Report on the investigation of

the collision between

Lady Hamilton of Helford

and

Blithe Spirit

Falmouth Bay, Cornwall, England

3 October 2007

Marine Accident Investigation Branch
Carlton House
Carlton Place
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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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GLOSSARY OF ABBREVIATIONS AND ACRONYMS

CO_2	-	Carbon Dioxide
COLREGs	-	The International Regulations for Preventing Collisions at Sea, 1972, as amended.
FISG	-	Fishing Industry Safety Group
FTAG	-	Fishermen's Training Advisory Group
g	-	Grams
GPS	-	Global Positioning System
GRP	-	Glass-Reinforced Plastic
HP	-	Horse Power
IMO	-	International Maritime Organization
ISAF	-	International Sailing Federation
ISO	-	International Organization for Standardization
kW	-	Kilowatts
LOA	-	Length Overall
m	-	metre
"Mayday"	-	The international distress signal (spoken)
MCA	-	Maritime and Coastguard Agency
MCIB	-	Marine Casualty Investigation Board
MED	-	Marine Equipment Directive
MGN	-	Marine Guidance Notice
MSN	-	Merchant Shipping Note
Nm	-	Nautical mile
ORC	-	Offshore Racing Council
OSR	-	Offshore Special Regulations
PLRS	-	Premium Liferaft Services
RFD	-	RFD Beaufort Ltd

RNLI	-	Royal National Lifeboat Institution
RORC	-	Royal Ocean Racing Club
RYA	-	Royal Yachting Association
SEAC	-	Safety Equipment Advisory Committee (chaired by MCA)
SOLAS	-	International Convention for the Safety of Life at Sea
UK	-	United Kingdom
UTC	-	Universal Co-ordinated Time
VHF	-	Very High Frequency

All times used in this report are UTC + 1 unless otherwise stated

SYNOPSIS

At approximately 0600 on 3 October 2007, *Lady Hamilton of Helford* left the Helford River and headed across Falmouth Bay at 6 knots towards the 'Old Wall' fishing grounds. Her skipper was on watch in the wheelhouse while the vessel's two deckhands slept. At approximately 0615, *Blithe Spirit* left Falmouth and headed south towards the Manacles at a speed of between 18 and 26 knots. Shortly after leaving the harbour, the skipper of *Blithe Spirit*, who was operating single handed, altered course to port to avoid a cluster of unidentified lights ahead of him. Once steady on his new course, with the way ahead apparently clear, he sat down to rest.

At approximately 0622, *Blithe Spirit* and *Lady Hamilton of Helford* collided. The crew of *Lady Hamilton of Helford* were thrown to the deck and covered in debris. *Lady Hamilton of Helford* was holed above and below the waterline and started to rapidly take on water. Her skipper used a mobile phone to inform the coastguard while his crew launched a liferaft. The liferaft did not fully inflate and was unusable. Fortunately, a local pilot boat quickly arrived on the scene and recovered the skipper and his crew. The damaged vessel was taken in tow but sank at 0646. When the two vessels collided, the skipper of *Blithe Spirit* hit his head on a chart plotter on impact before landing on the deck of his boat. It would appear that he then lost consciousness for a short period. After coming to, *Blithe Spirit*'s skipper took the boat back to Falmouth, arriving there at about 0715.

Neither skipper saw the other vessel immediately before or after the collision and both concluded they had struck semi-submerged objects. The investigation identified a number of factors which led to the collision. In particular, neither skipper maintained an effective lookout.

To improve fishing vessel safety, the MCA intends to require skippers of vessels under 16.5m to hold a certificate of competency and is considering the provision of a team of safety advisors to raise awareness of the risks associated with a fishing vessel's routine operation. It is also considering the promulgation of a minimum recognised standard for liferafts carried on board fishing vessels of less than 15m.

The investigation also identified that the liferaft deployed from *Lady Hamilton of Helford* had not been serviced in accordance with its manufacturer's instructions and did not fully inflate because there was insufficient gas in its cylinder. As a result, the MAIB strongly advises that all owners of leisure craft and fishing vessels who own or hire liferafts seek confirmation from service agents that all maintenance, checks and tests conducted have been in accordance with the manufacturer's instructions.

Recommendations have been made to the MCA and Premium Liferaft Services, which seek to improve the reliability of liferafts carried on smaller vessels. A further recommendation to the MCA aims to improve the safe operation of fishing vessels capable of fast speeds.

SECTION 1 - FACTUAL INFORMATION

1.1 PARTICULARS OF *LADY HAMILTON OF HELFORD* AND *BLITHE SPIRIT* AND ACCIDENT

Vessel details		***Lady Hamilton of Helford***
Registered owner	:	Privately owned
Port of registry	:	Falmouth
Flag	:	UK
Type	:	Gill Netter
Fishing number	:	FH 214
Built	:	1972 Looe, Cornwall
Construction	:	Wood
Length overall	:	8.53m
Gross tonnage	:	6.73
Engine power and/or type	:	99 kW, six cylinder Perkins Sabre
Service speed	:	8 knots

Accident details		
Time and date	:	0622 on 3 October 2007
Location of incident	:	50° 06.41'N 005° 02.59'W, 2.2 Nm south of Pendennis point
Persons on board	:	3
Injuries/fatalities	:	None
Damage	:	Vessel foundered

Vessel details		***Blithe Spirit***
Registered owner	:	Privately owned
Port of registry	:	Falmouth
Flag	:	UK
Type	:	Rod fishing
Fishing number	:	FH 683
Built	:	1988
Construction	:	GRP
Length overall	:	5.2m
Gross tonnage	:	0.85
Engine power and/or type	:	90 HP, 4 stroke, Honda outboard motor
Service speed	:	26 knots

Accident details		
Time and date	:	0622 on 3 October 2007
Location of incident	:	50° 06.41'N 005° 02.59'W, 2.2 Nm south of Pendennis point
Persons on board	:	1
Injuries/fatalities	:	Facial injury and bruising of the knee
Damage	:	Impaction damage to bow and distortion of cab framework

1.2 NARRATIVE

1.2.1 *Lady Hamilton of Helford*

At approximately 0535 on 3 October 2007, the skipper and two deckhands of *Lady Hamilton of Helford* met on the beach at Helford. After making their way to the gill-netter, they loaded supplies and equipment onto the boat and carried out their usual pre-sailing preparations. The skipper turned on the navigation and deck lights, started the engine and pumped the vessel's bilge; the deckhands washed the bridge windows and prepared the deck for fishing.

Lady Hamilton of Helford was cast off from her mooring on the Helford River at about 0600 and headed east into Falmouth Bay for passage to the 'Old Wall' fishing grounds south of St Anthony Head, at a speed of 6 knots **(Figure 1)**. It was dark, and during the passage one deckhand went to sleep on a bench in the cuddy forward of the wheelhouse; the other slept on the engine casing in the wheelhouse.

The skipper used a chart plotter to monitor the vessel's position, and kept a visual lookout from the steering position on the starboard side of the wheelhouse. The starboard forward wheelhouse window was opened to make it easier to spot crab pot marker buoys laid by other fishermen. The skipper occasionally leant through the open window and looked to port for other vessels heading south from Falmouth harbour, but none were seen.

As he approached the area where he intended to shoot his first set of nets, the skipper's attention was divided between avoiding fishing buoys and watching his chart plotter. At approximately 0622, *Lady Hamilton of Helford*'s port side made heavy contact with an object.

