MAIB
MARINE ACCIDENT INVESTIGATION BRANCH

ACCIDENT REPORT

VERY SERIOUS MARINE CASUALTY | REPORT NO 5/2015 | FEBRUARY 2015

Foundering of the fishing vessel *Diamond* resulting in the death of a crew member West Burra Firth, Shetland, United Kingdom 25 March 2014

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SUMMARY

At 0253 UTC on 25 March 2014, the wooden fishing vessel *Diamond* sank after hitting a rock in West Burra Firth, Shetland Islands. The skipper and crewman were recovered about 40 minutes later but only the skipper survived.

The investigation found that *Diamond* most likely hit a rocky outcrop outside of the main navigation channel. It sank rapidly, due to damage caused by the force of the collision, and this did not allow the skipper and crewman sufficient time to collect their lifejackets from below decks prior to jumping overboard. It was the crewman's first voyage to sea and he had not had any sea survival training.

Both the skipper and the crewman were intoxicated by illegal and controlled drugs such that their ability to function was significantly impaired.

No recommendations have been made.

FACTUAL INFORMATION

All times UTC

The vessel

The 12.2 metre long fishing vessel *Diamond* **(Figure 1)** was built in 1962 as a stern rigged trawler and was later modified for scallop dredging. The vessel was of wooden construction and registered in Lerwick, Shetland. The internal transverse bulkheads separating its forward space, hold, engine space and lower accommodation space were not watertight. The draught of the vessel was 2 metres.

The wheelhouse was equipped with an autopilot, chart plotter integrated with GPS, radar, two VHF radios and an echo sounder.

Figure 1: *Diamond* (LK 6)

Diamond, which had been based previously in North Shields, England, was purchased by the skipper in April 2013. During his initial voyage from North Shields to Lerwick, the skipper stopped at the Orkney Islands to use the dredge gear and to assess the vessel's overall condition. When *Diamond* arrived in Lerwick in June 2013, the skipper delivered it to a repair yard for remedial works to be carried out. On 15 October, while in the repair yard, a Maritime and Coastguard Agency (MCA) surveyor conducted a targeted inspection and detained the vessel for various deficiencies. On the 19 December 2013, with the repair work complete and the deficiencies rectified, the MCA re-inspected the vessel and issued it a Small Fishing Vessel Inspection Certificate.

Environment

At the time of the accident the wind was south-south-easterly Beaufort force 6, gusting to force 8, with choppy sea conditions and good visibility. There was little cloud cover; moonrise was at 0322 and sunrise at 0553. High water was at 0304 with a height of 1.70 metres above chart datum. The sea temperature was 7½ºC and the air temperature was 8ºC (0ºC taking into account the effects of wind chill).

Narrative

On the afternoon of 24 March 2014, the skipper and crewman of *Diamond* drove from Lerwick to Scalloway where the fishing vessel was moored. The skipper had checked the weather forecast earlier that day and decided that the south-easterly winds were favourable for fishing to the west of the mainland. After boarding *Diamond* the skipper prepared it for sea while his crewman, John Leonard Scollay (Leonard), carried out maintenance of the scalloping gear.

The skipper manoeuvred *Diamond* off its berth at about 2030 and headed for the North Shoals, 20 miles to the west of Scalloway **(Figure 2)**. At about midnight, as the vessel approached the fishing grounds,

