

Extract from The United Kingdom Merchant Shipping (Accident Reporting and Investigation) Regulations 2012 – Regulation 5:

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

NOTE

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

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FV PROSPECT

Grounding on Skibby Baas and foundering in the north entrance to Lerwick Harbour, Shetland Islands

5 August 2013

SUMMARY

At 1835 (UTC+1¹) on 5 August 2013, the twin-rig stern trawler *Prospect* (**Figure 1**) grounded on Skibby Baas rocks in the north entrance to Lerwick Harbour while on passage towards its intended fishing grounds. The hull was penetrated, causing the fish hold to immediately flood. The pumps were unable to cope with the water ingress and, after *Prospect* floated free from the rocks on the rising tide, the vessel adopted an angle of loll. The skipper and three crewmen transferred to the Lerwick all weather lifeboat (ALB) as its crew prepared to take *Prospect* under tow with the aid of the Lerwick Port Authority's (LPA) tug *Knab*. A short time later *Prospect* foundered in 15m of water. There were no injuries or pollution. The vessel was salvaged but declared a constructive total loss.

Image courtesy of Davie Tait



Figure 1: Prospect

¹ All times in this report are Universal Co-ordinated Time +1 hour.

The MAIB investigation determined that the skipper had not effectively planned and monitored the vessel's passage. He had become distracted in continuing a telephone conversation while altering the vessel's course. It is possible that his performance was adversely affected by alcohol that he had consumed earlier in the day.

A recommendation has been made to the skipper to attend a navigation skills refresher course. A further recommendation has been made to *Prospect's* owner aimed at improving navigation practices and emergency procedures on any future vessels it may own.

FACTUAL INFORMATION

Vessel

Banff-based *Prospect* was of wooden hull construction with an aluminium wheelhouse and mild steel shelter. The vessel's layout included a forepeak store, an 87m³ fish hold, engine room and crew cabin. A combined galley and mess room was located on the main deck under the wheelhouse. *Prospect* was powered by a 480kW Mitsubishi S12A2 main engine, driving a four-bladed propeller through a reversing gearbox and Kort nozzle.

The vessel was owned by MV Prospect Ltd, which was formed in 2011. There were four shareholders: the vessel's two skippers, the engineer and Buckie-based BCK100 Ltd.

Operating pattern

Fishing trips were usually of 7-10 days' duration with the catches being landed at northern Scottish ports. During 2013, the vessel had landed its catch at Lerwick Harbour eight times; the skipper who was on board *Prospect* at the time of the accident was in charge of the vessel during three of these visits. Since 1997, *Prospect* had visited Lerwick Harbour on 54 occasions.

Crew

At the time of the accident there were four crew on board *Prospect*. The skipper was a UK national. He had worked in the fishing industry since 1974 and held a Class 2 (Fishing Vessel) Certificate of Competency awarded in 1994.

The mate was also a UK national. He had been engaged in fishing since 1994 and had served on board *Prospect* for the previous 6 years. The two other crewmen were Sri Lankan nationals who had been employees on board *Prospect* for the previous 3 years.

All of the crew held the appropriate safety training course certificates.

Environment

At the time of the accident it was sunny with good visibility. The wind was north-north-east force 2, and the sea state was smooth. It was spring tides, with low water at Lerwick occurring at 1704, and high water at 2317. The predicted tidal stream in the vicinity of Skibby Baas was flooding 357° True (T) at 1 knot.

NARRATIVE

Entry into Lerwick Harbour on 5 August 2013

At 0600 on 5 August 2013, *Prospect* left the fishing grounds in Balta Sound to land its catch at Lerwick. At about 1200, the skipper loaded into the chart plotter one² of two historical tracks held on board for the entry into Lerwick Harbour via the north entrance. He then navigated by eye to leave the beacon marking Skibby Baas, a rocky outcrop located to the west of the main channel, about 50 metres to starboard, before altering course to port and continuing into Lerwick.

