ACCIDENT REPORT

Report on the investigation of the

contact between the ro-ro cargo ferry

Clipper Point

at the Port of Heysham's South Quay,

and two berthed ships

on 24 May 2011

MAIB
MARINE ACCIDENT INVESTIGATION BRANCH

SERIOUS MARINE CASUALTY | REPORT NO 16/2012 | June 2012

Extract from

The United Kingdom Merchant Shipping

(Accident Reporting and Investigation)

Regulations 2005 – Regulation 5:

"The sole objective of the investigation of an accident under the Merchant Shipping (Accident Reporting and Investigation) Regulations 2005 shall be the prevention of future accidents through the ascertainment of its causes and circumstances. It shall not be the purpose of an investigation to determine liability nor, except so far as is necessary to achieve its objective, to apportion blame."

NOTE

This report is not written with litigation in mind and, pursuant to Regulation 13(9) of the Merchant Shipping (Accident Reporting and Investigation) Regulations 2005, shall be inadmissible in any judicial proceedings whose purpose, or one of whose purposes is to attribute or apportion liability or blame.

Front cover image courtesy of Martin Edmondson

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GLOSSARY OF ABBREVIATIONS AND ACRONYMS

BRM	-	Bridge Resource Management
CCTV	-	Closed Circuit Television
CPP	-	Controllable pitch propeller
DfT	-	Department for Transport
DPA	-	Designated Person Ashore
ECS	-	Electronic Chart System
IMO	-	International Maritime Organization
kW	-	kilowatt
LOA	-	Length overall
LPS	-	Local Port Service
m	-	metre
MCA	-	Maritime and Coastguard Agency
MSMS	-	Marine Safety Management System (Port of Heysham)
OOW	-	Officer of the watch
PEC	-	Pilotage Exemption Certificate
PMSC	-	Port Marine Safety Code
Ro-ro	-	Roll on, roll off (ferry)
Seatruck	-	Seatruck Ferries Limited
SMS	-	Safety Management System
STCW	-	International Convention on Standards of Training, Certification and Watchkeeping for Seafarers
UKC	-	Under keel clearance
UTC	-	Universal Time, Co-ordinated
VDR	-	Voyage Data Recorder
VHF	-	Very High Frequency

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

SYNOPSIS

On 24 May 2011, Seatruck Ferries Limited's ro-ro cargo ferry, *Clipper Point,* made heavy contact with the quay, two ro-ro ferries and another vessel while manoeuvring to berth stern-first at the Port of Heysham's No.1 linkspan. *Clipper Point* sustained damage to her starboard quarter and her steering compartment was holed below the waterline.

During a scheduled arrival into the port, the wind increased to 34 knots and the ship was set closer to the port's South Quay than was intended. After *Clipper Point* narrowly missed one of two vessels that were alongside South Quay, the master attempted to turn the vessel to port in his usual manner; however, the vessel was out of position and only one of the ship's two bow thrusters was operational. At 0516 the starboard quarter of *Clipper Point* made contact with South Quay, holing the ship below the waterline. The tug skipper, who had been standing by in his vessel to assist *Clipper Point* conduct the turn, decided not to engage his tug due to the risk of damage to his own vessel. *Clipper Point*'s master persevered with the turn and the ship subsequently made contact with two other ro-ro ferries that were berthed at No.2 and No.3 linkspans before it was finally secured at No.1 linkspan.

The master's decision to enter the Port of Heysham, with strong winds, reduced bow thruster power, and restricted manoeuvring room was ill-considered. The teamwork between the officers on the bridge was ineffective and the master had no contingency plan once the manoeuvre started to go wrong. The bridge controls were awkward to use; they and the navigational information provided at the bridge wings did little to support the master in conducting what was a very challenging berthing manoeuvre.

Management of the marine risks in the Port of Heysham was incomplete. What guidance there was had not been properly communicated to masters or the companies that they worked for. Too much of the control of marine risks had, effectively, been delegated to the vessel operators.

Seatruck Ferries Limited's managers had produced some guidance for their masters, but masters were not required to follow it and the limits that had been set out were routinely exceeded. Little training was provided and there was no opportunity for bridge teams to understand the effects of equipment failures in a controlled, safe environment.

Neither Seatruck Ferries Limited nor the Port of Heysham's safety management systems had properly controlled the risks that their organisations faced from berthing operations. These factors combined to place too much emphasis, on the success or failure of berthing in the Port of Heysham, onto the master. This had the effect of creating a single, human, point of failure and it was inevitable that a 100% success rate could not be maintained.

Both Seatruck Ferries Limited and The Port of Heysham have taken action to address the investigation's findings, and recommendations have been made to both organisations to ensure that the proposed actions are implemented. In addition, the Maritime and Coastguard Agency (MCA) has been recommended to carry out a Port Marine Safety Code 'Health Check' of the Port of Heysham in early 2013.

SECTION 1- FACTUAL INFORMATION

1.1 PARTICULARS OF *CLIPPER POINT* AND ACCIDENT

SHIP PARTICULARS	
Flag	Cyprus
Classification society	Det Norske Veritas
IMO number	9350666
Type	Ro-ro cargo ship
Registered owner	Delfos Naviera AIE, Spain
Manager(s)	Seatruck Ferries Limited
Construction	Steel
Length overall	142.0m
Registered length	133.0m
Gross Tonnage	14759
Minimum safe manning	11
Authorised cargo	No
VOYAGE PARTICULARS	
Port of departure	Warrenpoint, County Down, UK
Port of arrival	Heysham, Lancashire, UK
Type of voyage	Coastal
Cargo information	Ro-ro cargo
Manning	22
MARINE CASUALTY INFORMATION	
Date and time	24 May 2011 0516
Type of marine casualty or incident	Serious Marine Casualty[1]
Location of incident	Port of Heysham
Place on board	Steering gear room
Injuries/fatalities	Nil
Damage/environmental impact	Hull damage
Ship operation	Manoeuvring
Voyage segment	Arrival

External & internal environment	Wind - Force 8 Gale (34 - 40 knots) Weather - Clear Light – Daylight Visibility - Moderate
Persons on board	22

Image courtesy of Martin Edmondson

Clipper Point

[1] MSC-MEPC.3/Circ.3 dated 18 December 2008

Serious (marine) casualties are casualties to ships which do not qualify as very serious casualties and which involve a fire, explosion, collision, grounding, contact, heavy weather damage, ice damage, hull cracking, or suspected hull defect, etc., resulting in:

- Immobilization of main engines, extensive accommodation damage, severe structural damage, such as penetration of the hull under water, etc., rendering the ship unfit to proceed, or
- Pollution (regardless of quantity); and/or
- A breakdown necessitating towage or shore assistance.

1.2 BACKGROUND

Clipper Point and a sister ship operated a ro-ro cargo service between Warrenpoint in Northern Ireland and the Port of Heysham in Lancashire, England. The service provided morning and evening sailings between the two ports, with a transit time of around 8 hours.

Like the majority of the ferries calling at the Port of Heysham, *Clipper Point* discharged and loaded cargo over the stern and, once in the harbour, had to turn through 180° before berthing stern first onto the linkspan.

Information from the vessel's Voyage Data Recorder (VDR) was used extensively during the investigation to provide the sequence and timings of events, and to show how manoeuvring and propulsion equipment was used.

1.3 NARRATIVE

1.3.1 Pre-arrival

Clipper Point departed Warrenpoint at 2000 on 23 May 2011 and sailed for the Port of Heysham as scheduled. The wind was west-south-west force 5 to 7 throughout the voyage across the Irish Sea.

At 0317 the following day, the second officer, who was on duty as the officer of the watch (OOW), called the Port of Heysham's duty manager by very high frequency (VHF) radio and gave him *Clipper Point*'s estimated time of arrival. The duty manager informed the OOW that the wind speed in the port, provided by an anemometer positioned at the port entrance, was 35 knots from the west-south-west with a peak reading of 39 knots. The duty manager also informed the OOW that there were two small vessels secured alongside at the western end of South Quay. The duty manager did not ask if *Clipper Point* had any defects, and the OOW did not tell the duty manager that one of the ship's two bow thrusters was inoperative. At 0318 the OOW phoned the master and relayed the information to him. The master instructed the OOW to order a tug, ready to assist with the vessel's arrival in the port.

The master arrived on the bridge at 0352 and reviewed the wind information that was provided by his company's anemometer (also located at the port entrance) as well as the latest wind forecast from the Met Office and from the internet website 'www.windfinder.com' that provided hourly wind predictions for the local area. The forecasts all predicted that the wind speed would reduce over the next few hours, but that the possibility of stronger gusts remained.

Clipper Point passed the Lune Deep buoy at 0355 **(Figure 1)** and the master reported the ship's position to the duty manager by VHF radio as required by the port's procedures. The duty manager told the master that the wind speed was 35 knots, and confirmed that the tug, *Sea Trojan,* was available. The master informed the duty manager that he would continue on his approach to the port.

The ro-ro cargo ferry *Scotia Seaways* was astern of *Clipper Point* and also heading towards Heysham. At 0356, *Clipper Point*'s master called *Scotia Seaway*'s master by VHF radio and requested that she overtake and enter the port ahead of his vessel in order to allow more time for the wind to decrease as forecast. This was agreed, and

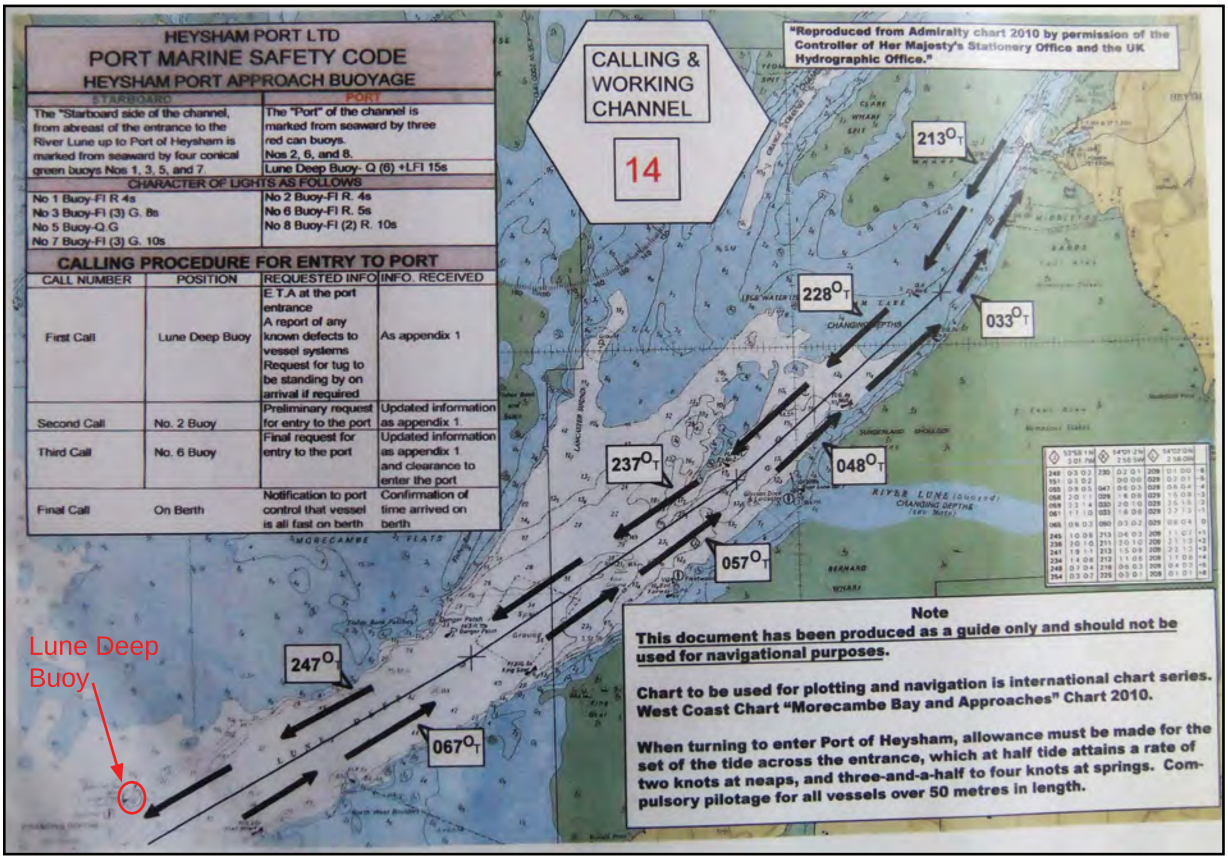

Figure 1: Port of Heysham port approach procedure

at 0400 *Clipper Point* slowed to allow *Scotia Seaways* to overtake. *Clipper Point*'s master ordered cargo unlashing to be postponed until he could confirm that the ship would berth alongside.

