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“The sole objective of the investigation of an accident under the Merchant Shipping (Accident Reporting and Investigation) Regulations 2012 shall be the prevention of future accidents through the ascertainment of its causes and circumstances. It shall not be the purpose of an such investigation to determine liability nor, except so far as is necessary to achieve its objective, to apportion blame.”

NOTE

This report is not written with litigation in mind and, pursuant to Regulation 14(14) of the Merchant Shipping (Accident Reporting and Investigation) Regulations 2012, shall be inadmissible in any judicial proceedings whose purpose, or one of whose purposes is to attribute or apportion liability or blame.

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Foundering of the fishing vessel **SPEEDWELL** with the loss of her skipper Firth of Lorn 25 April 2013

SUMMARY

Shortly after 1307¹ on 25 April 2013, the 8.7m fishing vessel *Speedwell* foundered 0.5nm south of Insh Island in the Firth of Lorn, Scotland. An extensive air, sea and shore line search was immediately commenced. Although debris from the vessel was sighted, *Speedwell* was not located on the seabed until a month later; the vessel was upright and intact in a depth of 83m. The skipper's body has not been found.

Speedwell probably sank as a result of water ingress through an unsealed and unsecured flush deck hatch leading to the vessel's aft store. Other factors that also contributed to the loss of the vessel and the skipper include:

- The bilge pump and bilge alarm in the aft store were not working.
- Single-handed operation of the vessel seriously compromised the skipper's ability to deal with the situation encountered.
- The skipper did not contact the coastguard until very shortly before the vessel sank.
- Lifesaving equipment was out of date, had not been serviced and was not used.

A recommendation has been made to the owner of *Speedwell* that is intended to help ensure that any vessel he may own in the future is operated safely.



Image courtesy of John Connell

Speedwell

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

FACTUAL INFORMATION

Narrative

Speedwell was slipped from its swinging mooring at Cuan Sound (**Figure 1**) at approximately 0600 on 25 April 2013. The vessel's skipper, Scott MacAlister, then briefly stopped at the nearby Cuan ferry slipway on Luing to collect prawn tubes² and fuel. *Speedwell* was then seen heading towards Loch Buie on the south coast of the Isle of Mull (**Figure 1**).

At 1250, the skipper's partner called the skipper's mobile telephone. During the brief conversation that followed, the skipper spoke along the lines of "it's not good, there's water coming in through the hatches; the boat is sinking and the owner needs to sort it out" He also said that he was off Easdale and was heading home. The skipper sounded calm and told his partner not to inform the coastguard but to call him again in about an hour.

At 1301, the skipper telephoned *Speedwell*'s owner at his home. There was no answer so he left a short message on the answer machine: "is anybody there". Other than the skipper's voice, the answer machine recorded nothing, such as alarms, to indicate anything was amiss on *Speedwell*.

At 1305:58, the skipper called the Easdale ferry on very high frequency (VHF) radio channel 16, but there was no reply. Twenty seconds later, he transmitted a distress call also via VHF radio channel 16, to which Stornoway Maritime Rescue Co-ordination Centre (MRCC) responded. The radio exchanges between the skipper and the MRCC are at **Table 1**.

Time	Transmission by	Transcript
1306:18	<i>Speedwell</i>	Mayday, mayday. This is Speedwell, are you hearing us, over? Going down fast off the point of Easdale.
1306:30	Stornoway	Station transmitting on channel 16; say again your call, over.
1306:35	<i>Speedwell</i>	Just about to go under, just about to go under, off the point of Easdale.
1306:40	Stornoway	Point of Easdale, how many people over?
1306:43	<i>Speedwell</i>	Just me, err one person aboard, one person aboard. I'm on the west side, just to the north entrance.
1306:49	Stornoway	Roger, can you get a lifejacket on? Over.
1306:51	<i>Speedwell</i>	Will do, bye.