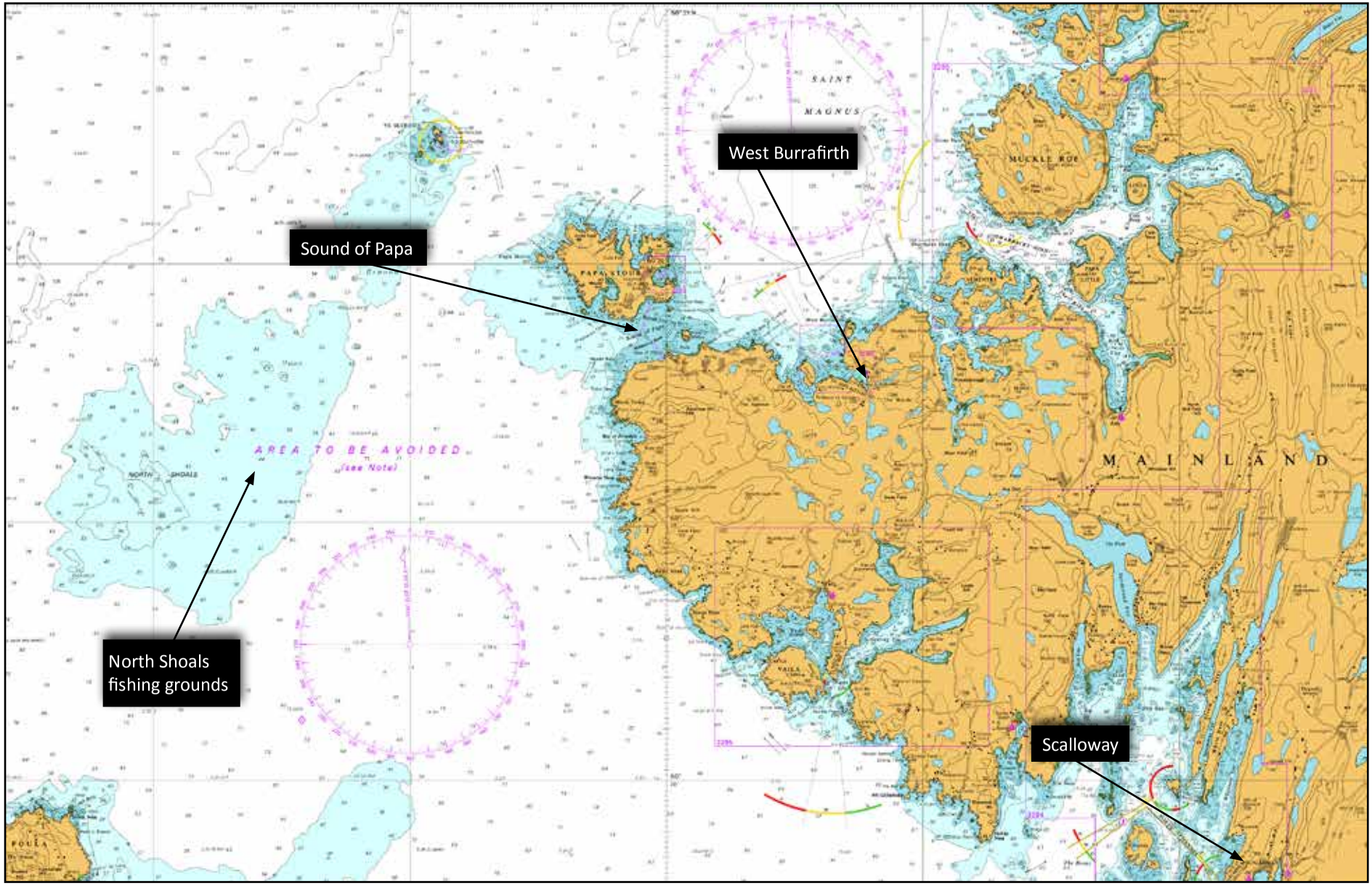

Figure 2: Extract from Admiralty Chart 3281 with points of interest

the skipper found a problem in the engine room that he could not resolve. He consequently decided to abort the fishing trip and return to port. The closest refuge with access to technical support was West Burrafirth[1].

From the North Shoals, the skipper headed east-north-east, aiming to pass through the Sound of Papa, between the island of Papa Stour and the mainland. As *Diamond* rounded Snarra Ness **(Figure 3)** into the approach to West Burrafirth the crew of another fishing vessel, to the north-west of the entrance, noted that *Diamond* appeared to be close inshore and to the west of the expected track into West Burra Firth.

