

Report on the investigation of the
grounding of the cargo vessel

Sea Mithril

on the River Trent

18 February 2008

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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.

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GLOSSARY OF ABBREVIATIONS AND ACRONYMS

AB	-	Able seaman
ABP	-	Associated British Ports
AIS	-	Automatic Identification System
BA	-	British Admiralty
BPA	-	British Ports Association
CEC	-	Certificate of Equivalent Competency
CHA	-	Competent Harbour Authority
DOC	-	Document of Compliance
DPA	-	Designated person ashore
GRT	-	Gross registered tonnage
HP	-	Horse power
IMO	-	International Maritime Organization
ISM	-	International Safety Management
Kw	-	Kilowatt
MCA	-	Maritime and Coastguard Agency
NAABSA	-	Not always afloat but safely aground
PEC	-	Pilot Exemption Certificate
UKHO	-	United Kingdom Hydrographic Office
UKMPA	-	United Kingdom Maritime Pilots' Association
UKMPG	-	United Kingdom Major Ports Group
UTC	-	Coordinated Universal Time
VHF	-	Very High Frequency
VTS	-	Vessel Traffic Services

All times in this report are UTC unless otherwise stated

Photograph courtesy of Fotoflite



Sea Mithril

SYNOPSIS



Between 0420 and 0450 on 18 February 2008, the UK registered cargo vessel *Sea Mithril* grounded in the River Trent on three occasions. A river pilot was embarked and the visibility had reduced to about 20m by dense fog. The groundings occurred after the vessel had been manoeuvred by the master, to increase the passing distance from vessels moored alongside at Flixborough. After touching the river bottom for the third time, *Sea Mithril* moored alongside Grove Wharf at 0510. There were no injuries to the crew and no pollution, but the vessel sustained material damage to one of her azimuth propulsion pods.

The investigation highlighted a number of factors which contributed to the ship's groundings, including:

- The master was the helmsman because he was the only person able to control the ship's azimuth propulsion system when in hand-steering.
- The master was unable to maintain a command overview of the vessel's passage.
- The master relied totally on the pilot for the safe navigation of his vessel.
- Communication and co-ordination between the master and pilot prior to the groundings was poor.
- The pilot was not supported by the bridge organisation, which became dysfunctional after restricted visibility was encountered.
- Flaws in the bridge organisation and available support were not identified by the master or the pilot.

To prevent a similar accident in the future, the MAIB has issued a flyer to industry reminding vessel owners and masters of the need to have sufficient persons on board their vessel who are competent to control the propulsion and steering systems fitted, and emphasising the requirement for embarked pilots to be adequately supported by bridge teams. ABP Humber has conducted a survey of visiting vessels in order to gather information on key aspects impacting on the conduct of pilotage in its waters. A recommendation has been made to the United Kingdom Maritime Pilots' Association (UKMPA), British Ports Association (BPA) and United Kingdom Major Ports Group (UKMPG) which calls for similar surveys at other UK ports.

Recommendations have been made to the UKMPG, BPA, UKMPA and all UK Competent Harbour Authorities with the aim of ensuring that vessels which are unable to provide adequate support to embarked pilots are identified. A recommendation to the ship's manager is aimed at improving passage planning and ensuring crew nominated as helmsmen on ships fitted with azimuth propulsion systems receive appropriate training.

SECTION 1 - FACTUAL INFORMATION

1.1 PARTICULARS OF *SEA MITHRIL*

Vessel details

Registered owner	:	White Horse Malta Limited
Ship manager	:	Torbulk Ltd
Port of registry	:	Hull
Flag	:	United Kingdom
Type	:	General cargo vessel
Built	:	Yorkshire drydock, U.K.
Classification	:	Lloyds Register
Length overall	:	78.0 metres
Breadth	:	11.0 metres
Gross tonnage	:	1,382
Engine power / type	:	2 x 500hp (Total 746kw) / Cummins diesel
Service speed	:	10 knots
Winter loaded draught	:	3.942m
Other relevant info	:	Twin azimuth propulsion system Suitable for NAABSA ¹ berths

Accident details

Time and date	:	0425 UTC, 18 February 2008
Location of incident	:	53° 36.6'N, 000° 42.1'W
Persons on board	:	6 crew + 1 pilot
Injuries / fatalities	:	None
Damage	:	Material damage to the port azimuth pod

¹ NAABSA – Not always afloat but safely aground. This is a charter clause used where ships are expected to use berths in tidal ports where it is customary to lay aground for some periods. The sea or river-beds at such berths are usually soft mud.

1.2 NARRATIVE

1.2.1 Events prior to the grounding

Sea Mithril completed loading coal in Amsterdam on the evening of 15 February 2008 with a maximum draught of 4.20m aft and 3.50m forward. The vessel then sailed at 0100 the following morning bound for Grove Wharf on the River Trent, England. She anchored in the Bull anchorage (**Figure 1**) at the entrance to the River Humber at 2125 on 16 February 2008 to await a sufficiently high tide, which was predicted for the following evening.

A pilot boarded at 2333 on 17 February. *Sea Mithril* then weighed anchor and commenced passage up the Humber towards the Trent, with the autopilot engaged. The visibility was more than 5 miles and, although it was not forecast to reduce, the pilot was aware that fog was likely to form without warning at that time of the year. The wind was light.

