

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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Grounding of the general cargo ship *DOUWENT* Haisborough Sand 26 February 2013

SUMMARY

At 0256¹ on 26 February 2013, the United Kingdom (UK) registered general cargo ship *Douwent* grounded on Haisborough Sand in the North Sea. The vessel re-floated approximately 1 hour later and anchored in safe water nearby. *Douwent* lost its rudder during the grounding and had to be towed by tug to Rotterdam, the Netherlands, for survey and repair. There were no injuries and no pollution.

The MAIB investigation established that the vessel had followed a navigation track displayed on the global positioning system (GPS) receiver and on the radar. The officer of the watch (OOW) did not notice that the vessel was heading into danger until it was too late for effective action to be taken. Contributory factors included:

- The waypoint selected as the destination in the GPS receiver did not follow the intended sequence of waypoints detailed in the voyage plan.
- The vessel's position was not sufficiently monitored or plotted on the paper chart on the bridge.
- The OOW was alone on the bridge and probably fell asleep.
- The bridge watch alarm was switched off.

The investigation concluded that the rudder was lost while the vessel was grounded and that the crew attempted to conceal the grounding by falsifying documents and providing inaccurate accounts.

A recommendation has been made to the ship's manager which is aimed at helping to ensure the safe navigation of its vessels.



Douwent

¹ All times are UTC+1 unless otherwise stated

FACTUAL INFORMATION

Narrative

At 1840 on 25 February 2013, the general cargo ship *Douwent* sailed from Boston, UK. The vessel was in ballast with a mean draught of 2.62m and was bound for Amsterdam, the Netherlands.

At 2355, the chief officer took over the bridge watch from the master. The vessel was on an autopilot controlled heading of 110° and was making good a speed over the ground (SOG) of approximately 7.5 knots (kts). Approximately 10 minutes later, the master left the bridge and went to sleep in an armchair in his cabin. An able seaman (AB) was also on watch but he was told by the chief officer that he was not required to remain on the bridge so he returned to the accommodation below.

Douwent was rolling in the rough seas and the chief officer predominantly remained seated, monitoring the vessel's progress against the navigational track displayed on the 3cm radar display. The bridge heaters were on and the bridge was warm. During his bridge watch, the chief officer left the bridge on one occasion for between 4 and 8 minutes to go to the toilet. He also completed some administrative tasks on the ship's computer but did not plot the vessel's position on the paper chart.

At 0256, *Douwent*'s speed decreased rapidly as the vessel started to take the ground (**Figure 1**). By 0300, the chief officer had put the main engine to 'full astern' but the vessel was now stationary. The master and crew were woken by the change in the vessel's movement and also by the chief officer shouting. The master immediately went to the bridge and moved the engine telegraph to 'stop' and switched on the echo sounder. He then looked at the GPS receiver and noticed that the vessel's position was close to the track on the display. He also noticed that the destination was waypoint 90, not waypoint 48 as he had expected. The master plotted the position displayed on the GPS receiver onto the paper chart. This confirmed that the vessel was in very shallow water on Haisborough Sand.

The master manoeuvred *Douwent* between 'full ahead' and 'full astern' together with maximum rudder movements to try and free the vessel. At approximately 0355 *Douwent* re-floated, but the master quickly realised that the helm was having no effect when he attempted to manoeuvre away from the shallow water and resume passage towards Amsterdam. However, the rudder indicator was showing that the rudder was moving as intended and the chief engineer confirmed that the steering pumps and hydraulic rams were working correctly in the steering compartment.

In view of the lack of steering, *Douwent* was anchored at 0530 (**Figure 1**). At 0536, the master informed Yarmouth Maritime Rescue and Co-ordination Centre (MRCC) by very high frequency radio (VHF) that *Douwent* had anchored due to a problem with the rudder. He did not mention that the vessel had been aground.

While at anchor, an AB used a pilot ladder over the vessel's side to inspect *Douwent*'s stern area. The AB saw that the rudder was missing. The double-bottom ballast tanks were also half-emptied and then monitored to check for water ingress. No water ingress or other damage was identified.

At 2250 on 28 February, *Douwent* was taken in tow by the tug *Christine* and was berthed in Rotterdam, the Netherlands at 0125 on 2 March 2013 for survey and repair.

