learned that the vessel was probably intending to be out for just one tow. The intended fishing ground was identified from other information given by local fishermen as being about 6 miles east-north-east of Staffin Island (**Figure 2**).

At about 2300, the coastguard watch officers began checking the mobile phone history of the skipper and the crewman and, after a number of enquiries, determined that the skipper's mobile phone had last logged off the network at 0421, approximately 2 hours after leaving Gairloch.

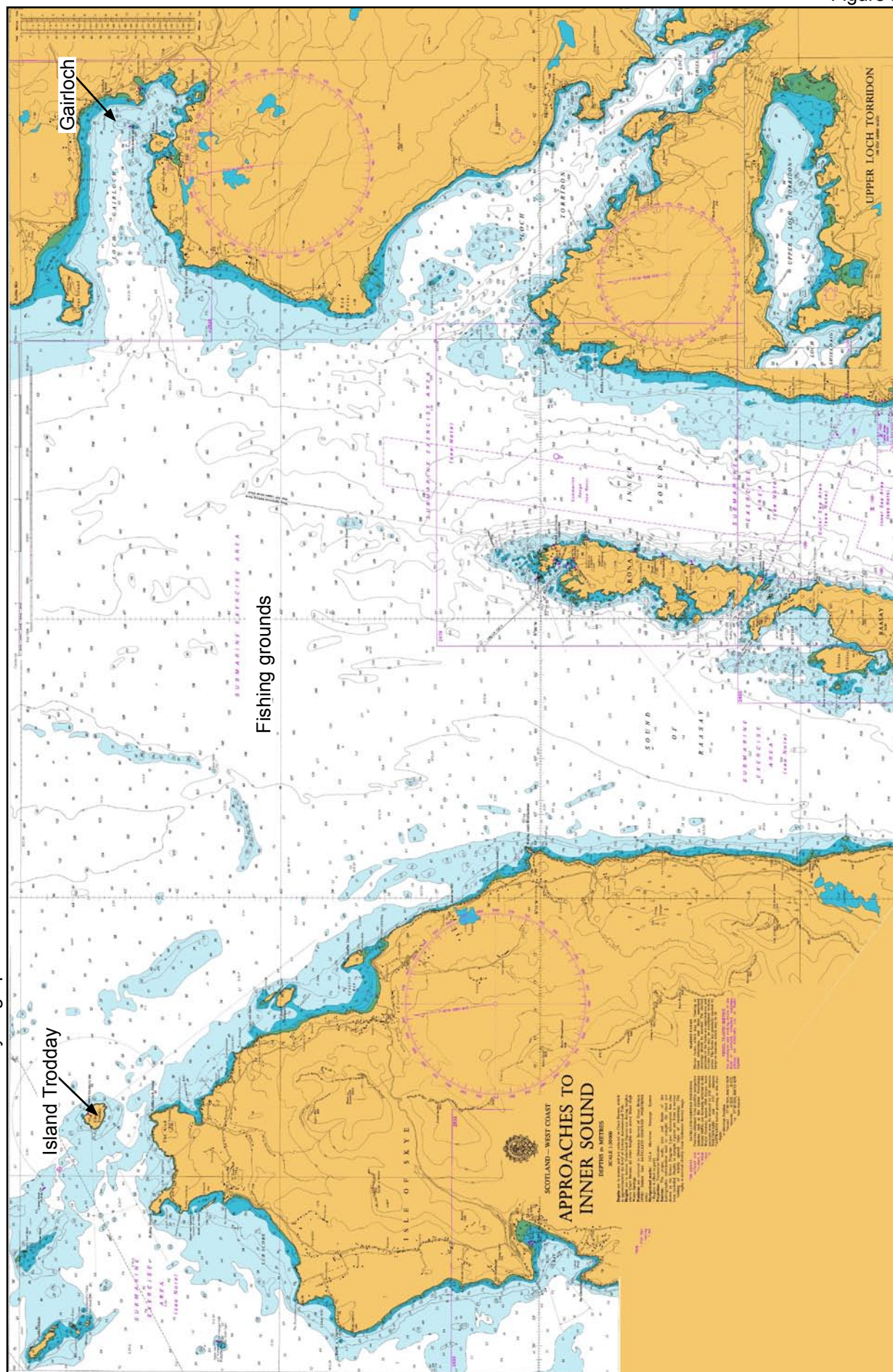
At 2309, the incident was upgraded to "Pan Pan" status, and the coastguard rescue helicopter based at Stornoway and the Portree RNLI lifeboat were tasked to conduct a search. The lifeboat was launched at 2345, and the helicopter was airborne at 2348, and these search units began searching the east coast of Skye and the fishing grounds respectively.

By 0210, the Stornoway MRCC had determined that the crewman's mobile phone had last logged off the network at 0213 the previous morning, just before the vessel had sailed from Gairloch.

The incident was upgraded to a distress situation at 0228 after the initial searches had failed to find any trace of the vessel.

By daylight, 24 hours after the vessel had left port, additional helicopters had been tasked and were searching for the vessel. The Portree Lifeboat was joined by those from Lochinver and Stornoway, and a fleet of local fishing vessels was also involved in an organised sea search. A number of teams of auxiliary coastguard volunteers were also searching the mainland coastline for signs of the vessel or her crew.

The search was primarily centred in the Trodday fishing grounds that had been identified as the likely intended destination of the vessel, but it also covered the open sea between Skye and the mainland to take account of the prevailing



Trodday fishing grounds

Figure 2

current and local winds which were from the south-west. The east coast of Skye, the islands of Rona and Raasay, and the mainland coast from Loch Torridon in the south to Loch Ewe in the north were also searched.

At about 0500, the father of the skipper told the coastguard, during one of their regular contacts, that the vessel had a liferaft and lifejackets on board, but did not have an EPIRB “because the vessel was fitted with a CPRS unit”.

At about the same time, a report of an oil slick off Gairloch was logged, but by mid-morning, after being investigated, it was established that the slick was not from *Brothers*.

At 0936 Portree harbourmaster reported to the MRCC that the crew of an inflatable boat had seen a large oil slick off the east coast of Eilean Trodday, the previous day, and this information was logged.

During a telephone call between Stornoway MRCC and a local police officer, the officer stated that the police had checked the mobile telephone records for the two crew and had found that the skipper’s telephone had last logged off the network at 0518 on 1 June. This led the police officer to conclude that the phone “was above water 3 hours after the vessel had departed Gairloch”. However, this information was logged as the crewman’s phone history, rather than the skipper’s. The coastguard timeline consequently showed (incorrectly) the last mobile phone times as 0421 for the skipper and 0518 for the crewman.

By late morning several fish boxes, plastic bags and a spare cod end net had been found midway between Gairloch and the north end of Skye, in the Trodday fishing grounds. The fish boxes were confirmed to be the same type as those used on board *Brothers*.

During the afternoon, further items were sighted and recovered from that area.

In order to determine where the flotsam might have drifted, the MRCC used its Search and Rescue Information System (SARIS) computer programme to form a hind cast model. Based on the positions and times that the items were discovered, and assuming that *Brothers* sank at 0500 (0400 UTC) on 1 June, it was concluded the flotsam might have come to the surface from the area around the north coast of Skye and drifted past the coast of Eilean Trodday east to where it was discovered (**Figure 3**). An alternative possibility that the items were floating to the surface from a sunken vessel in the immediate vicinity of the fishing grounds was also considered.