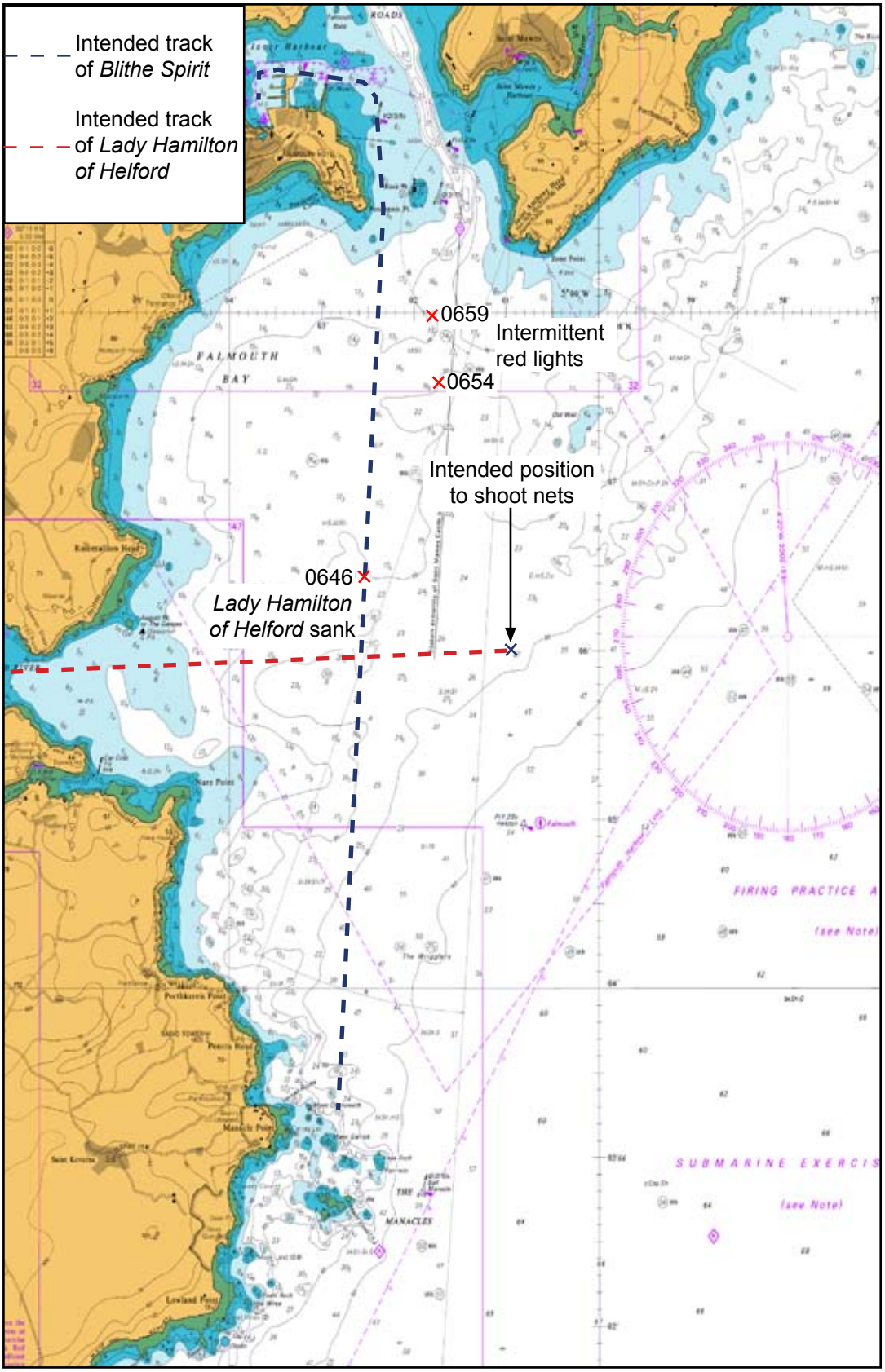
The impact threw the skipper to the deck and the vessel went into a starboard turn. The wheelhouse structure was displaced to starboard, and what remained of the wheelhouse was covered in debris. The deckhand in the cuddy made his way through the debris into the wheelhouse where the skipper found the other deckhand under the engine casing which had collapsed. An assessment of the damage established that the vessel was holed and was taking in water.

The water level within the boat rose quickly and it was apparent that the vessel was sinking. About 1 minute after the impact, the skipper told the deckhands to look for other craft in the immediate vicinity while he alerted the coastguard using a mobile telephone. The skipper was unable to access the VHF radio, flares or bilge pump. No other vessels were seen nearby and the skipper assessed that *Lady Hamilton of Helford* had hit a floating or semi-submerged object. As the vessel continued under helm to starboard, power was lost to her navigation and deck lights.

Prompted by the coastguard, the crew found and put on their lifejackets. The skipper then located the engine control panel among the debris and stopped the engine. This enabled the deckhands to launch the liferaft. Once it was lowered into the water, its activation cord was pulled but, although its canister opened, the raft did not fully inflate. The crew considered the liferaft might have inflated upside down and turned it over, but this was not the case.

Reproduced from Admiralty Chart BA 154 by permission of
the Controller of HMSO and the UK Hydrographic Office