Table 1: Transcript of communications between *Speedwell* and Stornoway MRCC

At 1307 Stornoway MRCC transmitted a "Mayday Relay"³ to which many vessels in the vicinity immediately responded. Attempts to establish further contact with *Speedwell* via VHF radio were unsuccessful. A number of vessels quickly made their way towards *Speedwell*'s last reported position. Amongst these was the passenger ferry *Lord of the Isles*, which assumed responsibility as 'on-scene co-ordinator' and launched her fast rescue craft. Debris and oil from *Speedwell* were soon sighted on the

² Prawn tubes – a method of landing prawns in which individual prawns are placed into separate compartments within a tray system.

³ Mayday Relay – Distress call broadcast by another station on behalf of a vessel in distress.

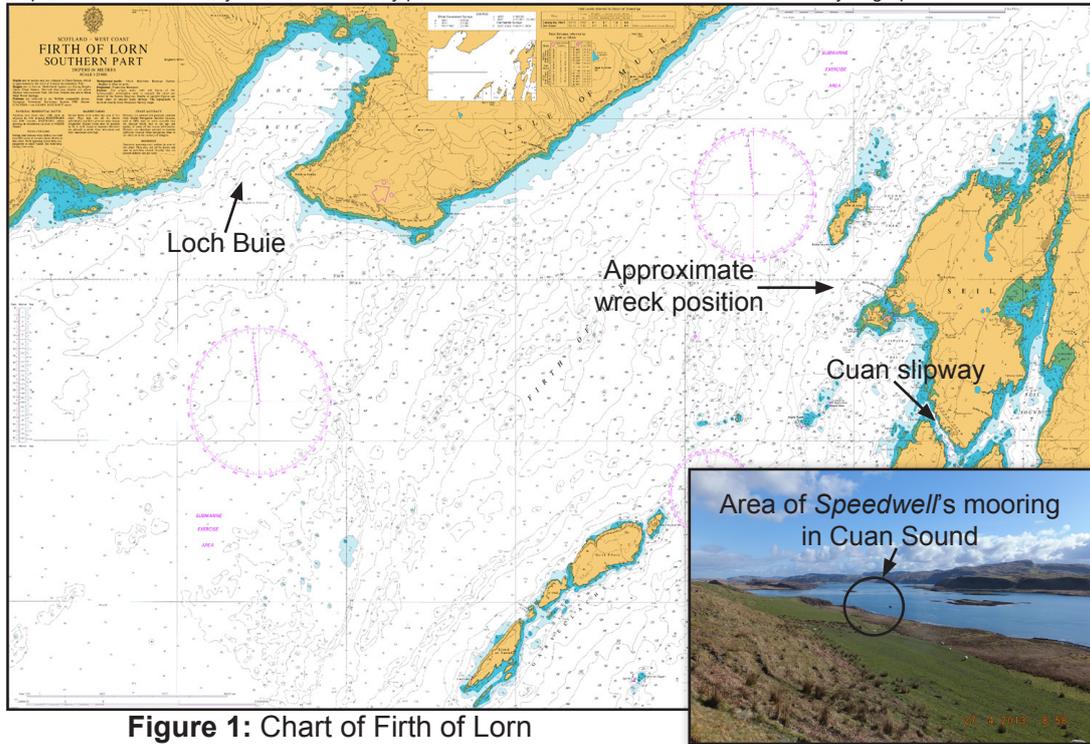


Figure 1: Chart of Firth of Lorn

sea surface, the positions of which were plotted by the skipper of the fishing vessel *Lodestar*. Over 20 vessels, including local fishing boats, two RNLI lifeboats, yachts, small ferries, as well as a search and rescue helicopter participated in the search but neither *Speedwell* nor the skipper were found.

Stornoway MRCC suspended the surface search at 1245 on 26 April 2013, but a side-scan survey of the area was completed by *Calanus*, a research vessel operated by the Scottish Association for Marine Science (SAMS), the following day. Local fishing vessels also continued to search using sonar and towed creeps (grapples), and coastguard coast rescue teams continued to search the shoreline.