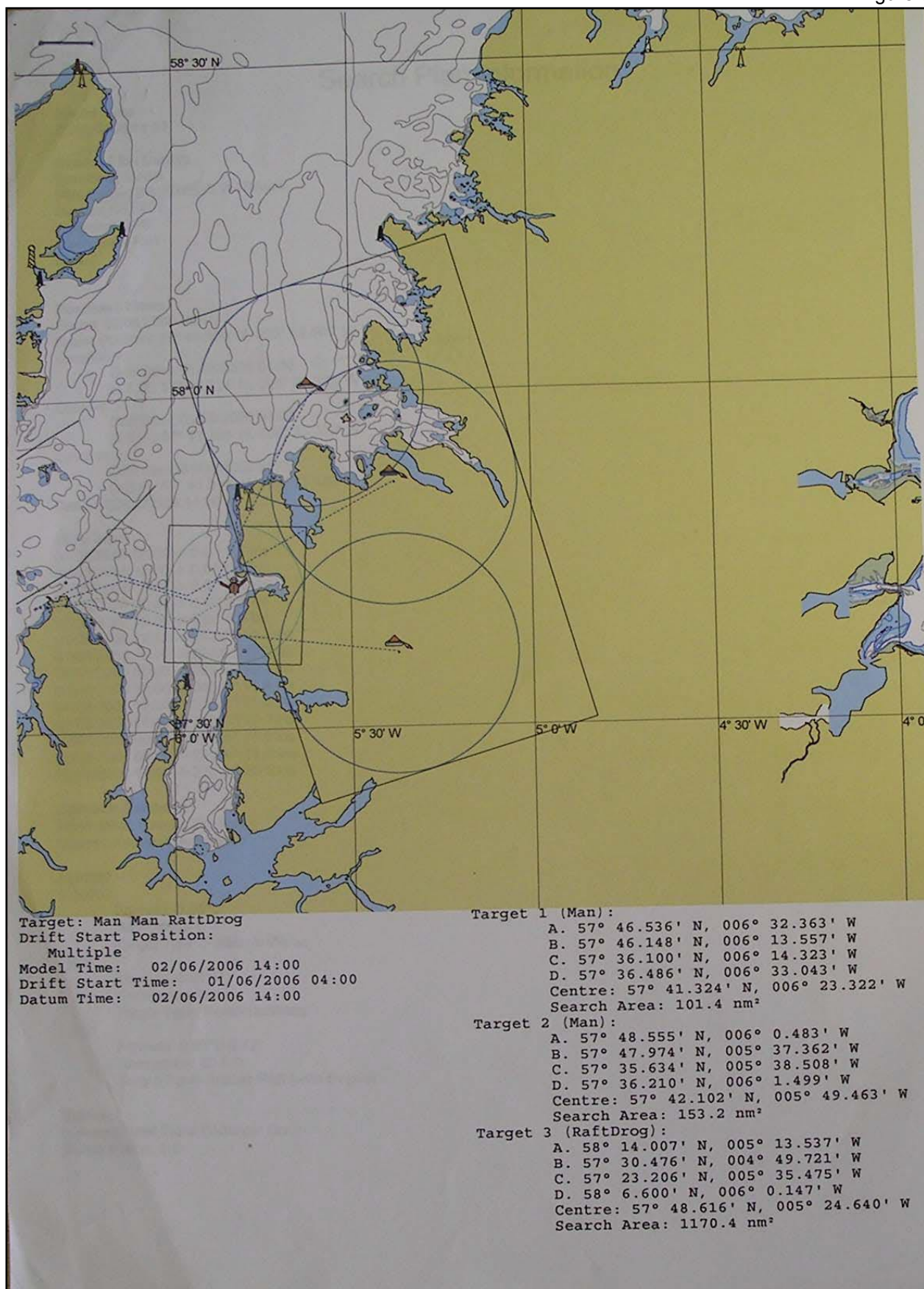
No SAR assets were tasked to search the area around the north coast of Skye.

The search was called off in the evening of 2 June, with the intention of resuming at sunrise the following morning.

During that evening, two local fishermen discussed the situation and decided to take their boats and search the north coast of Skye and Eilean Trodday the following morning, as nothing had been found elsewhere.



Figure 3



SARIS back track result

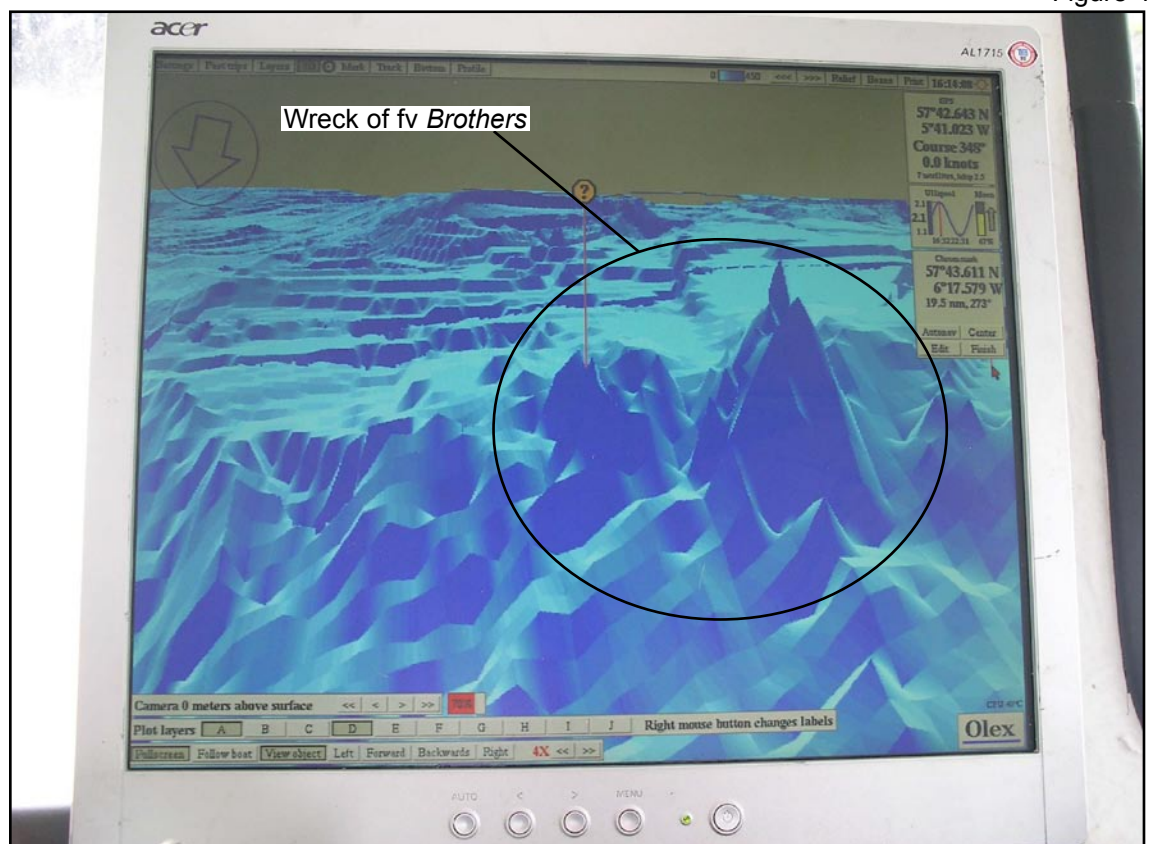
By 0800 on 3 June, more than 2 days after *Brothers* had left port, the search was resumed using helicopters, lifeboats, local fishing vessels and shore search teams. The two local fishermen set off in their boats from Gairloch to search the north coast of Skye and Eilean Trodday.