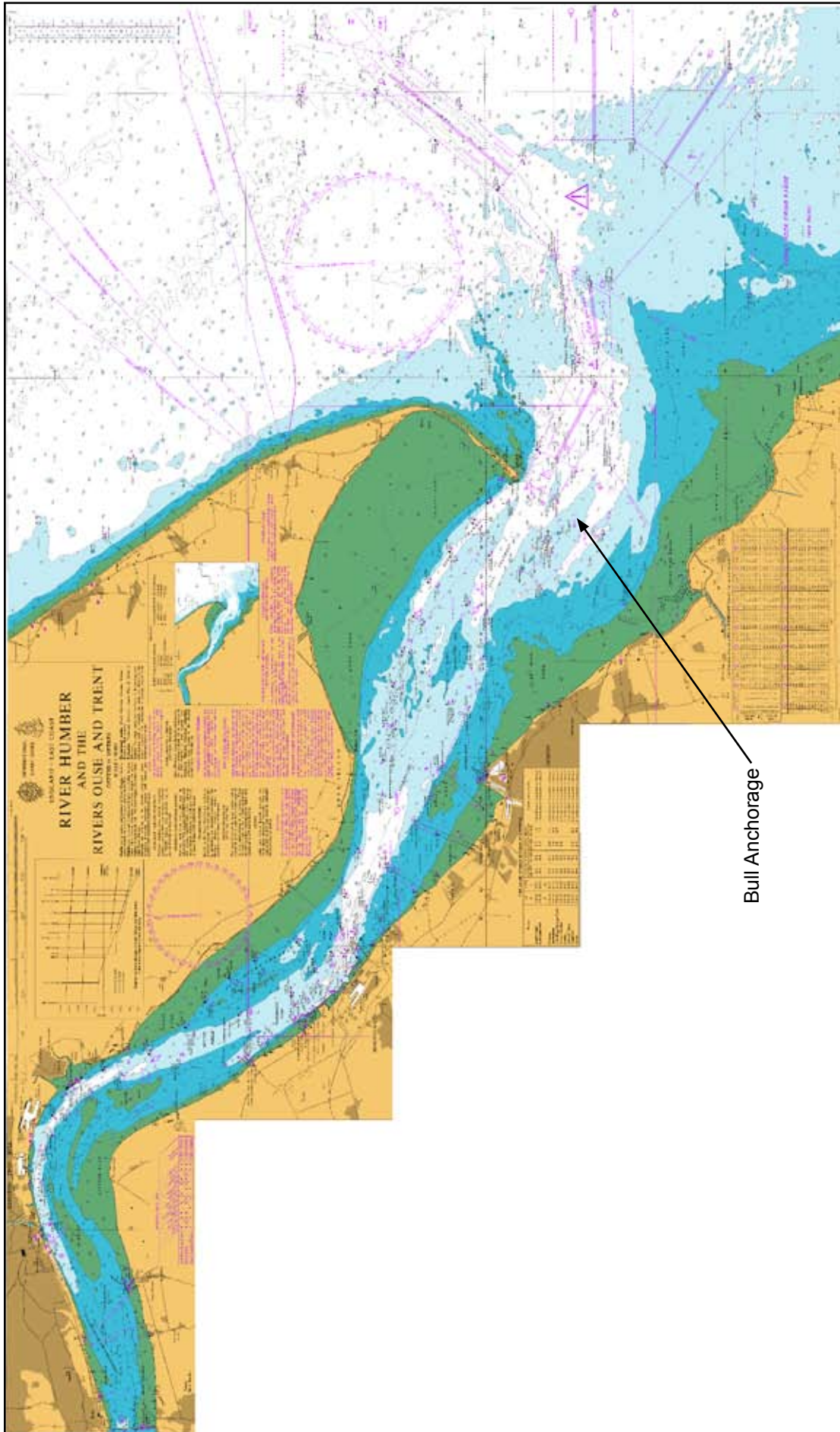
The master was relieved on the bridge by the chief officer at midnight. During the handover, the master instructed the chief officer to call him when the vessel reached the Humber suspension bridge or earlier in the event of reduced visibility. The master then retired to his cabin.

At about 0215, as *Sea Mithril* approached the Humber suspension bridge, the visibility suddenly reduced to about 50 metres. The chief officer immediately called the master; he also called the vessel's engineer and an AB. When the master arrived on the bridge, he sat in the centre chair (**Figures 2 and 3**), from where he started to steer the vessel manually. The pilot stood by the radar display which was sited on the starboard side of the bridge. The chief officer also remained on the bridge, while the engineer went to the engine room and the AB went to the focsle head to act as lookout. The lookout was able to communicate with the master via a hand-held radio.

The master and pilot discussed the reduced visibility and agreed it was safe to continue the passage. The pilot's only concern was passing outbound vessels once in the confines of the Trent, but no such movements were planned. Visibility improved to about 200m in the vicinity of Apex Light (**Figure 4**), but soon decreased again to about 20m as she entered the Trent.

Man Reval light (**Figure 4**) was passed just after 0400 at a speed of 8 knots. *Sea Mithril* was on the right-hand side of the river where the water was deepest. Soon afterwards, course was adjusted to manoeuvre closer to the left-hand side of the river in order to remain in the deeper water. The pilot advised the course alterations via a combination of helm orders and compass courses to steer. Neither riverbank, nor any shore lights were visible.

On approaching Flixborough Wharf (**Figure 4**), in case any vessels were berthed alongside, the pilot advised the master to reduce engine speed from half to slow ahead. The pilot also gave the master 20 minutes' notice for arrival at Grove Wharf. Accordingly, the chief officer started to call the remaining crew for standby.



Bull Anchorage

Extract of chart BA 109 showing the lower reaches of the River Humber and its estuary