Environmental conditions

When *Douwent* grounded the sea was rough to very rough and the wind was north-east between force 7 and force 8². The visibility was good, and at 0255 the tidal stream was setting over Haisborough Sand in a northerly direction at a predicted rate of 2.4kts. The predicted height of tide on Haisborough Sand at 0300 on 26 February 2013 was 0.3m and falling; the predicted time of low water was 0330. The seabed on Haisborough Sand is fine sand.

Automatic Information System (AIS) information

Positional information obtained from *Douwent*'s AIS transmissions from 0030 is shown at **Figure 2**. The vessel's heading, SOG and course over the ground (COG) at selected points have been overlaid on the vessel's paper chart. Examination of the data at approximately 30 second intervals indicates that the vessel's heading from midnight until taking the ground at about 0256 was generally between 111° and 113°.

² Beaufort Scale

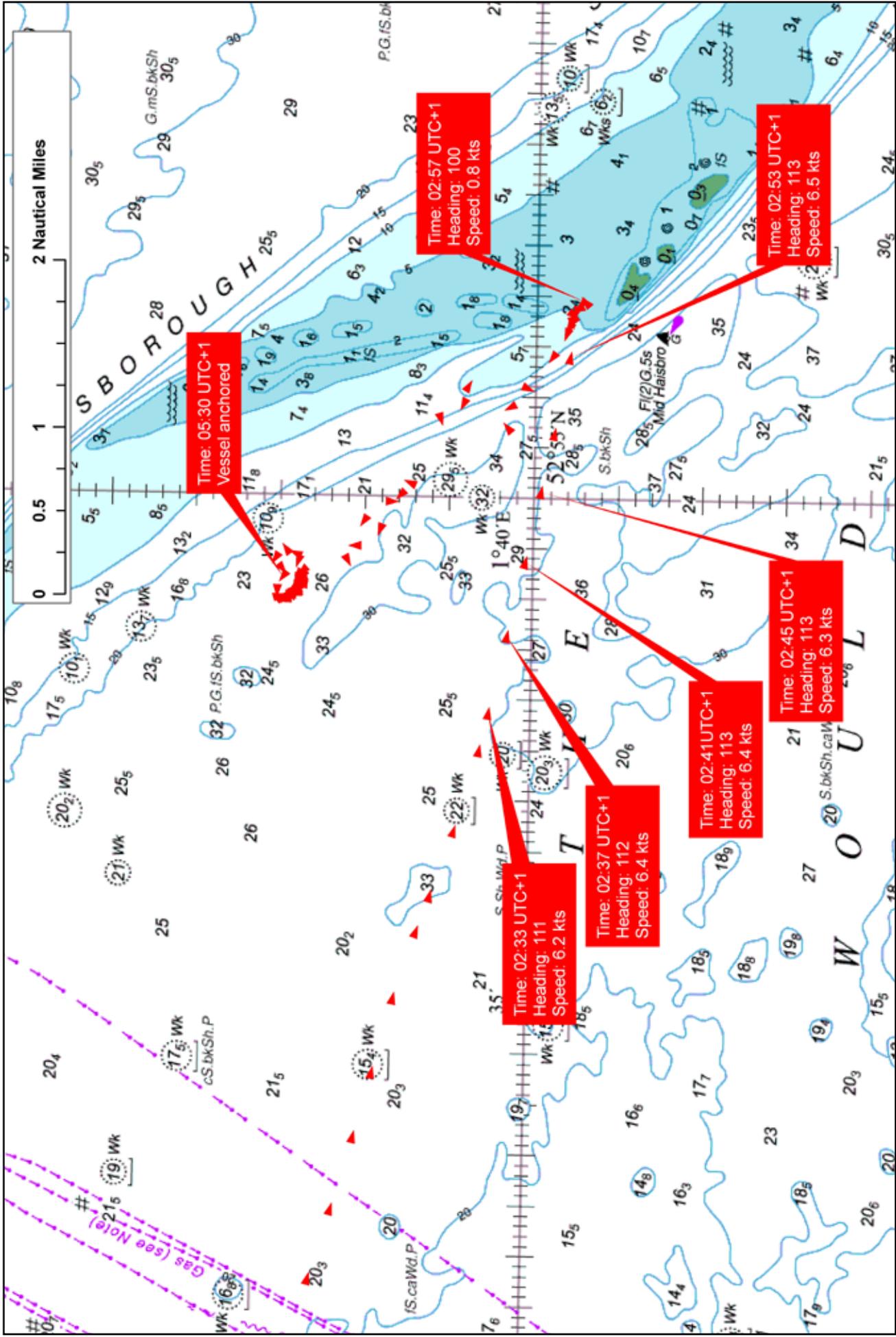


Figure 1: Extract of chart BA 106 with AIS overlay

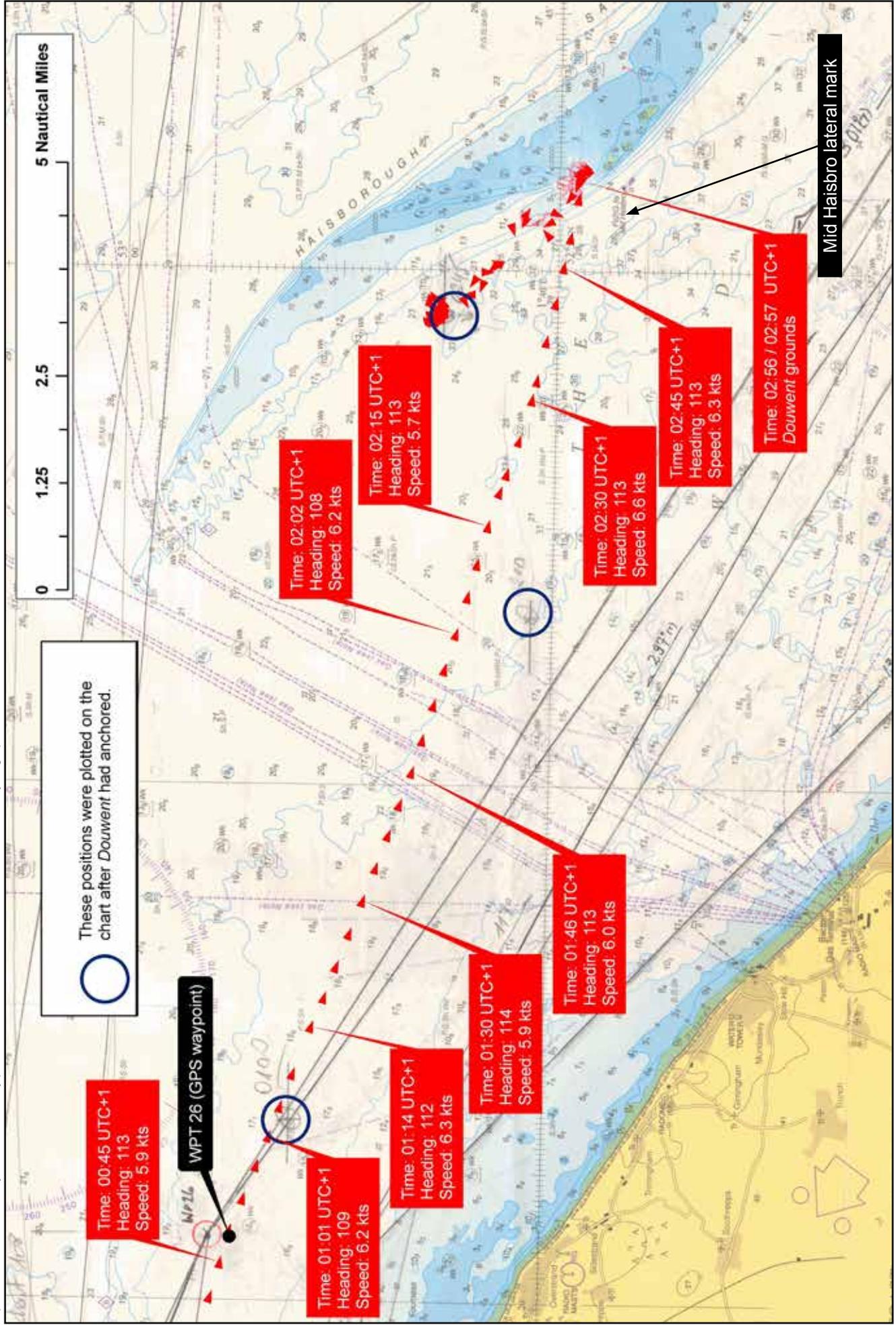


Figure 2: Extract of ships paper chart (BA 106) with AIS overlay

AIS data also showed that vessel traffic in the area was not heavy. The vessels passing closest to *Douwent* were:

- At 0126 the ro-ro passenger ferry *Pride of Bruges* crossed 2.1nm ahead on a heading of 145° at a speed of 14kts.
- At 0219 the general cargo ship *Pauline* passed 1.1nm ahead on a heading of 140° at a speed of 15kts.
- At 0241 the ro-ro passenger vessel *Pride of Hull* passed 1.7nm astern on a heading of 320° at a speed of 20kts.

Bridge equipment

Douwent's bridge navigation equipment included:

- A Furuno GPS Navigator GP-150 receiver **(Figure 3)**.
- A GPS Shipmate RS 5700 receiver that was used to provide positional data to the vessel's AIS.
- A 3cm radar display, sited on the starboard side of the bridge.
- A 10cm radar display, sited on the port side of the bridge.
- A Furuno FE-700 echo sounder.
- A watch alarm.



Figure 3: Furuno GPS Navigator GP - 150

During the chief officer's bridge watch on 26 February 2013, the port radar display, the watch alarm and the echo sounder were switched off. The starboard radar display was generally set at the 6nm range scale, offset to the west-north-west and orientated north-up.

In addition to radar information, the starboard radar display also showed information from the GPS Navigator GP-150 including the track and distance to the next selected destination. The destination could be set on the GPS receiver by cursor, by man overboard or event position, by waypoint and by route. The GPS was fitted with a cross track error facility but this was turned off. The receiver's arrival alarm was switched on and was set to activate at a radius of 200m from the destination waypoint.

Passage planning and navigational charts

The passage from Boston to Amsterdam was planned by the chief officer during the morning of 25 February 2013 using a library of waypoints stored in the vessel's Furuno GPS Navigator GP-150. The waypoints of the voyage plan were entered as a route in the GPS. The voyage plan was signed by the master and the chief officer and included:

NR	Name WPT	Latitude	Longitude	Course	Dist	To Go	Charts
26	CROMER L TH	52°58,60'N	001°21,20'E	120.1°	28.3	121.3	106/1408
48	S WINTERBOR RID	52°44,40'N	002°01,80'E	102.8°	68.4	92.9	1504
90	IJM RW LTB	52°29,30'	003°51,60'	093.2°	19.8	24.6	1631

The waypoints and tracks for the voyage, along with the waypoints and tracks for other regularly used routes between the UK and north-west Europe, had already been drawn on the navigation charts in ink (**Figure 2**).

The master did not check the route on the navigational charts, which were relatively old and well used. Consequently, the crew preferred not to mark them where possible. Therefore, it was not normal practice to routinely plot the ship's position during a voyage.

Crew

Douwent's crew comprised the master, chief officer, chief engineer and three ABs. All of the crew were Polish nationals, except for one of the ABs who was Albanian. At sea, the master kept the 6-12 bridge watches and the chief officer the 12-6 watches. During the hours of darkness, an AB was nominated to be available to act as lookout on the bridge and also to conduct fire and safety rounds.

The master was 59 years old and had spent much of his seagoing career working on board chemical tankers. This was his first contract on board *Douwent* and he had joined in December 2012 when the vessel was in dry dock in Hull.

The chief officer was 55 years old and had been a chief officer for approximately 12 years. He had worked on board general cargo ships for the last 5 years. The chief officer's first contract on board *Douwent* was between 25 October 2012 and 12 December 2012 during which the vessel also carried a second officer who was responsible for passage planning.

The chief officer had started his second contract on board *Douwent* on 23 February 2013. He arrived on board the vessel in Boston at approximately 1130 after leaving his home in Poland at 0200. The chief officer remained on board and reported that he had not slept well during the nights of 23 and 24 February while the vessel remained in Boston.