At 0406 the port's duty manager reported to *Scotia Seaways'* master that the wind speed at the port entrance was 32 knots. On *Clipper Point*, the chief officer relieved the second officer as OOW at 0424.

At 0437 the master told the chief officer that the wind speed was ranging between 27 and 33 knots and that the necessary manoeuvres in the port should be achievable with tug assistance.

The master called *Sea Trojan* **(Figure 2)** by VHF radio at 0438 to establish communications. The tug's skipper stated that he would wait close to No.1 berth **(Figure 3)** until required. The master then advised the tug's skipper that he wanted the tug to push *Clipper Point*'s bow round to port until the bow had passed through the direction of the wind, and then stand by to push the ship alongside if required.

At 0446 the master advised the chief officer that as there were two vessels berthed on South Quay, he intended to turn early and use full engine power to turn the ship to port.

The master called the port control office at 0456 as *Clipper Point* passed No.6 buoy; the duty manager told him that the wind at the port's entrance was now 28 knots from the west-south-west, with an average speed during the previous 10 minutes of 25 knots.

Figure 2: The tug *Sea Trojan*

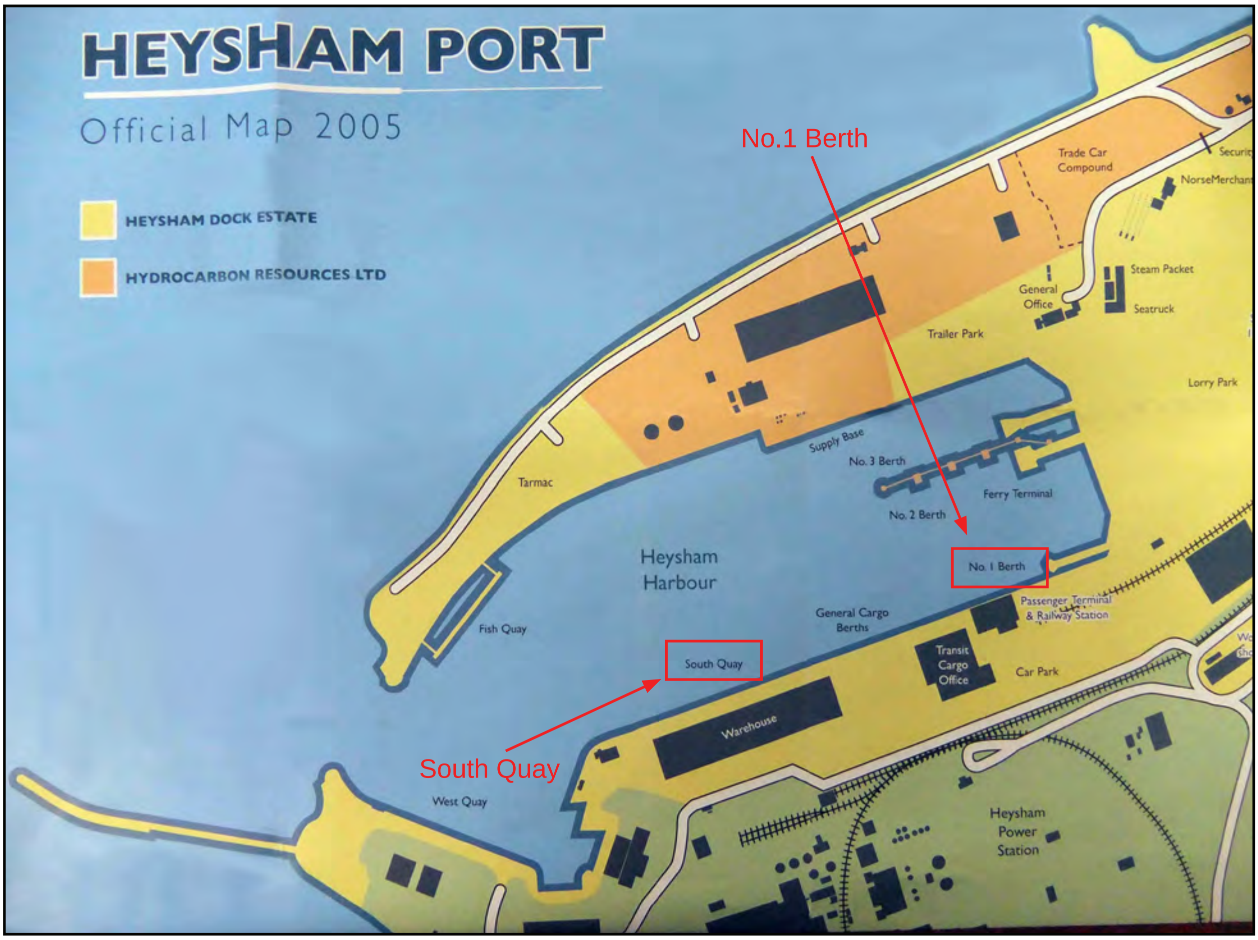

Figure 3: Plan of Heysham Harbour (2005)

At 0501 the master again mentioned the wind speed to the chief officer, stating that he thought the berthing manoeuvre was achievable. The master then provided an update of the planned approach into Heysham, probably to the chief engineer, by telephone, and finished his conversation with 'if not we'll crash'.

1.3.2 Harbour entry

At 0507, as *Clipper Point* approached the harbour entrance, the master saw the two vessels that were alongside South Quay **(Figure 4)** and then identified the vessel that was close to No.1 jetty as *Sea Trojan*. The master remained at the centre console; the chief officer, standing on the port bridge wing, monitored the ship's position in relation to the North Roundhead[2]. The third officer, at the aft mooring station, monitored the distance of the stern from the South Roundhead. *Clipper Point* approached the Roundheads and, at 0512, the master used the rudders to turn the ship to port and reduced pitch on the propellers to slow the vessel.

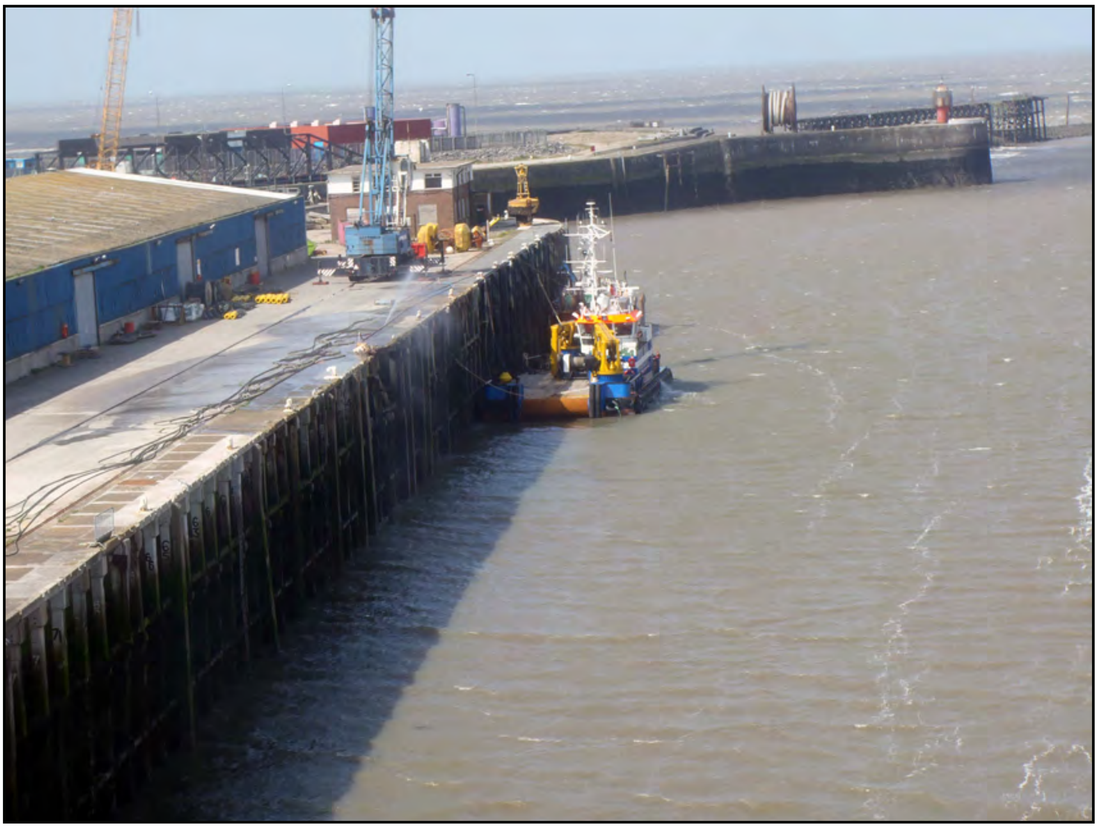

Figure 4: Position of the two vessels alongside South Quay

At 0513 *Clipper Point* passed between the Roundheads **(Figure 5)** at a speed of around 8 knots. Once the stern was clear of the Roundheads the master placed the rudders hard to starboard. He also used the one functional bow thruster to push the bow to starboard in order to stop the turn to port and steady the ship's heading.

The chief officer moved to the starboard bridge wing as *Clipper Point*'s bow came level with the vessels that were alongside South Quay. At the same time, the ship's speed reduced to about 3.5 knots and the wind speed increased to around 34 knots.

[2] The Roundheads are the circular extremities of the breakwaters at the entrance to the Port of Heysham

Figure 5: Ferry passing through the Port of Heysham's Roundheads

At 0515:20 *Clipper Point* was heading 050º **(Figure 6)**, but with a course over the ground of around 070º (parallel to South Quay). The third officer reported the distance to the vessels that were alongside at South Quay; the first, a fishing boat at the western end of South Quay and then, next to it, the 11m beam work boat *MPR2* as *Clipper Point* came further into the harbour.

The ship's forward speed through the water was down to 2 knots when the master briefly used the twin high lift rudders and thrust the bow to starboard[3] in an attempt to lift the stern away from *MPR2* berthed on South Quay. Although the ship's heading did not change significantly, the combination of the manoeuvre and the wind set *Clipper Point* towards South Quay.

At 0516 the third officer reported that *Clipper Point*'s stern had cleared *MPR2* by a distance of about 0.5m, 8 seconds later he reported that the stern was 4m away from South Quay. The master used the single bow thruster to push the bow to port, and put both rudders full to port. He put the port propeller pitch astern and increased ahead pitch on the starboard propeller with the intention of starting a short turn round to port. Although the master was aware that his vessel was now closer to South Quay than was usually the case, he had always manoeuvred in the harbour by turning to port and had not considered an alternative method, or how a turn could be aborted safely.

[3] The terminology used throughout this report to describe the use of the bow thruster refers to the direction in which the vessel's bow was moved, ie 'thrusting the bow to starboard' means that the bowthruster was used in order to move the bow laterally to starboard.