A short while after entering West Burra Firth, *Diamond* hit an obstruction. The skipper kept the engine running and headed towards West Burrafirth pier. Leonard went aft to the galley area, looked down the ladder into the accommodation space, and reported back to the skipper that there was a lot of water below. The skipper told Leonard that they were sinking and to get ready to abandon the vessel. Leonard went outside to the aft deck of *Diamond.*

At 0252, the skipper broadcast a “Mayday” message on VHF radio Channel 16. The Shetland Maritime Rescue Coordination Centre (MRCC) responded and the skipper informed them that *Diamond* had hit a rock and stated that the vessel would not make it to West Burrafirth pier. Forty-one seconds after he started the distress message, the skipper said *“we’re going over”* and ended the radio transmission.

The skipper joined Leonard at the aft deck and, with *Diamond* down by the bow and nearly vertical, he told Leonard to jump into the water and swim for shore. Both men abandoned the vessel and once in the water they lost contact with each other.

On receipt of the “Mayday” call, the MRCC tasked the local lifeboat and a Search and Rescue (SAR) helicopter to the position given by *Diamond’s* skipper. A “Mayday Relay” message was broadcast by Shetland MRCC on VHF Channel 16 requesting any vessels in the vicinity to assist. The skipper of a nearby fishing vessel, *Diane Maxwell,* responded and Shetland MRCC requested the vessel to proceed to *Diamond*’s last known position.

Shortly after 0320, *Diane Maxwell* entered the firth and started to search for *Diamond*. The sea area was pitch black, the wind was south-south-easterly force 6, gusting to force 8, with a short choppy sea. The crew sighted a liferaft to the north of the channel but when they reached it they found it unoccupied. *Diane Maxwell*’s skipper relayed this information to MRCC and then resumed the search upwind of the liferaft.

At 0334, *Diane Maxwell*’s crew located Leonard in the water; he was face down and not wearing a lifejacket. He was recovered to the deck and, finding no signs of life, the crew started cardiopulmonary resuscitation (CPR). The local lifeboat arrived on the scene at the same time that Leonard was recovered and, not knowing how many personnel were on *Diamond***,** proceeded to look for more casualties.

At 0340, the skipper of *Diane Maxwell* was instructed by Shetland MRCC to head for West Burrafirth pier to transfer Leonard to the helicopter; during this time the boat’s crew continued CPR on Leonard.

The skipper of *Diamond* was found by the lifeboat crew at 0343; he was breathing but cold and disorientated. The lifeboat crew recovered the skipper to the deck and he confirmed that only two people had been on board *Diamond*. With no more casualties to locate, the lifeboat headed for West Burrafirth pier.

The crew of *Diane Maxwell*, aided by the coastguard’s coast rescue team, transferred Leonard from the boat to the waiting helicopter where CPR was continued. At 0407, the helicopter had both casualties on board and airlifted them to the hospital at Lerwick, 10 minutes away.

[1] The port is referred to as West Burrafirth, the approaches as West Burra Firth. A firth is the local name for a small inlet.

Reproduced from Admiralty Chart BA 3299-3 by permission of the Controller of HMSO and the UK Hydrographic Office.