Vessel management

Following *Douwent's* change of ownership to Douwent Shipping Ltd on 31 December 2012, while the vessel was in dry dock in Hull, UK, Marco Polo Maritime Ltd was appointed as the vessel's technical and safety manager. Marco Polo Maritime Ltd managed three other general cargo ships, *River Trader* (Liberia), *River Pride* (Liberia) and *River King* (Belize)³. The company was based in Piraeus, Greece and was operated by a general manager, a safety and training manager who is the designated person, an operations manager and a technical manager.

Douwent had been UK flagged since 2005 and the new owners wanted the vessel to remain on the UK register. Accordingly, the Maritime and Coastguard Agency (MCA) issued an interim Document of Compliance (DOC) to Marco Polo Maritime Ltd and a Safety Management Certificate (SMC) to *Douwent* on 9 January 2013 in accordance with the International Safety Management (ISM) Code. The certificates were based on audits conducted on 20 December 2012 and 9 January 2013 respectively. The DOC audit of Marco Polo Maritime Ltd was completed on board *Douwent* in Hull when the company's senior management were visiting the vessel in dry dock. An interim DOC had also been issued to the company by Bureau Veritas (BV) Greece on behalf of Liberia in November 2012.

The safety management system (SMS) manual carried on board *Douwent* included:

7.2.2.4.2 Planning

Prior to each voyage the master of the ship shall ensure that the intended route from the port of departure to the first port of call is planned using adequate and appropriate charts and other nautical publications necessary for the intended voyage, containing accurate, complete and up-to-date information regarding those navigational limitations and hazards which are of a permanent or predictable nature and which are relevant to the safe navigation of the ship. [sic]

When the route planning is verified taking into account all pertinent information, the planned route shall be clearly displayed on appropriate charts and shall be continuously available to the officer in charge of the watch, who shall verify each course to be followed prior to using it during the voyage

³ Marco Polo Maritime Ltd is no longer responsible for the safety management of *River King* which is now on the Panama ship register.

The SMS provided comprehensive guidance on performing a navigational watch which emphasised, among other things, that a proper lookout shall be maintained at all times and the bridge should not be left unattended. It also provided instructions to the master on the use, maintenance and replacement of nautical charts, and checklists to be followed in the event of an emergency. The checklist for grounding included:

- *Stop the engines*
- *Close all watertight doors-bulkhead valves*
- *Call master*
- *Raise alarm*
- *Mustering all crew in the Muster Stations [sic]*
- *VHF to Channel 16 (alert other vessels in the area)*
- *Fix vessel's position*
- *Exhibit Lights/signals [sic]*
- *Sound all tanks and bilges*
- *Check stability criteria*
- *Depth soundings around the vessel*
- *Check the tide*
- *Estimate damage*
- *Determine if tug assistance required*
- *Forward initial report as per Reporting Procedures...*
- *Inform Company Emergency Response Team...*
- *Enter facts in Log Book*

Incident report

In the incident report forwarded by the master to the ship's manager after *Douwent* had anchored, the master stated that the chief officer had experienced a problem keeping the vessel on course. He had changed from autopilot to hand-steering to emergency steering, but this did not solve the problem. The chief officer had called the master to the bridge, sent the chief engineer to check the steering system, sent seamen to open the ventilation flaps to allow the use of the bow thruster and to prepare both anchors for letting go. The master also stated that when he arrived on the bridge, he checked the steering but the vessel was drifting onto a shallow bank.

The incident report also included the chief officer's account, which accorded with the master's description of events and a report from the AB on watch which stated that he had been on duty on the bridge between 0000 and 0400.

Onboard records

Entries in the deck log included *Douwent's* latitude and longitude for 0100, 0200 and 0245. The 0245 entry also stated that the vessel had anchored due to problems experienced with the steering. The positions noted in the logbook corresponded to the positions plotted on the paper chart (**Figure 2**).



Figure 4: Broken rudder stock

However, during the investigation it was determined that the log entries and the positions marked on the chart were made after the vessel had anchored at 0530.