Actions while in Lerwick Harbour

At 1225, *Prospect* berthed at Holmsgarth Quay North to refuel. Between 1430 and 1550, the catch was landed at Laurenson Quay fish dock during which time the skipper and mate went ashore to buy stores. As the mate returned to the vessel, the skipper visited a nearby public house and consumed alcohol.

With the skipper back on board, *Prospect* left the fish dock shortly after 1550 to pick up fish boxes at Holmsgarth Quay North and to load ice at Shearer's Quay.

At 1818, the skipper advised LPA's Port Control, on very high frequency (VHF) radio channel 12 (the port's working channel), that the vessel was about to sail for Balta Sound via the north entrance. Because of the high level of interference on VHF radio channel 12, the skipper then turned the radio volume control to its minimum setting while maintaining a watch on VHF radio channel 16 on a second radio set.

Events leading up to the grounding

At 1820, *Prospect* sailed from Shearer's Quay. The vessel's two radars were operating with their displays set on a 0.75 mile range scale, and two chart plotters were running. Soon afterwards, the mate went to the galley to prepare a meal and the other crewmen went to the mess room.

At 1826, the skipper transmitted a mandatory departure email to Marine Scotland. An acknowledgement email was sent back to *Prospect* at about 1827.

At 1832, the vessel was under autopilot as it passed Greenhead Base; there was no incoming or outgoing traffic in the north channel. Although the skipper occasionally glanced at the chart plotter, which displayed the same track as for the morning entry, he navigated *Prospect* by eye. At 1833:52, the skipper took a telephone call on the vessel's satellite telephone in the wheelhouse. Very soon afterwards, at 1834, he noticed the Skibby Baas beacon on the starboard bow and he altered *Prospect*'s course by adjusting the autopilot setting to put the beacon fine on the port bow. *Prospect* then made a course over the ground (COG) of 015.5°(T) and a speed over the ground of 7.6 knots.

At 1835, the Port Control watchkeeper noticed on his radar display that *Prospect*'s radar echo was heading towards Skibby Baas, and he tried twice, without success, to alert the skipper to the danger on VHF radio channel 12. At 1835:25, the skipper ended his telephone conversation and moved to the starboard side of the wheelhouse to check for receipt of the acknowledgement email from Marine Scotland. He did not check the vessel's position at that time.

At 1835:45, *Prospect* grounded on Skibby Baas. The fish hold bilge alarm sounded in the wheelhouse as the vessel immediately listed about 15° to port. A chartlet showing the vessel's track is at **Figure 2**.

² The track had been passed to *Prospect* by another fishing vessel's skipper in 1997.