Figure 2

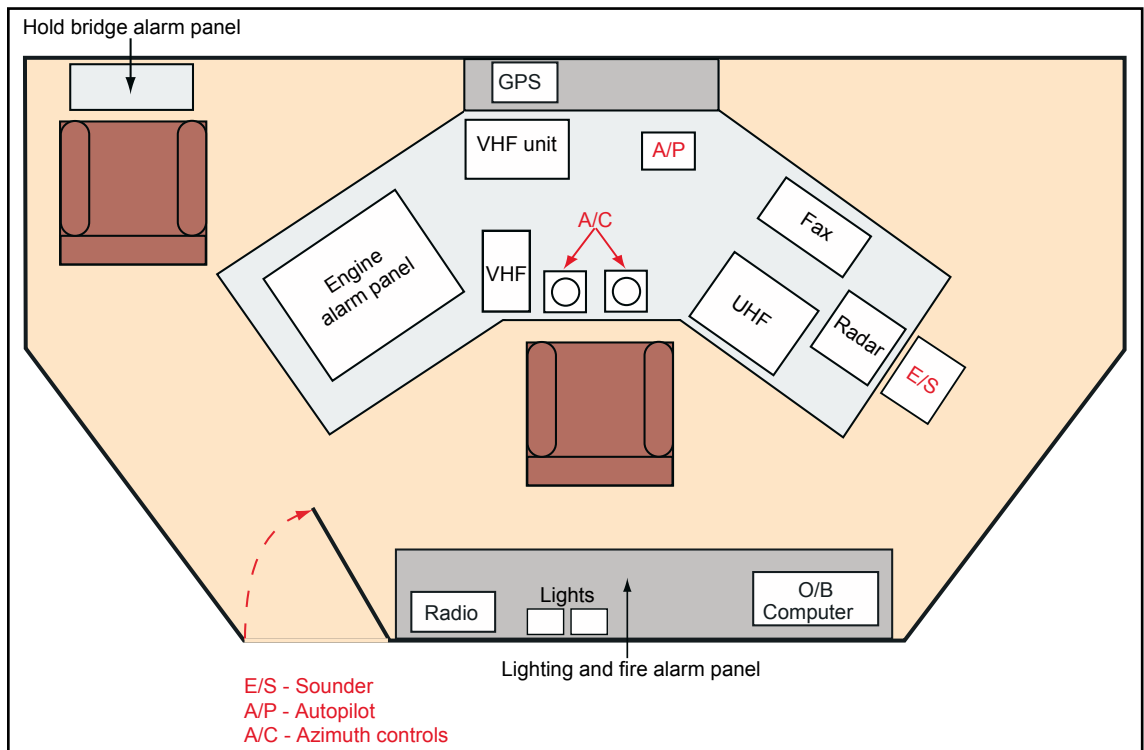
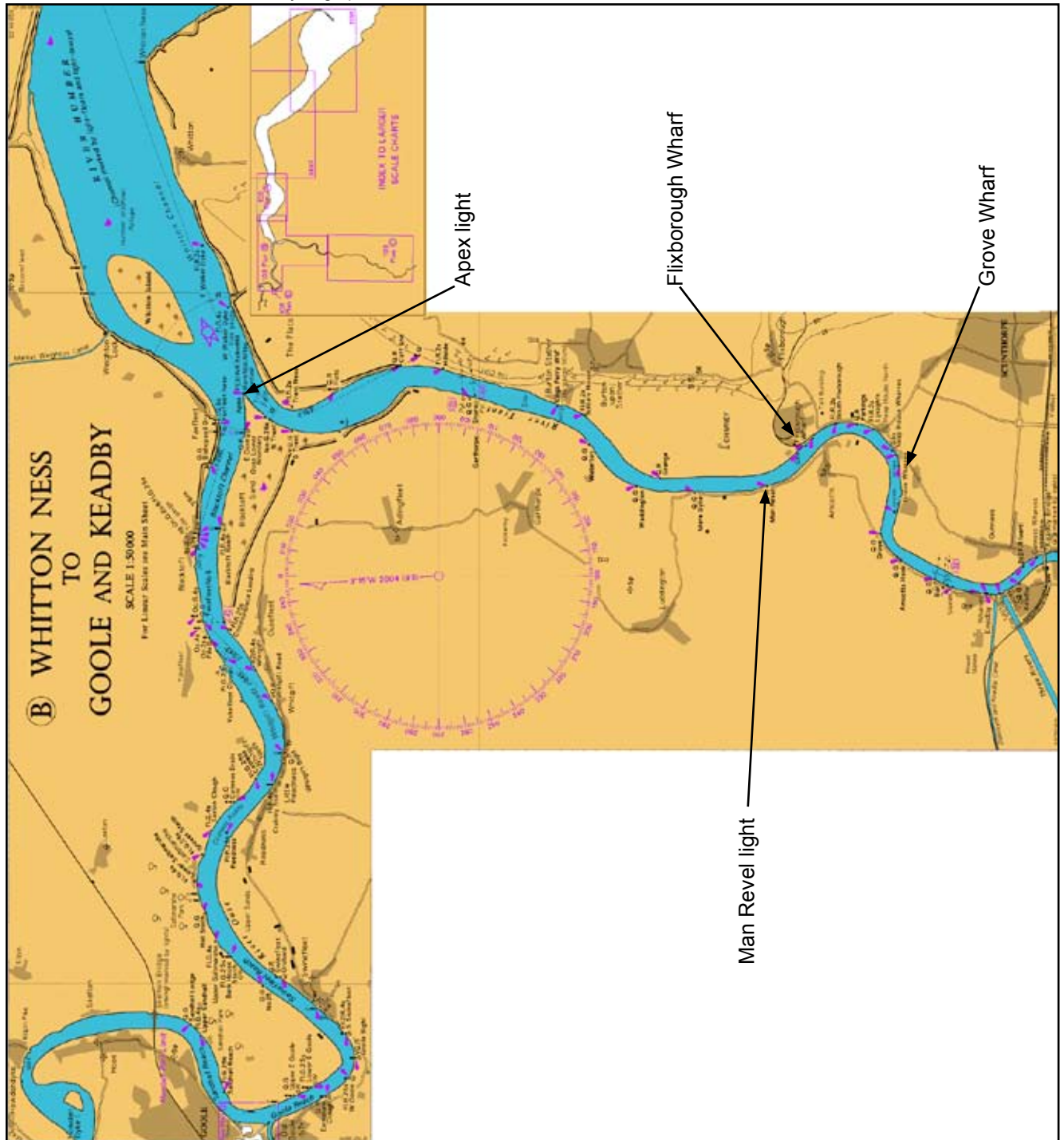


Diagram of the bridge layout

Figure 3



Photograph of the bridge layout



Extract of chart BA 109 showing the River Trent and the upper reaches of the River Humber

Soon afterwards, the lookout on the focsle saw the loom from the deck lights of a vessel moored on the wharf appear out of the fog. He called the bridge via his radio and informed the master in Russian that there was a ship close off the port bow. There was then a series of loud exchanges in Russian between the master, the chief officer and the AB, during which the master further reduced the engine speed and altered course to starboard, away from the lights.

By 0410, *Sea Mithril* was clear of the moored vessel but, almost immediately, the lookout reported the lights of a second vessel on the port bow. Again, the situation was discussed by the master, the chief officer and the lookout in Russian, and the master manoeuvred the vessel to increase the passing distance. The pilot heard the exchanges between the master and crew, but he was not aware of their concerns over the proximity of the moored vessels, or the master's changes to the vessel's course and speed.