Rudder stock

Inspection of the rudder stock when *Douwent* arrived in Rotterdam confirmed that the rudder was missing (**Figure 4**). The MAIB arranged for the end section of the remaining post to be removed and analysed. The conclusions of the analysis included '*The fractured surface clearly shows a fatigue fracture. The large surface area of the final fracture (>90%) combined with the multiple origins implies that the rudder stock suffered from high loads.*' [sic]

ANALYSIS

Navigation

When *Douwent* was in the vicinity of Waypoint 26 at 0048 (**Figure 2**), the vessel's heading should have been altered to make good a course of 120° in order to follow the intended passage plan towards Waypoint 48. However, it is evident from the AIS data that *Douwent*'s heading remained between 111° and 113°. This was almost certainly because Waypoint 90, rather than Waypoint 48, had been displayed as the next destination on the GPS. The master noticed that Waypoint 90 was selected when he looked at the GPS shortly after he arrived on the bridge and *Douwent*'s COG between midnight until the vessel grounded was 107°, which was the course required between Waypoint 26 and Waypoint 90 (**Figure 5**).

As the destination set in the Furuno GPS could be selected by route or by waypoint, it is feasible that Waypoint 90 was set either because Waypoint 48 had been accidentally omitted from the route in the GPS (the resulting difference in the total distance was only about 1 mile) or because Waypoint 90 was selected instead of Waypoint 48 as the vessel passed Waypoint 26. The chief officer input the waypoints into the GPS route and he was also on watch on passing Waypoint 26. Therefore, both of these possibilities would have been the result of lapses on his part.

Voyage monitoring

It is puzzling that, during the 2 hours from passing Waypoint 26 until the vessel grounded, the chief officer did not notice that *Douwent* was not following the intended route. This was most likely due to his reliance on GPS, which in turn contributed to a lack of stimulus. Ultimately, this probably resulted in him falling asleep. As a consequence, the chief officer did not see the Mid Haisbro lateral mark (**Figures 1 and 2**), which would have been clearly visible as *Douwent* approached Haisborough Sand, in time to take successful avoiding action.

The chief officer only monitored *Douwent*'s GPS position against the tracks shown on the GPS receiver and on the 3cm radar display. He did not plot the ship's position on the paper chart. Consequently, he would have assumed that the vessel was on or close to its intended track. The chief officer would also have not been associating the visible lights and navigational marks with the lights and navigation marks shown on the paper chart.

Although the chief officer completed some minor tasks during the watch, he remained seated for most of the time. There were no vessels causing concern and the next waypoint and course alteration was over 90 miles ahead. Furthermore, the bridge was warm, the vessel was rolling and the chief officer was probably fatigued to some degree after travelling overnight from Poland and not sleeping well during his 2 nights on board. In such conditions, it is likely that he fell asleep for an extended period of time. Indeed, given the absence of any marked course change during the chief officer's watch (**Figure 2**), the possibility that he fell asleep even before the vessel reached Waypoint 26 cannot be dismissed.

Research has shown that alertness and performance tend to be at their lowest during the early hours of the morning. The human circadian rhythm is synchronised with the normal pattern of daytime wakefulness and sleep at night. Adjustment of the rhythm can be achieved during exposure to consecutive night watches over a period of time. In this case, this was the chief officer's first watch on board since returning from leave, and therefore the risk of fatigue was high.

As it is likely that both the presence of the lookout on the bridge and the utilisation of the watch alarm would have prevented the chief officer from sleeping for an extended period, the failure to implement these important precautionary measures was significant.

Actions on grounding

When the master arrived on the bridge, his actions to stop the engine, switch on the echo sounder and plot *Douwent*'s position appear to have been positive and timely. However, it is evident that his attempts to re-float the vessel using maximum engine and helm orders resulted in the rudder coming into contact with the sandy bank with sufficient force to cause its loss. It is concluded that the rudder was not lost prior to the grounding as the vessel would not have been able to maintain the relatively steady course into the shallow water as shown at **Figures 1 and 2**.