At 1100, the coast of Eilean Trodday was searched for the first time by a helicopter, however the pilot reported that visibility was poor and nothing had been found.

At about this time, the MRCC was contacted by the skipper's father, who had become aware of the difference between the last contact times of the skipper's and crewman's mobile phones. The father believed that, had the boat sunk, both phones should have lost contact with the two phone networks at about the same time. In a conversation with the coastguard watch officer, the skipper's father expressed an opinion that the difference might have been due to the two networks covered recording the information on BST and UTC respectively, and that, in effect, the times recorded were very similar. The coastguard watch officer confirmed his understanding that both of the times were BST, but agreed to check to re-confirm the situation.

A little after midday, one of the fishing boats which was searching off the north-east coast of Eilean Trodday, reported that fuel could be seen coming up from the seabed and that an oil slick had formed on the surface. Upon closer investigation, they reported seeing an unusual trace on their fish finder and what appeared to be a mast under the water in the area where the oil was coming to the surface (**Figure 4**).

Figure 4



Fishfinder trace of sunken vessel

The MRCC tasked Portree lifeboat to the area to investigate the report.

The water was shallow, and a sports diver, who was on board one of the fishing boats, dived to investigate. At 1300 he returned to the surface, confirming that the wreck was that of *Brothers*, but that he could find no sign of the crew.

An aerial search of the area was undertaken and photographs taken of the wreck and oil slicks (**Figures 5 and 6**).

A thorough land and sea search for the crew continued, which was centred on and around Eilean Trodday and which included landing a search team onto the island by helicopter. However, by evening, no sign of the crew had been found and the search was called off.

The sea and coastline search for the crew was continued the following day, but without success.

On 8 June, the MAIB placed a prohibition notice on the wreck of *Brothers* prohibiting any unauthorised diving operations (**Annex 1**).

The crewman's body was found on the mainland shore at Mellon Udrigle, to the north of Gairloch, on 19 June, 18 days after the vessel was lost. A post mortem found the cause of death to have been drowning. A toxicology examination found a negligible trace of alcohol in his bloodstream.

#### **1.4 ENVIRONMENTAL CONDITIONS**

Low water at Gairloch on 1 June 2006 occurred at 0514 BST, therefore the tidal stream offshore between Gairloch and Eilean Trodday at 0520, when the vessel is thought to have grounded, would have been negligible. However, there would have been a north-easterly tidal stream close to the coast of Eilean Trodday, with a rate of 0.5 to 1.0 knot.

Sunrise was at 0350 BST and the sea temperature was about 10°C.

#### **1.5 DESCRIPTION OF THE BOAT AND HER EQUIPMENT (Figure 7)**

*Brothers* was of wooden construction with a wheelhouse sited forward and a partly enclosed working deck aft. Stairs led from the wheelhouse down to a small cabin area which had an additional emergency escape hatch to the foredeck. The vessel carried six lifejackets, which were all stowed in the cabin.

The wheelhouse was well equipped with a number of electronic navigational and fish finding instruments including GPS, radar and a video plotter. The vessel had a Robertson autopilot which was interfaced with a watch alarm, and she carried a prototype CPRS system, the controls for which were sited in the wheelhouse (**Figure 8**).

The engine space was situated aft of the cabin and could be accessed from stairs leading down from the wheelhouse.

The vessel carried a liferaft which was lashed in a cradle on the wheelhouse top, and other lifesaving equipment including flares and lifebuoys.



Figure 5



Wreck of  
fv *Brothers*

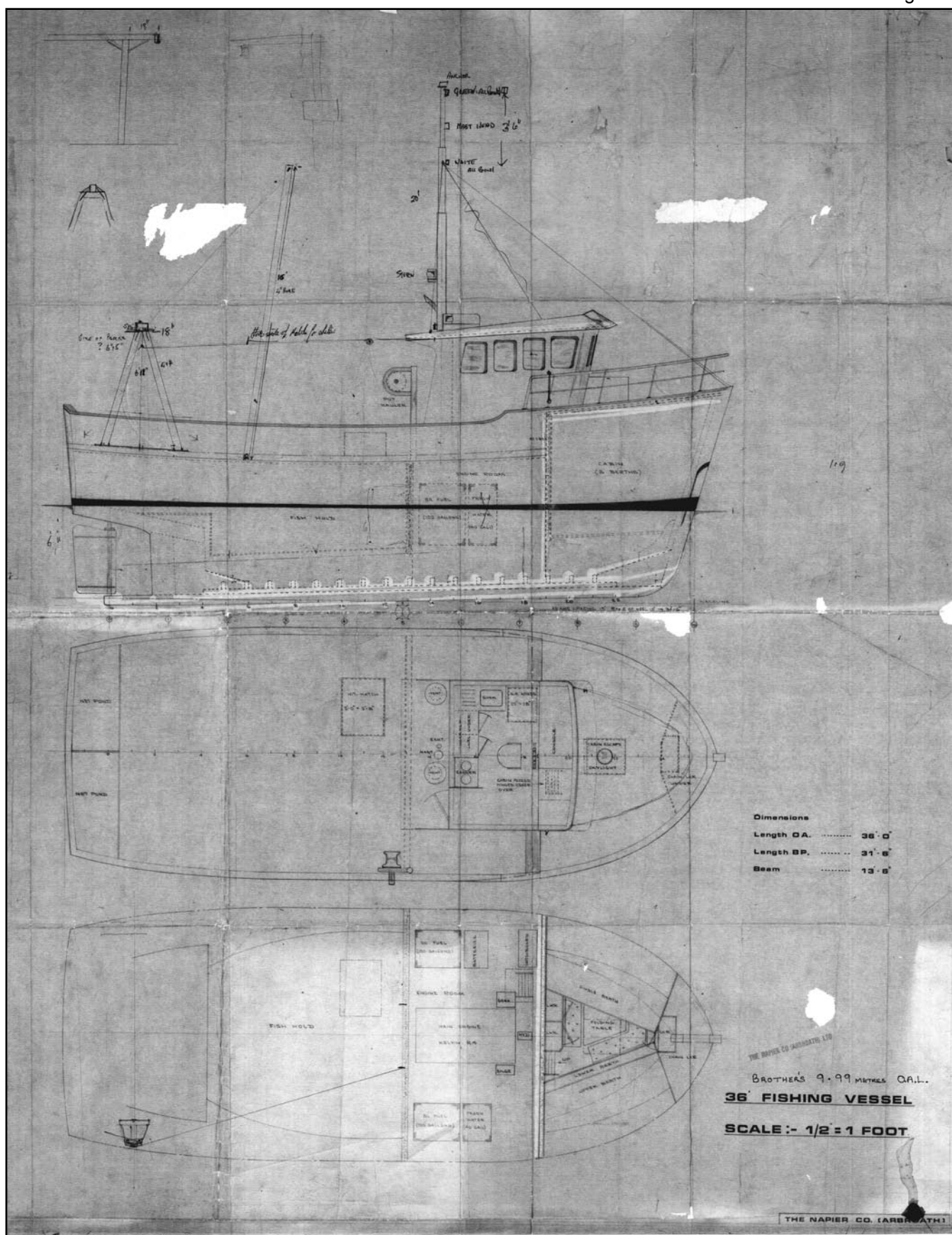
Oil off Eilean Trodday and wreck

Figure 6



Oil on surface off Eilean Trodday

Figure 7



Profile drawing





CPRS vessel equipment

## 1.6 DIVING SURVEYS

After the initial dive on the vessel by a sports diver who was on one of the searching fishing vessels, diving surveys were conducted on two further occasions. During these surveys, accessible areas of the boat and her equipment were inspected and photographed and, among other things, the CPRS unit and the vessel's autopilot were recovered for detailed analysis.