Speedwell's wreck was eventually located 5 cables south of Insh Island by local fishermen on 25 May. Side-scan sonar images of the wreck were obtained by *Calanus* 3 days later, and the wreck was positively identified on 7 June by a remotely operated underwater vehicle (ROV) arranged by the police. *Speedwell* was seen to be upright and apparently intact in 83m of water (**Figure 2**).

In view of the depth of water in which *Speedwell* was found, and the verbal evidence provided by the skipper prior to the accident, the MAIB decided not to conduct any further underwater surveys, or to raise the vessel. However, on 16 June an independent diver spent 15 minutes on the wreck. During this time he established that the skipper's body was not on board. The diver also noted:

- The vessel was listed by between 5° and 10° to starboard.
- The deck was clear of equipment (baskets etc).
- All the hatch lids were present apart from the lid to the engine room access hatch.
- A short length of 1.5" diameter reinforced hose was protruding from the engine room access hatch.
- The wheelhouse door was open.
- The VHF microphone was attached to its cable but was lying on the wheelhouse floor.
- The liferaft valise was on the wheelhouse floor and was unopened.

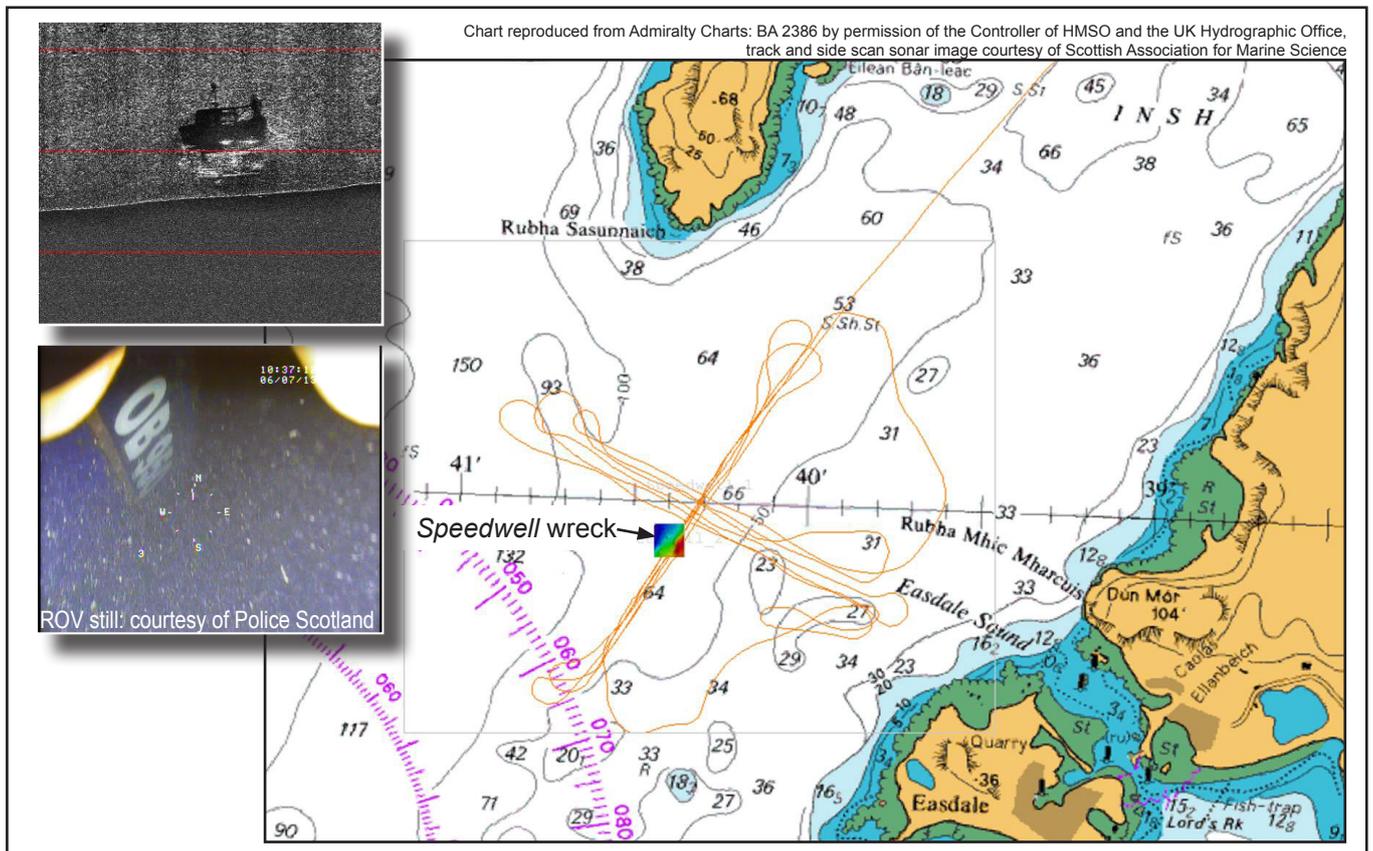


Figure 2: Chart showing the side scan sonar track with inset still from ROV footage and side scan sonar image

Environmental conditions

At the time of the accident the wind was south-west force 5 to 6. The sea was moderate and the visibility was good. The predicted low water in Oban was at 1130 and the tidal stream had started to flood to the north. The sea temperature was 8.2°C.

Skipper

The skipper was 40 years old and had been a fisherman on and off for most of his working life. He held the four mandatory Seafish⁴ training certificates (Basic sea survival, Basic first-aid, Basic fire-fighting and prevention and Safety awareness).

The skipper had completed the additional components required to qualify for the Seafish under 16.5m skipper's certificate⁵, which included:

- A 2 day basic engineering course.
- A 5 day watchkeeping course.
- A 1 day intermediate fishing vessel stability awareness course.
- A short range VHF radio certificate.

However, the skipper had not applied to Seafish for the issue of an under 16.5m skipper's certificate.

⁴ Seafish – the Sea Fish Industry Authority works across all sectors of the UK seafood industry to promote good quality and sustainable seafood, and to improve the safety and standards of training for fishermen.

⁵ The under 16.5m skipper's certificate allows holders to skipper a fishing vessel under 16.5m beyond 20nm from a safe haven but not further than the limited area. It is often referred to as the "Gold Standard".

In addition to fishing, the skipper ran his own painting and decorating business but he also worked the evening shifts as a deckhand on board a local ferry on alternate weeks.

Owner

Speedwell's owner was 54 years old and, although he had worked in various industries throughout his life, most of his career had been spent in the maritime environment, mainly on board inter-island ferries operating off the west coast of Scotland.

The owner held a Boatmasters' Licence (BML) (Tier 2)⁶, a VHF certificate and a Global Maritime Distress and Safety System (GMDSS) Restricted Operator's Certificate (ROC). Although the owner had worked on boats for much of his life, he was not a fisherman and, other than some limited experience creeling, he was unfamiliar with fishing vessels and the working practices adopted on board.

Vessel construction and layout

Speedwell was built in 1998. The hull was made from glass reinforced plastic (GRP) using a Cygnus GM28 mould that had been fitted out as a stern trawler by the vessel's first owner.

The hull under *Speedwell's* deck was divided into three spaces: forepeak, engine room and the aft store (**Figure 3**) that was originally intended to be a fish room. The bulkhead between the forepeak and engine room was watertight but the bulkhead between the engine room and aft hold had various openings at deck head level through which pipelines and cables were routed.