By the time *Sea Mithril* had cleared Flixborough Wharf, her speed had reduced to about 2.5 knots over the ground and she was being swept bodily towards the left-hand bank by the flood tide (**Figure 5**). The pilot advised the master to steer to starboard. When he noticed the vessel's speed from the radar display he immediately advised the master to "speed up" and "come more to starboard." Reed beds were then seen to port, and a few moments later the vessel momentarily touched the river bottom at her stern near the left-hand riverbank.

The master quickly put the azimuth controls to full ahead and to starboard. The vessel turned sharply and began to head across the river. The pilot realised *Sea Mithril* was now in danger of grounding in the shallows near the opposite bank and advised the master to turn back to port. Although the master put the engine controls to port, the vessel ran gently aground at 0425 (**Figure 6**).

The pilot informed Humber VTS of the grounding. He was aware that the predicted high water was not until 0450, and considered there was still sufficient rise of tide left to enable the vessel to re-float without difficulty. He was also aware that the vessel was able to visit NAABSA berths and that the bottom was soft mud. Consequently, the pilot advised the master that there was no need to use the vessel's propulsion. This advice was ignored by the master, who applied full astern power.

After several minutes, the engineer arrived on the bridge and told the master that water was spraying from the port azimuth oil vent in the engine room (**Figure 7**). The master replied that he wanted to continue running both engines until the vessel had re-floated and was safely alongside. This exchange was in Russian and the pilot was not made aware of the problem that had been reported. All empty spaces and the cargo holds were sounded, but no other water ingress was found.

The vessel re-floated at 0447 and, with her engines operating at full astern, she moved rapidly towards the other side of the river, stern-first. The master put the engine controls to full ahead, but this did not prevent the vessel grounding for a third time (**Figure 8**), albeit momentarily.

As soon as control of *Sea Mithril's* movement was regained, the vessel was turned around in the river to allow her to berth starboard side to at Grove Wharf. The pilot could not see the berth and asked a linesman to illuminate the orange flashing lights on the top of his truck to assist. This was done and the vessel safely moored alongside at 0510. When the pilot left the vessel he was not aware of any damage, and completed an incident report on the groundings on his return to the harbour office.

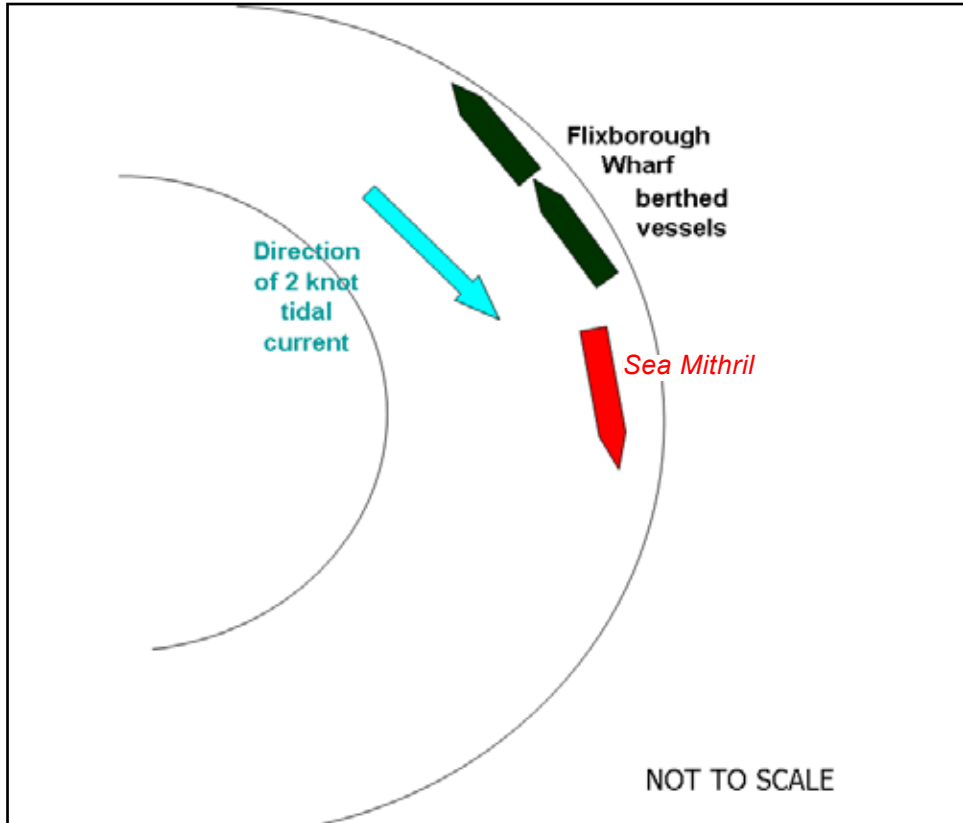


Diagram showing the position of *Sea Mithril* after passing Flixborough just prior to her touching bottom for the first time