Figure 1

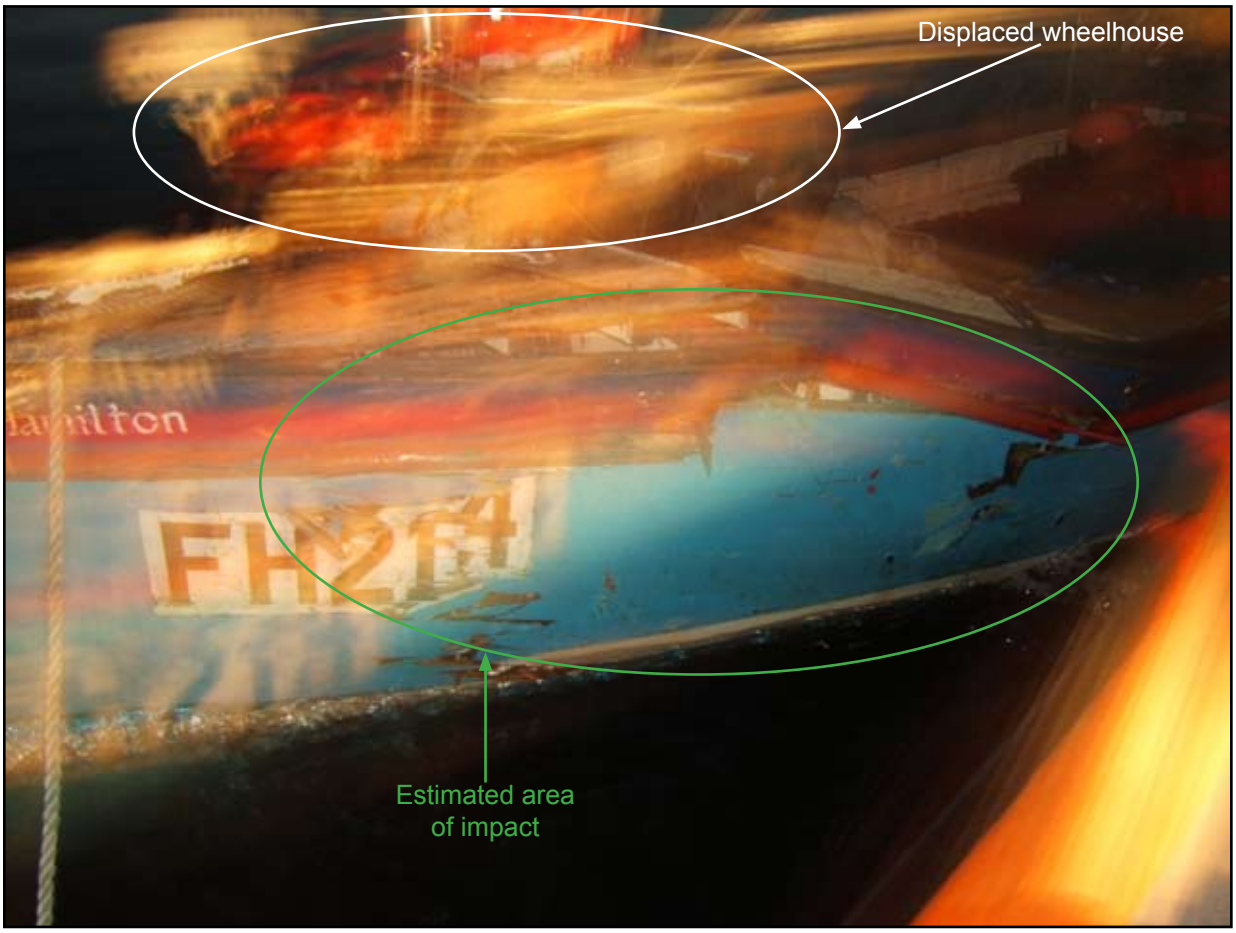


Extract of chart BA 154

On receipt of the call from the skipper of *Lady Hamilton of Helford*, the coastguard broadcast a “Mayday” and requested the assistance of vessels in the area. At 0628, it also tasked the RNLI inshore and all weather lifeboats. The pilot cutter, *Arrow,* responded to the “Mayday” and came alongside the stricken fishing vessel at 0632. The coxswain of *Arrow* had initially headed towards two radar targets. As he closed, he saw the mizzen sail of *Lady Hamilton of Helford*, which he associated with the southerly of the targets. The coxswain assumed that the second radar target, which was about 1 mile further to the north, was a fisherman’s marker buoy.

The two deckhands transferred to *Arrow* at 0634 while the skipper attached a line to the bow cleat of his vessel. He then also transferred to *Arrow*, and *Lady Hamilton of Helford* was taken in tow to the north east, towards Maenporth. However, after being towed for less than 200m, she foundered at 0646 in an upright attitude in position 50º 06.41’N 005º 02.59’W. A photograph of the vessel taken on a digital camera moments before she sank is at **Figure 2**. The crew of *Lady Hamilton of Helford* were transferred to the inshore lifeboat at 0655.

Figure 2



Photograph taken of *Lady Hamilton of Helford* before she foundered

The coastguard tug *Anglian Princess* was tasked to assist in the search for other boats and any floating objects that might have been struck by *Lady Hamilton of Helford*. At 0654, an intermittent red light was seen, which associated with a radar target 1.2 miles to the north of the foundered vessel. The red light was again seen 1.6 miles north of the scene at 0659, but was not observed thereafter. A piece of timber approximately 3m in length was recovered from the vicinity of the impact at 0749.

1.2.2 *Blithe Spirit*

The dory, *Blithe Spirit,* left Grove slipway in Falmouth harbour between 0600 and 0615. Her skipper, working alone, transited the harbour at a speed of between 8 and 10 knots, but increased speed to between 18 and 26 knots as he entered open water. He intended to head south to fish for sea bass around a group of rocks known as the Manacles **(Figure 1)**.

Soon after leaving the harbour, the skipper saw a number of lights about 3 miles ahead when standing at the steering position. He was able to identify two large ships but was uncertain about the source of a third group of lights. The lights did not seem to be moving, and the skipper assessed that they were just to the west of his intended track. With the intention of increasing the passing distance of the unidentified lights to about half a mile, the skipper altered course several degrees to port. With the way ahead apparently clear he then sat down; he was not wearing a kill-cord[1] or a lifejacket.

The next recollection the skipper had was of finding himself lying in the bottom of the dory, which was now moving at about 6 knots through the water, with its engine running at much reduced throttle. He did not remember an impact, but quickly realised that his boat had hit something. The skipper stood up, put the engine in neutral, and looked to see if he could see any other vessel or object nearby. He could not. The skipper was feeling very groggy and had to squint to focus. He then carried out a slow turn to port and headed back to Falmouth harbour at a speed of between 10 and 15 knots. He assumed that *Blithe Spirit* had hit a log or other floating debris released during the recent demolition of a pier.

Blithe Spirit returned to Grove slipway at about 0715, and her skipper was helped ashore by two yachtsmen who saw that he had sustained injuries to his face. The yachtsmen made the skipper aware of the seriousness of his injuries and persuaded him that he needed medical treatment. They also informed him of the accident to *Lady Hamilton of Helford*. The yachtsmen moved *Blithe Spirit* onto the slipway and then took her skipper to Falmouth hospital. Aware of the loss of *Lady Hamilton of Helford* and the damage to *Blithe Spirit*, the skipper realised that there was a possibility that the two vessels had collided, and reported his accident to the coastguard. The skipper was later transferred to Truro hospital where he was treated for facial injuries and a bruised knee.

1.3 ENVIRONMENTAL CONDITIONS

At the time of the collision, it was dark, the wind was southerly force one, the sea was calm to slight and the visibility was good. Although there was some mist reported in the area, none was seen in the vicinity of the accident. Predicted high water at Falmouth was at 1027. Civil twilight[2] was at 0651 and sunrise was at 0722.

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[1] Kill-cords connect the helmsman to an engine shut down switch and are designed to stop the engine if he is thrown to the deck or overboard.

[2] In the morning, civil twilight is the period between when the sun is 6 degrees below the horizon and sunrise. Depending on cloud cover, there is usually enough light from the sun to conduct outdoor activities during this period, without the aid of artificial light sources.

1.4 NAVIGATION EQUIPMENT AND LIGHTS

1.4.1 *Lady Hamilton of Helford*

Lady Hamilton of Helford was fitted with a global positioning system (GPS) receiver, chart plotter, radar, echo sounder and compass. The radar was less than 1 year old and was operational, but it was not switched on. It was the skipper's usual practice to use the radar only when visibility was poor.

The vessel was fitted with a masthead light, sidelights and a sternlight to comply with the requirements of Rule 23 of the International Regulations for Preventing Collisions at Sea, 1972, as amended (COLREGs) for power-driven vessels underway. Her deck lights comprised two fluorescent strip lights and a mast mounted spotlight. The navigation lights were not checked before departure and the deck lights remained on throughout the passage across the bay. When the deck lights were switched on, the vessel's mizzen sail tended to reflect the light generated and made the navigation lights difficult to see.

1.4.2 *Blithe Spirit*

Blithe Spirit carried a compass and an integrated Raymarine GPS receiver, chart plotter and fish finder[3], which was switched on. However, the skipper generally navigated by eye.

The dory was fitted with port and starboard sidelights and one *'*all round'[4] white navigation light. She also had a white halogen deck light. The white navigation light was sited on top of the boat's cabin. As the light was at eye level when the skipper stood at the steering position **(Figure 3)**, the wiring circuit for the navigation lights had been modified to allow the white navigation light to be operated independently of the sidelights. The skipper usually switched off the all round white light and switched on the deck light when standing, and vice versa when seated **(Figure 4)**. Problems with the reliability of the navigation lights had been experienced when operating in rough weather. The bulbs for the navigation lights were purchased from an automotive parts supplier.

1.5 POST-ACCIDENT SURVEY

Both boats were in date for survey, both receiving their last small fishing vessels' safety inspection in 2005, and their material state prior to collision was understood to be sound.