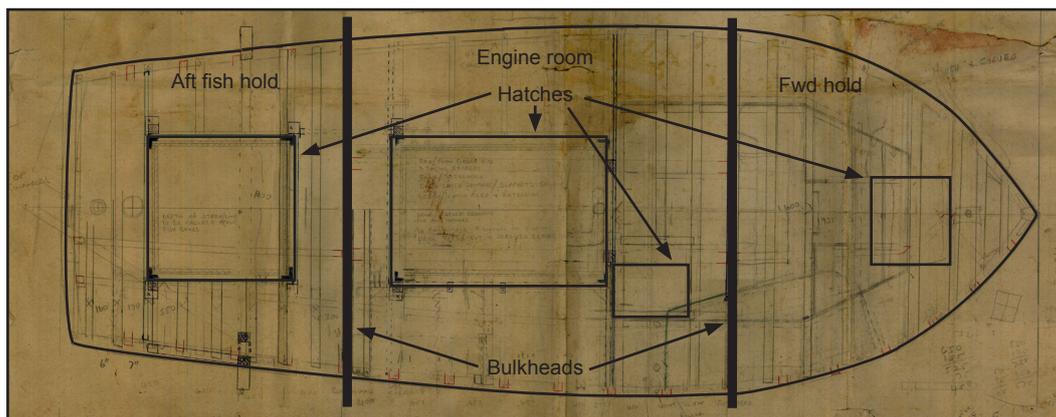


Figure 3: Original drawing of *Speedwell* with compartments and hatches highlighted

The vessel had four through deck hatches. The forepeak hatch was hinged on the aft side and had been sealed shut. The engine room access hatch, immediately outside the wheelhouse door, was a lid without hinges or means of closure. In the centre of the vessel was a large hatch for engine removal and replacement; this was bolted down. The hatch to the aft store was a flush deck hatch, measuring approximately 1200mm x 1200mm, that was hinged at the aft side. It was not sealed and had no means by which it could be secured.

To make the aft store hatch cover flush with the deck when closed, the cover sat in a 'well' on the deck, the channels of which were fitted with small bore pipes to drain any accumulated water overboard. The drain pipes were reported to easily become blocked with debris, causing water in the channels to drain into the store below.

⁶ A BML Tier 2 is for a specified area which may be Category A, B or non-linked C waters [non-tidal].

Vessel history and modifications

Speedwell was first registered as a fishing vessel in 2000 and was used to trawl for prawns in Loch Sunart until the vessel was sold in June 2008. In 2009, a local skipper worked *Speedwell* for several weeks, during which he identified a number of problems including flooding of the aft compartment.

Over the following 3 years, *Speedwell* was predominantly moored at Cuan ferry slipway on Seil (**Figures 1 and 4**), which dried at low water. During this period, a number of modifications were made to the vessel, primarily with the intention of removing top weight which the vessel's owner had identified as a potential problem when shifting the vessel from Loch Sunart. The modifications included:

- Removal of the net drum.
- Removal of a corner section of the wheelhouse to allow a creel hauler to be fitted.
- Replacement of the canopy aft of the wheelhouse with a canopy made from lighter material.
- Removal of the side shelter.
- Replacement of the steel mast with an aluminium tripod.
- Replacement of the main engine exhaust system which had been routed behind the wheelhouse with a 'wet' system in which the exhaust gases were mixed with engine cooling water before being expelled from the boat via the stern.

The estimated reduction in weight was 250kg. The owner did not seek the advice of a naval architect or assess the vessel's stability before or after the modifications were made.



Figure 4: *Speedwell* alongside Cuan slipway

Bilge pumping and bilge alarm systems

The engine room was fitted with:

- An electric bilge pump with a capacity of 500 gallons per hour (gph) that was operated from inside the machinery space by connecting its associated wiring to the battery.
- An engine-driven Jabsco pump that was primarily used to supply sea water to the deck hose but which could also be configured to pump the bilges in an emergency.
- A hand-operated gusher pump.
- A bilge alarm, activated by a 'float switch', which provided an audible warning in the wheelhouse.

According to sales receipts, a new 'Rule' 2000gph bilge pump and alarm float switch had been bought by the owner on 3 April 2013. The new pump was bought to replace the bilge pump in the engine room. These items had been given to the skipper, but they had not been installed.

The aft store was fitted with:

- An electric bilge pump operated by a float switch, which was not working.
- An air switch activated bilge level alarm, which also was defective.

The forepeak was not fitted either with a bilge pump or a bilge alarm.