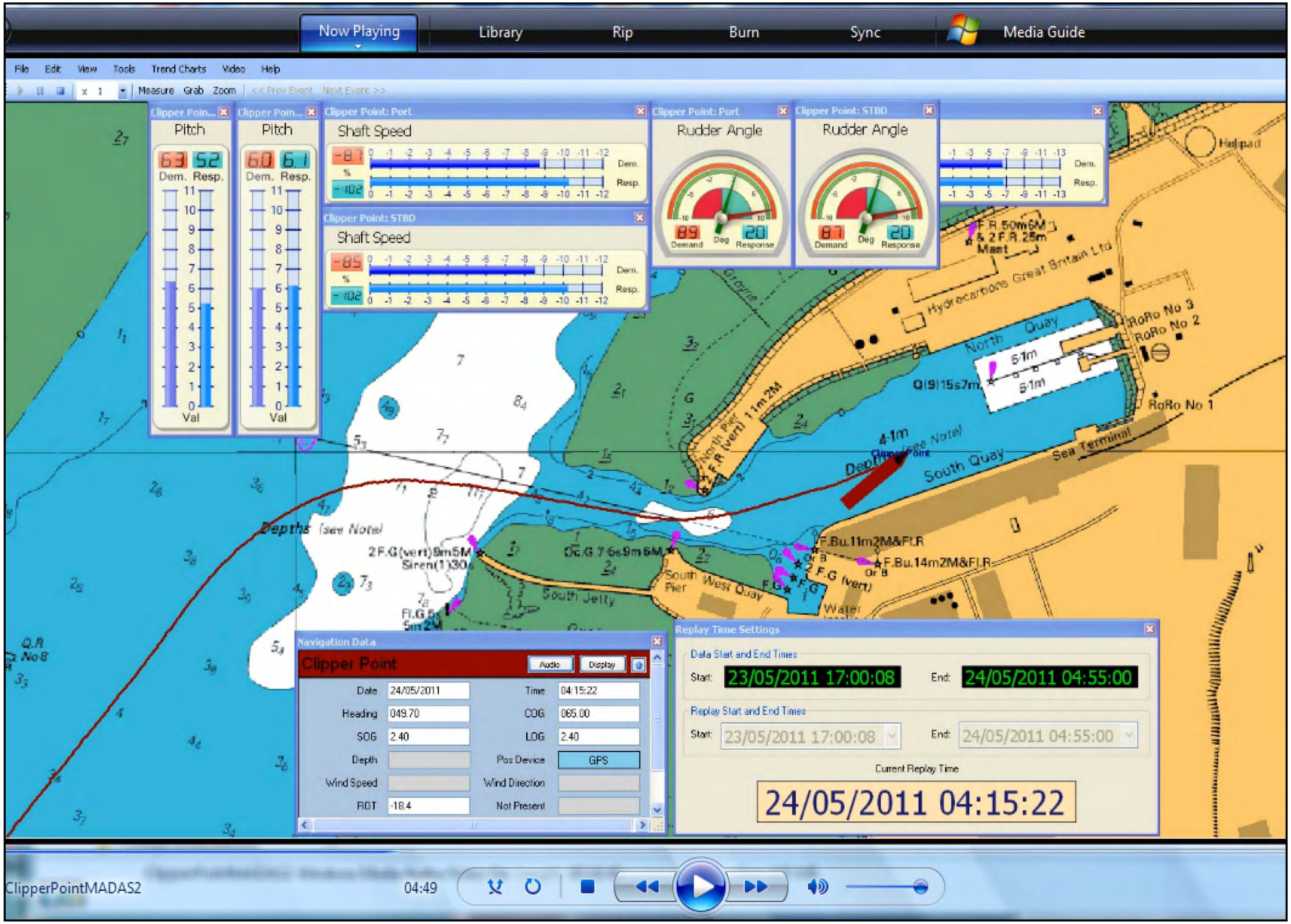

Figure 6: *Clipper Point*'s position and propulsion status prior to contact

1.3.3 Contact

At 0516:40, *Clipper Point*'s starboard quarter made heavy contact with South Quay, stopping the ship's swing to port. The master instructed the chief officer to ask the tug to push the bow to port. The master was unable to see the tug's location from his position on the bridge, and was unaware that *Sea Trojan* had remained between No.1 and No.2 berths **(Figure 3)**, well clear of *Clipper Point*.

The master made further demands for the chief officer to instruct the tug to push against the bow. The tug's skipper had seen *Clipper Point*'s contact with South Quay and knew that she was out of position and might need to abort the turn. The tug's skipper decided not to push against *Clipper Point*'s bow as requested because he was concerned about damaging his vessel, but he did not communicate this to *Clipper Point*'s chief officer because he thought it would be obvious to see. The master made more requests for the chief officer to tell the tug skipper to assist while the ship continued towards the ferries *Clipper Ranger*, alongside at No.2 berth, and *Scotia Seaways*, alongside at No.3 berth **(Figure 7)**.

Figure 7: *Clipper Ranger* (No.2 berth) and *Scotia Seaways* (No.3 berth)

At 0516:45 the master started to transfer control from the centre console to the port bridge wing console. At 0518:00, having taken control on the port bridge wing, the master switched the control of propeller pitch to the emergency mode, which provided him with immediate pitch response. At the same time, *Sea Trojan* started to push on *Clipper Point*'s starboard shoulder. Control of the starboard propeller's pitch did not engage immediately and the master regained control at 0518:50.

Clipper Point's bow made contact with *Scotia Seaways'* port bow at around 0520 before striking the jetty's circular fender, known locally as the 'doughnut' **(Figure 7)**. *Clipper Point*'s stern swung to starboard and, at 0523, the starboard shoulder made contact with the bow of *Clipper Ranger*. The effect of the wind reduced and the master allowed the stern to continue to swing to starboard until he was able to move *Clipper Point*'s bow to port and away from *Clipper Ranger*'s bow. *Clipper Point* then started to swing to port to continue its turn; during this process *Sea Trojan* made further contact with *Clipper Ranger* and had to stop pushing against *Clipper Point*.

1.3.4 Berthing

As the master manoeuvred *Clipper Point* astern, the stern made contact with South Quay again. The master continued with the manoeuvre and, at 0528, *Clipper Point* was secured alongside No.1 berth.

At 0535 the steering gear bilge level alarm sounded in the engine control room. The chief engineer telephoned the master and told him about the alarm and then started to pump the bilge water overboard. The chief engineer went to the steering gear compartment and confirmed that it was holed. The master then filled the forward ballast tanks and emptied the aft ballast tanks to lift the hole in the stern clear of the water. The chief officer also had 11 self-drive trailers, which were parked at the aft end of the vehicle deck, driven ashore. By 0548, the damaged hull section was raised above the water.

1.4 DAMAGE

The shell plating on the starboard side of *Clipper Point*'s stern was severely indented and punctured around 300mm below the normal waterline over an area measuring 3.5m long by 1.5m high **(Figure 8)**. The associated internal frames were also buckled. The starboard quarter was heavily indented 5m above the waterline at main deck level, with a puncture that measured 700mm long by 350mm high.

The upper edge of South Quay was damaged over a length of around 5m, set in by 0.8m and one mooring bollard was dislodged. South Quay's lower level and supporting structure was also heavily damaged **(Figure 9)**.

Scotia Seaways' port bow bulwark plating and two internal frames were damaged over a length of around 3m **(Figure 10)**. *Clipper Ranger*'s port bow sustained minor damage to port bow bulwark plating.

1.5 WEATHER AND ENVIRONMENTAL DATA

Recorded conditions on the day of the accident were:

- Sunrise – 0457
- High water 0448; 2 days before neaps, tidal range 5.7m
- Height of tide at the time of the accident – 8.1m (*Clipper Point*'s draught was 5.35m forward and 5.45m aft)
- Visibility – good
- Wind – west-south-west 20 to 25 knots gusting to 34 knots.

Figure 8: Damage to *Clipper Point*

Figure 9: Damage to South Quay

Figure 10: Damage to *Scotia Seaways*

Information about wind strength and direction was available to the master from instruments on *Clipper Point*'s bridge as well as other external sources. Just before *Clipper Point* entered the port, the master received a report that the wind speed was 27 knots. As *Clipper Point* entered the port the wind was observed to increase in speed to 34 knots.

1.5.1 Weather forecast

The master had received: the Meteorological Office's shipping forecast for the Irish Sea; the inshore waters forecast and strong wind warnings for the area which included the Port of Heysham; and the Meteorological Office's general weather forecast for Heysham.

The inshore waters forecast from 1200 UTC on 23 May 2011 **(Annex A)** stated, inter alia:

Wind - Southwest veering West 7 to severe gale 9, decreasing 5 or 6 later

Weather – Squally showers

The Meteorological Office's Heysham 5-day weather forecast **(Annex B)**, updated at 1042 on Monday 23 May 2011, stated the following for 24 May:

0400: Wind WSW 27 mph (23 knots), gusts 50 mph (43 knots)

0700: Wind WSW 25 mph (22 knots), gusts 46 mph (40 knots)

1000: Wind W 26 mph (22.5 knots), gusts 49 mph (42 knots)

The master also referred to the 'www.windfinder.com' website. This provided hour by hour wind and weather predictions for Heysham **(Annex C)**. The forecast was updated at 1017 on 23 May and predicted the wind for 24 May as being:

0400: Wind W 19 knots, gusts 28 knots

0500: Wind W 18 knots, gusts 27 knots

0600: Wind W 17 knots, gusts 25 knots

1.6 BRIDGE MANNING

At the time of the accident the bridge was manned by the master and the chief officer. This met both Seatruck Ferries Ltd (Seatruck) and the Port of Heysham's requirements for minimum bridge manning.

1.6.1 The master

The master, a 58 year old British national, held an STCW II/2 Certificate of Competency as master, limited to the Local European Area. He joined Seatruck in 2008 as chief officer, gained his pilotage exemption certificate (PEC) for the Port of Heysham in 2009 and was promoted to master in May 2010. He first joined *Clipper Point* as master in September 2010.

At the time of the accident he was well rested, having been off duty overnight since departing Warrenpoint the evening before. He worked a cycle of 2 weeks on board, followed by 2 weeks on leave.

1.6.2 The chief officer

The chief officer was a 59 year old British national with an unlimited STCW II/2 Certificate of Competency. He joined Seatruck as chief officer in November 2010 and had previous experience of working on ro-ro cargo ships. The chief officer did not keep watches and was well rested at the time of the accident. He too worked a cycle of 2 weeks on board, followed by 2 weeks on leave.

1.7 *CLIPPER POINT*

1.7.1 P-class ships

Clipper Point was one of four 142m length overall (LOA) P-class vessels that were operated by Seatruck Ferries. These ships were considered by Seatruck Ferries managers' to be the maximum size ferry that could be routinely operated in the Port of Heysham.

1.7.2 Ergonomics

The bridge centre console provided independent pitch controls for the two propellers (including emergency pitch override), synchronised pitch control to the bow thrusters, and either independent or combined control of the two rudders.

The control consoles at each of *Clipper Point*'s fully-enclosed bridge wings **(Figure 11)** provided the same propeller, bow thruster and rudder controls as the centre console. To transfer control from one console to another, each of the control levers had to be manually aligned separately with the corresponding control position on the master console. Control was then transferred by pushing separate buttons for each of the individual control functions. If the levers were not aligned correctly an alarm sounded and control could not be passed.

When more than 60% of the maximum propeller pitch was ordered, the propulsion power management system limited the rate of propeller pitch increase to stop the engine being overloaded. This safety function was disabled when emergency pitch control was selected. If an operator increased pitch too rapidly in this mode, there was a risk that a main engine could shut down if any of its own protection features (such as engine over-speed) were activated.

The electronic chart system (ECS) display, ship's heading, rate of turn, wind speed and direction, as well as log speed and ground speed information, were displayed on the centre console **(Figure 12)**. The consoles at the bridge wings only provided wind speed and direction, shown on a square, 100mm sided display **(Figure 13)**.

Other similarly sized ferries that called at the Port of Heysham were fitted with synchronised propeller and bow thruster controls at each of the control stations. These were kept aligned automatically, simplifying the process of transferring control. Instruments provided at the bridge wings provided heading and speed information, as well as large easy to read indications of rudder angle. The open bridge wings of these vessels also provided the bridge team with an immediate appreciation of the actual wind speed and direction **(Figure 14)**.

Figure 11: *Clipper Point* - Bridge wing consoles

Figure 12: *Clipper Point* - Bridge centre console

Figure 13: Bridge wing wind indicator

Figure 14: Bridge wing arrangement of a ship similar to *Clipper Point* operating from the Port of Heysham

1.7.3 Bridge Team Management

Clipper Point's master and chief officer normally operated as follows when entering Heysham with the assistance of a tug:

As *Clipper Point* approached the Roundheads the master controlled the ship from the centre console. The chief officer monitored the ship's position in relation to the North Roundhead from the port bridge wing and advised the master of the clearing distances. The officer at the aft mooring station reported when the starboard quarter was clear of the South Roundhead.

Once inside the port and clear of the Roundheads, the master would start turning the ship to port. The chief officer moved to the starboard bridge wing to monitor the distance between the vessel's starboard quarter and any vessels alongside South Quay, and/or South Quay itself. He also made all radio communications with the tug's skipper, passed the master's instructions and monitored the tug's actions. Once the stern was clear of any vessels alongside South Quay, the master set the bow thrusters to push the bow to port, set the port propeller pitch astern, the starboard pitch ahead and put both rudders to port. Once the turn had started, the master moved to the port bridge wing, aligned each of the propeller pitch, bow thruster(s) and rudder controls and transferred each control function in turn.