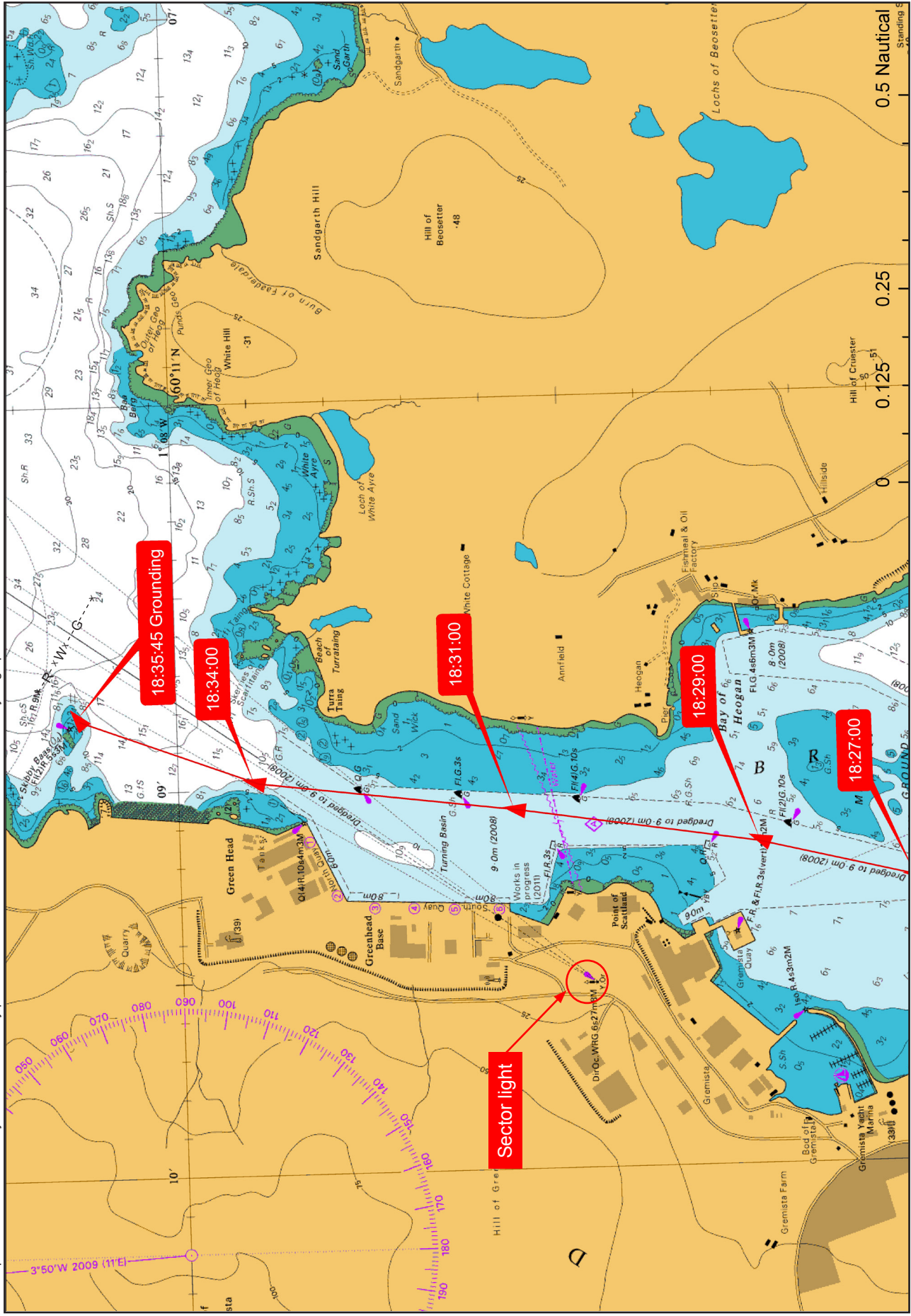


Figure 2: Chartlet BA2371 showing Prospect's AIS track

Post-grounding actions

The watchkeeper on board the offshore supply vessel *Vos Enterprise*, which was berthed at Greenhead Base, had been monitoring the situation and reported to Port Control that he believed *Prospect* had run aground. This was verified by the Port Control watchkeeper, who contacted *Prospect*'s skipper on VHF radio channel 16.

The Assistant Harbour Master (AHM) was on board LPA's tug *Knab* in preparation for a pilotage task. The Port Control watchkeeper requested that *Knab* proceed immediately to Skibby Baas to provide assistance. The Lerwick ALB's coxswain, who was preparing to undertake an exercise, also offered to help. At 1850, the ALB left its berth and headed for Skibby Baas.

In the meantime, *Prospect*'s crew inspected the vessel internally and confirmed that the flooding was restricted to the fish hold. The main and auxiliary engine-driven, 220 litres/minute Desmi pumps were engaged but they were unable to lower the level of flood water, which by now had half-filled the fish hold. No consideration was given to possible abandonment because the vessel appeared to be fast on the rocks.

At 1850, *Knab* arrived on scene and the AHM undertook the On-scene Commander's role. Soon afterwards, the harbourmaster (HM) assumed his Incident Commander's role at the LPA offices in accordance with LPA's HSEQ³ Management System, and a communications link was opened between LPA and Shetland Coastguard (CG).

As the height of the water level in the fish hold increased, additional pumps were supplied from the dive boat *Valkyrie* and from the ALB, which had arrived on-scene at 1900. Two additional pumps were airlifted to the scene by Sumburgh-based rescue helicopter R102. By about 2000, a total pumping capacity of approximately 200 tonnes/hour was available although the pumps had to be regularly stopped to clear debris from their suction strainers.