Life-saving appliances

Speedwell carried:

- A 4-man liferaft in a canvas valise in the forepeak. There is no record of the liferaft ever having been serviced, and its condition was unknown.
- A coastal flare pack with an expiry date of December 2012.
- Two constant wear inflatable lifejackets for which no records of service were available.
- A fixed VHF radio in the wheelhouse that was not equipped for Digital Selective Calling (DSC).

Recent vessel operation

In September 2012, *Speedwell's* owner and the skipper agreed that the skipper could operate the vessel and that any profits after running expenses had been deducted would be shared equally. As *Speedwell* had been out of service for over 3 years, the skipper and the owner also agreed that work needed to be done to get the vessel ready. Over the winter, the skipper cleaned and painted the hull and applied a coat of antifouling. The winch was also refurbished by a local boatyard.

The skipper worked *Speedwell* as a prawn trawler from 25 February 2013 onwards when his other work commitments allowed. He was initially assisted by a friend as deckhand. The men soon developed a daily routine with *Speedwell* sailing from Cuan Sound at approximately 0600 and heading for Loch Buie, a passage that usually took about 1 hour. Between seven and eight tows were then conducted, each lasting about 1 hour before the vessel returned to Cuan Sound by 1700. This was in time for the prawn catch to be transferred into a 'keep' cage near the mooring and for the skipper to work the evening shift

on the local ferry when necessary. Neither the skipper nor his crewman wore the lifejackets available on board. In the weeks prior to the accident, the crewman had started to prepare his own boat for fishing so it had become routine for the skipper to operate *Speedwell* on his own.

A number of difficulties were encountered during the first weeks of the vessel's operation:

- On two occasions, sea water to a depth of approximately 1m had to be bailed out of the aft store with a bucket. The skipper and his crewman identified that the water had drained into the store from the deck above through the deck hatch. Although a rubber matt placed over the hatch appeared to slow down the rate of water ingress, it did not prevent it.
- The autopilot was not working, which meant that the vessel had to be steered by hand at all times; it was reported that *Speedwell* would veer off course very quickly if the wheel was left unattended while underway.
- The propeller was fouled by a rope while the prawn 'keep' was being lifted. A local diver removed the rope from the propeller and no damage was reported. The skipper re-packed the stern shaft gland shortly after this incident.

No problems were reported with the vessel's exhaust system or the bilge alarm in the engine room.

The trip on 25 April was the skipper's first opportunity to fish in approximately 2 weeks due to a financial dispute with the vessel's owner and bad weather.

Regulatory compliance

Speedwell was last inspected by a sector manager of the Maritime and Coastguard Agency (MCA) in June 2009. The deficiencies identified during the inspection included the lack of securing arrangements and the lack of a watertight seal on the forward hatch, which were corrected by sealing the hatch shut. The remaining defects were also rectified to the satisfaction of the MCA.

The inspection was completed under Merchant Shipping Notice (MSN) 1813 (F) – The Fishing Vessels Code of Practice for the Safety of Small Fishing Vessels (2007), which requires that a vessel of less than 15m length overall be inspected at intervals not exceeding 5 years. MSN 1813 (F) also requires that a vessel's owner (or other competent person) certifies each year that:

1. *safety equipment carried on board the vessel has been suitably maintained and serviced in accordance with the manufacturers instructions. [sic]*
2. *safety and other specified equipment continues to comply with the checklist appropriate to the length and construction of the vessel.*
3. *health and safety risk assessment has been completed.*

Speedwell's owner was unaware of this requirement and had never completed an annual self-certification for the vessel.

ANALYSIS

Down-flooding

The skipper's telephone conversation with his partner just 17 minutes before communication with *Speedwell* was lost indicates that he had recognised that his vessel was in difficulty. He was aware that water was leaking through the deck hatches into the spaces below and had decided to 'head home'. Therefore, it is almost certain that the loss of stability that ultimately resulted in *Speedwell's* foundering

was due to progressive down-flooding through the deck hatches. Although water ingress through other hull openings such as the 'wet' exhaust and the stern gland cannot be discounted, no evidence has been found to support these possibilities.