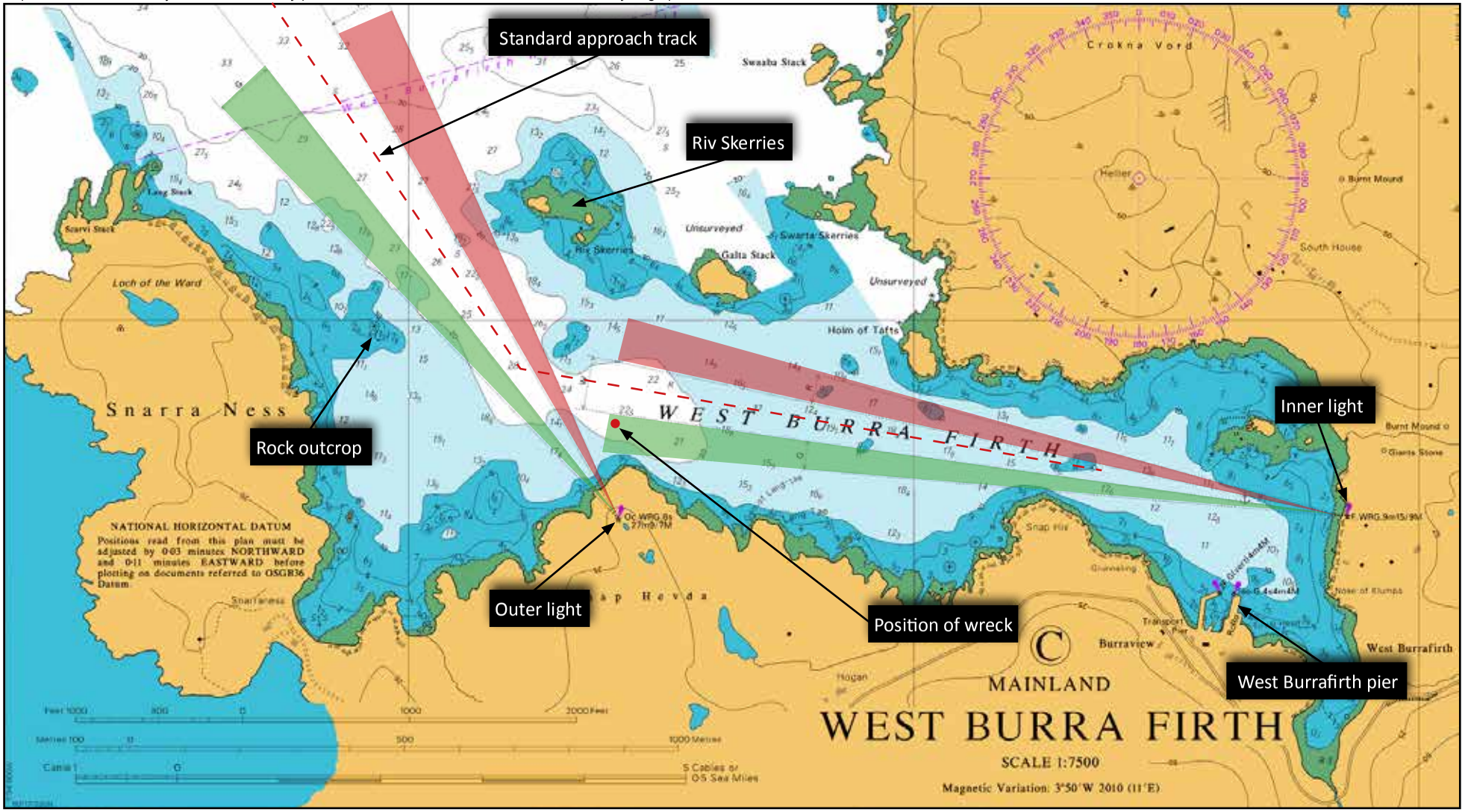

Figure 3: Chartlet of West Burra Firth with added sector light colours and standard approach track. The red dot shows the position of *Diamond* on the seabed

Leonard never regained consciousness and was declared deceased later that morning. The skipper of *Diamond* remained in hospital for observation until he discharged himself that afternoon.

The skipper

The skipper was a 37 year old Shetland Islander. He had worked as a crewman on board a variety of commercial fishing vessels since the age of 16 but had also worked in various shore jobs. He had owned a fishing boat about 10 years earlier, which he had operated as a crab potter for a year before selling it. He had completed the four statutory courses for fishermen as detailed in Marine Guidance Note (MGN) 411 (M+F)[2]. He had no formal navigation qualification.

The skipper had a Category B (Scallop) fishing licence issued by Marine Scotland. This allowed him to collect and land scallops caught outside a 6 mile limit around the Shetland Islands. To collect scallops within the 6 mile limit required a separate Shetland Islands Council licence; he had applied for this additional licence but it was not issued as the quota limit was full.