The diving surveys confirmed the following relevant information:

- *Brothers* was lying about 40m off the coast, upright on the seabed in a depth of about 14m;
- No sign of the skipper or crewman was found in the spaces searched;
- The liferaft was still lashed to its cradle. The liferaft was subsequently cut away by the divers and recovered;
- The engine throttle control was set in the astern position;
- The CPRS unit was switched on;
- The vessel's hull was holed in the area of the port bow – the hole measuring about 2.5m x 1.5m spanned both the cabin and engine spaces;
- The escape hatch for the cabin was open.

(Figures 9 and 10)

Figure 9



Area of damage to vessel

Figure 10



Damage to timber hull

## 1.7 CERTIFICATION, TRAINING AND EXPERIENCE OF THE CREW

### 1.7.1 Certification and training

The skipper

The skipper of *Brothers* passed the relevant examinations and was issued with a Class 1 Fishing Certificate of Competency in 1989. This was revoked in 1999 as a result of enquiries surrounding his role in the grounding and loss of a fishing vessel. He did not need a certificate of competency to be skipper of *Brothers*. He had attended all the statutory safety training courses including a Fishing Safety Awareness course in 2001.

The crew member

The crewman had attended all four basic safety training courses as follows:

Fishing Safety Awareness	2001
Basic Fire-Fighting	1999
Sea Survival	1984
Basic First-Aid	1998

### 1.7.2 Experience

Both of the men had worked in the fishing industry for more than 20 years since leaving school, and each had served on larger fishing vessels as well as vessels the size of *Brothers*. They were good friends, they lived close to each other, and had worked together on *Brothers* for 2 years.

## 1.8 CONFIDENTIAL POSITION REPORTING SYSTEM (CPRS)

The CPRS was designed by the RNLI to fulfil a perceived need for a confidential emergency position reporting system suitable for fishermen and small fishing boats. CPRS was originally designed to use the Inmarsat D Plus satellite system and 100 prototype transceiver units were manufactured as part of a test pilot scheme to determine if the idea was feasible. The units were fitted in early 2004 to various fishing boats around the UK coast and to some deep sea vessels.

The pilot scheme was originally expected to last only 12 months, during which the RNLI and its subcontractor, NTL Broadcast, now Arqiva, would monitor the system to discover any faults, problems or other concerns. In the event, the pilot scheme was still operational at the time of the accident, over 2 years after the first units were fitted.

The equipment fitted to the vessels for the pilot scheme consisted of a terminal control box, cabling, processor unit and an external antenna (**see Figure 8**). The units were designed to send the vessel's position at intervals of 20 minutes to the receiving station. An important element in the operation of the system was that this information would be treated in confidence unless an emergency was thought to exist.

The system was designed such that if a vessel missed a report, it was automatically polled by the monitoring station. If the vessel failed to respond to the poll, an alarm would be generated at either NTL Broadcast, now Arqiva's operations room, or the RNLI operations room at Poole. The last position of the vessel would then be checked and contact would be attempted via agreed telephone numbers. If the vessel was confirmed as safe, she would be switched to "not monitoring" at the control centre. Once the vessel's unit began operating again, and a signal was received, the system would automatically restart monitoring her.

If, however, the vessel's safety and whereabouts could not be confirmed, the emergency services would be alerted.

The skipper or crew on board a vessel fitted with a CPRS unit needed only to switch the unit on when leaving port, and to remember to switch it off when having safely returned. When the unit was switched on or off a message was transmitted to the monitoring station.

## **1.9 MOB GUARDIAN**

The RNLI has developed its MOB Guardian system using the lessons learned from the CPRS pilot scheme. The system incorporates an on board unit that automatically transmits hourly confidential updates of a vessel's position, course and speed via satellite using the Iridium satellite system.

Unlike CPRS, if the vessel fails to poll on the system, the alarm is raised with SAR agencies immediately. MOB Guardian also provides a man overboard safety capability which might be particularly useful for single-handed fishermen. Each fisherman can wear a personal safety device that is in radio contact with the on board base unit. If the device loses contact with the base unit, because the wearer has fallen overboard for instance, an alarm sounds on the base unit which, if not cancelled, will cause an alert to be automatically sent to SAR agencies with the position of the incident and vessel details.

MOB Guardian is NOT an Electronic Position-Indicating Radio Beacon (EPIRB), and has not been developed to be used as such.

The full cost of purchasing and fitting MOB Guardian is about £1,800. However, nationally agreed funding is available and, with this help, fishermen should be able to purchase the units for about £300, plus an annual air time subscription of around £240.

Subsequent to this accident, the RNLI has written to the owners of each of the vessels which have been involved in the CPRS pilot scheme and, as a gesture of thanks, offered to fit these vessels with an MOB Guardian unit without charge, although each owner would still be responsible for the annual air time subscription.

## 1.10 ELECTRONIC POSITION-INDICATING RADIO BEACON (EPIRB)

*Brothers* did not carry an EPIRB.

EPIRBs were first developed in the 1970s and now form part of the statutory equipment carried on all merchant ships and on all fishing vessels of over 12m in length. They provide a proven method of quickly alerting the SAR authorities in the event that a vessel founders (when the unit would be activated automatically on contact with salt water) or in the event of another emergency (when the unit can be activated manually).

An EPIRB can be fitted with a hydrostatic release so that it floats free in the event of the vessel foundering, or it can be used as a hand-held manually activated unit.

Currently, the retail price of a standard 406 MHz EPIRB is from about £300.

An EPIRB is dormant until activated, thus offering confidentiality unless needed in an emergency.

Many under 12 metres in length fishing vessels carry an EPIRB voluntarily as recommended by the MCA in Merchant Shipping Notice No MSN.1467 (**Annex 2**). Funding is available in some regions of the UK which will provide an EPIRB free of charge for fishing vessels, like *Brothers*, which do not have a mandatory requirement to carry one.



## 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 THE CIRCUMSTANCES SURROUNDING THE LOSS OF *BROTHERS*

Although a number of possible scenarios that might have led to the foundering of *Brothers*, and the consequent loss of her two crew, have been considered, the evidence strongly indicates that the vessel ran aground at speed on Eilean Trodday, causing catastrophic damage to her port bow. It appears that one of the crew members was able to put the engines astern and pull the vessel clear of the rocks before she rapidly sank at about 0520 and in the position in which she was later discovered 40 metres from the shore. The fact that the escape hatch from the cabin was found open by the police divers might indicate that at least one crew member was asleep in the cabin at the time, and that he escaped from the sinking vessel by that means. However, the escape hatch could also have been blown open by the water rushing into the space when the vessel foundered.

The regular routine adopted on board *Brothers* was for one of the crew to keep the first watch after leaving harbour, while the other got some rest. It appears that, on departure from Gairloch, the autopilot was engaged and the vessel steered a steady course across the sound, past the fishing grounds and onto the shore of Eilean Trodday. The speed of the boat and the elapsed time between leaving Gairloch and the loss of the vessel at 0520 is consistent with this sequence of events.