By the time the skipper spoke to his partner at 1250, *Speedwell* was already off Easdale (**Figures 1 and 2**), which strongly suggests that the flooding had prompted his departure from Loch Buie much sooner than normal. During the easterly passage across the Firth of Lorn, the wind and moderate sea would have been on the vessel's starboard quarter. As a result, it is likely that a substantial amount of water would have been 'washed' across the fishing vessel's deck, resulting in some down-flooding through the flush-deck hatches.

Taking into account the experience of previous fishing trips, it is most likely that down-flooding would have been most significant in the aft store, which accounted for one third of the vessel's internal volume. Although the hose found by the diver, protruding from the engine room hatch, possibly indicates that the skipper was attempting to pump water from the engine space, this cannot be verified.

Unlike the previous occasions when this had occurred, the skipper was alone and it would have been extremely difficult for him to bail out the aft store using a bucket. Without an autopilot, the vessel would either have to have been stopped in the water or allowed to veer off course, both of which were likely to have increased the amount of water washing over the deck. In addition, the skipper would have needed to remove the rubber matt over the hatch, brace the hatch open against the stowed prawn trawl using his shoulder, and bail the water at a faster rate than the ingress. With the hatch fully open, this task would have been extremely difficult.

Although the initial rate of down-flooding was probably relatively slow, and possibly led the skipper into thinking that he might be able to pilot *Speedwell* into the shelter of Easdale Sound without assistance, the rate would have increased as the vessel's freeboard reduced. The vessel's stability would have also reduced and been further adversely affected by the likelihood of free surface effect and of water flowing from the aft store into the engine room via penetrations in the common bulkhead. Therefore, it is not surprising that the situation deteriorated significantly during the short period from when the skipper spoke to his partner and the time he broadcast a "Mayday".

Vessel condition

Between 2008 and 2012 *Speedwell* had predominantly been laid up alongside a drying berth. During this period, the vessel had been extensively modified to reduce her top weight. However, although *Speedwell* was cleaned and re-painted before the first fishing trip in February 2013, it is of significant concern that the vessel was not watertight and the bilge pumping and alarm arrangements were inadequate; both contributed to the vessel's loss.

As *Speedwell* was built before April 2001, it was not required by MSN 1813 (F) to comply with the latest release of the Seafish Construction and Outfit Standards which require flush deck hatches to be secured by positive means and to be capable of being closed weathertight. The standards also require each below deck space to be fitted with pumping arrangements.

Despite *Speedwell's* exemption from these requirements due to its age, it is evident that the risk of flooding in the aft store had been recognised by the vessel's previous owner and had been mitigated by the installation of a bilge alarm and pump. However, the risk had not been addressed by the current owner or by the skipper as the defective pump and alarm had not been repaired or replaced. That the risk of catastrophic down-flooding in the aft store had not been recognised is supported in that the replacement bilge pump purchased by the owner, but not fitted, was intended for the engine space. The engine space was the only compartment fitted with a working bilge pump and bilge alarm and was reported to stay relatively dry.

Survivability

Although *Speedwell* was in difficulty when the skipper spoke to his partner at 1250, he did not want his partner to notify the coastguard. By the time he tried to contact the Easdale ferry and then broadcast a “Mayday” at 1306, valuable time had been lost and the vessel was only seconds away from sinking.

In the circumstances, earlier notification to the coastguard would have been a sensible precautionary measure as the coastguard could have arranged for the transfer of pumps and for other vessels to stand by. The earlier donning of a lifejacket, and abandonment, would also have undoubtedly improved the skipper’s chances of survival. Like many fishermen, the skipper did not wear a lifejacket when at sea, even when operating single-handed. It is evident from his exchange with Stornoway MRCC that he was still not wearing a lifejacket when he broadcast the “Mayday”.