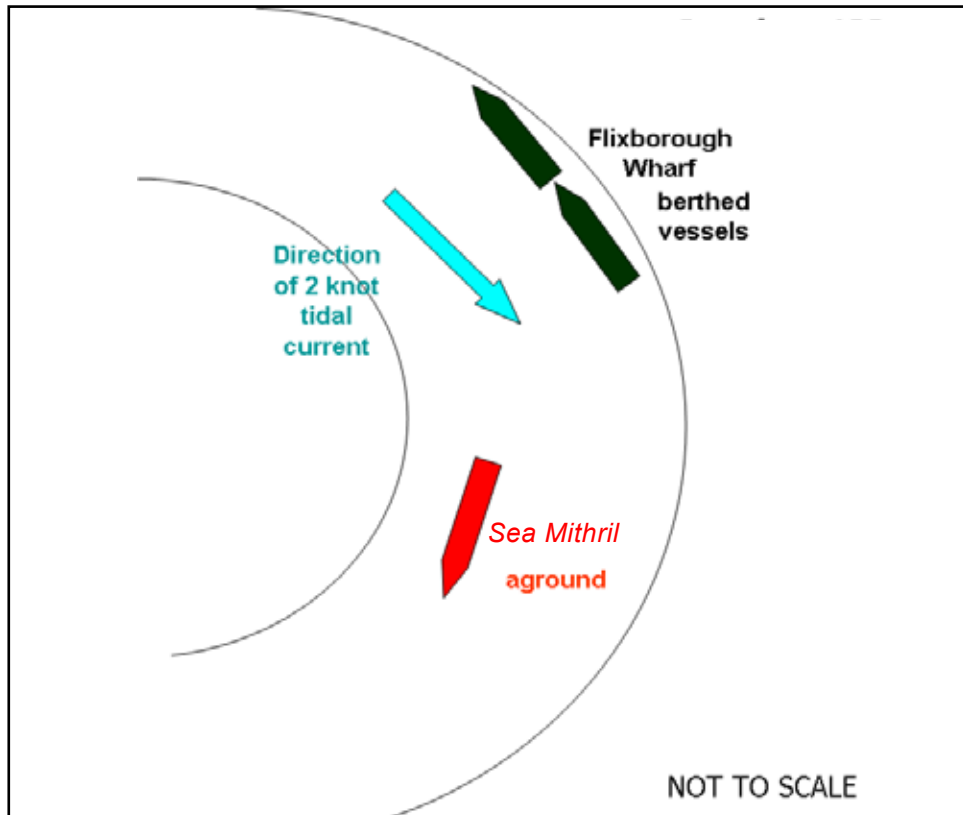


Diagram showing the position of *Sea Mithril* when aground for the second time



Photograph showing position of water ingress

Image from ABP Humber AIS

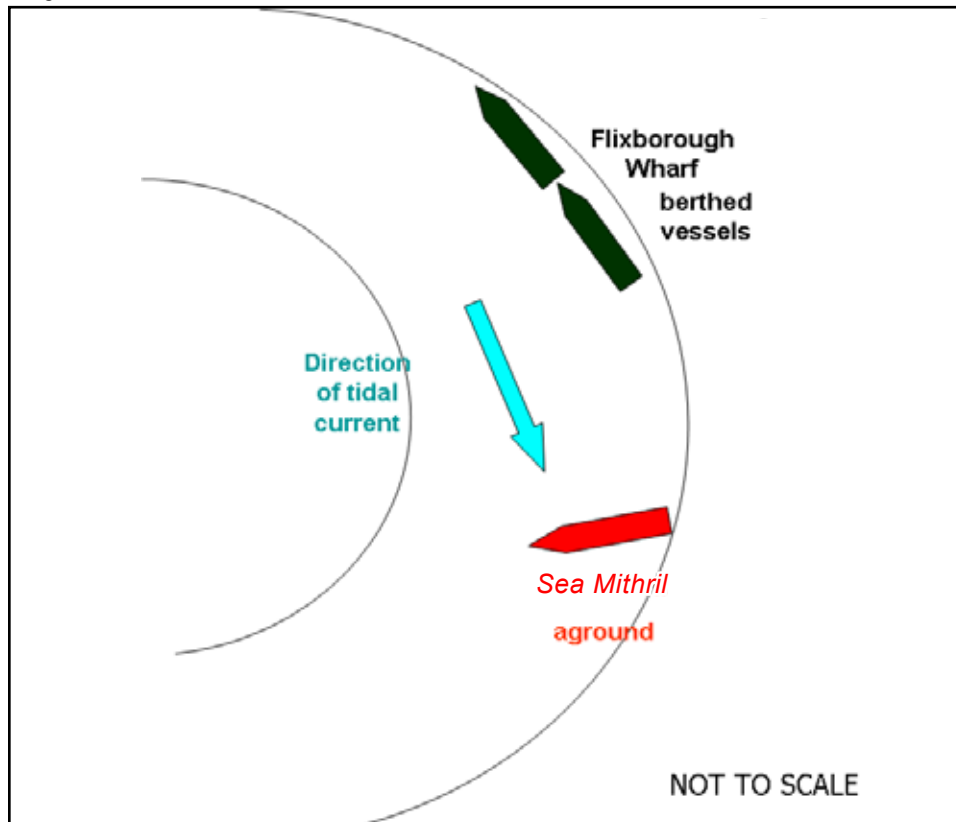


Diagram showing the position of *Sea Mithril* when touching the river bottom for the third time

1.2.2 Events following the grounding

During an inspection at Grove Wharf on 19 February 2008, the vessel's port azimuth pod casing was found to be fractured and its propeller blades badly damaged (**Figure 9**). The vessel was given dispensation to sail to Leith, Scotland, for repairs. ABP Humber was informed of the vessel's condition but was not made aware that the damage had been caused during the groundings the previous day. *Sea Mithril* sailed from Grove Wharf on 19 February with a pilot embarked. She was escorted by a tug during her passage down the Trent and Humber and, at the request of the ship's manager she was closely monitored by the Coastguard during her passage to Leith, where she arrived the following day. When the vessel was later dry-docked it was established that, in addition to the damage already identified, the port azimuth drive shaft had to be replaced. There was also evidence of recent coating damage under the vessel's port quarter (**Figure 10**).

1.3 BRIDGE TEAM

1.3.1 Master

The master was a Lithuanian national. He first went to sea in 1984 serving as a deck officer on board fishing vessels, until he joined his first cargo vessel in 2001 as a chief officer. Promoted to master in June 2004, he held a Lithuanian Certificate of Competency to command vessels of up to 3000grt and had applied for a temporary UK Certificate of Equivalent Competency (CEC).

The master joined *Sea Mithril* on 12 December 2007. It was his second contract on board the vessel on which he had visited the Trent on two previous occasions, both of which had been in good visibility. The master had not attended any bridge team or resource management training courses.

1.3.2 Chief officer

The chief officer was also a Lithuanian national. He had worked at sea for 25 years, the last 9 years of which had been as chief officer. He joined the vessel on 8 February 2008 for his second contract on board. The chief officer had not attended any bridge team or resource management training courses.

1.3.3 Pilot

The pilot was a Dutch national. Following a career at sea on board deep sea cargo vessels, he worked for 23 years as sea pilot in Flushing. He then served 5 years as master on board North Sea freight ferries, with PECs for the Thames and Zeebrugge, before joining ABP Humber as a river pilot in 2006. The pilot had returned to work on 17 February 2008 following a 3 week period on leave.