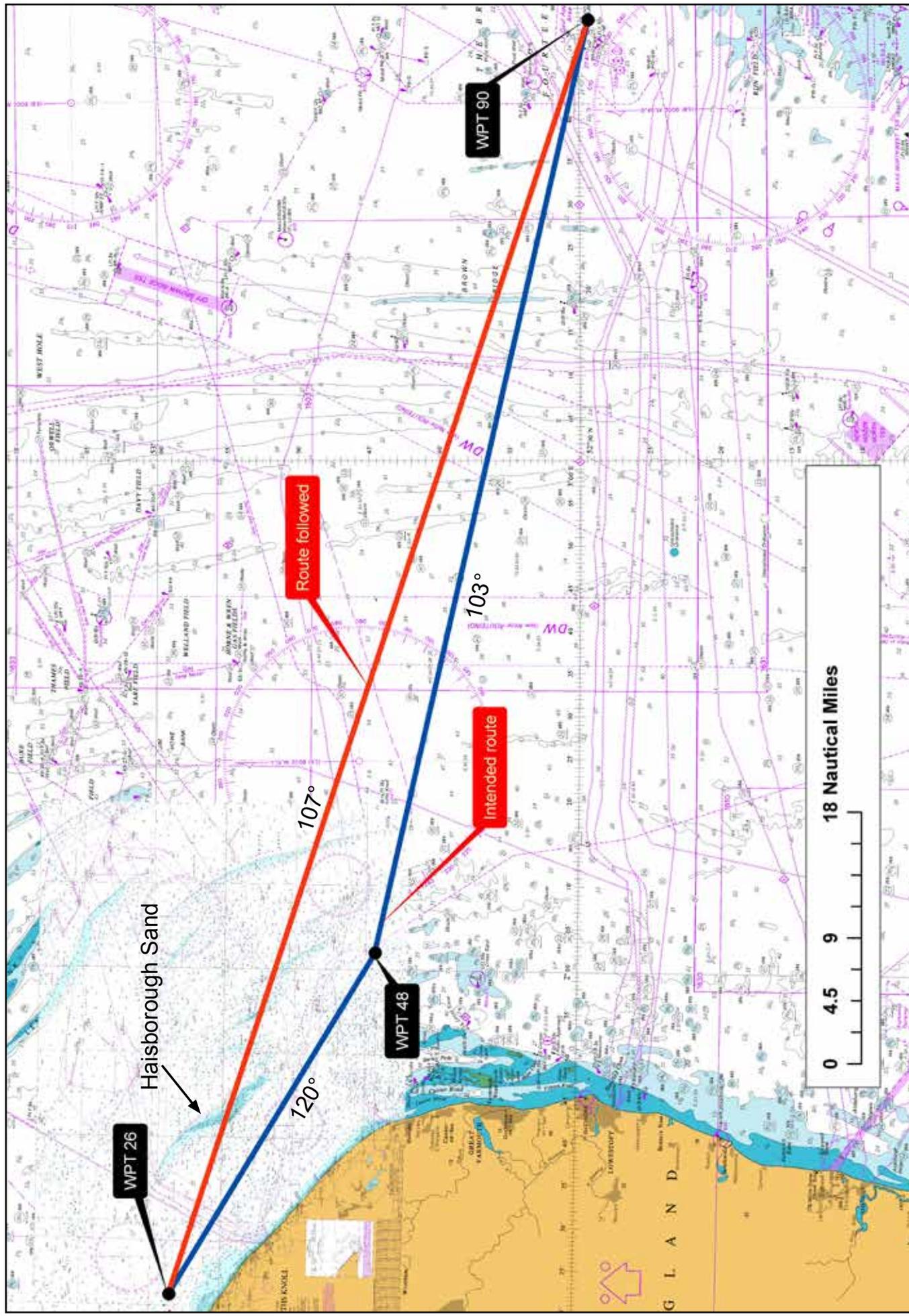


Figure 5: Extract of chart BA 1408 showing the intended route and the route followed

It is also apparent that, apart from the master's initial actions, many of the other actions detailed in the onboard checklist were not followed. In particular, the tides were not checked and there was no immediate assessment of damage. Given that *Douwent* went aground about 30 minutes before low water, it would have been prudent to sound around the vessel and wait until the rising tide reached a similar height 1 hour later (which was when *Douwent* eventually came free) before attempting to manoeuvre.