The master and chief officer then talked to one another across the width of the bridge until the ship was manoeuvring astern onto the berth, when the chief officer joined the master on the port side. The officer stationed aft also provided the bridge team with a verbal countdown of the stern's distance from the final berthing position.

Other bridge teams on vessels calling into the Port of Heysham operated differently. On one vessel both the master and the PEC-holding chief officer alternated the ship-handling role daily; this allowed each to observe the other's actions, provided support to one another and quickly identified any omissions or errors in judgment. Transfer of control between consoles was verified before the supporting officer joined the officer who was in charge of manoeuvring the ship **(Figure 15)**. The master and chief officer transferred control from the centre console to the starboard bridge wing once the stern was inside the port's Roundheads; this allowed both officers to monitor the stern's position during the swing compared with South Quay, and any berthed vessels. The two officers then transferred to the port bridge wing once the stern was well clear of South Quay to enable them to watch the ship's port side as the vessel approached the berth.

1.7.4 Windage

Clipper Point's manoeuvring booklet estimated the wind forces acting on the vessel **(Annex D)** in different scenarios. The forces from the effect of wind acting on the vessel while it was in a fully loaded condition are shown in **Table 1** below.

Wind speed – knots	Lateral wind (beam on) Force – tonnes	Head or Stern wind force – tonnes
19.4	11.1	3.3
29.2	24.9	7.4
38.9	44.2	13.2

Table 1: Wind Force Moments – loaded condition

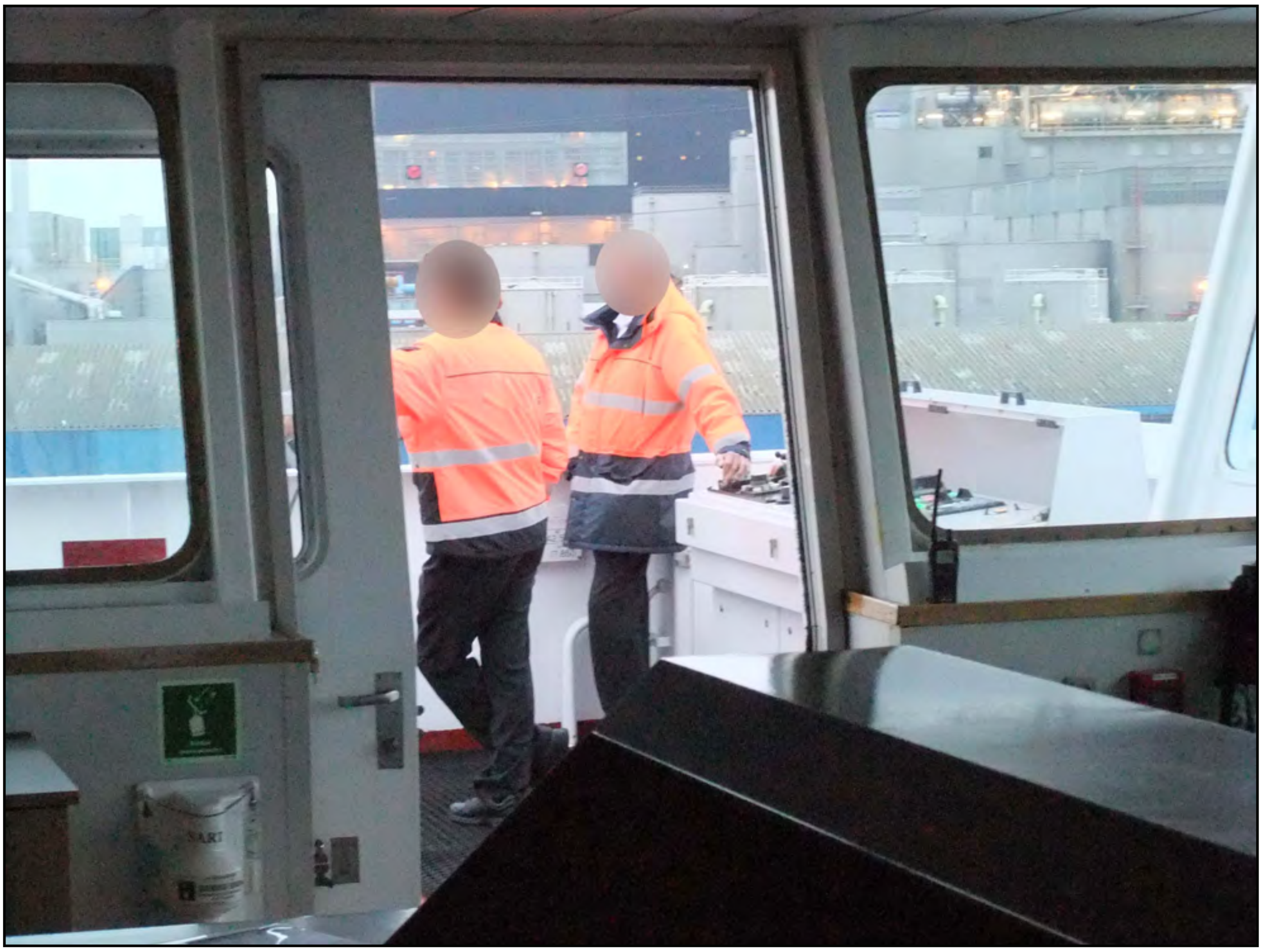

Figure 15: Bridge team on board a ship similar to *Clipper Point* operating from the Port of Heysham

With observed wind speeds of around 35 knots during *Clipper Point*'s berthing manoeuvre, it is estimated that the maximum force from a beam wind acting on the ship would have been over 35 tonnes.

1.7.5 Bow thruster availability

At the time of the accident, only the after one of the two 1000kW bow thrusters fitted to *Clipper Point* was operational.

Clipper Point's starboard shaft generator provided power for the forward bow thruster; the port shaft generator provided power for the aft bow thruster. The starboard shaft alternator was taken out of service on 23 April 2011 due to excessive vibration, consequently the forward bow thruster could not be used.

Previously, the aft bow thruster had been unavailable between 18 October 2010 and 3 January 2011 due to a defective port shaft alternator; and between 19 January and 27 March 2011 due to a burnt out motor.

1.7.6 Tug use

Clipper Point's master had previously berthed with the assistance of the tug *Sea Trojan* three times during May 2011. On each occasion one of the bow thrusters was not available and the wind speeds were between 24 and 33 knots.

1.7.7 Weather delays

Late arrivals and the reasons for such delays were reported to Seatruck's managers. On occasion, managers required masters to justify why they had decided to delay an arrival, particularly when competitors' vessels had not been significantly delayed. A series of emails between a master and a senior manager dating from 31 March 2010 illustrated one such occasion and the priority given to maintaining the schedule wherever possible.

In the year before the accident *Clipper Point* and a sister ship *Clipper Panorama* had, between them, delayed their arrival into Heysham on three occasions due to high winds, and nine times due to restricted visibility. The master on duty at the time of the accident had postponed entering the Port of Heysham once due to high wind conditions, once when one of the two bow thrusters was unavailable and twice due to restricted visibility.

1.8 SEATRUCK FERRIES

1.8.1 Guidance to masters

Seatruck's Safety Management Manual clearly endorsed the master's overriding authority and provided standing orders for the officers and crew. The company's Operational Procedures Manual provided a procedure for 'Navigating with a Pilot', however there was no guidance on how masters holding PECs should navigate vessels in pilotage waters. The list of master's duties provided by the company included a specific requirement for masters to train their chief officers in the master's duties.

Company managers issued Seatruck Ferries Fleet Notice, SFN 11 **(Annex E)** on 11 March 2009. This was prompted by contact between *Clipper Point* and the North Roundhead in October 2008 during an attempt to enter the harbour in wind speeds in excess of 30 knots. SFN 11 included a risk assessment of '*All aspects of the conduct of navigation in the approaches and within Heysham Harbour'* that had been conducted by a senior master and the company's Safety, Quality and Marine Manager. SFN 11 stated that the guidance should be consulted on each arrival into the Port of Heysham and that, inter alia, the following should be considered by the master prior to entering the port:

- *The current wind speed and direction*
- *The forecast wind speed and direction*
- *If the wind speed exceeds 29 knots the master should not attempt to make an approach or manoeuvre within the harbour*
- *Whether South Quay is clear, or not*
- *On each occasion, and in addition to the above guidance, the master must use his own personal knowledge and experience and take into account the manoeuvring characteristics of his vessel. Any known defects to propulsion (including bow thrusters), steering, navigational equipment or anchors should also be considered.*

The notice provided a matrix to establish a 'Risk Factor' for manoeuvring in the port depending on factors including wind speed and direction. *Clipper Point*'s master had not consulted SFN 11 on 24 May 2011; he was aware of some advice relating to wind speed and direction but could not recall any guidance that cautioned against entering the harbour if the wind speed exceeded 29 knots.

1.8.2 Training

Seatruck's managers relied on their masters' professional competence and PEC certification to manoeuvre the company's vessels successfully. Training for new masters was based on advice and practical guidance from existing masters during vessels' normal operating schedules.

Bridge teams were not provided with company specific Bridge Resource Management (BRM) training. Simulator training was not available as neither the Port of Heysham nor the P-class ships had been modelled. Similarly, ship-handling training, such as through the use of manned models, was not considered necessary by Seatruck's managers.

1.8.3 Alternative manoeuvres in the Port of Heysham

Masters of some vessels routinely calling into the Port of Heysham had considered what alternative manoeuvres could be made if the expected clearing distance from South Quay (or vessels berthed alongside) decreased below critical levels. One option included berthing their ship temporarily alongside South Quay with the bow facing the linkspan. Alternatively the ship could be stopped, manoeuvred astern further to the north of the harbour, and turned short round when either the wind conditions moderated and/or the tug was correctly positioned and ready to push.

1.8.4 Future expansion

Four vessels, similar in size to the 'P' class vessels are scheduled to be added to the Seatruck fleet before the end of 2012. This fleet expansion will require the recruitment and training of a significant number of sea staff, including masters and senior deck officers.

1.8.5 Previous accidents

In addition to the contact with the North Roundhead in October 2008[4], *Clipper Point* was involved in a manoeuvring accident on 4 April 2011, with the same master in command as during the accident which occurred on 24 May 2011.

On 4 April 2011, *Clipper Point* was required to shift berth from No.3 linkspan to No.1 linkspan in order to complete loading. A south-south westerly wind had been blowing on *Clipper Point*'s port bow at speeds in excess of 30 knots. The master observed a reduction in wind speed and began the manoeuvre. Both bow thrusters were operational and the master did not require the port's tug to stand by. As the stern of the ship cleared the jetty, the headwind increased, and the master was unable to prevent the bow from shearing to starboard. As the distance from the bow to a supply ship berthed on the North Quay decreased, the master placed the engines astern and used full power to thrust the bow to port.

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[4] *Clipper Point* was under the command of a different master in October 2008.

The vessel was lightly loaded and trimmed by the stern. The bow thrusters were not deep enough in the water to avoid cavitating, and this caused the bow thrusters to shed almost half their combined load. As the distance continued to close between the bow and the alongside vessel, the master took emergency control of the propeller pitch and increased the pitch astern. As the vessel gained sternway the master applied ahead pitch to stop the ship. In doing so, the starboard engine shut down when its overspeed safety limit was exceeded; the starboard shaft and one bow thruster also stopped. The vessel was forced onto the end of the jetty and made contact with *Clipper Ranger*'s bow.

1.9 THE PORT OF HEYSHAM

The Port of Heysham is operated by Heysham Port Limited, which is owned by the Peel Ports Group; it is managed as a limited company in its own right but, for marine matters, is administered by staff from the Mersey Docks and Harbour Company Limited[5]. The port has a 91m wide entrance leading to a harbour that is 213m wide, 730m long, with a charted minimum depth of 4.1m.

1.9.1 Safety Management System

The Peel Ports Group most recently affirmed that its subsidiary companies continued to comply with the Port Marine Safety Code (PMSC) in a group policy statement published in January 2011. Heysham Port Limited operated a marine safety management system (MSMS) that had been in use (and developed and updated) since 2001. The version in use at the time of the accident was published in June 2010.