1.5.1 *Lady Hamilton of Helford*

Following the foundering of *Lady Hamilton of Helford*, several dive surveys were conducted to assess her suitability for recovery. During a dive survey conducted on 5 October 2007, video footage indicated that the vessel had been struck above the waterline on her port side, adjacent to the wheelhouse **(Figure 5)**. This damage was confirmed when the vessel was later recovered **(Figure 6)**. The impact had caused a number of wooden planks on and above the waterline to split. A number of additional planks below the waterline had also cracked and sprung. The extent to which the wheelhouse structure had been dislodged to starboard is shown at **Figure 7**.

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[3] A *'Fish finder'* is a generic term used for electronic devices, generally sonar, which identify fish and outline the bottom contours of a body of water.

[4] An *'all round'* white light may be fitted to vessels less than 12m in length in lieu of a masthead light and a stern light (COLREGs; Rule 23(c)(i)).

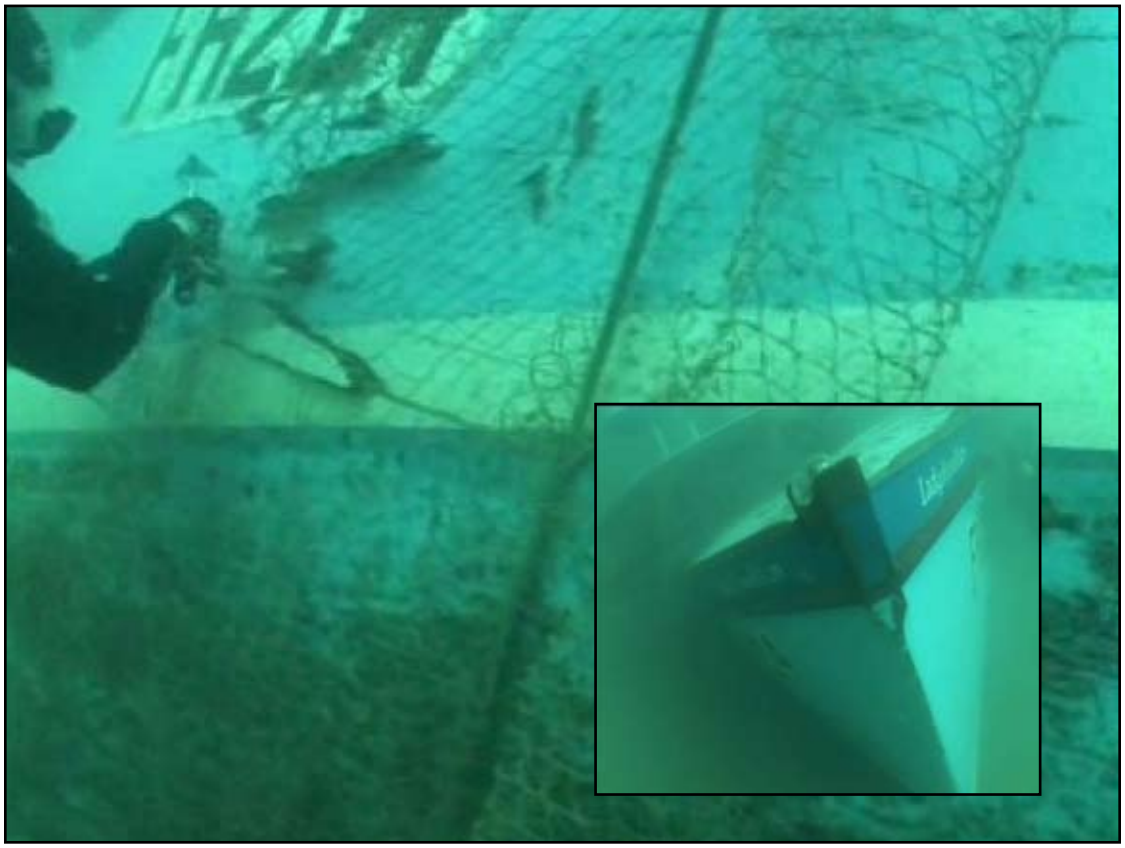
Figure 3

Blithe Spirit navigation and deck lights

Figure 4

View from the seated position on board *Blithe Spirit*

Figure 5



Damage observed by diving team

Figure 6

Damage to the hull of *Lady Hamilton of Helford*

Figure 7

Damage to the wheelhouse of *Lady Hamilton of Helford*

Figure 8

Damage to the bow of *Blithe Spirit*

1.5.2 *Blithe Spirit*

The glass-reinforced plastic (GRP) of the starboard side of *Blithe Spirit*'s blunt nosed bow was compressed and split across a length of approximately 1m **(Figure 8)**. Traces of paint matching the paint used on the hull of *Lady Hamilton of Helford* were found on the damaged bow area and chines **(Figure 9)**. The starboard side and starboard forward facing cabin windows had been knocked out and the stanchion between them was torn. Two Perspex windows of identical dimensions to the windows missing from *Blithe Spirit* were later found on the deck of *Lady Hamilton of Helford* after she was recovered.

Figure 9

Paint marks on chines of *Blithe Spirit*'s hull

The day after the accident, the white navigation light switch was found to be in the off position, and its bulb had failed. The starboard sidelight also failed to illuminate when the power was switched on. Both sidelights were dismantled and inspected **(Figure 10)**. The port sidelight bulb was in very poor condition, but was the appropriate type for the fitting and functioned correctly. The starboard sidelight bulb was canted over to one side, which caused its end caps to short out the electric circuit. When the bulb was squared up in its housing it illuminated correctly. The bulb was not designed for the housing, it was too long and it did not have conical end caps with locating nipples to hold it in place. The flares and smoke floats carried on board were out of date and in very poor condition.

Figure 10

Blithe Spirit's sidelight lamps

1.6 CREW QUALIFICATIONS, EXPERIENCE AND WORKING PATTERNS

1.6.1 *Lady Hamilton of Helford*

The skipper of *Lady Hamilton of Helford* was the vessel's owner. He had fished off the coast of Cornwall throughout his fishing career and had also helped set up a number of small fishing businesses abroad. The crew were experienced and had worked on board throughout the summer. The skipper and crew had completed the mandatory courses in sea survival, fire-fighting, first-aid and safety awareness, and the skipper had also completed a VHF long range radio operator's course.

Lady Hamilton of Helford fished with static nets in the Falmouth Bay and Garrens Bay area 6 days a week. The crew worked from 0500 to 1500 Monday to Wednesday, and 0500 to 1700 Thursday to Saturday. The skipper went to bed at 2215 on 2 October and got up at about 0415 the following morning. This had been his usual routine for many years. The skipper was colour blind and was unable to distinguish between green and white light.

1.6.2 *Blithe Spirit*

The skipper of *Blithe Spirit* was the vessel's owner and had been fishing single handed for sea bass with a rod and line in the vicinity of the Manacles since 1995. The skipper had previously worked abroad as a teacher. He fished as a hobby until 1998 when he became licensed. The skipper had completed the mandatory courses in sea survival, fire-fighting, first-aid and safety awareness and had also completed a VHF radio operator's course. He went to bed at 1800 during the evening of 2 October 2007 and got up at 0340 the following morning. The skipper felt well rested and alert and was not taking any medication.

The skipper usually fished on four and five occasions each week. Throughout the summer, he had left his home near Truro at approximately 0440, which had enabled him time to travel to Falmouth, put his boat in the water and park his car and trailer before the slipway became busy. On the day of the collision he had consciously left home at 0510 to allow for the progressively later time of sunrise in the autumn. His departure was further delayed by his conversation with a friend.