At 2040, *Prospect* floated free on the rising tide and settled deep in the water with an even trim. The HM, AHM and ALB coxswain agreed a plan for the ALB to initially tow *Prospect* in a northerly direction and to determine the vessel's stability condition before any attempt was made to begin a tow into port via the main channel. Other than confirming, from the deck, that the fish hold was about three-quarters full and that the forepeak and engine room appeared to be free of water, *Prospect*'s skipper was not engaged in the decision-making process. Just before the tow commenced, he and his crew transferred to the ALB.

At 2102, the ALB connected a towline to *Prospect*'s bow and towed the vessel slowly in a northerly direction with *Knab* in close attendance. The tow was difficult to control as *Prospect* adopted an angle of loll. The AHM advised the ALB's coxswain to tow the vessel west after it had cleared Skibby Baas so that its condition could be determined clear of the entrance to the main channel. However, *Prospect* then rolled "lazily" to port and the ALB's coxswain, concerned about its stability, cut the towline. *Knab* then went alongside *Prospect* and carefully pushed it towards shallow water near to the bank (**Figure 3**). However, before the vessel could be beached, it sank in 15m of water, to the north of Skibby Baas, settling on its starboard side.

The ALB took *Prospect*'s crew to the ALB's berth where they were met by Lerwick-based officers of Police Scotland. At 2230, the crew were breathalysed. The skipper recorded an "amber zone"⁴ reading, indicating a level of 31-35 microgrammes of alcohol in 100 millilitres of breath. The remainder of the crew recorded readings of zero.

³ Health, Safety, Environment and Quality

⁴ A "red zone" reading requires further intervention.



Figure 3: *Knab* pushing *Prospect* into shallow water

Recovery

During the period 6-22 August, divers sealed off the diesel fuel oil tank vents to prevent any pollution and four attempts were made to salvage the vessel. *Prospect* was finally recovered on 22 August and taken to Greenhead Base for survey. She was later declared a constructive total loss.

Aids to navigation

Skibby Baas is a 45 metres (m) long, drying outcrop of rocks situated 120m from the western coastline in the north entrance to Lerwick Harbour. It is marked by a beacon with a 3-mile range red light that flashes twice every 5 seconds in low ambient light conditions. A radar reflector and solar-charging panel are fitted to the grey-painted supporting post (**Figure 4**). The beacon was fitted to Skibby Baas in 1999; because of instability of the rock formation, it was located approximately 8m from the most easterly point of the outcrop.

Admiralty Sailing Directions North Coast of Scotland Pilot (NP52) recommends vessels entering Lerwick Harbour via the north channel to use the white sector on a bearing of 215°(T) within the sector light (marked by a yellow triangle and orange stripe) (**Figure 2**).

Voyage planning and distraction

The requirement for fishing vessels to conduct voyage planning is laid down in the Safety of Life at Sea Convention (SOLAS) Chapter V, Regulation 34 and is invoked by The Merchant Shipping (Safety of Navigation) Regulations 2002. Regulation 34 of SOLAS includes the following relevant requirements:

1. Prior to proceeding to sea, the master shall ensure that the intended voyage has been planned using the appropriate nautical charts and nautical publications for the area concerned...
2. The voyage plan shall identify a route which:
 1. takes into account any relevant ships' routing systems;
 2. ensures sufficient sea room for the safe passage of the ship throughout the voyage;
 3. anticipates all known navigational hazards ...



Figure 4: Skibby Baas beacon

Marine Guidance Note (MGN) 313 (F) – Keeping a Safe Navigational Watch on Fishing Vessels identifies the danger of distraction, It also reiterates the requirement for proper voyage planning and monitoring, and includes guidance on the use of navigation equipment, specifically:

“4.2 It is important that watchkeepers maintain a close watch on their own vessels and always know the position, speed and course steered. Most groundings occur when the position is not being monitored and the watchkeeper thinks that the vessel is in safe water.