Prior to the accident, the MSMS was subject to internal audits and reviews by port staff and the group's marine director. A programme of external audits has since been added, with the first external audit of the system in use at the Port of Heysham due to be conducted in 2012. The MCA had not conducted any verification audits or 'health check'[6] visits to the port prior to the publication of this report.

A fundamental part of compliance with the PMSC is to have a formal marine safety management system which should ensure that all risks are controlled. The PMSC recommends that risks should be assessed on a continuous basis, and one of the ways that this was achieved in the Port of Heysham was with a register which summarised each area of risk and the measures that were employed to control those risks. The edition of the *Heysham Formal Marine Safety Assessment Risk Register* in use at the time of the accident was issued on 26 April 2010. The risk of a collision or contact in the port approaches and in the harbour had been identified and a number of relevant hazards had been recorded. These included collisions and contacts resulting from the circumstances summarised in **Table 2**.

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[5] The Mersey Docks and Harbour Company Limited, Manchester Ship Canal Company Limited and Port of Heysham Limited are in the same division of the Peel Ports Group. One harbourmaster and his staff of deputies and assistant harbourmasters administer all three areas. A deputy harbourmaster is nominated to manage the day to day marine issues in Heysham.

[6] Compliance with the Port Marine Safety Code (PMSC) is on a voluntary basis, encouraged by the Department for Transport (DfT) and the Maritime and Coastguard Agency (MCA) as a means of demonstrating statutory compliance and adherence to industry 'best practice'. Port duty holders can self-certify that their port management procedures comply with the PMSC, but DfT and latterly MCA staff can, by invitation, visit ports to check marine safety management systems, offer advice and guidance on achieving the aims of the PMSC. These visits were initially known as verification audits, but have now been rebranded as 'health checks'.

Reference	Hazard	Most relevant control measures[7]
HEY010	Contact with harbour installations	Compulsory pilotage Weather recorded by port control Tug available on request Knowledge of local conditions
HEY011	Poor advice / conduct of the pilot	Pilots local to the port
HEY019	Inadequate tug provision	*Navigation guidelines* *Towage guidelines*
HEY024	Large vessels swinging inside the harbour	Port control provide information to other users on vessels swinging *Navigation guidelines* *Towage guidelines*
HEY027	Increase in wind, sea or swell	*Navigation guidelines* Weather stations at the breakwaters
HEY034	Port users not being informed or consulted on changes to the harbour	Stakeholder meetings Notices to Mariners Byelaws
HEY035	Lack of navigational planning	Passage planning Byelaws PEC and Pilots' examinations
HEY036	Insufficient number of pilots for each vessel movement	Official consultation Pilots conduct dynamic risk assessment

Table 2: Summarised extracts from the 'Heysham Formal Marine Safety Assessment Risk Register'

The Navigation Guidelines referred to as one of the control measures in the risk register had not been established at the time the risk register was compiled and were included in error. At the time of the accident, a draft edition of the Towage Guidelines had been published for consultation with stakeholders.

1.9.2 Harbour operations

The MSMS manual described the procedures for harbour operations and the general management of marine safety. The section titled *'Function and regulation and management of marine safety'* referred to the Heysham Harbour Byelaws 1979 as the principal legislation and the powers of the harbourmaster to make Special Directions to regulate vessel movements in the port's waters. There was no provision giving the Heysham Port authorities the power to make general directions.

[7] Control measures that were not considered to be directly relevant to this accident have been omitted for ease of presentation.

Heysham Port Limited provided the port's users with information to a Local Port Service (LPS) level, as defined in Marine Guidance Note 401[8]. Accordingly, vessels arriving and departing from Heysham were provided with details of the berths in use within the harbour and the local weather conditions. All vessels were required to report any defects with their propulsion or manoeuvring equipment to port control before entering the harbour. There were no guidelines on what defects could be tolerated or when additional control measures should be required. If in doubt, duty port managers were instructed to contact the duty harbourmaster for advice.

Heysham Port Limited did not provide the port's regular users with updated copies of its MSMS, or notify them of changes to the document. The shore-based management team of Seatruck did hold an uncontrolled and out of date copy of the MSMS. However, there was no evidence to indicate that this had been disseminated to masters within its fleet.

1.9.3 Pilotage

The MSMS stated that arriving and departing from Heysham port was a '*complex navigational process'* and compulsory pilotage was required for all vessels over 50m in length. Pilotage services were provided by a third party company working on behalf of Heysham Port Limited. The pilots typically worked with general cargo vessels that visited the port occasionally. It was unusual for them to conduct acts of pilotage on the regular ferry traffic.

Masters and appropriately qualified chief officers of vessels calling regularly at Heysham could apply to obtain a PEC, and most of the acts of pilotage involving ferries were conducted by PEC holders. The Heysham Pilotage Directions required that in order to qualify for a PEC, the applicant must have:

- The appropriate certificates of competency
- Experience of navigating in the port, the port byelaws and port control system
- The ability to manoeuvre the vessel alongside
- Completed at least 10 arrivals and 10 departures to/from the port, at least 4 of which to be during the hours of darkness.
- Satisfactorily completed a 'check ride' under the supervision of a first class pilot.

The MSMS stated that PEC applicants would be provided with a 'PEC Pack', but this pack was not always provided and when it was, its contents varied. PEC applicants were not provided with access to the relevant passage planning sections from the Port of Heysham's MSMS.

Clipper Point's master obtained his first Heysham PEC in 2009 and his PEC for the P class ships in 2010. The chief officer had not begun the process of applying for a PEC. Certificates had to be renewed annually, but the qualification remained valid for 5 years before a check ride was required to re-affirm the holder's performance.

[8] Maritime and Coastguard Agency Marine Guidance Note 401 (Merchant+Fishing) Navigation: Vessel Traffic Services (VTS) and Local Port Services (LPS) in the United Kingdom

1.9.4 Passage planning

Instructions in the MSMS required masters and PEC holders to complete a port passage plan for each and every passage in or out of the port to ensure that the vessel's navigation was planned in adequate detail, with contingency plans where appropriate. Guidance, in accordance with that published by the International Maritime Organization (IMO)[9], was provided in the MSMS on port passage planning. It required the following:

- *The harbour master shall assess passage plans when investigating incidents*
- *A systematic bridge organisation shall be provided that provides for:*
    - *Comprehensive briefing of all concerned with the navigation of the vessel*
    - *Close and continuous monitoring of the vessel's position ensuring as far as possible that different methods of determining the position are used to check against error in any one system*
    - *Cross-checking of individual human decisions so that errors can be detected and corrected as early as possible*
- *Ensure that optimum and systematic use is made of all appropriate information that becomes available to the navigational staff*
- *Ensuring that the intentions of the pilot are fully understood and acceptable to the navigational staff and that the pilot is fully supported especially during periods of restricted visibility.* [sic]

The MSMS also stated that the master or PEC holder of a vessel should consider the height of tide and resulting under keel clearance together with the prevailing wind speed and direction when planning their arrival or departure. No limitations or further guidance, beyond that published by the IMO, were provided. Masters were required, in accordance with the conditions of their PEC, to assess their own knowledge and experience and to take into account the manoeuvring characteristics of their vessels and any defects when deciding to enter or leave the port.

Clipper Point's master was not aware of this guidance, but had completed the P-class generic passage planning pro-forma **(Annex F)** with the expected time of arrival and corresponding tidal heights. His plan did not contain any wind limitations, minimum under keel clearances or contingency plans.

An investigation was conducted by the port's managers following the accident, but the report did not refer to *Clipper Point*'s passage plan.

1.9.5 Towage

Towage in The Port of Heysham was provided on a commercial basis with vessel owners required to contract directly with towage companies to arrange assistance. It was left to the vessel owner and tug operator to decide whether or not a particular tug was suited to the intended task.

[9] IMO Resolution A893 (21)

The tug *Sea Trojan*, built in 1964, was based in Heysham, and offered towage assistance when it was available. It also undertook work away from Heysham and was under no obligations to either the vessel owners or the port authority. The vessel's last recorded test of her towing capacity was conducted in 1999, and achieved a bollard pull of 14.5 tonnes. The tug was generally acknowledged as being unsuited to towing large vessels in the harbour, but it was accepted that it could be used to push against a slow moving vessel to assist with turning. At the time of the accident, *Sea Trojan* was for sale.

The Heysham Port Limited published draft towage guidelines in April 2011, based on a 'standard vessel' and a tug with a minimum bollard pull of 20 tonnes. The ability of *Sea Trojan* to assist a turn was noted and masters of ro-ro ferries were advised to consider using tug assistance when turning in the harbour during high winds. Although a range of parameters to be considered when deciding whether to use tug assistance was provided, there were no guidelines or limiting thresholds to trigger a decision.

1.9.6 Berth availability

At the time of the accident, ro-ro ferry traffic was the major proportion of the trade in the Port of Heysham, with the three linkspans in regular use. Examination of the ferry schedules indicated that there were around 108 vessel movements[10] per week.

In addition to the ferry traffic, the north quay area was used by vessels servicing offshore hydrocarbon-based energy installations. Recent development of local offshore wind turbine fields had increased demand for wind farm support vessels to use the port. The area known as fishermen's quay, at the western extremity of north quay, was not in regular use; it was prone to silting and was not accessible for deep draught vessels throughout the whole tidal range. The western end of South Quay **(Figure 4)** was frequently occupied by manned wind farm support vessels, workboats, fishing vessels and dredgers. Inevitably, this reduced the amount of space in which the ferries could turn before moving astern to berth onto the linkspans.

There were no formal limitations restricting the size of vessels that could use the South Quay berths, it being left to the judgment of the duty port manager and the harbourmaster. Several masters and ferry company representatives reported concerns to the harbourmaster that a ferry might make contact with a vessel berthed on South Quay. One incident was reported on 19 June 2011, where the master of a ferry estimated that during a turning manoeuvre there was as little as 3m clearance between the stern of his vessel and a vessel (in this case a dredger) secured on South Quay. The incident was investigated by the harbourmaster who, after replaying the manoeuvre on the port's closed circuit television system (CCTV), concluded that there was more than 7m clearance between the two vessels, and decided that no further action was needed.

1.9.7 Introduction of the P-class vessels into service

Managers from Seatruck consulted with the Heysham port authorities during the building and commissioning of *Clipper Point* and its P-class sister vessels regarding the capability of linkspans and mooring arrangements. Vessels of a similar size had occasionally operated in the port before this time and, although all parties

[10] Entering or leaving harbour, but not including vessels changing berth within the harbour.

acknowledged that manoeuvring a P-class vessel could be challenging in certain combinations of weather and tidal conditions, the consensus was that it would be achievable.

The first vessel in the class was successfully brought into the harbour under the supervision of the port authority. No further work was conducted to evaluate the safe operating limits, alternative berthing plans or defect thresholds for the class until *Clipper Point* made contact with the north Roundhead while attempting to enter the harbour on 20 October 2008 (see 1.8.1).

1.9.8 Port-user group meetings

Port-user group meetings were held on an ad-hoc basis prior to the accident and were attended by representatives of the port and port users, including ferry operators, energy logistics companies and others.

The meetings were used to discuss the operation of the port, dredging requirements and other issues identified by the port managers, and included an opportunity for 'any other business' to be discussed.

A port user group meeting was held on 30 November 2010 and minutes of the meeting were taken; prior to this meeting, minutes of port user group meetings had never been recorded. The harbourmaster introduced the planned dredging campaign scheduled for the following month along with the option to dredge some of the silt from the north side of the harbour. The dredging would have increased the room available for ferries to swing clear of vessels berthed on South Quay, as well as providing the port with further commercial opportunities for new customers. This additional dredging was supported by the ferry operators, who then raised their concerns for the safety of vessels on South Quay. However, no action was agreed. A safety issue regarding the need for improved lighting of the port entrance was raised by another ferry operator, again no action was agreed. The harbourmaster did agree to '*plan to investigate*' the effect of weather damage to the wooden breakwater at the port entrance on tidal flows, however this plan had not been communicated to port users at the time this MAIB investigation was conducted. The harbourmaster closed the meeting without setting a date for the next one, but requested that the attendees initiate a meeting when there were *'areas you want to discuss'* , and suggested that after the dredging campaign might be a suitable time.

Some safety issues had been discussed and addressed through the port user group meetings, for example, the fitting of remote anemometers on the north Roundhead so the port's duty manager could provide the masters of vessels approaching the port with up to date data on the strength and direction of the wind. However, the accuracy of the anemometers was questioned by several of the ferry masters. In response, Seatruck's managers installed an additional anemometer on the south Roundhead that allowed wind data to be transmitted directly to their vessels.