1.4 STEERING AND PROPULSION

Sea Mithril is powered by two engines driving a series of shafts connected to two azimuth pods (**Figure 11**). The speed of the propellers and the azimuth of the pods are controlled by single levers sited on the bridge (**Figure 12**). The ship is steered by changing the direction of the pods via the levers.

Figure 9



Port azimuth pod and damaged propeller

Figure 10



Paint damage to the underside of the hull on the vessel's port side

Figure 11



Typical azimuth pod

Figure 12



Sea Mithril's wheelhouse azimuth pod controls

It was the ship manager's policy for all its masters joining a ship fitted with an azimuth propulsion system for the first time to be trained in its use by the outgoing master. Accordingly, when the master joined *Sea Mithril* for his first contract in February 2007, the outgoing master stayed on board until the next port of call to demonstrate the operation of the azimuth propulsion.

Following an earlier incident, the vessel's manager issued a memorandum to its fleet in January 2008, instructing that during critical periods:

...the master is to ensure that another crew member is handling the controls. The master will then be free to move around the bridge to ensure full visibility and full command of the manoeuvring situation.

However, the master of *Sea Mithril* considered that the control of the azimuths during critical periods of navigation was solely his responsibility, and he always steered the vessel when the autopilot was not selected. None of the remaining crew, including the chief officer, were trained or had experience in steering the vessel by hand.

1.5 PASSAGE PLAN

The vessel's passage plan for the open sea voyage from Amsterdam to the approaches to the Humber consisted of a list of waypoints, and the courses and distances between them. There was no written passage plan or chart preparation for the river passages in either port. The chart in use for the passage from the Bull anchorage to Grove Wharf was BA 109.

1.6 MASTER AND PILOT EXCHANGE

During the initial interchange between the master and pilot, a copy of the vessel's pilot card containing details of the vessel's particulars was handed to the pilot. The master informed the pilot that he had visited the Trent on previous occasions; little other information was exchanged. The pilot carried a large scale chart of the Trent but did not show this to the master. He also placed a copy of the ABP passage plan on the navigation console, but this was not seen by the master or chief mate. However, he did inform the master that he had no experience of azimuth propulsion systems and would therefore need someone to steer the vessel when manual steering was required.

1.7 HUMBER AND TRENT NAVIGATION AND PILOTAGE

The Humber is a major river on the east coast of England. It flows from the junction of the rivers Ouse and Trent from where it widens to form one of the largest deepwater estuaries in the UK. The competent harbour authority (CHA) for the river is Associated British Ports (ABP) which owns and operates 21 ports in the UK, including Grimsby, Immingham, Hull and Goole.

Pilotage limits for the Humber coincide with the port limits which extend as far as Goole on the Ouse and Gainsborough on the Trent. Pilotage is compulsory for vessels over 60m in length and all vessels carrying dangerous substances in bulk. Pilots for small inbound vessels generally board in the Bull Anchorage off Spurn Point at the entrance to the estuary.

Vessel Traffic Services (VTS) Humber, which is located at Spurn Point, operates a 24-hour service for all river users. Its major function is to monitor and regulate navigation within the area of jurisdiction of the harbourmaster, Humber. The service provides AIS and radar coverage from the estuary to the Humber suspension bridge. There is no radar tracking in the Trent and, apart from vessels carrying hazardous cargo, there are no restrictions on the use of the river in restricted visibility.

1.8 PILOTAGE

1.8.1 IMO Resolution A.960

The recommendation on operational procedures for maritime pilots other than deep-sea pilots included in IMO Resolution A.960 (**Annex A**) states:

Efficient pilotage depends, among other things, upon the effectiveness of the communications and information exchanges between the pilot, the master and the bridge personnel and upon the mutual understanding each has for the functions and duties of the other. Establishment of effective co-ordination between the pilot, the master and the bridge personnel, taking due account of the ship's systems and equipment available to the pilot, will aid a safe and expeditious passage.

1.8.2 Common practices

It has been common practice on the Humber and Trent, and some other rivers in the UK, for pilots to steer vessels themselves rather than use helmsmen from the crew. Reasons given by pilots for this practice include:

- Greater control when negotiating the tight turns found on the Trent.
- Low competency of the helmsmen provided. In many cases, even though a vessel has the required number of certificated seamen, there are no competent helmsmen on board.
- Masters expecting pilots to steer and not making a helmsman available.
- The rate of turn of vessels fitted with propulsion systems such as azimuth pods frequently being difficult to gauge, and pilots experienced in the use of such systems feeling more comfortable when controlling the vessels themselves.

1.9 NAUTICAL CHARTS

The largest scale United Kingdom Hydrographic Office (UKHO) chart of the Trent and the upper Humber is British Admiralty (BA) chart 109 Plan B with a scale of 1:50,000 (**Figure 4**). The chart shows little detail of the upper Humber and the Trent, and contains no depth information in the Trent due to the rapid changes in the course of the river, which makes it impractical to keep up to date. A new edition of this chart is expected to be produced by the UKHO in September 2008.

ABP Humber also produces charts of the Humber, Trent and Ouse. Their chart of the section of the Trent in which *Sea Mithril* grounded is of scale 1:10,000 (**Figure 13**). The chart of the upper reaches of the Humber and the approaches to the Trent has a scale of 1:25,000. These charts are regularly updated to incorporate periodic surveys completed by the port authority's hydrographic department and are primarily intended for use by its pilots, who are required to carry copies of the charts when conducting

pilotage acts. Although the charts can be purchased by other river users on request, their availability is not widely advertised. Consequently they are not frequently held on board visiting ships. However, a local notice to mariners strongly advises mariners to ensure they possess up to date navigational information before entering the Humber.

1.10 SHIP MANAGEMENT

Founded in 1986, and based in Grimsby, UK, Torbulk Ltd operates and manages a fleet of 12 vessels, including *Sea Mithril*. The fleet comprises 10 bulk cargo carrying cargo vessels, a cement tanker, and a sand dredger. The fleet's primary trading areas are N.W. Europe and the Mediterranean Sea. Its vessels are registered with a number of administrations including the UK, Panama, and the Cayman Islands. *Sea Mithril* is one of three vessels in the fleet fitted with an azimuth propulsion system.