Given this scenario, it is reasonable to assume that the watchkeeper must have become incapacitated for some reason. For example, it is possible that he had fallen over the side or that he tripped over and knocked himself out. However, it is more likely that the watchkeeper fell asleep. In this latter case, it is not known why the watch alarm did not wake him, but there are three possible explanations for this:

- The watch alarm was not working;
- The watchkeeper was so soundly asleep that the alarm failed to wake him - MAIB has investigated accidents previously where this had happened, in particular, the loss of *Betty James*, also off the west coast of Scotland in 2000 (see Section 2.9).
- The alarm aroused the watchkeeper sufficiently for him to cancel it, however it did not wake him enough for him to realise the danger that the vessel was standing into.

The watch alarm fitted on board *Brothers* sounded only in the wheelhouse, so it would not have woken up the other crew member when it activated. The particular issues associated with fatigue are explored in more detail in Section 2.6.

After *Brothers* struck the shore at speed, there was enough time for someone to reverse the engines to pull the vessel astern but then she appears to have foundered very quickly, as there was not enough time for the crew to get their lifejackets, send a distress message or release the liferaft or other buoyancy aids.

## 2.3 THE POSSIBILITIES FOR SURVIVAL

### Survival times without aids

The fact that nobody was found on board does indicate the possibility that both of the crew escaped from the vessel as it sank. The investigation considered why these reportedly strong swimmers were apparently unable to swim the 40 metres to the shore. Although the coastline was rocky, it would have been familiar to the fishermen, and the closest shoreline had places where a swimmer could climb out from the water. It was daylight and the sea conditions were calm. However, at the probable time of the accident, 0520, there was a 0.5 to 1 knot tidal stream flowing along the coast of Eilean Trodday and the water temperature was only 10°C. In these conditions, it would have been very difficult, or impossible, to successfully swim to the shore. It is difficult to estimate with accuracy the likely survival times in water of 10°C as there are too many uncertainties. The prevailing sea temperature is one of many factors that will influence the time a person can survive. Also relevant to this will be the build of the person, the type of clothing, the sea state, the person's activity (swimming or treading water), the person's general health and whether there was anything to help support the person's weight. These factors are unknown in this case but, given the known circumstances and the MAIB's experience of similar accidents, it is likely that the crew's survival times would have been measured in minutes rather than hours. In addition, the men could have been affected by cold shock as they entered the water, which might have reduced their prospects for survival even further.

### Survival and emergency alerting aids

Despite the short predicted survival times and the probable circumstances of the accident, there are a number of things that could be done in similar future accidents to improve survival chances. These are as follows:

- Embarkation into the liferaft

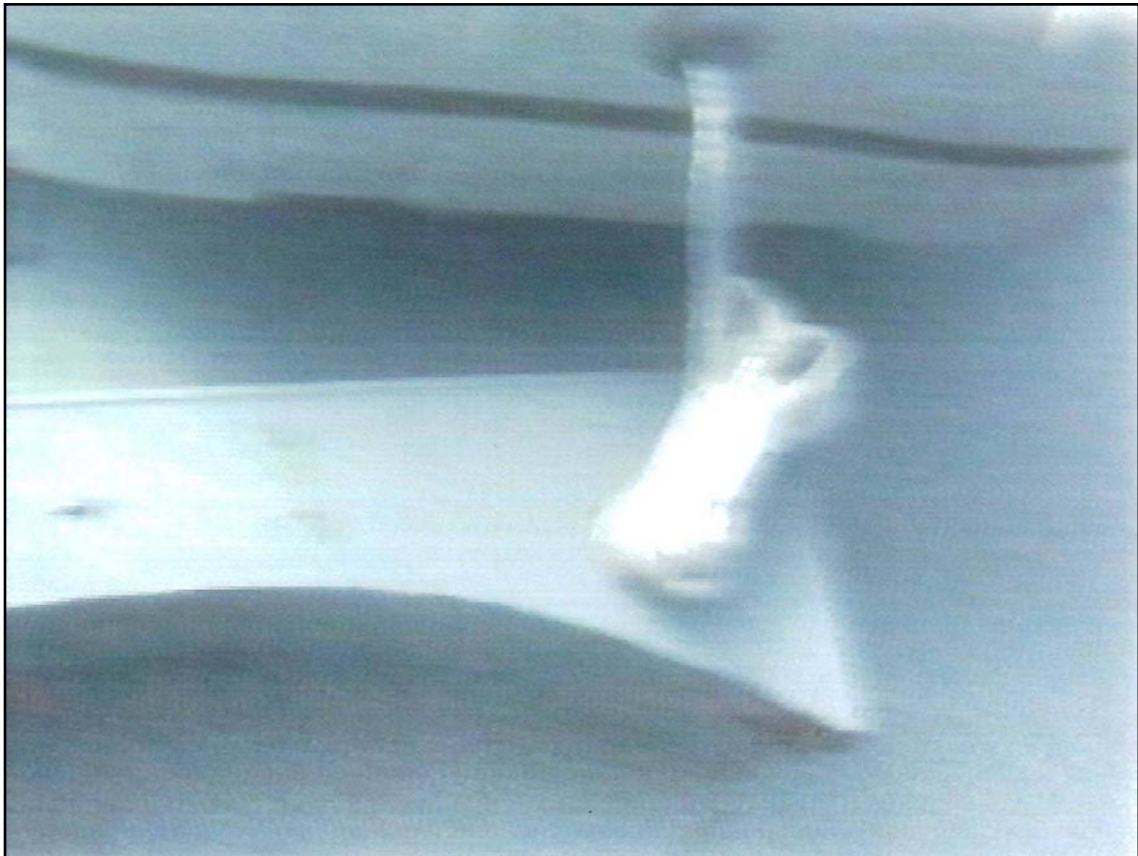
*Brothers* had a fully serviced 4-man Lifeguard Oceanic liferaft on board, even though there was no requirement to carry one. The raft was lashed by rope to a purpose-built cradle on top of the wheelhouse, and the painter was left unsecured (**Figures 11 and 12**). If the vessel's liferaft had been fitted with a hydrostatic release unit, it would have been released from its cradle, allowing it to float to the surface soon after the vessel foundered. A liferaft would have provided protection for the two fishermen for several hours, or longer, as well as making a potential search more likely to succeed. The RNLI fishing safety team developed a Hydrostatic Release Unit (HRU) Installation Guide during 2004, which has been widely distributed to the fishing industry (**Annex 3**).

Figure 11



Liferaft lashed to cradle on wheelhouse top

Figure 12



Unsecured liferaft painter



- Donning of lifejackets

The vessel had six lifejackets on board, which were stowed under a bunk in the crew cabin, and in this way she complied with the appropriate regulations. No lifejacket has been recovered, and it is believed therefore that they are still stowed on board. If the crew had been wearing, or had quickly donned their lifejackets at the time of the accident, their potential survival times would have been increased dramatically.

In the MAIB's view, fit for purpose lifejackets should be worn at all times while working on a fishing boat or, at the very least, should be stowed in an easily accessible location.

Seafish and the RNLI have been identifying lifejackets that are practical and suitable to be worn by fishermen while they work. A final report and a 'key features' data sheet was produced and promulgated in January 2007.

- Activation of CPRS/MOB Guardian

The purpose of the CPRS was specifically to alert the authorities in the event of an accident like the one which occurred to *Brothers*. The CPRS unit on board *Brothers* failed in that purpose on this occasion. The fact that the skipper was probably unaware that the unit was not operational might, conceivably, have influenced his actions in the seconds prior to the vessel foundering.

Even if the CPRS unit had been operational, and the system had polled the vessel, a period of 21 to 37 minutes would have passed before the personnel monitoring the system would have been aware of the alert and taken measures to check the vessel's safety. Although the potential benefits of the CPRS system are clear, it is unlikely that, in the case of this accident, activation of the system would have prevented the deaths of the crew. If hypothetically the vessel had carried an operational new MOB Guardian unit this might have raised the alarm sooner.