1.7 LOOKOUT

Rule 5 of the COLREGs states:

> *'Every vessel shall at all times maintain a proper look-out by sight and hearing as well as by all available means appropriate in the prevailing circumstances and conditions so as to make a full appraisal of the situation and of the risk of collision'.*

Rule 7(b) of the COLREGs states:

> *'Proper use shall be made of radar equipment if fitted and operational, including long-range scanning to obtain early warning of risk of collision and radar plotting or equivalent systematic observation of detected objects'.*

The MCA has provided guidance on the keeping of a safe navigational watch on fishing vessels in MGN 313 (F). With regard to lookout, this states:

> *It is absolutely essential that a proper look-out is kept at all times. Casualties to fishing vessels, resulting in loss of life, continue to occur because of the lack of look-out. In addition to assessing the situation and risk of collision, stranding and other navigational dangers, the duties of the look-out should include the detection of other vessel(s) and/or aircraft in distress, shipwrecked persons, wrecks and debris, plus anything out of the ordinary.*

1.8 THE LIFERAFT

1.8.1 General

Lady Hamilton of Helford carried a 'Lifeguard Forties',[5] canister packed, four person liferaft which had been hired from Premium Liferaft Services (PLRS). The liferaft was designed for use on small recreational and commercial craft; it did not meet SOLAS[6] requirements. The liferaft was last serviced at the end of January 2007. The skipper had hired liferafts from PLRS for approximately 15 years.

1.8.2 Recovery and testing

The partially inflated liferaft was attached to the vessel when it sank, but was recovered by divers **(Figure 11)**. It was then returned to its manufacturer, RFD Beaufort Ltd (RFD), for testing.

The liferaft was visually inspected and was found to be in good condition. It was then inflated with compressed air. During the inflation, one of the raft's pressure relief valves failed to reseat correctly, but this was not considered to be a factor in its failure to fully inflate.

The carbon dioxide (CO_2) gas cylinder and its operating head were also examined. The operating head appeared to function correctly but the steel cylinder had a significant amount of corrosion **(Figure 12)**. The cylinder was charged with CO_2 and subjected to a chemical leakage test. The test indicated that at least 0.0022g of CO_2 had escaped over a 1-hour period. Attempts to locate the exact leakage point, by immersing the pressurised cylinder in water, failed. This indicated that the leak was extremely small. The manufacturer concluded that the gas leakage path was most probably through the threaded connection between the cylinder neck and its operating head. The test report is at **Annex A**.

1.8.3 Maintenance history

The liferaft was manufactured and sold to PLRS in 1989. It was then placed on hire and serviced annually. The manufacturers' maintenance schedule required its gas cylinder to be weighed annually and to be hydrostatically pressure tested at 5-yearly intervals. It also required that the bottle's weight be recorded. The liferaft's maintenance record sheet **(Annex B)** shows that the gas cylinder was initially fitted to the raft in 1999, but

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[5] 'Lifeguard Forties' liferafts are manufactured by RFD Beaufort Ltd and are distributed within the UK by Ocean Safety.

[6] The SOLAS requirements for inflatable liferafts are laid down in the IMO's Life-Saving Appliances (LSA) Code.

Figure 11

Lady Hamilton of Helford's liferaft (photograph taken during diver's survey)

Figure 12

Liferaft CO_2 gas cylinder

the weights of the cylinder at its annual inspections or details of its hydrostatic tests were not recorded. The cylinder label indicated that it had been refilled by Ocean Safety in December 2002, but it is not known if the bottle was pressure tested at that time. With the exception of the fitting of the new cylinder in 1999, the only information recorded was the replacement of items with a limited shelf life such as batteries, sea-sickness tablets and adhesive.

1.9 PREMIUM LIFERAFT SERVICES

PLRS is the UK's largest liferaft hire company and has been established for over 30 years. Based in Essex, England, with distribution depots throughout the UK, it offers liferafts of differing sizes, types and standards for hire to both the commercial and leisure sectors for periods varying from 4 days to 3 years. The company owns approximately 2000 liferafts, the majority of which are Lifeguard Forties. It has about 1800 liferafts on hire at any one time. In addition to servicing its own liferafts, PLRS also services privately owned liferafts. It sub-contracts the servicing and testing of gas cylinders to companies with the specialist knowledge and facilities required for this type of work.

PLRS is an approved service station for SOLAS compliant liferafts manufactured by Zodiac and Viking. The company also holds servicing agreements with several manufacturers for non-SOLAS compliant liferafts. PLRS advertised itself as a servicing agent for Lifeguard products on its web-site and a service engineer had completed the RFD maintainer's course for Lifeguard products and was issued a certificate of approval in December 2003 **(Annex C)**. However, the company was not recognised as a service agent by RFD, which required its service agents to complete refresher training courses at 3-yearly intervals.

1.9.1 Premium Liferaft Services quality management system

To maintain its status as an approved service station for Zodiac and Viking SOLAS compliant liferafts, PLRS must demonstrate to these manufacturers that it meets the criteria laid down in the International Maritime Organization's (IMO) resolution A 761(18)[7]. Consequently, the company keeps a full service record for each SOLAS compliant liferaft it maintains, and also issues a manufacturer's certificate of re-inspection following each survey **(Annex D)**. Third party validation of the company's service process for SOLAS standard liferafts is provided by the Maritime and Coastguard Agency (MCA) which periodically inspects UK approved service stations. Although the last two inspections of PLRS conducted by the MCA did not identify major non-conformities, a lack of refresher training by PLRS staff was highlighted **(Annex E)**.

For liferafts which are not compliant with SOLAS and are privately owned, PLRS completes a comprehensive liferaft servicing report **(Annex F)**. This itemises the work carried out during each service, including gas cylinder weights. The due dates for pressure testing of cylinders are also noted. The records kept by PLRS for its own liferafts, which are not compliant with SOLAS, did not include maintenance and test information such as gas cylinder weights or gas inflation tests.

[7] IMO Resolution A761(18) – Recommendations on conditions for the approval of servicing stations for inflatable liferafts as set down in DSG Doc 419.

1.10 LIFERAFT STANDARDS

1.10.1 General

There is a wide range of liferafts available for purchase or hire which meet a number of different standards set by the IMO, the Offshore Racing Council (ORC), the International Sailing Federation (ISAF) and the International Organization for Standardization (ISO). There are also many types of liferafts available that do not meet a recognised standard. Such liferafts are often advertised as budget liferafts and are primarily aimed at the recreational craft market. The price range of four-person liferafts is currently between £500 and £2000, depending on the standard the raft has been built to.

1.10.2 Offshore Racing Council (ORC)

The ORC was the international organisation representing yacht racing prior to 2003. The ORC concluded that SOLAS compliant liferafts, which are designed to be stored on open decks and dropped from 18m height, were too heavy and bulky for use on yachts. Additionally, subsequent to the experiences gained from the Fastnet yacht race of 1979, the Special Regulations Committee of the ORC produced its own, ORC, standard for yacht liferafts. The liferaft on board *Lady Hamilton of Helford* met the ORC standard.

1.10.3 International Sailing Federation (ISAF)

The ORC was subsumed by the ISAF in 2003. The ISAF, as a consequence of the lessons learned in the Sydney Hobart yacht race 1998, updated the ORC standard and re-launched this as the ISAF Part II standard during 2003. The ISAF standard is published in its Offshore Special Regulations (OSR). ISAF allows liferafts which meet the ORC standard and which were manufactured before January 2003 to be carried during races provided the raft is still within its serviceable life. The ORC standard is also published in the OSR, but as the ISAF Part 1 standard.