The vessels' crews are employed via a crewing agency in Latvia and nearly all speak Russian. The company's fleet technical director is the Designated Person Ashore (DPA) for its vessels and its International Safety Management (ISM) Document of Compliance (DOC) is valid until 20 June 2011. The last flag state inspection of *Sea Mithril* was done on 8 February 2008 during which a number of deficiencies were recorded. The vessel's last ISM internal inspection was 6 September 2007, during which six minor items were found and subsequently addressed. None of the deficiencies identified during the flag state inspection or internal audit related to the navigational safety of the vessel.

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 FATIGUE

In view of the time the vessel was at anchor before the river pilot embarked and the pilot's recent return from vacation, fatigue is unlikely to have been a contributory factor in this accident.

2.3 SIMILAR ACCIDENTS

The MAIB is aware of 132 grounding incidents on the Trent in the last 10 years; in the majority of cases, the vessels concerned were able to re-float on the same tide.

2.4 BRIDGE MANAGEMENT

Sea Mithril was being navigated using autopilot as she approached the Humber suspension bridge, with her pilot and chief officer on the bridge. This would not have been unusual for a vessel of this size. Furthermore, when fog was encountered, the actions taken by the chief officer in calling the master and engineer and stationing a lookout on the focsle head were in accordance with good practice. However, when the master arrived on the bridge and changed to manual steering, he became the helmsman. As soon the vessel entered the Trent, where the need for continuous and rapid manoeuvring made the use of the autopilot inappropriate, the master had little choice but to remain by the azimuth controls.

Given the tidal nature of the Trent, the limited deep water available and the frequency of groundings, it is apparent that safe navigation on the river for sea-going vessels is challenging even when the visibility is good. The difficulty of this task is undoubtedly much greater when the visibility is reduced to about 20m. In such conditions, the need for good communications and co-ordination between a master and a pilot, which is emphasised in IMO Resolution A960, is compelling. On this occasion, a number of factors indicate that these requirements were lacking:

- Although the pilot intended the vessel to be to the left of the river's centreline as she passed Flixborough wharf, the sighting of the vessels moored alongside when the visibility was only 20m, indicates that *Sea Mithril* was probably closer to the wharf than the pilot intended.
- The pilot was the only person monitoring the vessel's position, but he did not alert the master to the proximity of the wharf or the possibility of vessels being sighted. Therefore, when the lookout reported seeing the lights of these vessels, it was not surprising that the master was alarmed.
- When the moored vessels at Flixborough were seen through the fog, the exchanges between the lookout, the master and the chief officer were conducted in Russian, and therefore the pilot was unaware of their concern. As the exchanges were also loud, some of the pilot's advice at this critical phase was possibly lost in the commotion.

- The master's attempts to manoeuvre the vessel away from the wharf resulted in a significant loss of speed. The master had not informed the pilot of his actions and the pilot had not been closely monitoring the vessel's heading and speed. Consequently, by the time the pilot realised what was happening, *Sea Mithril* was already perilously close to the shallows onto which she was being set by the flood tide. This was too late for the avoiding action taken to prevent the stern from touching the river-bed.
- Because the master opted to talk to the lookout himself, rather than delegate this task to the chief officer, it is possible that he became overloaded when simultaneously communicating with the lookout and manoeuvring as *Sea Mithril* passed the moored vessels.
- Finally, when *Sea Mithril* was aground, the master used full power astern to re-float the vessel despite being aware of the damage to the port azimuth propulsion unit and despite this action being contrary to the pilot's advice. As a result, when the vessel eventually re-floated her movement was rapid and her stern was set towards the left-hand bank by the remnants of the flood tide. In the absence of any visual references, this movement was not appreciated in sufficient time to prevent further contact with the river-bed.

It is evident that the need for the master to act as a helmsman prevented him from maintaining a command overview of the navigation of his vessel. With no specific duties or responsibilities allocated to the chief officer, the master was totally reliant on the pilot; *Sea Mithril's* bridge team was unable to carry out the duties detailed at **Annex A**, which seriously compromised its ability to navigate safely within the confines of the Trent in restricted visibility. This situation would have been avoided had another member of the crew been trained to act as the helmsman.

2.5 SUPPORT TO THE PILOT

Pilotage is one of the oldest professions in the world, and is also one of the most important in ensuring maritime and environmental safety. The role of a pilot is generally considered to be the provision of expert advice within a local area. However, although IMO has recommended procedures to follow when a pilot is embarked (**Annex A**) it is apparent that the approach of individual pilots towards their task is frequently more influenced by a number of other factors. These include personal preference, the custom and practice within individual ports, the expectations of masters, and the level of support provided by bridge teams.

Like many of his colleagues operating on the Humber, it was the pilot's usual practice to personally steer many of the vessels he piloted. On this occasion, he was unable to do so because of his lack of experience with *Sea Mithril's* propulsion system. This forced him to act in an advisory capacity. It is possible that the lack of a commentary on the vessel's position, and his failure to monitor the actions of the master as the vessel approached and passed Flixborough Wharf, reflected his lack of familiarity with this role. The pilot would have little need to take these actions when simultaneously steering and navigating the vessel without assistance. However, even if the pilot had been able to steer *Sea Mithril*, it would have been difficult for him to successfully execute and monitor the passage plan by radar alone while simultaneously steering the vessel from the central control position.

No pilot, no matter how knowledgeable, is infallible or invincible, and therefore adequate support must always be provided on the bridge. Although the responsibility for the provision of this support through appropriate bridge manning, crew competency, and equipment availability rests with a vessel's crews and her owners, it is evident from the pilotage of *Sea Mithril* without a competent helmsman, other than her master, and the common practice of piloting other vessels without any competent helmsmen (**see paragraph 1.8.2**), that even the most basic level of support is frequently not provided. Indeed, many masters expect pilots to navigate their vessels with little or no assistance from them or their crew.