The failure of the CPRS is discussed in detail in Section 2.4.

- EPIRB

Had *Brothers* carried an EPIRB, her crew's chances of survival would have been increased markedly. The alarm would have been raised quickly and the vessel's position established, enabling a rescue to be initiated promptly.

## 2.4 CONFIDENTIAL POSITION REPORTING SYSTEM (CPRS)

On 5 April 2004, *Brothers* was fitted with a custom built CPRS transceiver unit. This was fitted at the request of the then skipper after he became aware of the RNLI's pilot scheme.

The pilot scheme ended in April 2005; however the RNLI decided to continue operating the system.

The system began logging a fault with the unit on *Brothers* on 19 May 2005, and a replacement was dispatched on 10 June 2005 for fitting to the vessel. An engineer contacted the skipper to arrange to attend the vessel in Ullapool. However the engineer went to Ullapool but the vessel was not alongside and he was unable to replace the unit

The unit on board *Brothers* continued to operate intermittently, and the number of signals received from it continued to reduce until 7 October, when it ceased transmitting altogether.

Another unsuccessful attempt was made to contact the skipper and meet the vessel in Fraserburgh in October. The replacement unit was then left in Fraserburgh and later mislaid in the system.

In February 2006 the RNLi requested an update from Arqiva about the faulty units and this led to the replacement unit being discovered on 7 March. This information was passed to Arqiva, who requested the contracting engineers to contact the vessel again in order to replace the faulty unit.

Figure 13



CPRS control unit switched ON  
(Sample unit)

The unit had not been replaced 3 months later when, on 1 June 2006, the vessel sailed on her last voyage from Gairloch.

If the CPRS unit on *Brothers* had operated properly, the alarm would have been raised and the site of the wreck found earlier. But given the time that would have elapsed before the personnel monitoring the system would have been aware of the alert, it is unlikely that the outcome for the two crew members would have been altered.

The skipper was known to have switched the unit on each time he left port, and to switch it off on return. Further evidence that this was the case is highlighted by the unit being found switched ON or in the “seagoing position” after it was recovered from the wreck (**Figure 13**).

As stated above, the precise message passed to the skipper in October 2005 is not known. However it is unlikely that he was told the unit had completely failed because there is strong evidence to suggest that he continued to switch the unit “on” and “off” for the next 8 months, presumably in the belief that it was working or, at least, might work in an emergency. It is improbable that he would have continued to have done so had he been told that it had completely failed.

The CPRS units on a number of other fishing vessels had also failed over this period. Immediately following this accident, the owners and/or skippers of each vessel fitted with a malfunctioning unit that was not being monitored were contacted by telephone and told of the fact by the RNLI. This contact was also followed up by confirmation in writing. The MAIB established that at least some of these skippers/owners were unaware that their units were malfunctioning until contacted by the RNLI at this time.

The pre-installation CPRS registration document, which was signed by the then skipper of *Brothers*, proposed two different modes of action in the event of an emergency situation. Either the RNLI would pass the information directly to the coastguard, or they would make enquiries to one of two contacts named by the user. The skipper of *Brothers* opted for the information to be passed directly to the coastguard.

The registration document also contained the following statement:

*I further understand that as this is a trial, the equipment will not provide emergency alerting or communications facilities and that I must not rely upon it to do so.*

In actual fact, the equipment did provide a form of emergency alerting, and there is evidence to support the fact that the skipper at the time of registration believed that it had similar capability to that of an EPIRB.

It is not known whether the skipper at the time of the accident had read the registration document; he certainly had not signed it and was not required to have done so.

The CPRS pilot scheme test generated numerous false alerts that apparently plagued the system and which needed the coastguard to respond. It is questionable whether the pilot scheme should have been allowed to remain “live” beyond the end of the original 12-month test period. At that time, many of the units were not operational and more were failing all the time (such that by July 2006, 40% were not operational or not being used). Additionally, the Inmarsat D Plus satellite system was already proving unsuitable for the CPRS due to a shortfall in its cover around the UK coast.

From the foregoing, it would appear that the RNLI had not properly prepared for the foreseeable eventualities of CPRS unit failures or changes of vessel ownership. If the RNLI is going to manage the MOB Guardian system, reliability and notification of problems need to be addressed.

## **2.5 COMPARISON BETWEEN EMERGENCY REPORTING EQUIPMENT**

CPRS was only a pilot scheme and is not commercially available.

MOB Guardian is heavily subsidised under a national scheme and will give warning that a vessel is in trouble within an hour of the occurrence. It also offers personal sub-units which can be worn by fishermen and which will give an instant alert if the wearer falls overboard, or for some other reason gets out of range of the base unit. Although in normal operation vessel positions are

transmitted to a shore-based receiving station, this information is treated as in confidence unless an emergency situation arises. No other man overboard product has satellite connectivity to alert the SAR authorities.

An EPIRB is a tried and tested device for providing a quick indication that a vessel is in trouble. It is dormant unless activated, and therefore offers equivalent confidentiality to the MOB Guardian. Help in funding the supply of EPIRBs to small fishing vessels, which do not have a statutory duty to carry them, is available from some UK regions, but not all. If at some time in the future it becomes a requirement for small fishing vessels to carry an EPIRB, it is likely that the funding would be withdrawn.

The investigation has identified that many fishermen are unclear of the pros and cons of the various emergency position reporting aids. They are also unsure where to get independent advice. Previous investigations have shown that single handed fishermen especially would benefit from an MOB alerting system. However, it is the MAIB's firm view that in most cases fishermen, who might consider fitting just one emergency position reporting aid, should fit an EPIRB. In fitting an EPIRB, it is essential that the correct guidance is followed with respect to its location on board and its correct registration. **(See Annexes 2, 4, 5 and 6 for various Marine Guidance Notes and Merchant Shipping Notices on this.)**

## 2.6 FATIGUE

Merchant Shipping Notice (MSN) 1786 (F), the Application of the Fishing Vessels (Working Time: Sea-fishermen) Regulations 2004, contains detailed mandatory work time requirements for many fishing vessels (**Annex 7**). The purpose of the regulations is to apply common standards of working time throughout the fishing industry so as to ensure that the crews of fishing vessels receive adequate rest, thereby minimising the risk to health and safety arising from fatigue. They do not apply to self employed fishermen like the crew of *Brothers*, but self employed fishermen are advised to regard the regulations limiting working hours as useful benchmarks to avoid working excessive hours and the dangers of fatigue.

Prawn fishing is carried out during daylight hours. In Gairloch, on 1 June, the sun rose at 0350 and set 17½ hours later at 2120. It takes 2 hours to motor to and from the fishing grounds, and the fishermen usually wish to utilise as much of the daylight as possible. It is customary for the fleet of boats to sail from Gairloch at about 0230 and not to return until after 2200.

The normal procedure on board *Brothers* was for either the skipper or crewman to steer the boat out of the port while the other man rested below for a couple of hours. The nets would be shot on arrival at the fishing grounds, after which the roles would be reversed and the rested person would stand watch in the wheelhouse, while the other gained some sleep.

*Brothers* usually towed for about 4 hours. The work of hauling the nets, landing the catch and shooting the nets away again usually took about 30 minutes. The catch would then be processed and stowed below during the next tow, and on completion the roles would, once again be reversed as the other crewman got some rest before the nets were hauled again.