4.6 Domestic radios, cassette players and television sets and other recreational items should never be used in the wheelhouse when they will distract a watchkeeper from their duties ...

5.3 Over-reliance on video plotters has been a factor in several recent collisions and groundings. Using an electronic system does not remove the need for proper passage planning and navigation, using appropriately scaled proper charts.

5.4 Assessments or assumptions based on video plotters alone are dangerous and unreliable. A video plotter used for fishing purposes is not adequate for safe navigation.

5.6 Information, charts, routes and waypoints may be stored for future reference. However, stored data should always be checked and used with caution, especially if transferred between vessels. The data should be applicable to the vessel’s specific condition and voyage, and always kept up to date.”

The risks associated with using mobile telephones at inappropriate times during a vessel’s navigation and conning are highlighted in MGN 299 (M+F) – Interference with Safe Navigation Through Inappropriate Use of Mobile Phones. Although the skipper was using a fixed (satellite) phone rather than a mobile device, the contents of the MGN are relevant. Specifically:

“5. The ease of communications between ship and shore via mobile phones, in coastal and port approach areas, has resulted in excessive demands being placed, at times, on ships’ masters and officers by having to deal with enquiries from a wide range of organisations and individuals...”

The MGN concludes:

“10. ... there is a compelling need for clarity of purpose when conducting the safe navigation of a vessel which endorses the requirement for an active management policy for the use of mobile phones on the bridges of ships at all times, but especially when the navigation risks are higher.”

Electronic chart plotting systems for fishing vessels

The requirement to carry paper charts on fishing vessels is laid out in paragraph 9.4.3.3 of Merchant Shipping Notice (MSN) 1770 (F) – The Fishing Vessels Code of Safe Working Practice for the Construction and Use of 15 metre length overall (LOA) to less than 24 metre registered length (L) Fishing Vessels.

The Maritime and Coastguard Agency (MCA) recognises that use of electronic chart plotting systems for navigation purposes in fishing vessels is widespread. However, many of the systems use privately produced electronic chart data that do not satisfy the international carriage requirement for charts. In response, the MCA has laid out guidance on acceptable systems in MGN 319 (M+F) – Acceptance of Electronic Chart Plotting Systems for Fishing Vessels Under 24 metres and Small Vessels in Commercial Use (Code Boats) Up To 24 Metres Load Line Length.

Alcohol limits

The Railways and Transport Safety Act 2003 – Part 4 Shipping: Alcohol and Drugs defines the alcohol limit applicable to “a professional master of a ship” and “a professional seaman in a ship while on duty”. Section 81(1)(a) of the Act sets the prescribed alcohol limit as follows:

“in the case of breath, 35 microgrammes of alcohol in 100 millilitres”.

ANALYSIS

Passage monitoring

Prospect’s skipper had a regular pattern of sleep during the previous 5-day fishing period. Although he had little rest while in Lerwick, there was no indication that fatigue contributed to the accident. As *Prospect* departed Lerwick, there was no traffic in the vicinity and the vessel’s propulsion, steering and navigation equipment were all functioning normally. The weather conditions were calm and the skipper had clear visibility from the wheelhouse.

Although a track was loaded on one of *Prospect’s* chart plotters, the skipper’s primary means of navigation was by eye and he only made superficial reference to the chart plotter display. There is no evidence that he used the radars for navigation other than identifying the channel buoys.

The grounding occurred because the skipper, being the sole lookout, lost positional awareness after making the course alteration at 1834. He believed that *Prospect* would pass clear of Skibby Baas because the turn to starboard had put the beacon fine on the vessel’s port bow. Although he was reportedly aware of the rate and direction of the predicted tidal stream, he did not take sufficient account of its potential influence in setting the vessel towards Skibby Baas. The skipper then became distracted by continuing a telephone conversation, the risks of which are highlighted comprehensively in MGN 299 (M+F), which compromised his monitoring of the vessel’s track. It is likely that the tidal stream set the vessel onto the rocks, east of the beacon.