Safety culture

Although the ship manager had provided clear and comprehensive onboard guidance and instructions, and an interim SMC had been issued to the vessel, the circumstances of this accident are a cause for concern. In particular:

- The passage plan was not checked by the master and, although up to date for correction, the charts were old and in need of replacement.
- Scrutiny of the positions of the waypoints plotted on the paper charts showed that the plotted positions of Waypoints 26 and 48 were approximately 400m from the positions detailed in the passage plan.
- The chief officer relied solely on GPS and did not monitor the vessel's position by any other means. He also did not verify the next course when arriving at Waypoint 26.
- The chief officer left the bridge unattended when on watch.
- The chief officer probably fell asleep.
- No additional lookout was posted on the bridge during hours of darkness.
- The bridge watch alarm was switched off.
- Important elements of the checklist for grounding were not followed.

The subsequent actions of *Douwent's* master and chief officer are also of concern. It is clear from the retrospective entries in the deck log and the positions plotted on the paper chart after the grounding (**Figure 2**), the failure to inform the coastguard that the vessel was or had been aground and the inaccuracies in the incident report forwarded to the ship's manager, that the master and chief officer attempted to cover up what had actually happened.

In view of the circumstances which led to *Douwent* grounding and the subsequent lack of integrity demonstrated by the master and the chief officer, much work is clearly required by the ship manager to encourage and then maintain a more positive safety culture on board.

CONCLUSIONS

- *Douwent* departed from the intended route because the waypoint selected as the destination in the GPS receiver did not follow the sequence of waypoints detailed in the voyage plan.
- The chief officer did not notice that the vessel had deviated from the intended route because he relied solely on GPS and did not verify the course the vessel was following or plot the vessel's position on a paper chart.
- The chief officer probably fell asleep for an extended period; he was alone on the bridge and the bridge watch alarm was switched off.
- The vessel's rudder was lost as a result of making contact with the sandy seabed during the master's attempts to re-float the vessel.
- The circumstances of this accident together with the lack of integrity shown by master and chief officer in trying to hide the true sequence of events indicates a lack of a safety culture on board.

ACTION TAKEN

Douwent Shipping Limited

Douwent's owner transferred the vessel from the UK Ship Register to the Liberia Ship Register on 14 April 2013.

Marine Accident Investigation Branch

The chief inspector of marine accidents has forwarded copies of this report to the Liberian Ship and International Corporate Registry and the Panama Maritime Authority to enable the administrations to take the safety issues identified into account during future flag state inspections and ISM audits of Marco Polo Shipping Ltd and its vessels (where applicable).

RECOMMENDATIONS

Marco Polo Maritime Ltd is recommended to:

2014/102 Take steps to foster and maintain a positive safety culture on board its vessels, taking into account the circumstances of this accident, in particular:

- The need to ensure that crews comply with onboard guidance and instructions.
- The importance of passage planning and the need for a high standard of bridge watchkeeping practice.
- The potential for crew fatigue.
- The need for openness and honesty when reporting accidents and near misses.

SHIP PARTICULARS

Vessel's name	<i>Douwent</i>
Flag	UK
Classification society	Bureau Veritas
IMO number/fishing numbers	8703139
Type	general cargo ship
Registered owner	Douwent Shipping Limited
Manager	Marco Polo Maritime Limited
Year of build	1987
Construction	Steel
Length overall	79.9m
Registered length	75.25
Gross tonnage	1311
Minimum safe manning	6
Authorised cargo	general dry cargo

VOYAGE PARTICULARS

Port of departure	Boston, UK
Port of arrival	Amsterdam, the Netherlands
Type of voyage	Short International
Cargo information	In ballast
Manning	6

MARINE CASUALTY INFORMATION

Date and time	26 February 2013 at 0256 (UTC+1)
Type of marine casualty or incident	Serious
Location of incident	Haisborough Sand, North Sea
Place on board	Ship
Injuries/fatalities	None
Damage/environmental impact	Lost rudder. No pollution
Ship operation	On passage
Voyage segment	Mid-water
External & internal environment	Wind: north-east force 7-8 Sea state: Rough to very rough Visibility - good
Persons on board	6