In this way, the skipper and crewman would receive broken rest periods of 2 or 3 hours at a time, normally not totalling more than about 6 hours a day while the vessel was at sea. When in harbour, it was not uncommon for the crew of *Brothers*, and those of other vessels in the fleet, to visit a pub in Gairloch after landing the catch and before sailing for the next day's fishing.

The prawn fishermen that are based in Gairloch do not generally fish when the weather is poor. The season is short and for this reason there is added incentive to make the most of fine weather and to work excessive hours. It had been fine weather in the period preceding the accident.

*Brothers* had been out fishing for long days on the Monday and Tuesday, but had encountered problems and the catch had been poor. On the Wednesday they tried again, but there was no improvement in the catch so they returned to port to change the trawl doors and nets. They completed this at about midnight and, because of the disruption to their normal routine, they had probably received even less sleep than usual. They then went to a pub, and came back on board at about 0200 to ready the vessel for departure. They were known to have drunk some alcohol but it was not thought to have been an excessive quantity. However, any alcohol would have added to the lack of good quality sleep during the previous day and earlier in the week, to have left them both suffering from the effects of fatigue. In these circumstances, it is not surprising that one or other of them fell asleep on watch and failed to be alerted to the danger by the watch alarm.

Risk assessments must be undertaken by owners/skippers of all under 12m fishing vessels under the provisions of the Merchant Shipping and Fishing Vessels (Health and Safety at Work) Regulations SI 1997 No 2962 and the Fishing Vessels (Code of Practice for the Safety of Small Fishing Vessels) Regulations SI 2001 No 0009. There is no evidence indicating whether the skipper of *Brothers* had conducted risk assessments but, in MAIB's experience, very few under 12m fishing boats have done so. On a vessel like *Brothers*, bearing in mind the onerous nature of seasonal prawn fishing, fatigue should have been identified as a risk and appropriate control measures should have been considered. Suitable control measures might have included the limitation of the hours worked and the fitting of a watch alarm incorporating a unit that sounded a warning below in the crew cabin.

A parallel MAIB investigation into an injury that was sustained by a crew member on the FV *Danielle* discusses the practical assistance currently provided to fishermen regarding safety matters and the conduct of risk assessments by the MCA Fishing Liaison Inspector/Surveyor in the MCA's Aberdeen Marine Office. The *Danielle* report highlights the positive aspects of this scheme, and the need for the MCA to consider the possibility of extending it to other marine offices and regions.

## **2.7 THE COASTGUARD SEARCH AND RESCUE OPERATION**

The search and rescue operation was complex and prolonged. The coastguard officers, helicopter crews, auxiliary coastguard search teams and local fishermen worked long hours and displayed admirable dedication to the task of finding the fishermen. Especially in the early hours after the coastguard had been alerted, the MRCC was very busy with inquiries and reports coming in as well as the tasks associated with mobilising and directing search resources.

During the course of the operation, an oversight was made at the MRCC concerning the time the skipper's mobile phone was last logged onto the network. The oversight was then compounded and not noticed despite subsequently receiving correct information.

At 2300, the coastguard contacted a mobile phone network provider in an effort to determine when the skipper's phone had last logged off the network. At 2311 the network operator quickly determined that the phone had last been logged on the network 1073 minutes previously. 1073 minutes is 17 hours and 53 minutes. Therefore the actual time the phone was last logged on the network was 17 hours and 53 minutes before 2311, which is 0518 BST. However, the MRCC logged the time as 0421 BST.

The MRCC was fully aware that mobile phones can log off a network for many reasons including the phone being outside the network area, or the user taking it below decks and thus losing the signal. It knew, therefore, that the information needed to be used with care. However, as very little other factual information was available, the incorrect time was used as a basis for decisions. Because of this, searchers believed the vessel might have foundered 2 hours after leaving port, which put her most likely position near to the Trodday fishing grounds, exactly where they may have expected her to be, which is where they concentrated the search effort. It indicated that the vessel could not have got as far as Skye or Eilean Trodday as these islands are about 3 hours steaming time from Gairloch. It was logical to base the initial search area on the fishing grounds but, with the correct phone information, the search area might have been expanded to the west.

The following morning, the police told the MRCC that, according to them, the skipper's phone was last logged on to the network at 0518 BST; the correct time. For some unknown reason, the MRCC logged this time as that corresponding to the crew member's phone and failed to recognise the significance of the information. Thus, the error of the time and the consequent decisions were not revisited.

The MAIB believes that these oversights did not affect the outcome of this accident. However, in another situation, they might have had serious consequences. The MCA is taking action to improve the management of operations in the MRCCs so that similar mistakes, if made, will be identified and corrected.

It took a number of calls by the MRCC over a period of time to get the mobile phone data, and this included calls to incorrect numbers. It was also found during the investigation that the amount and quality of information available

from mobile phone records was changing quickly as the technology evolved, and it was noted that, in certain circumstances, this information could be vital in tracing missing vessels or people. It was further noted that the procedures adopted by the coastguard to obtain this data varied from station to station.

The MCA is now forming operational advice on the evidence available from mobile phones and how best to gain it (**see Section 4 - Action Taken**).

## **2.8 ACTION IN THE EVENT OF A GROUNDING**

When *Brothers* grounded, the evidence indicates that the engine throttle control was put astern and she came off the rocks to the position where she foundered.

It is possible that, had the vessel remained on the shore, she might have stayed afloat for longer, thus giving those on board time to assess the damage, broadcast a “Mayday” message, don lifejackets and warm clothing, or deploy the vessel’s liferaft.

If a vessel grounds it is, perhaps, the natural first action to try and pull the vessel off in the hope that she isn’t badly damaged and could therefore continue on the voyage. It is not uncommon for fishermen to take such action, and yet it could, in certain circumstances, prove disastrous. The MAIB believes that the subject of what action to take in the event of a collision or grounding should be added to the statutory fishing awareness syllabus and included in the certificate of competency damage limitation syllabus to encourage fishermen to think carefully before taking any action.

## **2.9 PREVIOUS INCIDENTS**

There have been a number of similar fishing vessel grounding accidents in recent years which have been caused by watchkeepers suffering from fatigue brought on by the very long working days. Some of the most notable are précised below.

*Our Nicholas* – Grounded and was lost near the entrance to Stornoway Harbour 24 July 2001.

The vessel had arrived in port and the crew had worked to discharge the catch and then taken the chance to go to the pub for an hour just before the vessel set sail at 2300. After sailing, the skipper went to bed and left two deckhands in the wheelhouse. They both fell asleep and the vessel grounded on rocks. The skipper’s first reaction on reaching the wheelhouse was to pull the vessel off. This hastened the sinking of the vessel. Fortunately other fishing vessels had witnessed the incident and were on hand to rescue the crew.

*Betty James* – Grounded and was lost on the Isle of Rhum, 10 July 2000.

The vessel had landed her catch in Mallaig in the evening and the three crew members went to the pub for between 1 and 2 hours. They returned to the vessel and sailed almost immediately at 0015. The watchkeeper fell asleep at about 0140 and the watch alarm, although working, failed to wake him. The vessel grounded at 0230. The skipper tried to pull the vessel astern off the rocks but was unable to do so. A liferaft was launched and the crew had enough time to successfully abandon the vessel. Nobody was hurt.

*Primrose* – Grounded on the Isle of Rhum on 15 June 2001.

The vessel arrived in Mallaig to land her catch at 2100. The crew later went to the pub for about an hour before returning to the vessel shortly after midnight and sailing almost immediately. At about 0230, the watchkeeper fell asleep and the vessel grounded at about 0320. The vessel was hard aground about 50 metres from the shore. The crew prepared the vessel's liferafts and donned survival suits but, eventually, were able to stay on board until the Mallaig lifeboat arrived on scene. Nobody had been hurt.