After the telephone conversation had ended, there was a chance that the grounding could have been averted had the skipper then checked the vessel's position instead of looking for the email from Marine Scotland. In addition, the wheelhouse television set was turned on, which might have added to his distraction.

Although the Port Control watchkeeper attempted to alert *Prospect's* skipper to the danger of grounding, the volume control on the radio set monitoring VHF radio channel 12 was turned down. Therefore, the potential benefit of alerting the skipper was lost.

The skipper was breathalysed approximately 6.5 hours after his last alcoholic drink and 3.75 hours after the grounding. The test result was just below the regulatory limit, suggesting that alcohol might have adversely affected his performance leading up to the grounding.

Passage planning

International and national shipping legislation requires that voyages are properly planned using nautical charts and publications. There is no evidence that *Prospect's* voyage was properly planned and the data displayed on the chart plotter is unlikely to have satisfied the requirements of MGN 319 (M+F).

After passing Greenhead Base, the skipper's planned track was well to the west of the recommended route and placed the vessel at unnecessary risk of grounding. Without reference to appropriate nautical charts and publications, the skipper did not appreciate that Skibby Baas beacon was positioned about 8m from the eastern extremity of the rocks, and he was unaware of the existence of the sector light. A suitable passage plan should have consisted of altering course onto a heading that ensured the vessel was in the white sector of the sector light. Once in the white sector, which was clearly visible in daylight, the skipper would only have had to keep within the sector so as to make a COG of 035°(T) and thereby safely clear Skibby Baas.

The extent to which the historical track on the chart plotter display followed the recommended route could not be determined because sea water damaged the chart plotters as a result of the accident. However, it can be concluded that the method of passage planning used on board *Prospect* on the day of the accident compromised the vessel's safe passage.

Emergency preparedness

Effective drills are essential in helping crew deal with an emergency in an instinctive and competent manner. Section 8.1.2 of MSN 1770 (F) required the skipper to ensure that drills, including fire-fighting and flooding drills and the use of lifesaving appliances, were carried out monthly and recorded. Drills were conducted during periods of guardship duties, the last in July 2013. However, there was no evidence that drills were conducted with the crew who were on board at the time of the grounding outside the guardship duty period. MGN 430 (F) – Fishing Vessels: Checks on Crew Certification and Drills provides surveyors with guidance on the conduct of drills which can also be used by owners and skippers.

While the skipper was aware that assistance was being organised soon after the grounding, the vessel's stability was nevertheless unclear. Despite the risk of capsize neither of the two liferafts was prepared in case of the need to abandon the vessel, and only one of the crew wore a lifejacket, although others were readily available.

The crew were unable to stem the flooding using only the vessel's pumping equipment. By calculation, the rate of water ingress was approximately 190 tonnes/hour and the total onboard pumping capacity was approximately 26 tonnes/hour. However, consideration could have been given to dealing with the hull damage, possibly by using fothering⁵ techniques, after the vessel refloated.

⁵ Method of covering hull damage, typically by passing canvas or other material around the hull.

Had regular emergency drills been conducted on board, it is likely that the crew would have been better prepared to deal with the flooding.

Lerwick Port Authority aids to navigation - observations

The steel post supporting the Skibby Baas beacon is preserved with a grey paint scheme. From certain viewing points, during daylight, the beacon blends in with the grey rocks forming the sea defences on reclaimed land at Greenhead Base. Although not contributory to the accident, the beacon's prominence could be improved if its supporting post were painted a high-visibility colour.

On the day of the accident, the north entrance sector light was clearly visible. However, it could become confused with other nearby lighting at night, and could be obscured during certain cargo operations at Greenhead Base. Although again not contributory to the accident, consideration could be given to limiting the obscuration of the sector light.