The skipper was a known user of Class A drugs[3].

The crewman

Leonard was 40 years old and was a Shetland Islander. He was a professional musician, and often supplemented his income by working as a carpenter or a landscape gardener. Leonard was not a fisherman, he had no experience of working at sea and he had not completed any of the statutory safety courses for fishermen.

Leonard was a friend of the skipper and he had expressed an interest in fishing a few weeks before the accident. The skipper offered Leonard the opportunity to work as his crewman on board *Diamond* and the accident occurred during his first trip to sea.

Leonard was also a known user of Class A drugs.

Medical reports

Leonard's post-mortem report indicated the most likely cause of death was drowning. However, a heart attack due to cold water shock, or hypothermia, was not ruled out. The report stated also that he had a significant amount of morphine in his system, and other substances present were consistent with using heroin. The levels quoted indicated recent use prior to death. The report did not suggest that Leonard was dead before he entered the water.

The skipper was tested for drugs and alcohol after the accident. The results showed that he had a significant amount of benzodiazepine and morphine in his system.

Effects of benzodiazepines and heroin

Benzodiazepines are a group of medicines classed as sedatives or tranquilisers that are used to treat anxiety, sleeping problems and other disorders. They are used also to nullify the withdrawal effects from drugs such as heroin.
Benzodiazepines work by affecting the way certain brain chemicals (neurotransmitters) send messages between neurons (brain cells). In effect, they decrease the excitability of many brain cells. This has a calming effect on various functions of the brain.

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[2] MGN 411 (M+F) - Training and Certification Requirements for the Crew of Fishing Vessels and their Applicability to Small Commercial Vessels and Large Yachts. Courses are: Health and safety, sea survival, first aid, and firefighting.

[3] The Misuse of Drugs Act 1971 places illegal drugs into three categories; A, B or C. Class A drugs include: heroin (diamorphine), cocaine (including crack), methadone, and ecstasy (MDMA),

Heroin is an illegal, highly addictive drug processed from morphine, a naturally occurring substance extracted from the seed pod of some varieties of poppy plant. Heroin can be injected, inhaled by snorting or sniffing, or smoked. All three routes of administration deliver the drug to the brain very rapidly. After the initial pleasurable sensation, users will be drowsy for several hours, mental functions are clouded, and the cardiopulmonary system is slowed.

West Burrafirth

West Burrafirth pier is regularly used to berth commercial fishing vessels and leisure craft. The port also has a slipway that is used by a roll-on roll-off ferry, which runs a 6 times a week service to the nearby island of Papa Stour.

West Burrafirth pier **(Figure 3)** is approached by entering the Firth between the north extremity of Snarra Ness and the westernmost rock of Riv Skerries. The safe navigation channel is indicated by two sector lights; the Outer Light and the Inner Light. The sector lights have three distinct colours; the main white sector indicates a safe zone of navigable water. The lights either side indicate that a vessel entering the firth is to port (red) or to starboard (green) of the main channel. The white sector of the Outer Light (142º to 150º) has a range of 9 nautical miles and the white sector of the Inner Light (098º to 102º) has a range of 15 miles.

Admiralty Chart (3299-3) shows that there are no underwater obstructions, of relevance, in the main navigable channel. The S57[4] electronic navigation chart cell, used by the manufacturer of the plotter fitted on board *Diamond*, shows the same depths.

On the day of the accident it was confirmed that both sector lights were operational.

Regulations

1. Merchant Shipping Act 1995

   Under Section 58 of the Merchant Shipping Act 1995, it is an offence for a master or seaman employed on a UK registered vessel, or a foreign vessel within UK waters or in a UK port, to endanger his own or other vessels when under the influence of drugs or alcohol.

2. The Fishing Vessels (Safety Training) Regulations 1989 (as amended)

   The regulations require that new entrants employed on British fishing vessels are trained appropriately. It is an offence for a person to go to sea in contravention of the regulations. The skipper and each owner of a vessel on which the offence is committed are themselves committing an offence.