1.10.4 International Organization for Standardization (ISO)

In 2005, ISO introduced a standard for inflatable liferafts for use on small craft (<24m registered length). The standard comprises three parts:

- Part 1 (ISO 9650-1) - Liferafts for use during extended voyages where high seas and significant wave height can be expected.
- Part 2 (ISO 9650-2) - Liferafts for use during voyages where moderate conditions may be met.
- Part 3 (ISO 9650-3) - Details the type of materials approved for use in liferaft manufacture and the test methods to be used on them.

ISO 9650-1 further distinguishes between group *A* liferafts for use in harsher environments (-15 to +65 deg C) and group *B* (0 to +65 deg C).

The ISO standard is similar to that of SOLAS and ISAF, in that it places a requirement on liferaft manufacturers to publish a list of approved service stations. It also requires them to ensure that approved spares are used, and that service technicians remain familiar with the equipment and servicing regimes. Lists of approved service stations

are usually shown on a manufacturer's web-site. ISAF adopted the ISO 9650-1 Group A standard with a number of caveats **(Annex G)** in January 2008. The Royal Yachting Association (RYA) has published a number of articles to help inform yachtsmen and other recreational craft users on the different types of liferafts that are available. It strongly endorses the ISAF and ISO standards.

1.11 REQUIREMENTS FOR UK COMMERCIAL AND FISHING VESSELS

All vessels over 24m registered length are required to carry SOLAS compliant liferafts. The standards of liferaft required by small commercial craft are detailed in MGN 280 (*Small vessels in commercial use for sport or pleasure, workboats and pilot boats – alternative construction standards*). Requirements vary between full SOLAS compliance and an enhanced ISAF standard depending on a vessel's role and area of operation.

Merchant Shipping Notice (MSN) 1770 (F) (*The code of safe working practice for the construction and use of 15m length overall to less than 24m registered length fishing vessels*) requires all fishing vessels between 15m length overall and less than 24m registered length to carry MCA type approved (or equivalent) liferafts.

The requirements for UK fishing vessels less than 15m length overall are detailed in MSN 1813 (F) (*The code of practice for the safety of small fishing vessels*). The Code requires closed deck vessels between 10m and 15m length overall to carry liferafts. It also recommends that vessels less than 10m carry a liferaft. Liferafts carried by fishing vessels less than 15m length overall are not required to meet a recognised standard.

1.12 LIFERAFT TRIALS AND STUDIES

1.12.1 Fishing Industry Safety Group (FISG)

The FISG Technical and Operations Sub-Group commissioned the Royal National Lifeboat Institution (RNLI), in partnership with Seafish, to carry out a series of liferaft trials. The aim of the trials, which were conducted in June 2007, was to assess the performance of liferafts and hydrostatic release units likely to be carried on small fishing vessels. Eleven types of liferafts were provided by various manufacturers and suppliers. The trials raised a number of serious concerns over the performance of some types of liferafts. These included several liferafts which had not been manufactured to meet a recognised standard. One of these was of a type supplied free of charge to owners of small fishing vessels, by a regional fisherman's association. The RNLI report on these trials had not been presented to FISG at the time of writing this report.

1.12.2 Royal Ocean Racing Club (RORC)

In 2006, at the request of ISAF's OSR Committee, RORC conducted a survey which was designed to quantify the extent of damage caused to liferafts on board recreational craft between normal service periods. The study looked at 12,463 liferafts serviced by over 20 different service stations, and found that 7.5% (940) had suffered some form of damage between services. It also noted that valise packed liferafts (11.5%) were more susceptible to damage than liferafts packed in canisters (5.3%)

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 PREVIOUS INCIDENTS

2.2.1 The vessels

In 2001, *Lady Hamilton of Helford* was involved in a near miss incident with the container ship *Mathilda*, which was subject to an MAIB investigation. The container ship failed to take avoiding action while on a collision course with *Lady Hamilton of Helford,* but the crew of the fishing vessel managed to cut their fishing gear and manoeuvred clear. The MAIB investigation report concluded that the master of *Mathilda* had not maintained a proper lookout.

Blithe Spirit was also involved in a near miss incident in 2003 when the skipper, again on passage to the Manacles, passed across the bows of a large cargo ship which he had mistakenly assessed to have been stationary. The skipper's manoeuvre was seen by the crew of a pilot boat and was reported to the harbourmaster in Falmouth.

2.2.2 Liferafts

The circumstances of the failure of a liferaft contained in Ireland's Marine Casualty Investigation Board (MCIB) investigation report into the sinking of the yacht *Megawatt*, are similar in a number of ways to this incident:

- The liferaft failed to fully inflate
- The liferaft was on hire
- The liferaft was in date for inspection/service
- The liferaft was not SOLAS compliant
- The gas had leaked past the loosely connected operating head
- The crew were rescued by another yacht before *Megawatt* sank.

The MCIB report made two recommendations relating to the failure of the liferaft:

1. *The Maritime Safety Directorate should issue a Marine Notice recommending non-SOLAS/MED[8] liferafts to be serviced only by authorised agents appointed by the manufacturer.*

2. *The Marine Survey Office should investigate the servicing of non-MED liferafts and introduce legislation in relation to servicing if considered necessary.*

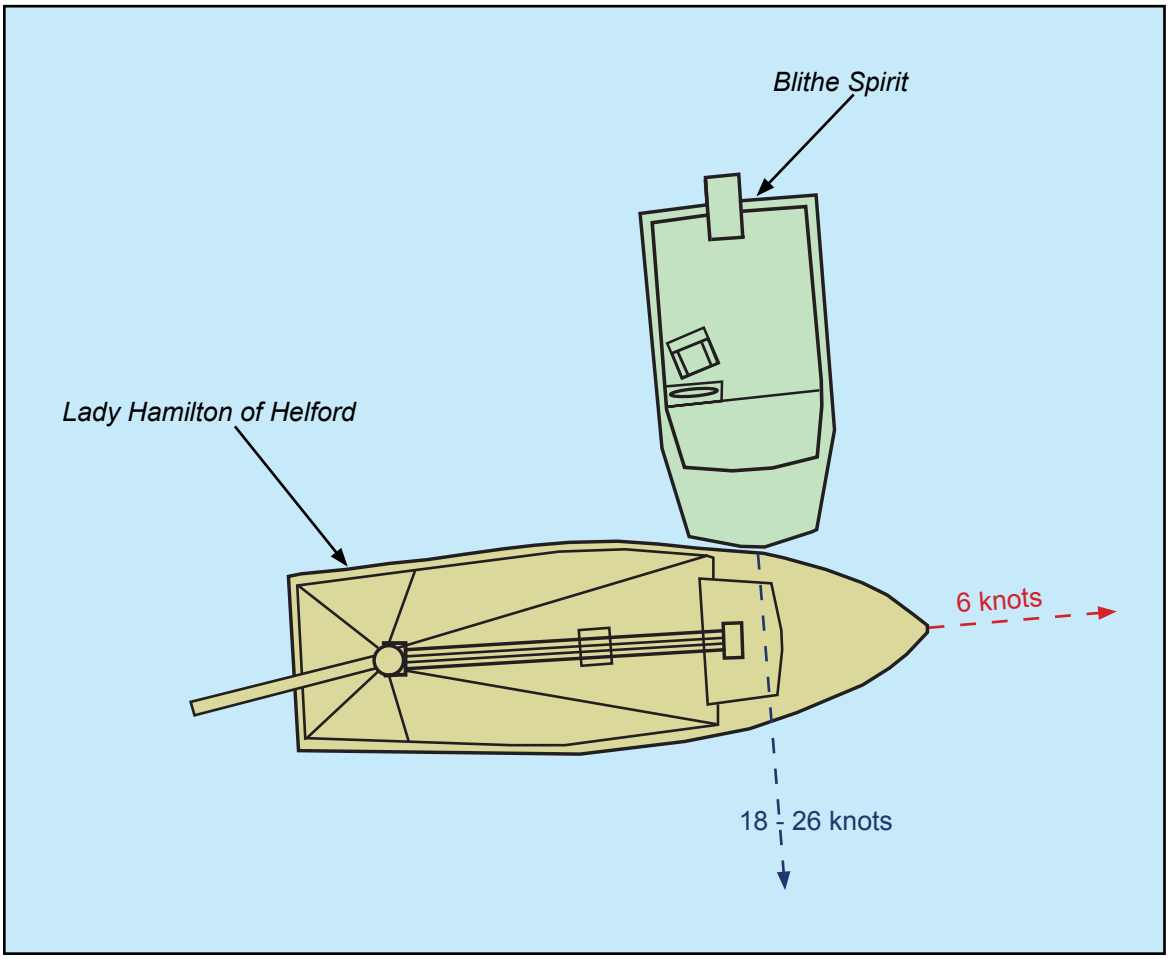
[8] The MED (Marine Equipment Directive) is an EU Directive which was published in December 1996 and was adopted into UK law in 1999 (Statutory Instrument 1999 N° 1957 The Merchant Shipping (Marine Equipment) Regulations). The MED covers any vessel flying the flag of an EEA member state. Compliance of marine equipment with the MED is shown by the ship's wheel mark.