Concerns from operators about safety issues, such as the near miss between a Seatruck ferry and a berthed dredger on South Quay, were not always discussed openly at these meetings, but dealt with directly between the deputy harbourmaster and company managers.

SECTION 2 – ANALYSIS

2.1 AIM

The purpose of the analysis is to determine the contributory causes and circumstances of the accident as a basis for making recommendations to prevent similar accidents occurring in the future.

2.2 THE BRIDGE TEAM

2.2.1 Preparation for the approach to the Port of Heysham

Prior to entering the port, the master talked to the OOW about the high wind speed, lack of one bow thruster and the presence of the two vessels on South Quay. It was evident from analysis of the VDR that he was conscious of the constraints and the challenges that were involved in turning *Clipper Point* inside the harbour. The master decided to enter the Port of Heysham based on his assessment that he could successfully berth the ship, several times stating to both the OOW and the chief officer his intention to turn the vessel early once inside the harbour.

Company guidance had been provided that should have reinforced the master's view that the manoeuvre would be difficult. The guidance stated that, even with both bow thrusters available, no attempt should be made to enter the harbour when the wind speed was greater than 29 knots. However, the master had not routinely consulted this guidance and was not fully aware of what it contained. Had the master referred to the company guidance he would have realised the prevailing conditions precluded any attempt to enter the harbour for the following reasons:

- The forecast and measured wind speeds were gusting in excess of 29 knots
- *Clipper Point* had only one bow thruster available for use.
- There were two vessels berthed at South Quay, which restricted the space available to safely turn the vessel.

The master's interpretation of the various weather forecasts was that the wind speed would reduce. He asked *Scotia Seaways* to overtake and berth before *Clipper Point*, allowing himself more time for the anticipated wind reduction to occur. Examination of the forecasts shows that while there was some reduction, gusts of between 27 and 43 knots were still expected. It was therefore reasonable to expect that a significant increase in wind speed might occur while the vessel was attempting to enter the harbour, turn and berth.

The master had expected that assistance from *Sea Trojan* would compensate for the unserviceable bow thruster. This had been successful on previous occasions in similar wind speeds, but relied on *Clipper Point* being almost stationary and in a suitable position in order for the tug to push to best effect. The lateral force generated by a beam wind was estimated to be in excess of 35 tonnes, significantly more than the combined output from one bow thruster and *Sea Trojan*[11]. Consequently, additional turning forces from the propellers and rudders were needed.

[11] The force generated by one 1000kW bow thruster was estimated to be 10 tonnes. Assuming that Sea Trojan was able to deliver a 14.5 tonne push, the maximum lateral force generated would have been about 24.5 tonnes.

Vessels such as the two berthed on South Quay were often moored in this location. When they were berthed, the master had to adjust his manoeuvre for the reduced turning room available to him.

Despite these added complications, the master did not fully consider aborting entry to the harbour or discuss any other options that could have been available with either the OOW or chief officer, stating that if the manoeuvre did not work, the vessel "would crash." Although this comment was probably a flippant remark between colleagues, it did illustrate that the master had no alternative plan in case he was unable to turn as planned. Consequently, the chances that the officers on the bridge would be able to work as an effective team were reduced. The chief officer had not yet begun the process of obtaining a PEC, and despite his professional qualifications and ro-ro experience, lacked the knowledge and skills that gaining a PEC would have provided in order to support or challenge the master's decisions.

A proper assessment of: the actual and forecast wind conditions; bow thruster limitations; ability and effectiveness of the tug; and the presence of the two vessels alongside South Quay, should have made the risks of attempting to enter the harbour readily apparent. Comparison of these risks against the guidance provided by the company should also have shown that the likelihood of successfully berthing was severely reduced, and that it would have been sensible to delay *Clipper Point*'s entry into Heysham until the wind had abated.

2.2.2 The manoeuvre

Berthing immediately after high water provided additional water depth in the north of the harbour in which *Clipper Point* could swing. However, the height of tide also increased the vessel's exposure to the wind once inside the harbour.

As *Clipper Point* entered the harbour, the master reduced speed as normal and began a slow turn to port until *Clipper Point*'s stern was clear of the berthed vessels and a full swing to port could be initiated. The wind increased around this time and pushed *Clipper Point* closer to the berthed vessels than was intended. To maintain a safe distance from the vessels, the master briefly placed the high lift rudders full to starboard and thrust the bow to starboard. This action induced a small swing to starboard. As a result, the ship was both bodily closer to South Quay and heading further to starboard than the master intended. The combination of wind and the master's manoeuvre put the vessel further to the south and reduced the space available for the stern to swing during the intended turn to port.

Once *Clipper Point* was clear of the second vessel berthed on South Quay, the master placed both high lift rudders full to port and thrust the bow to port. The port propeller pitch was placed astern and the starboard propeller pitch was put ahead. *Clipper Point*'s stern swung quickly to starboard and a few seconds later made heavy contact with South Quay. This had the effect of both reducing the ship's rate of turn to port and dissuading the tug's skipper from making his approach towards *Clipper Point*'s starboard bow.

When the master commenced turning *Clipper Point* to port, it was inevitable that the vessel's stern would strike the quayside. If he had prepared a manoeuvring plan, using radar ranges, clearing bearings or transits to determine when his vessel was in a safe position to commence turning, he would likely have appreciated that *Clipper Point* was too far out of position to turn successfully without striking the quayside. Had the entry into Heysham been more carefully assessed, such an appreciation might then also have prompted the master to adopt a contingency course of action, developed for just such circumstances.

2.2.3 Contingency planning

The master persevered with his intended manoeuvre of swinging the ship to port despite increasing evidence that he was not going to be able to turn *Clipper Point* before she struck the other ferries moored in the port. He had not considered any alternatives to the berthing manoeuvre and had no contingency plan to fall back on. The chief officer was not sufficiently skilled or experienced in manoeuvring *Clipper Point* in the Port of Heysham to be able to advise or assist.

Two options were available to the master once *Clipper Point* was out of position and the planned turn to port was unlikely to avoid contact with South Quay or the berthed vessels. The first would have been to manoeuvre *Clipper Point* past the berthed vessels and - once the tug was confirmed as being clear - berth the ship temporarily with the starboard side alongside South Quay. The second option would have been to manoeuvre the stern out to port, away from the berthed vessels and through the wind direction, then manoeuvre the ship into a safe position in the centre of the harbour. This would also have provided time for the tug to take up station on the bow once the vessel was stationary and ready to begin the turn.

Other masters using the port had considered, and carried out, alternatives to the accepted routine of turning to port; however these alternatives were not widely discussed between masters or operating companies.

If *Clipper Point*'s master had considered the possibility of using alternative manoeuvres inside the harbour, he could have rehearsed these options during navigational briefings or table-top discussions with his officers, and then tested the practicality of the manoeuvres when favourable weather conditions and the operating schedule permitted.

Effective navigational briefings, and the sharing of best practices throughout the fleet, should be used to prepare masters and their bridge teams to be able to execute contingencies if required to compensate for weather conditions, equipment failure or other emergencies.

2.2.4 Control of tug during berthing

To compensate for the defective bow thruster, the master had decided to use the tug *Sea Trojan* to help turn *Clipper Point* inside the harbour. The master and the tug skipper agreed that the tug would push *Clipper Point*'s bow to port 'as normal'. *Sea Trojan*'s skipper told the master that he would stand by in a different position than usual, close to No.1 berth, as he needed to keep clear while *Scotia Seaways* berthed. The tug's limitations were well understood, and both the master and the tug skipper were aware that *Clipper Point* would need to be partially turned and almost stopped in the water before the tug could take position on her starboard shoulder and commence pushing.

As the master commenced *Clipper Point*'s turn to port, having passed clear of the vessels berthed at South Quay, he believed that the tug was in a position to push against the bow. The chief officer, who had sight of the tug, could see that it was around 70m away, but did not communicate this to the master. The master's repeated instructions for the tug to push were therefore based on an incorrect assumption, because the reality of the situation had not been conveyed to him. The tug skipper had a clear view of *Clipper Point*'s bridge and assumed that it would be obvious to the bridge team that he would not risk damaging his vessel by moving in to push. Consequently he did not think it necessary to inform the bridge team on *Clipper Point* that he was not going to push as instructed.

The master continued to attempt to turn the ship short round in the belief that the tug would, in combination with the single bow thruster, be able to push the bow into the wind and assist the ship to turn. This did not occur and *Clipper Point*'s bow then made contact with the two vessels alongside No.2 and No.3 jetties and the jetty itself.

The effective turning moment from the 14.5 tonnes bollard pull tug, positioned aft of the shoulder, and the single 1,000kW bow thruster was insufficient against a lateral wind force of over 35 tonnes. The effective turning moment decreased further as the tug moved further aft from the bow when it became restricted by the berthed ships.

By engaging the emergency pitch controls, the master also risked the main engines shutting down if any of their safety settings were reached. This had happened during a similar accident 6 weeks earlier, and had compounded the difficulty of manoeuvring the vessel.

The master's reliance on *Sea Trojan* to assist with the turn allowed no room for error and offered no contingencies if the plan did not work. The poor communication between the tug's skipper, and the bridge team on *Clipper Point* meant that the master committed his vessel to the manoeuvre even though a vital element for its successful execution, the tug, was not in a position to assist. The result was that there was neither sufficient manoeuvring power nor sea room to avoid *Clipper Point* making contact with the berthed ferries.

2.2.5 Summary of the manoeuvring process

The manoeuvre that resulted in *Clipper Point* making contact with the quay resulted from a lack of planning in the foreseeable conditions on the day. The master predicted that the wind speed would reduce, but did not consider that the wind might increase. The master relied very heavily on a tug of limited power and manoeuvrability. When the tug skipper decided not to place his tug between *Clipper Point* and South Quay, the likelihood that the turn was achievable reduced significantly. However, poor information flow meant that the master was not aware of the tug skipper's decision.

Prior to entering the port, the master had not determined where *Clipper Point* needed to be positioned in order to turn safely. Nor had he considered what alternative actions could be taken, such as turning further to the north, stopping the turn, or temporarily berthing the ship. This lack of planning resulted in the master having only one plan and persevering with that plan until he eventually berthed the ship after making contact with two other berthed vessels, the jetty between them and South Quay.

A thorough passage plan, briefing with the bridge team prior to arrival, and consideration of the guidance available to him should have prompted the master to reconsider his decision to attempt to berth *Clipper Point* and alerted him to the available alternatives.

2.2.6 Bridge team organisation

At the beginning of the passage into the harbour, it was the usual practice for the master and chief officer to stand together near the centre bridge controls providing the two officers with access to all the navigational information available. As *Clipper Point* approached the Roundheads, the chief officer moved to the port bridge wing to report passing distances. He then transferred to the starboard side to monitor the distance from South Quay, any vessels alongside it and the tug. The master transferred control to the port bridge wing at the start of the turn inside the harbour and was joined by the chief officer once the ship started to move astern to berth at the linkspan.

This arrangement had the advantage that both ship sides were monitored throughout and that control was only transferred once during the manoeuvres; however, this system also had several disadvantages. As soon as the ship approached the port entrance the master and chief officer separated, reducing the opportunity for the chief officer to observe and check on the master's actions. The master was totally reliant on the information relayed to him by the chief officer from one side of the bridge to the other; he could not see South Quay, any vessels alongside it, or the tug.

Had the master transferred control to the starboard bridge wing once inside the Roundheads, he could have monitored the South Quay and would have known that the tug was not in position. Communications between him and the chief officer would have been easier. The master's actions would have been immediately apparent to the chief officer, encouraging him to spot errors and question the master's intentions if necessary. Other masters and operators had identified the benefits that this system offered, and used it successfully.

Bridge team practises must be considered carefully and alternative methods evaluated to ensure that the most effective and safest practises are found and put into use.

2.2.7 Bridge ergonomics

Transferring control from *Clipper Point*'s centreline console to the bridge wing console required both propeller pitch, thrust and helm controllers to be aligned and accepted; the transfer from normal to emergency pitch control added further complexity. The process was time consuming, required the operator to pay close attention to each individual control setting and discouraged the transfer of control beyond the absolute minimum necessary.