Dive survey

On 29 April 2014, a commercial diving team contracted by the MAIB conducted a visual survey of the vessel's exterior. The wreck was located in position 60º17'.9N 001º33'.62W **(Figure 4)**. The inspection showed damage to the bow, specifically stem damage with substantial scraping on the port side. The hull planks were displaced and a section of plank was missing on the starboard side **(Figure 5)**.

The rudder was found to be at about 15º to port and the engine controls in the ahead position at about 75% of full travel. Other details noted were: the scallop dredge gear was displaced forward; the main hold hatch cover was off; and the lifebuoys were wedged tight in their holding brackets.

[4] An electronic navigation chart must conform to standards stated in the International Hydrographic Organization (IHO) Special Publication S-57 before it can be certified as an electronic navigation chart.

Figure 4: *Diamond* resting on the seabed

Figure 5: Photograph of stem and starboard side of *Diamond* showing missing and displaced planks

ANALYSIS

The grounding

Diamond sank rapidly due to flooding, having suffered severe hull damage when it struck a rock head-on. *Diamond*'s draught was 2 metres and the height of tide was about 1.7 metres. Consequently, there were no obstructions within the main navigation channel marked by the white sectors of the outer and inner lights, nor in the red and green sectors, that would have prevented the vessel from safely transiting in these sectors. It is therefore certain that *Diamond* was outside of the light sectors.

The evidence indicates it is most likely that *Diamond* hit the rocky outcrop east of Snarra Ness. The skipper navigated into the firth from the north-west and *Diamond* was observed, by another fishing vessel, to be closer to the coast of Snarra Ness than would be expected, and probably to the west of the outer light safe sector.

Diamond was travelling at between 5 and 6 knots. The force of the grounding taken on the stem displaced several planks on both sides, particularly the starboard side. The damage to the hull allowed water to flood the hull which had no watertight integrity between spaces.

The engine was kept running ahead for an indeterminate time after the collision and it is not unfeasible for the vessel to have travelled 450 metres, following the grounding, to where it sank. At between 3 and 4 knots it would have taken about 4 minutes to travel 450 metres; deducting the time taken for the skipper to realise what had happened, the time taken to assess the damage and the 41 seconds of the Mayday call, it is likely that the skipper did not reduce speed, or stop, and that *Diamond* continued on after hitting the rock.

Drug use

At the time of the accident, both crewmen had significant amounts of illegal and controlled drugs in their system. A forensic pharmacologist was commissioned to analyse how such quantities might affect their decision making and behaviour.

The expert concluded that the skipper was likely to be a habitual user of benzodiazepine and heroin. The quantities of both in his system would indicate that, at the time of the accident, the skipper was unfit to drive a vehicle of any description because of the performance deficits produced by the drugs, even though such deficits might have been reduced due to his habit.

The physiological reaction times of the skipper would have been delayed significantly, and the combination of benzodiazepines and heroin would have diminished any recognition of danger to a level of passivity.

It is important to note that, given the potential consequences of illegal and controlled drug use, the evidence provided by the skipper has to be treated with caution.

The expert found that Leonard had levels of morphine and other chemicals in his system that were consistent with him being an habitual user and this would have had a detrimental effect on his cognitive and motor functions. Leonard's capacity for survival would have been adversely affected by morphine intoxication.

Survivability

Diamond's two lifebuoys sank with the vessel because they were too firmly wedged in their stowages to float free. However the liferaft deployed as designed and its light operated. Unfortunately neither crew man made it to the liferaft and there was no other buoyant material to cling to.

The skipper was wearing a one-piece flotation suit that helped keep him afloat and provided some insulation from the debilitating effects of the cold water. However, by the time he was rescued, about 50 minutes after entering the water, he was cold and disoriented. Without a lifejacket to keep his airway clear of the water his chances of surviving much longer were slim.