2.3 THE COLLISION

As the skippers of both vessels did not see another vessel in close proximity, either before or after the collision, their assessments that they had hit semi-submerged objects was understandable. However, notwithstanding the small piece of timber later found nearby, it is evident from the damage sustained **(Figures 2 and 5 to 9)** and post-accident surveys that the vessels collided with each other when both were making way. First, the paint found on the bow and chines of *Blithe Spirit* matched the paint on the hull of *Lady Hamilton of Helford*. Second, the windows found on the deck of *Lady Hamilton of Helford* matched the windows missing from *Blithe Spirit*. Third, the stem of *Lady Hamilton of* Helford was undamaged **(Figure 5)**. Finally, the extent of the damage to *Lady Hamilton of Helford* would probably have required a speed of impact much faster than 6 knots.

Lady Hamilton of Helford was struck on her port side forward and the damage to *Blithe Spirit* indicates she impacted with her starboard bow. The relative positions of the damage and the force of impact is consistent with the directions and the speeds of the vessels at the time **(Figure 13)**. The geographical location of the collision is also consistent with intersection of the vessels' intended passages. The paint marks on the starboard and centre chines of *Blithe Spirit* **(Figure 9)** indicate that the dory rode up the side of *Lady Hamilton of Helford* before deflecting to port.

Figure 13



Estimated relative position of vessels on impact

2.4 LOOKOUT

2.4.1 Regulation

It is a fundamental requirement of the COLREGS that vessels maintain a proper lookout. If they do not, many of the regulations intended to avoid collisions in varying circumstances cannot be applied. The importance of keeping a proper lookout is also emphasised to fishermen in MGN 313(F). As neither skipper saw the other vessel, despite the good visibility and calm conditions, it is apparent that an effective lookout was not being kept immediately before the collision.

2.4.2 *Blithe Spirit*

It is highly probable that the lights shown by *Lady Hamilton of Helford* were among those initially seen by the skipper of *Blithe Spirit*. The brightness of the gill-netter's deck lights would have made it difficult to distinguish the vessel's navigation lights. Therefore, it was not surprising that *Blithe Spirit's* skipper was unable to determine the direction in which the gill-netter was travelling. However, having taken action to avoid the lights to the south by half a mile, he then sat down in a position from where his view ahead was extremely restricted. Consequently, he did not monitor the effectiveness of his course alteration or make any further attempts to assess the movement of the lights ahead. It is not certain how long the skipper was seated, but when travelling at between 18 and 26 knots, it would only have taken between 7 and 10 minutes to cover the 3 mile distance the skipper had estimated the lights to be from his vessel. Considering the potential difficulty in judging distances during darkness, it is possible *Lady Hamilton of Helford* was much closer than the skipper assessed, and the time interval from the course alteration to the collision was even shorter. Regardless of the time the skipper of *Blithe Spirit* was seated, it is evident that the lookout routine he adopted was not commensurate with the speed of his vessel or the absence of other navigational aids such as radar to determine the range and movements of other vessels.

2.4.3 *Lady Hamilton of Helford*

The ability of *Lady Hamilton of Helford*'s skipper to detect *Blithe Spirit* was impeded by the combination of several factors. First, the glare from the bright deck lights would have adversely affected his night vision. Second, the vessel's radar was not switched on. Third, the lights displayed by *Blithe Spirit* would have merged among the shore lights from Falmouth and St Mawes to the north. Fourth, as the skipper found it necessary to lean through a forward facing window to get an unobstructed view to port, the view to port from the steering position was not as clear. Fifth, his inability to distinguish between green and white lights would have made the approach of a vessel from the north less obvious. Finally, the skipper was focussed on avoiding fishing marks ahead and monitoring the chart plotter to ensure his vessel was in the correct position to shoot her nets.

As the bulb of *Blithe Spirit*'s all round white light was subsequently found to have failed, and the bulb in the starboard sidelight, which was an auto bulb and not the correct type for its housing, had been dislodged, it is also possible that one or both of these lights were not illuminated. However, it is equally possible that the sidelight bulb was dislodged and the all round light bulb failed when the vessels collided.

2.5 COMPLACENCY

Both skippers had a good knowledge of the local area and had completed the mandatory training courses required to operate their vessels. However, they failed to keep an effective lookout despite both having previous experience of near misses (paragraph 2.2.1). The skippers' actions inevitably raise concerns regarding competency, particularly as there is currently no requirement for skippers of fishing vessels of less than 16.5m length overall to hold a certificate of competency. However, both were working repetitive routines in a familiar and comfortable environment, and it is more likely that their behaviour was the result of an acceptance of risk, rather than a lack of knowledge of the COLREGS. The skippers had worked to their normal working patterns during the week leading to the incident, and were considered to have been well rested the night before the collision. Therefore, fatigue is unlikely to have been a contributory factor on this occasion.

It was dark, difficult to detect the lights of vessels among the shore lights to the north, and the workload of the skipper of *Lady Hamilton of Helford* increased as he approached the fishing grounds. However, this was a situation he experienced on a daily basis and it is evident from his decision not to switch on the radar unless the visibility was poor and to allow his crew to sleep, that he was not concerned by the increased risk to his vessel. Moreover, by keeping his deck lights on when underway, it is possible he assumed that she would be seen by other vessels approaching from the north which would then be obliged by the COLREGS to keep out of his way. However, such an assumption is reliant on other vessels keeping a proper lookout and taking the appropriate action. This accident clearly demonstrates that this is not always the case. Had the skipper used his radar, and employed one of his crew to act as lookout, there is a high probability that the fast moving *Blithe Spirit* would have been detected in sufficient time for avoiding action to have been taken.