Synchronised controllers were in common use on similar vessels and would have reduced the time and level of concentration needed to transfer control between consoles. The opportunity for errors, such as being unable to accept control due to misalignment of individual controllers, would also have been eliminated.

Information on the ship's speed, heading, rate of turn or position was not displayed on the bridge wings. This significantly reduced the master's ability to appreciate whether the vessel was manoeuvring as intended. This information could have been passed to the master by another crewman stationed at the centre console, but with the only other person on the bridge positioned at the opposite bridge wing, this was not possible.

Information that was provided at the bridge wings on wind, rudder position and engine pitch was given on small displays that were not as easy to read as those provided at the centreline. Berthing and departure are among the most demanding bridge operations and typically controlled from the bridge wings. Operators should therefore be provided with comprehensive and clearly readable information displays at these control stations.

Retrofitting additional or upgraded systems after a ship is built can be costly and time consuming, and the best time to consider effective bridge design is prior to the ship's build using input from the masters and other operators. However, if poor ergonomic design, which seriously impacts on the operators' ability to control the vessel safely, is identified after the vessel enters service, better controls and clearer displays should be retrofitted.

Clipper Point's bridge wing ergonomics increased the workload on the bridge team at a critical time, limited their ability to move quickly to the console closest to the nearest hazard, and increased the risk of an error being made while control was being transferred between consoles. Improved controls and information displays would have improved the efficiency of the manoeuvring operation. Consequently, Seatruck's managers should consider what improvements can be made to enhance the operability and provision of appropriate information to the bridge team when working at the bridge wings of the P-class ships. Lessons learned from this exercise should be applied to all vessels in the Seatruck fleet.

2.3 SEATRUCK FERRIES

2.3.1 Bridge resource management

Seatruck's managers delegated the management of bridge resources to the masters of their vessels, and did not take a view on what practises were most appropriate or effective. The masters were left to decide how personnel and resources should be used, based on their previous experience and whatever advice they had gained from mentoring sessions. There was no structured way of sharing experiences between masters or agreeing the best practices for operating the P-class vessels.

An effective review of bridge operations should have identified the weaknesses in the bridge resource management, in transferring control, and the insufficient level of information that was available at the bridge wings.

Seatruck did not provide bridge resource management training to its senior officers and there were few opportunities to practise ship-handling outside the constraints of the normal operating schedule. Simulator or ship-handling training had been considered, but was not perceived as being a suitable training method for Seatruck's ship handlers. There was no other method for masters to explore their vessels' operating limits, develop alternative or emergency manoeuvres, or understand the effects of equipment failures in a controlled, safe environment.

Delegating responsibility for all aspects of bridge team management to masters was an ineffective policy because the masters were not provided with the support needed to evaluate and develop operating methods or a means to share best practices. Consequently, masters were left in isolation to manage the situation to the best of their abilities. In these circumstances it was inevitable that a master would find himself in a situation that he was neither prepared for nor able to deal with successfully.

Seatruck's managers should identify how best to facilitate the development of their masters' and officers' skills in both ship-handling and bridge resource management. This could be achieved through a structured package of simulator training (specifically focused towards the operation of P-class vessels within the Port of Heysham), bridge resource management training, and/or manned model training. Arrangements should also be made that encourage masters and bridge teams to share their experience and ideas within the company.

2.3.2 Operations in the Port of Heysham

Following *Clipper Point*'s contact with the north Roundhead in October 2008, Seatruck provided guidance to its masters (SFN 11) on the risks of manoeuvring in the Port of Heysham. However, the limits set out in the guidance were frequently exceeded by masters who were either not aware of them or disregarded what was, ultimately, only optional advice.

No steps were taken by the managers of Seatruck to encourage greater adherence to the limits set out in SFN 11 and there was no policy on whether it was acceptable that masters routinely exceeded the recommended operational limits. The consequence of this was that SFN 11 ceased to be an effective tool for establishing operational limits for the P-Class ships in the Port of Heysham.

Managers must support the use of operational guidelines, particularly those that are intended to improve safety, and if they are not followed should take action to understand the reasons why. If guidance is found to be impractical or too restrictive in use, a proper review should be conducted to find alternative ways of controlling the risks.

The difficulties of operating in the Port of Heysham were well known by the managers of Seatruck. These difficulties were compounded by the introduction of the P-class vessels, yet little was done to support the masters in what was undoubtedly '*a complex navigational process*'. Seatruck managers should identify the training requirements of its masters and ship-handlers, identify how these requirements can be met, and ensure that the appropriate personnel are suitably trained.

2.3.3 Commercial pressure

Masters of Seatruck vessels were made fully aware of their responsibilities for the safety of their ships and crews; however, they were also under pressure to provide a competitive service. With other operators using similar sized vessels and routes, it was inevitable that unfavourable comparisons could be drawn against a particular master if he decided to delay or abort entering the harbour when others did not. This was particularly evident on one occasion from email correspondence between a senior manager of Seatruck and a master (see 1.7.7). A scheduled ferry service must be profitable to survive, but with the challenging ship-handling required, Seatruck managers need to ensure that commercial priorities do not deter masters from taking decisions that safeguard their vessels.

2.3.4 Bow thruster

Due to various technical defects, only one of *Clipper Point*'s two bow thrusters had been operable for 6 of the 7 months prior to the accident. On board *Clipper Point* this defect became an accepted operational constraint, to the extent that it was not reported to the port prior to each arrival as required. The delays in rectifying the bow thruster defects required greater use of the tug, which had limited abilities, and increased the risk of a berthing incident.

In a constrained operating environment, such as the Port of Heysham, any defects that affect the manoeuvrability of the vessel must be treated as a top priority. When it becomes apparent that a defect cannot be repaired quickly, managers should work with masters to agree other control measures that limit the risk. The use of *Sea Trojan* partially achieved this; however, the tug's limited capability should also have prompted other considerations – such as reducing the maximum wind speed in which *Clipper Point* was allowed to berth.

Seatruck should review its management of technical defects that impact on their masters' ability to manoeuvre their ships to ensure that such failures are rectified as soon as is reasonably possible. Where this can not be achieved, other measures should be put in place to make sure that any increased risks are properly controlled.

2.3.5 Seatruck Ferries Limited expansion

With four new vessels of similar size to the P-class ships, soon to join the Seatruck fleet, additional masters and chief officers will be required to learn the '*complex navigational process'* of arriving and departing from the Port of Heysham. This transition could lead to situations where there might be less experienced masters being employed on board Seatruck's vessels. Without a carefully structured programme for evaluating the new vessels and training the new officers, it is likely that bridge teams will be operating with limited knowledge and experience of the vessels, the port or, potentially, both. In such a situation, there will be a heightened risk that further accidents will occur.

Seatruck's managers, in conjunction with their established sea staff, must focus on the need to carefully manage the specific risks of operating in the Port of Heysham during the expansion of the fleet.

2.4 THE PORT OF HEYSHAM

2.4.1 Risk assessment

The port's *Heysham Formal Marine Safety Assessment Risk Register* that was issued in April 2010 included the risks of a vessel making contact with harbour installations, collision with other vessels and large vessels swinging inside the harbour. The risk assessment process identified relevant control measures, including PEC examinations, provision of weather information and tug assistance. However, the navigation guidelines and towage guidelines that were referred to in the risk register had not been implemented, control measures such as ‘tug available on request’ were not factual, and the requirement for ‘passage planning’ was not verified at any time by the port’s managers.

Significant elements of the risk assessment process were seriously flawed and provided limited practical mitigation of the risks.

A thorough and factual risk assessment that considered both the port’s infrastructure and the types of vessels calling at the port should have identified further control measures, such as those that are now being considered by the port’s managers. These control measures could, and should, have been identified and implemented if the risk assessment process had been properly effective.

2.4.2 Marine Safety Management System

Heysham Port Limited’s MSMS required masters of visiting vessels to conduct a passage plan for each arrival and departure, and as part of that activity for them to consider under keel clearance (UKC), tidal height, and wind strength and direction. There were no minimum or maximum criteria specified for any of them, and no checks were undertaken of the passage plans or the limiting criteria used by PEC holders. Even after this accident, and contrary to the MSMS, no assessment was made of the passage plan used by *Clipper Point*’s master. The consequence of this lack of scrutiny was that port officials were unable to assess whether or not the margins of safety being applied by PEC holding masters were adequate.

The port’s MSMS also required masters to report to the duty port controller, prior to arrival, any defects with their vessel’s manoeuvring equipment or propulsion. However, the duty port controller had no formal guidance on how to use this information, and so needed to contact the duty harbourmaster for a decision on whether or not a vessel should be permitted to enter or depart the port. Some masters did report defects to port control, but the evidence gathered during this investigation indicates that, on *Clipper Point,* reporting of defects had become, at best, sporadic and it did not result in the port refusing the master permission to arrive or depart. As above, port officials were not able to assess whether masters holding PECs were giving proper consideration to the likely impact of defects affecting propulsion and manoeuvring equipment when making the decision to enter or leave port.

Operating restrictions on the movement of vessels within ports, that specify when pilot or tug assistance is required, and define when a vessel should not be permitted to enter or depart, are essential control measures for any safe port operation. In many ports such restrictions are generic but have vessel specific permissions for regular port users that are determined through dialogue with the relevant operator. Such restrictions provide clear guidance to PEC holders and assist port authorities to mitigate the risks associated with the loss of control of a vessel when manoeuvring within the port.

Heysham Port Limited should define operational limits and defect thresholds for vessels using the port. Guidance should be provided on the control measures required if normal limitations need to be exceeded, such as tug use, compulsory pilotage or, if appropriate, for ships to postpone their arrival or departure from the port. These should be set out in the MSMS, copies of which should be made available to all operators and PEC holders.

2.4.3 South Quay

Clipper Point narrowly avoided making contact with the second of the two vessels that were berthed alongside South Quay. She passed these vessels at a closest distance of around 0.5m before finally coming into contact with the quay. The vessels berthed at South Quay were frequently manned and routinely passed by the swinging sterns of ro-ro vessels at relatively small distances. Harbour managers had indicated this to be an acceptable hazard in a previous reported near miss incident where a passing distance of between 3m and 7m was reported.

Large ro-ro ferries operating in the Port of Heysham are more likely to pass closer to South Quay than smaller vessels that use the harbour. Any manoeuvring error, engine failure, or unexpected wind increase could cause a ferry to move out of position such that contact between it and a vessel secured at South Quay cannot be prevented. With regular use of the Port of Heysham by large ferries, the port's managers should, as a matter of urgency, establish limits on the size and number of vessels that are berthed alongside South Quay to mitigate the risks of them being struck by manoeuvring ferries.

2.4.4 PEC application and renewal process

Applicants for PEC for the Port of Heysham were not made aware of the port authority's MSMS requirements during the PEC process or kept updated thereafter. They were therefore unaware of the control measures that were in place, or the reminder of the guidance on passage planning published by the IMO.

Officers holding PECs who routinely operate in the port were required to undergo a check ride once every 5 years under the supervision of one of the port's contracted pilots.

The vast majority of acts of pilotage on ferries in the Port of Heysham were conducted by masters holding PECs. It is therefore essential that the local pilots maintain sufficient knowledge and experience of manoeuvring large ferries in the port, not only for conducting Acts of Pilotage if required, but also so that they can assess PEC applicants effectively. A structured combination of frequent familiarisation trips on ferries, simulation, manned model and marine resource management training could address this need.

The Port of Heysham's managers should consider how best to maintain and develop their pilots' knowledge and practical skills of handling large ferries in order to provide credible assessment of those seeking to gain or renew a PEC.

2.4.5 Tug provision

There was no formal tug service provided at the Port of Heysham. *Sea Trojan*, with its bollard pull of 14.5 tonnes, offered a limited service only when it was available. There was no contractual agreement for the tug to provide a service to the port or any of the operators, and at the time of the accident the tug was for sale.

The limited availability and capability of the tug put further pressure on the masters of vessels entering the port. The tug's performance had not been formally assessed and its effectiveness in assisting a vessel with defective manoeuvring equipment was determined by trial and error. *Sea Trojan*'s presence lent a false sense of security; this was demonstrated by *Clipper Point*'s master, who expected that the tug would enable him to complete his manoeuvre - with one bow thruster, in high winds even when his vessel was out of position and had already made contact with the jetty.