*Lomur* – Grounded in the approaches to Scalloway, Shetland Islands on 14 June 2001.

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

Other notable recent accidents which share some common factors include:

*Crimond II* – Capsized and foundered on 24 April 2001.

The two crew found themselves in seawater of temperature 8°C to 9°C, clinging on to various items of wreckage, including two lifebuoys and a gas bottle. More than an hour later they were rescued by helicopter, after the coastguard had received a signal from the vessel's EPIRB. Both men were taken to hospital, suffering from hypothermia, but both made a full recovery.

*Auriga* – Capsized and foundered on 30 June 2005.

This small GRP trawler capsized and sank while trying to recover her net which had a heavy object in the cod end. Fortunately the rescue services were alerted to the incident by the automatic activation of the vessel's EPIRB. The crew of two were rescued unharmed from their liferaft by a passing container ship about an hour after the sinking.

*Jann Denise II* – Flooded and was lost with both her crew on 17 November 2004.

This 9.7 m long fishing vessel flooded rapidly and sank while returning to port. The coastguard was unaware of the accident until another fishing vessel reported *Jann Denise II* as being overdue in harbour. Both crew were lost with the vessel and she did not carry either a liferaft or an EPIRB.

*Greenhill* – Grounded and then flooded and was lost on 19 January 2006.

The 20.04m long vessel grounded because her wheelhouse had been left unattended. She was then manoeuvred off the rocks, which allowed the vessel to flood rapidly and sink. Two of her three-man crew died.



## SECTION 3 - CONCLUSIONS

### 3.1 SAFETY ISSUES

The following safety issues have been identified by the investigation. They are not listed in any order of priority.

1. Although there are other possible scenarios, the MAIB believes it likely that the watchkeeper on *Brothers* fell asleep and thus allowed the vessel to sail past the fishing grounds and onto the rocky shoreline on Eilean Trodday. [2.3]
2. The watch alarm failed to alert the crew for one of the following reasons:
  - o It was not working;
  - o The watchkeeper was too soundly asleep; or
  - o The watchkeeper was aroused only sufficiently to cancel the alarm, but not to recognise the dangerous situation. [2.2]
3. After the vessel struck rocks, one of the crew put the engines astern and to pull the vessel off. In the event, this was an unwise decision as she foundered in deeper water very soon afterwards. [2.2; 2.8]
4. After the vessel had pulled astern off the rocks there was not enough time to send a distress message, prepare the liferaft or get lifejackets before *Brothers* foundered. [2.2]
5. In the conditions that prevailed, once the crew were in the water they could not have easily swum to the shore and their possible survival times would have been measured in minutes rather than hours. [2.3]
6. If the vessel's liferaft had been fitted with a hydrostatic release, allowing it to float free when the vessel sank, it would have been of great benefit to the two fishermen in the water. [2.3]
7. The lifejackets on board *Brothers* were stowed in an inaccessible position and, in the event, were of no use to the crew. [2.3]
8. Even if the vessel's CPRS unit had been fully operational, it is unlikely that it would have made any difference to the outcome for the crew because of the delay before the alarm would have been raised with the SAR authorities. [2.3]
9. *Brothers* did not carry an EPIRB. Had she done so, the alarm would have been raised quickly and this could have been very beneficial to the people in the water. [2.3]
10. In common with a number of other fishing vessel owners and skippers, the skipper of *Brothers* had not been clearly informed that his CPRS unit was malfunctioning. [2.4]
11. The fact that the skipper was probably unaware that his CPRS unit had failed completely could have affected his actions after the vessel grounded. [2.4]

12. It appears that the RNLI had not properly prepared for the foreseeable eventualities of CPRS failures or changes of vessel ownership. If the RNLI is going to manage the MOB Guardian system, reliability and notification of problems need to be addressed. [2.4]
13. Many fishermen appear unclear of the pros and cons of the various emergency position reporting aids. Previous investigations have shown that single handed fishermen especially would benefit from an MOB alerting system. However, it is the MAIB's firm view that in most cases fishermen, who might consider fitting just one such aid, should fit an EPIRB. However, it is essential that the correct guidance is followed with respect to its location on board and to its correct registration. [2.5]
14. Both of the crew on *Brothers* would have been suffering the effects of fatigue brought on by a number of long days of work with only short, broken rest periods. In these circumstances, it is not surprising that one of them probably fell asleep on watch. [2.6]
15. There is no evidence indicating whether the skipper of *Brothers* had conducted risk assessments, but in MAIB's experience, very few skippers of under 12m fishing boats have done so. On a vessel like *Brothers*, fatigue should have been identified as a risk, and appropriate control measures should have been considered. [2.6]
16. An oversight was made at Stornoway MRCC in logging the time that the skipper's mobile phone had logged off the network. This oversight was not noticed by other members of the team. [2.7]
17. Procedures concerning the gathering of historical mobile phone data vary between coastguard stations, and the type of information available is rapidly changing and improving as the industry evolves. [2.7]

## **SECTION 4 - ACTION TAKEN (OR TO BE TAKEN)**

**The Royal National Lifeboat Institution** has:

- Contacted the owners of all the vessels which were known to have malfunctioning CPRS units, to inform them of the fact.
- Decided to deal with the monitoring of any MOB Guardian unit failures, and the subsequent notification and repair of the units, “in house”, instead of subcontracting the work as they did with CPRS.
- Addressed the problems concerning maintenance and administration of MOB Guardian by the implementation of a direct auditing system to follow up installations, reliability issues and notification of problems.
- The RNLI is promoting the correct installation and use of liferafts and HRUs through its fishing safety team.
- Assisted with informing fishermen of the differences between EPIRBs and other position indicating beacons such as MOB Guardian, through its fishing safety team.

**The Maritime and Coastguard Agency** will:

- Re-emphasise to all MRCC watch personnel the importance of checking and cross checking of received information due to the concerns raised during this investigation.
- Improve the knowledge of MRCC personnel concerning the rapidly evolving mobile phone industry and, in particular, the information available from the network suppliers and how to obtain it quickly and efficiently.

**Seafish UK** has:

- Assessed the training provided to skippers and crews of fishing vessels on the action to be taken after a grounding, with particular regard to damage limitation and whether there is a need to improve relevant training for certificates of competency and/or safety awareness.
- Promulgated the findings of its joint project with the RNLI to identify a lifejacket for use by fishermen while working on board.
- Assisted with informing fishermen of the differences between EPIRBs and other position-indicating beacons such as the MOB Guardian.

**The Marine Accident Investigation Branch** will:

- Circulate widely a 2-page synopsis of this accident in order to highlight to the fishing industry, in particular, the grave dangers associated with long working hours and fatigue, and the advantages of voluntarily supplying and fitting an EPIRB and a liferaft with a hydrostatic release unit.
- In its *Danielle* investigation report, highlight the need for the MCA to consider extending the current provision of practical assistance to fishermen with regard to mandatory risk assessments.

## **SECTION 5 - RECOMMENDATIONS**

In the light of the actions already taken as a result of this investigation, no formal recommendations are being made. However, the MAIB strongly advises all owners and skippers of under 12 metre fishing vessels to fit an EPIRB and a liferaft fitted with a hydrostatic release system. Finance to pay the full price for this equipment is available in some UK regions and, in any case, the price is a small one to pay compared to the benefits that can be gained.

**Marine Accident Investigation Branch  
January 2007**