The actions of *Blithe Spirit'*s skipper also indicate a complacent approach to the operation of his craft. He habitually transited the bay at speed during darkness and was fully aware that he was unable to see ahead when seated. However, he made no attempt to monitor the effectiveness of his alteration to port. The skipper's lack of action in this respect not only indicates an acceptance or disregard of the risks involved, but it also demonstrates a lack of awareness of the pace at which situations change when travelling at speed. The poor condition of the pyrotechnics on board *Blithe Spirit,* and her skipper's decision not to wear a lifejacket or kill-cord are further examples of the skipper's casual attitude to safety. On this occasion, he was extremely fortunate. Had he been thrown into the water rather than into the boat on impact, it is almost certain that, unconscious and without a lifejacket, he would have drowned.

2.6 EVENTS AFTER THE COLLISION

It is not possible to determine at what speed, or in which direction, *Blithe Spirit* left the scene of the collision but, by the time the crew of *Lady Hamilton of Helford* had stood up and looked around, she could have been a considerable distance away. Furthermore, it was still dark and, with *Blithe Spirit*'s all round white light and starboard sidelight extinguished, she would not have been readily visible on anything but a port aspect. It would also have been difficult to hear *Blithe Spirit'*s relatively quiet four stroke outboard engine over the noise produced by the larger diesel engine of *Lady Hamilton of Helford*, which was also under constant helm to starboard.

When the vessels collided, it is almost certain that the skipper of *Blithe Spirit* was thrown forward from his seat and struck his head on the chart plotter and his knee on the steering wheel before he fell to the deck. As he did not recall the impact, and assuming that the second radar target detected by the coxswain of *Arrow,* and the intermittent red light seen about 30 minutes later was *Blithe Spirit*, it is highly likely that the skipper lost consciousness for a short period. Consequently, he did not see *Lady Hamilton of Helford* after the collision, or the rescue efforts of *Arrow* and the RNLI lifeboats. It is possible that the throttle of *Blithe Spirit* was either 'knocked back' during the impact or steadily worked itself towards the neutral position while underway.

2.7 LIFERAFT RELIABILITY

2.7.1 Servicing

The liferaft on board *Lady Hamilton of Helford* failed to fully inflate and was therefore unusable. It was fortunate that the pilot boat was sufficiently close to quickly assist her crew; otherwise the failure of her liferaft would potentially have led to more serious consequences.

Tests on the liferaft **(Annex A)** indicate it did not fully inflate because there was insufficient CO_2 in its cylinder and gas had leaked from the cylinder via an extremely small leak in the screw connection to its operating head. However, it has not been possible to determine how long the leak had been present. The weight of the cylinder was not recorded on the liferaft's maintenance record sheet during its annual services **(Annex B)**, and the cylinder had not been pressure tested in 2004, as required by the manufacturer. Although records indicate that the cylinder was re-filled in 2002, the reasons for this are not known.

A liferaft is a critical item of lifesaving equipment in which seafarers must have complete confidence. As shown by the RORC survey, liferafts are prone to damage when in service. It is therefore essential that they are properly maintained, regardless of the standard to which they are manufactured, or whether they are hired or privately owned. In this case, the absence of maintenance records for the liferaft is of concern, and it is evident that PLRS did not follow the manufacturer's service requirements for the liferaft, and the manufacturer's accreditation for this liferaft type had lapsed. Had the liferaft supplied to *Lady Hamilton of Helford* been subject to a similar service regime to that used by the company for the servicing of SOLAS compliant and privately owned liferafts, the likelihood of such departures would have been considerably reduced. All owners and hirers of liferafts are strongly advised to seek confirmation that the services and maintenance conducted by service agents have been in accordance with the liferaft manufacturer's instructions.

Furthermore, while checks on individual components are undoubtedly the most efficient method of ensuring the serviceability of a liferaft, there are a number of defects which might not be identified without full-system gas inflation. This is already a periodic requirement of some manufacturers, but its application to all liferaft types would provide further assurance of their operational reliability.

2.7.2 Standards

The trials conducted by the RNLI on behalf of FISG showed that the performance and reliability of a number of liferafts which did not meet SOLAS, ISAF or ISO 9650 standards, was questionable. Such liferafts, which tend to be the least expensive, will inevitably be attractive to many owners of smaller craft, including small fishing vessels. The RYA's endorsement of the ISAF and ISO standards and its published guidance are positive steps in the education of recreational seafarers. However, in the absence of a stipulated or recommended recognised standard for liferafts carried on board fishing vessels of less than 10m LOA in the *code of practice for small fishing vessels* (MSN 1813 (F)), it is highly likely that many fishermen will opt for the least expensive and less reliable option. The necessity for a liferaft to operate correctly applies to all vessels, irrespective of size.

SECTION 3 - CONCLUSIONS

3.1 SAFETY ISSUES WHICH HAVE RESULTED IN RECOMMENDATIONS

1. The actions of the skipper of *Blithe Spirit* indicate his lack of awareness of the pace at which situations change when travelling at speed. [2.5]
2. The liferaft service station did not follow the manufacturer's service requirements for the Lifeguard Forties liferaft, and the manufacturer's accreditation of the service station for this liferaft type had lapsed. [2.7.1]
3. A greater assurance of the liferaft's reliability would have been afforded had the liferaft been subject to similar service regimes to those required for the service station's SOLAS compliant and privately owned liferafts. [2.7.1]
4. There are a number of liferaft defects which might not be identified without full-system gas inflation. [2.7.1]

3.2 SAFETY ISSUES WHICH HAVE NOT RESULTED IN RECOMMENDATIONS BUT HAVE BEEN ADDRESSED

1. Neither the skipper of *Lady Hamilton of Helford* nor the skipper of *Blithe Spirit* maintained an effective lookout. [2.4]
2. In view of their repetitive routine in a familiar environment, it is likely that the actions of the skipper of *Lady Hamilton of Helford* and the skipper of *Blithe Spirit* was the result of an acceptance of risk, rather than a lack of knowledge of the COLREGS. [2.5]
3. Recent trials conducted by the RNLI indicated that the performance of liferafts which are not manufactured to a recognised standard was questionable. [2.7.2]
4. In the absence of a stipulated or recommended recognised standard for liferafts carried on board fishing vessels of less than 10m LOA, it is highly likely that many fishermen will opt for the least expensive and less reliable options if not advised or directed to do otherwise. [2.7.2]

SECTION 4 - ACTION TAKEN

The MCA has:

1. Undertaken to consider the benefits of creating a team of safety advisors to assess and provide advice to owners and skippers of small fishing vessels on the safety of the vessel and operational activities, and the dangers of complacency.

2. Agreed to introduce a formal certification process for skippers of fishing vessels of less than 16.5m LOA in response to a request from the Fishermen's Training Advisory Group (FTAG).

3. Agreed, through FISG, to consider (as part of its ongoing improvement/review of The Fishing Vessels Code of Practice for the Safety of Small Fishing Vessels (MSN 1813 (F)):
   - the application of a minimum standard for liferafts required by, or recommended for use on fishing vessels below 15m LOA.

SECTION 5 - RECOMMENDATIONS

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

2008/124 Ensure candidates' understanding of the additional risks posed by the operation of the higher speeds associated with non displacement fishing vessels is fully tested when developing the syllabus for the <16.5m fishing vessel skippers' certificate.

2008/125 Propose to industry, via its Safety Equipment Advisory Committee (SEAC):

- Independent auditing of companies providing servicing for non-SOLAS liferafts.
- Periodic full system gas inflation during testing of all types of liferaft.

Premium Liferaft Services is recommended to:

2008/126 Ensure, with immediate effect, that its fleet of hire liferafts is maintained in accordance with equipment manufacturer's instructions, and ensure compliance can be demonstrated through the application of a robust quality management system.

Marine Accident Investigation Branch
April 2008