The Port of Heysham's managers and ferry operators should consider if, and how, improved tug assistance should be provided. The potential difficulties of funding a vessel with the necessary capabilities, in a port where there is a limited and variable amount of work available, are acknowledged. However, if it is accepted that large ferries need to operate in high winds and with defects to their manoeuvring equipment, then reliable tug assistance will be necessary.

The Port of Heysham's managers, working with vessel operators, should carefully consider the benefits of providing a suitable tug to assist in berthing ferries when defects and/or wind strength determine that this is required.

2.4.6 Acceptance of P-class vessels

The P-class ships commenced operations from the Port of Heysham with no formal assessment of how their routine operations might affect marine safety.

Although vessels of a similar length to *Clipper Point* had previously berthed in Heysham successfully, the increased frequency of such vessels calling significantly increased the risks to the port. Their arrival also sent a signal to other ferry operators that ships of this size could be routinely used in the port without any special consideration.

The Heysham Port Limited managers should establish a risk-based procedure that requires ferry operators to demonstrate how the potential hazards from vessels that routinely use the port can be controlled. This procedure should include an assessment of how the vessel can be manoeuvred within appropriate safe operating limits, based on consideration of the vessel's available power, its windage, its handling characteristics and the capability of the bridge teams.

2.5 CO-ORDINATION AND CO-OPERATION

Communications between Seatruck and the Port of Heysham were usually conducted on a single-issue basis between company managers and the harbourmaster, or at the port-user group meetings. Port user-group meetings were until recently, not minuted and no agreed actions were published. It was reported that safety issues, such as the risks to vessels berthed on South Quay, were discussed, however a mutual agreement on the mitigation for these risks could not be reached.

The lack of consensus between stakeholders was evident in other issues: Seatruck's managers fitting their own anemometer adjacent to the port's anemometer; the disrepair of the wooden breakwater at the port's entrance; and the limited dredging of the north side of the harbour.

A more open and supportive relationship between all the stakeholders in the Port of Heysham was needed to enable a better understanding of the safety concerns and for the conflicting priorities in the port to be managed. The Port of Heysham's managers should continue to develop an effective forum to engage with their stakeholders to consider the risks involved in the port's operations and work with them to ensure that identified risks are effectively mitigated.

2.6 SUMMARY

Management of the marine risks in the Port of Heysham was incomplete, and the risk assessment was, in places, incorrect. What guidance there was had not been properly communicated to PEC holders or the companies that they worked for. Too much responsibility for the control of marine risks within Heysham had, effectively, been delegated to the vessel operators.

Seatruck Ferries managers had produced some guidance for their masters, but masters were not required to follow it - to the extent that managers were unconcerned that the promulgated limits were routinely exceeded. *Clipper Point*'s bridge wing controls and equipment were basic, offering little support to the bridge team at probably the most critical phase of the voyage. Similarly, little training was provided and there was no opportunity for bridge teams to understand the effects of equipment failures in a controlled, safe environment.

These circumstances all combined to put the success or failure of berthing in the Port of Heysham on one person, the master. This had the effect of creating a single, human, point of failure, and it was inevitable that a 100% success rate could not be maintained.

While the master's responsibility for the safety of the vessel, his passengers and crew is absolute, he can not operate alone. Vessel operators and port authorities have similar, if less clearly defined, responsibilities for equipping the master with the tools, rules and infrastructure that are needed for him to be able to operate safely.

While the contact was ultimately caused by *Clipper Point*'s master's handling of his vessel, both Seatruck and the Heysham Port Limited's managers must reconsider how they can support and enable bridge teams to work effectively to avoid one person's error leading to an accident, as it did in this case.

2.7 PORT MARINE SAFETY CODE

Peel Ports Group had confirmed to the MCA that the Port of Heysham complied with the requirements of the Port Marine Safety Code (PMSC). The port had not undergone an MCA 'Health Check' to verify its compliance with the PMSC, nor had any external review of the port's compliance with the Code been carried out. The port's managers relied on their own internal risk assessment and reviews of its MSMS to verify its compliance with the PMSC.

The introduction of an external assessment of the port's compliance with the PMSC and an MCA PMSC 'Health Check' would provide the port managers with an independent view on compliance with the PMSC.

SECTION 3 - CONCLUSIONS

3.1 SAFETY ISSUES DIRECTLY CONTRIBUTING TO THE ACCIDENT WHICH HAVE RESULTED IN RECOMMENDATIONS

1. The risks of *Clipper Point* attempting to enter Heysham harbour were readily apparent to the master. Comparison of these risks against the guidance provided by the company should also have shown that the likelihood of successfully berthing was severely reduced and that it would have been sensible to delay the arrival until the wind had abated. [2.2.1]

2. The combination of effects of wind on the vessel and the master's manoeuvre put *Clipper Point* further to the south than intended and reduced the space available for the stern to swing during the intended turn to port. Had the master prepared a plan for manoeuvring in the harbour, he would likely have appreciated that *Clipper Point* was too far out of position to turn successfully without striking the quayside. [2.2.2]

3. Effective navigational briefings, and the sharing of best practices throughout the fleet, should be used to prepare the master and the bridge team so that they can execute alternative manoeuvres if required to compensate for weather conditions, equipment failure or other emergencies. [2.2.3]

4. *Clipper Point*'s master's reliance on *Sea Trojan* to assist with the turn allowed no room for error and offered no contingencies if the plan did not work. The poor communication between the tug's skipper, chief officer and master meant that the master committed his vessel to the manoeuvre even though a vital supporting part, the tug, was not in a position to assist. The result was that *Clipper Point* had neither sufficient manoeuvring power nor sea room to avoid making contact with the berthed ferries. [2.2.4]

5. An appropriate passage plan, briefing with the bridge team prior to arrival, and consideration of the guidance available to him should have prompted the master to reconsider his decision to berth *Clipper Point* and alerted him to the available alternatives. [2.2.5]

6. The introduction of the P-Class vessels compounded the difficulty of operating ferries in the Port of Heysham. Managers must ensure that operating guidance is followed and that masters and ship-handlers have appropriate training in handling these vessels in the port. [2.3.2]

7. In a critical operating environment any defects that affect the manoeuvrability of the vessel must be treated as a top priority. When it becomes apparent that a defect can not be repaired quickly, managers should work with masters to agree other control measures that limit the risk. [2.3.4]

8. The Port of Heysham's managers should define operational limits and defect thresholds for vessels arriving at the port, providing guidance on further control measures where required. This should be set out in the Marine Safety Management System which should be readily available to all operators and PEC holders. [2.4.2]

9. While the contact was ultimately caused by *Clipper Point*'s master's handling of his vessel, both Seatruck's and the Port of Heysham's managers must reconsider how they can support and enable bridge teams to avoid one person's error leading to an accident. [2.6]

3.2 OTHER SAFETY ISSUES IDENTIFIED DURING THE INVESTIGATION ALSO LEADING TO RECOMMENDATIONS

1. Bridge team working practises must be considered carefully, and alternative methods evaluated to ensure that the most effective and safe methods are found and put into use. [2.2.6]

2. *Clipper Point*'s bridge wing ergonomics increased the workload on the bridge team at a critical time, limited their ability to move quickly to the console closest to the nearest hazard, and increased the risk of an error being made while control was being transferred. [2.2.7]

3. Seatruck's managers had delegated how bridge resources should be managed to their masters without providing them with the support needed to develop operating methods or a means of learning from best practices. [2.3.1]

4. With the challenging ship-handling required in the Port of Heysham, Seatruck's managers need to maintain a very careful balance between commercial priorities and supporting masters when they make decisions for the safety of their vessels. [2.3.3]

5. A carefully structured programme will be required throughout the forthcoming expansion of the Seatruck fleet to ensure that new vessels are properly evaluated and bridge teams are thoroughly prepared in order to minimise the risks of operating in the Port of Heysham. [2.3.5]

6. The process used in compiling the Heysham Formal Marine Safety Assessment Risk Register was flawed and provided little practical mitigation of the risks associated with manoeuvring large ferries within the port. A thorough and factual risk assessment of the infrastructure and type of vessels calling at the port should have identified further control measures. [2.4.1]

7. Any error or unexpected situation could cause a ferry to move out of position such that contact between it and a vessel berthed at South Quay can not be prevented. The Port of Heysham's managers should, as a matter of urgency, establish a method of controlling this risk. [2.4.3]

8. The Port of Heysham's managers should consider the familiarisation and training required to ensure that local pilots maintain sufficient knowledge and experience in manoeuvring large ferries in the port. [2.4.4]

9. The towage assistance available in the Port of Heysham at the time of the accident provided a false sense of security. The benefits of providing a more capable vessel, and a more reliable method of delivering the service, should be considered. [2.4.5]

10. The increased frequency of large ferries calling at the Port of Heysham significantly increased the risks to the port. Port managers should establish a risk-based procedure for operators to demonstrate how the risks from such vessels can be controlled. [2.4.6]

11. The Port of Heysham's managers should continue to develop an effective forum to engage with their stakeholders to consider the risks involved in the port's operations and work with them to ensure that the identified risks are effectively mitigated. [2.5]

12. The introduction of an external assessment of the port’s compliance with the PMSC and an MCA PMSC ‘Health Check’ would provide the port managers with an independent verification of compliance with the PMSC. [2.7]

SECTION 4 - ACTION TAKEN

4.1 **SEATRUCK FERRIES LIMITED** has:

- Produced the following Seatruck Ferries Fleet Notices:
  - SFN 64 - Incident recommendations: manoeuvring
  - SFN 65 - Incident recommendations: tug *'Sea Trojan'*
  - SFN 66 - Incident recommendations: South Quay, Heysham
- Revised Seatruck Ferries Fleet Notice No 11 - Navigation of P-class vessels: Heysham harbour & approaches, as SFN 57, to emphasise the need for the master to consider the state of propulsion equipment, including bow thrusters.
- Conducted an assessment of the master's capabilities by an experienced master, arranged for a second experienced master to ride with *Clipper Point*'s master for a week to both provide an assessment of his capabilities and also to discuss between them possible mitigating measures to reduce risks when manoeuvring in Heysham and Warrenpoint.
- Developed a familiarisation procedure for masters and chief officers either being promoted from within, or being employed from outside the company.

In addition, the company intends to:

- Investigate the use of a full-mission ship simulator for pilotage, ship-handling and bridge team management training, as well as a means to assess manoeuvring capabilities of its vessels; in Heysham and other route ports. This training will commence in 2012.
- Investigate the use of manned model ship-handling training.
- Make modifications to the P-Class ships to have main engine telegraphs synchronised at the earliest possible opportunity, or at the ship's next dry docking.
- Investigate ways to improve bridge wing console layout, in terms of visibility of indicators (ship's speed, wind, rudders etc.).
- Continue to make proactive representations to Heysham Port Limited for the improvement of navigational safety in Heysham.

4.2 HEYSHAM PORT LIMITED has:

- Conducted a Port User Group meeting on 16 September 2011.
- Issued Navigation Guidelines.
- Established a procedure that requires operators to supply information on the vessel manoeuvring capabilities of all vessels calling at the Port of Heysham for the first time, and their suitability for using the port.
- Proposed to implement a system to require operators of ferries currently using the Port of Heysham to demonstrate to the port's managers how their vessels can be operated safely within the harbour and meet the requirements of the port's MSMS.

SECTION 5 - RECOMMENDATIONS

Seatruck Ferries Limited is recommended to:

2012/122 Work with other stakeholders in the Port of Heysham, and develop and implement a programme to ensure that their bridge teams are properly trained and supported to enable them to improve their performance to avoid one person's error leading to an accident.

Heysham Port Limited is recommended to:

2012/123 Review the implementation of the Port Marine Safety Code in the Port of Heysham to ensure that:

- Its risk assessment is an accurate assessment of the port's risks.
- Communication between the port's managers and the port's users is effective and proactive.
- A risk-based procedure, that requires ferry operators to demonstrate how the potential hazards from vessels that routinely use the port can be controlled, is established.
- The provision of towage services is appropriate.

The Maritime and Coastguard Agency is recommended to:

2012/124 Liaise closely with Heysham Port Limited to agree a schedule to conduct a Port Marine Safety Code "health check" as soon as practicable during 2013, to assess and provide advice on PMSC compliance, once current measures being taken by the port authority to enhance its safety management procedures have been implemented.

Marine Accident Investigation Branch
June 2012

Safety recommendations shall in no case create a presumption of blame or liability

Marine Accident Report

INVESTORS IN PEOPLE