Leonard was in the water for about 40 minutes and during that time is unlikely to have suffered from severe hypothermia. However, the cold water temperature, about 7.5ºC, would have caused him to quickly lose control of his limbs thereby reducing his ability to perform survival functions. Without a lifejacket he would soon have drowned. The analgesic and mental detachment effect of heroin would likely have made Leonard indifferent to his predicament and unable to respond appropriately.

Competency

Diamond's skipper had no formal navigation qualification. However, he had gained experience on various vessels during the previous 20 years, primarily as a deckhand, and he had owned and previously operated another boat so had limited experience as a skipper. Nonetheless, there are many aspects of this accident that raise questions about the skipper's competency. Specifically he had taken his vessel to sea, at night, with an untrained and inexperienced crewman who was ill-equipped to operate in such an environment, let alone to survive the sinking of the vessel.

The Fishing Vessels (Safety Training) Regulations 1989 (as amended) require skippers to ensure that crew members have the appropriate training and qualifications. However, the skipper allowed Leonard to work on the vessel knowing that he was not qualified and had no experience of commercial fishing. The MCA allows new entrant fishermen to gain some experience before they are required to have completed all the mandatory safety courses, but insists that new crew complete the sea survival course before they first go to sea. Completing the course would have given Leonard an understanding of the perils of cold water immersion, and it would have equipped him with the skills necessary to abandon a vessel in an emergency. Leonard was almost certainly unaware that he was required by regulation to have attended this course, and by taking him to sea *Diamond*'s skipper was taking a significant risk with his crewman's life.

The skipper was navigating his vessel in an unsafe manner in that he was not making effective use of all the available navigation aids, visual or electronic, to ensure a safe passage. The drugs the skipper consumed would have affected his judgement and decision making, so it is not possible to draw firm conclusions about whether he would have performed in such as manner had he not been so impaired. However, it is possible that this accident would not have occurred had the skipper not been under the influence of drugs when he decided to take *Diamond* to sea.

CONCLUSIONS

The skipper had no formal navigation qualifications although he had previously shown some navigational competence when he steamed *Diamond* from North Shields to Lerwick. However, on the night of the accident he was not making use of the sectored lights to navigate safely into West Burra Firth.

Diamond struck a rock outside of the main navigation channel, most likely to the east of Snarra Ness.

The vessel sank rapidly due to the damage to the wooden hull and resultant flooding through the non-watertight bulkheads.

The skipper and his crewman, Leonard, were under the influence of illegal and controlled drugs that would have compromised their ability to operate safely, and to react appropriately after the collision.

The skipper's survival was almost certainly due to his wearing of a flotation suit.

The skipper employed Leonard without ensuring that he was appropriately trained.

It is likely that Leonard Scollay would have survived had he been wearing a lifejacket. However, he had taken heroin before the accident and this would have impaired his ability to survive or to appreciate his predicament.

RECOMMENDATIONS

No recommendations have been made.

SHIP PARTICULARS	
Vessel's name	*Diamond*
Flag	British
Classification society	Not applicable
IMO number/fishing numbers	LK6
Type	Scallop dredger
Registered owner	Privately owned
Manager(s)	Not applicable
Year of build	1962
Construction	Wood
Length overall	12.2 metres
Registered length	11.5 metres
Gross tonnage	16.5 tonnes
Minimum safe manning	Not applicable
Authorised cargo	Not applicable
VOYAGE PARTICULARS	
Port of departure	Scalloway, Shetland
Port of arrival	West Burrafirth
Type of voyage	Coastal
Cargo information	None
Manning	2
MARINE CASUALTY INFORMATION	
Date and time	25 March 2014 at about 0252 UTC
Type of marine casualty or incident	Very serious marine casualty
Location of incident	West Burra Firth 60°17.90'N 001°33.62'W
Place on board	Not applicable
Injuries/fatalities	One fatality
Damage/environmental impact	Loss of vessel
Ship operation	In passage
Voyage segment	Arrival
External & internal environment	Wind south-south-easterly force 6. Sea state slight. Visibility good. High water 0304. Height of high water 1.7 metres. Sunrise 0553. Moonrise 0322.
Persons on board	2