Although the sea temperature was 8.2°C and there was a risk of cold water shock, the skipper could have survived for up to 90 minutes or more in the water with the aid of a lifejacket. However, as the skipper was not found, despite numerous vessels quickly arriving on the scene, it is possible that he was initially trapped on board *Speedwell* as the vessel sank.

Safety culture

A lot of time and money had been invested in *Speedwell* since 2008 to reduce the vessel’s top weight, but there had been no investment in other equally important safety-critical areas. The defective bilge pump and alarm in the aft store, the ad-hoc wiring for the operation of the engine space bilge pump, the leaking deck hatches, the out of date flares, the un-serviced liferaft and lifejackets, and the inoperative autopilot, indicate that both *Speedwell*’s owner and skipper were prepared to accept and live with defects and sub-standard equipment regardless of the resulting detrimental impact on vessel and crew safety.

MSN 1813 (F) requires only that vessels less than 15m in length be inspected every 5 years, and details only baseline standards. Therefore, the condition and safe operation of these vessels is almost completely reliant on the actions of their owners and skippers. In this case, *Speedwell*’s owner was not aware of the need for annual self-certification and therefore even this most basic safety barrier was missing. As a result the vessel was not seaworthy. However, there was no compulsion for the skipper to operate the vessel in its unsafe condition.

Speedwell had been returned to fishing for only 2 months. During that time, the number of fishing trips had been limited by the skipper’s other work, a dispute between the skipper and the owner, and bad weather. Consequently, like many other small fishing vessels, *Speedwell*’s commercial operation was only ‘occasional’. Nonetheless, as the owner was a professional mariner and the skipper had completed the required courses and certification to qualify for the Seafish under 16.5m skipper’s certificate, it is of considerable concern that both men appeared to have placed insufficient importance on safety.

CONCLUSIONS

- It is almost certain that *Speedwell* foundered due to water ingress through the unsecured and unsealed flush-deck hatch to the aft store.
- Operating single-handed, it would have been extremely difficult for the skipper to have bailed water out of the aft store in the conditions experienced.
- Some of *Speedwell*'s through-deck openings were not watertight and the bilge alarm and pumping arrangements were inadequate.
- The risk of catastrophic down-flooding had not been addressed.
- *Speedwell*'s owner and skipper placed insufficient importance on safety and were prepared to accept and live with defects and sub-standard equipment.
- The skipper's chances of survival were reduced by not notifying the coastguard earlier and by not wearing a lifejacket.

RECOMMENDATIONS

The owner of *Speedwell* at the time of the accident is recommended to:

- 2014/101 Take steps to ensure that any vessel he may own in the future is operated safely, paying particular attention to:
- The importance of watertight and weathertight integrity and the risk of down-flooding.
 - The fitting and operation of bilge alarm and pumping arrangements.
 - The provision of serviced and 'in date' lifesaving and other safety equipment.
 - Applicable regulatory requirements.

SHIP PARTICULARS

Vessel's name	<i>Speedwell</i>
Flag	UK
Classification society	Not applicable – subject to inspection
Fishing number	OB 950
Type	Fishing vessel
Registered owner	Privately owned
Manager(s)	Not applicable
Year of build	1998
Construction	GRP
Length overall	8.7m
Registered length	7.96m
Gross tonnage	5.81
Minimum safe manning	Not applicable
Authorised cargo	Not applicable

VOYAGE PARTICULARS

Port of departure	Cuan Sound
Port of arrival	Not applicable
Type of voyage	Other
Cargo information	None
Manning	1

MARINE CASUALTY INFORMATION

Date and time	25 April 2013 1307
Type of marine casualty or incident	Very Serious Marine Casualty
Location of incident	Sound of Insh, Firth of Lorn, Scotland
Place on board	Ship
Injuries/fatalities	1
Damage/environmental impact	Vessel lost
Ship operation	On passage (returning from fishing)
Voyage segment	Mid-water
External & internal environment	South west force 5 to 6; moderate seas; good visibility; daylight; sea temp 8.2°C
Persons on board	1