CONCLUSIONS

- *Prospect* grounded because the skipper became distracted and lost positional awareness due to a telephone conversation and his decision to check whether an email had been received during the departure from Lerwick.
- The skipper did not effectively monitor *Prospect's* passage after making a course alteration to put Skibby Baas beacon fine on the port bow, and in particular gave insufficient consideration to the potential influence of the tidal stream that was setting the vessel towards Skibby Baas.
- The Port Controller's warning on VHF radio channel 12, that *Prospect* was heading towards Skibby Baas, was not heeded because the vessel's VHF radio volume control had been turned down.
- The skipper was not aware of the existence of the Lerwick Harbour north entrance sector light, or that Skibby Baas beacon was positioned about 8m from the eastern limit of the rocks, because he had not referred to the relevant nautical charts and publications.
- Alcohol consumed earlier in the day might have adversely affected the skipper's performance.
- The track loaded in the chart plotter was one passed on by another fishing vessel skipper in 1997; the risks associated with using potentially out of date data were not recognised.
- The chart displayed on the chart plotter is unlikely to have satisfied the requirements of MGN 319 (M+F).
- Despite the stability condition of *Prospect* being unknown while the vessel was aground, the liferafts were not prepared and only one of the crew donned a lifejacket.
- The crew had not participated in drills outside guardship duty periods to prepare them for an emergency.

ACTIONS TAKEN

Lerwick Port Authority has:

- Scheduled a site visit to investigate the viability of using high-visibility paint on the Skibby Baas beacon support post to improve its prominence.
- Fitted high-intensity lamps to the north entrance sector light to improve visibility against background lighting, and painted a “keep clear” zone on the quayside of Greenhead Base to highlight where the sector arcs pass in the vicinity of the berths.
- Planned a review of a requirement for LPA vessels to carry portable pumps for use on third-party vessels in the event of flooding.
- Arranged for a review of the co-ordination and command roles with Shetland CG for incidents occurring within the LPA port limits.

RECOMMENDATIONS

The skipper of FV *Prospect* is recommended to:

2014/108 Attend a navigation skills refresher/bridge watchkeeping course to update his knowledge of navigation best practice.

The owner of FV *Prospect* is recommended to:

2014/109 Improve the safe operation of any vessels it may own in the future by establishing measures to ensure:

- Skippers and crew comply with the watchkeeping and navigation best practice guidance promoted in MGN 313 (F) - Keeping a Safe Navigational Watch on Fishing Vessels and with MGN 299 (M+F) Interference with Safe Navigation Through Inappropriate Use of Mobile Phones.
- Electronic chart plotting systems, used in lieu of paper charts, are compliant with MGN 319 (M+F) - Acceptance of Electronic Chart Plotting Systems for Fishing Vessels Under 24 metres and Small Vessels in Commercial Use (Code Boats) Up To 24 Metres Load Line Length.
- Monthly emergency drills are carried out and recorded.

SHIP PARTICULARS

Vessel's name	<i>Prospect</i>
Flag	United Kingdom
Classification society	Not applicable (MCA surveys)
Fishing numbers	BF 573
Type	Twin-rig stern trawler
Registered owner	MV Prospect Limited
Manager(s)	MV Prospect Limited
Year of build	1995
Construction	Wooden hull, aluminium wheelhouse
Length overall	20.62 metres
Registered length	19.34 metres
Gross tonnage	72.17
Minimum safe manning	Not applicable
Authorised cargo	Not applicable

VOYAGE PARTICULARS

Port of departure	Lerwick
Port of arrival	Lerwick (intended)
Type of voyage	Coastal
Cargo information	None
Manning	4

MARINE CASUALTY INFORMATION

Date and time	5 August 2013 at 1835 (UTC+1)
Type of marine casualty or incident	Very Serious Marine Casualty
Location of incident	60° 11.17' N, 001° 08.83' W, in the north entrance to Lerwick Harbour
Place on board	Not applicable
Injuries/fatalities	None
Damage/environmental impact	Hull penetration in fish hold, constructive total loss/no environmental damage
Ship operation	On passage
Voyage segment	Transit
External & internal environment	Sunny with good visibility. Wind north-north-easterly force 2. Sea state smooth, spring tides with LW at 1704 and HW at 2317. Tidal stream direction 357°(T) at 1 knot
Persons on board	4