However, it is equally evident that adequate levels of support for pilots are not always demanded by either the port authorities that have a responsibility for the safe navigation of vessels in their areas, or by the pilots themselves. While most pilots are capable of navigating ships within their ports in normal circumstances, with little or no onboard assistance, this practice prevents both pilots and bridge teams from gaining experience in working together, and also discourages vessels from meeting their obligation to provide adequate support. Furthermore, while the almost complete reliance on pilots usually results in a safe passage, this will not always be the case in conditions such as restricted visibility where communications and teamwork are vital. To ensure pilots receive adequate support from visiting vessels, it is essential that any shortcomings in a vessel's bridge organisation, or deficiencies in competency, be identified and rectified before the vessel is allowed to enter confined waters. To this end, ports should make clear the standards that are required to operate within its limits, and pilots should be instructed not to commence pilotage if those standards are not demonstrably achieved.

2.6 PASSAGE PLANNING

The International Maritime Organization (IMO) Guidelines For Voyage Planning [Resolution A.893(21)] state: "*The need for voyage and passage planning applies to all vessels*". In the past 5 years the MAIB has investigated 40 accidents involving merchant vessels of 100 to 3,000grt where poor passage planning was identified as a causal factor.

Sea Mithril's passage plan from the Bull anchorage to Grove Wharf lacked detail. Although this was partly due to the small scale chart in use, passage planning is more than just the plotting of course lines. A number of aspects of a vessel's operation also need to be carefully considered. These include the organisation of the bridge in varying situations, machinery requirements, and the physical preparations required for port entry.

Notwithstanding the opportunity provided by the time *Sea Mithril* spent at anchor before the pilot boarded, it would appear that little consideration was given to planning for the river transit to the berth.

Such practice is not unusual in small vessels and reflects an attitude prevalent among many masters who appear to be prepared to rely without question on the knowledge and ability of embarked pilots. This reliance was further demonstrated by the brevity of the master's exchange with the pilot following his embarkation, which in the experience of the MAIB is the norm rather than the exception. The initial exchange between the master and pilot was an opportunity to update the vessel's passage plan and although it is recognised that some masters are reluctant to question pilots, had the master

been more enquiring on this occasion, the pilot would have been more likely to show the master the larger scale chart of the area that he carried. It is also possible that the likelihood of fog and vessels alongside the wharf at Flixborough would have been discussed and the limitations of the vessel's bridge organisation in restricted visibility identified.

2.7 CHARTS

A fundamental principle of passage planning and safe navigation is using the largest scale charts available. The largest scale chart published by the UKHO for the Humber, Trent and Ouse is BA109 which is generally carried by vessels using the Trent, but which is unsuitable for navigation in this area due to its scale of 1:50,000 and its lack of detail including depth information. The larger scale charts of the area, produced by ABP Humber are far more appropriate for navigation and it is unfortunate their availability has not been more widely promulgated. Although not produced by UKHO, the carriage of these charts would provide masters of vessels using the river with a better appreciation of the navigational marks, the boundaries of the deep water channels, the proximity of wharfs, and the changing nature of the river. As a minimum, where locally produced charts are available, it would be extremely beneficial for embarked pilots to refer to them when discussing the intended passage during the initial exchange with the master, and to make them available for scrutiny during the passage.

2.8 CONTROL OF THE AZIMUTH PROPULSION

The promulgation of a memorandum by the ship's manager, which instructed its masters to ensure that another member of the crew was able to control the vessel's azimuth propulsion, indicates it recognised the disadvantages of the master being on the helm during critical periods. However, the memorandum was ignored by the master of *Sea Mithril*, who considered the control of the azimuth propulsion was his responsibility and had trained none of the crew in its operation. Consequently, the master was on the helm of *Sea Mithril* during the river passage because there was no other person on board who he considered competent to undertake this task.

The safe control and operation of Azimuth propulsion systems requires a greater degree of training and experience than for a conventional propulsion system and rudder. However, unlike conventional systems on which competency is demonstrated by the award of a steering certificate, no similar arrangements exist for proof of competency in the control of azimuth systems.

Conventional steering certificates have no relevance to the operation of vessels fitted with azimuth propulsion systems. Therefore, in the absence of a competency standard for helmsmen using these systems, the responsibility for determining the expertise required, and ensuring that sufficient crew are trained to this level, lies with a vessel's owner. In this case, although the ship manager recognised the need for other crew to be trained in the use of the azimuth system, it did not stipulate which crew were to be trained, how they were to be trained, or to what level. It also did not check to ensure its instruction had been followed. Had it done so, the master's decision not to implement its instruction would have been evident.

SECTION 3 - CONCLUSIONS

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

1. Although safe passage in the Trent in restricted visibility required good communications and co-ordination between the master and pilot, there were a number of factors which indicated these were lacking on this occasion. [2.4]
2. Because the master was the helmsman, he was unable to maintain a command overview of the navigation of his vessel. Consequently, the ability of the bridge team to navigate safely within the confines of the Trent in restricted visibility was seriously compromised. [2.4]
3. It is evident from the pilotage of *Sea Mithril* and the common practice of piloting other vessels without any competent helmsmen, that even the most basic level of support for pilots is frequently not provided by visiting ships. [2.5]
4. Adequate levels of support from vessels are not demanded by the port authorities that have a responsibility for the safe navigation of vessels in their areas, or by the pilots themselves. [2.5]
5. It is essential that any shortcomings in a vessel's bridge organisation, or deficiencies in competency, are identified and rectified before a vessel is allowed to commence her passage into confined waters. [2.5]
6. The exchange between the master and pilot was brief and failed to highlight the potential problems during the passage or the limitations of the bridge organisation in restricted visibility. [2.6]
7. Where locally produced charts are available, it would be extremely beneficial for embarked pilots to refer to them when discussing the intended passage during the initial exchange with the master, and to make the charts available for scrutiny during the passage. [2.7]

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

1. Notwithstanding the limitations of the chart in use, the vessel's river passage was poorly planned and demonstrated complete reliance on the pilot for the vessel's safe passage. [2.6]
2. An instruction issued by the ship's manager regarding control of the azimuth propulsion system was ignored. Consequently, the master was on the helm of *Sea Mithril* during the river passage because there was no other person on board who he considered competent to undertake this important task. [2.8]
3. In the absence of a competency standard for the operation of azimuth propulsion systems, the responsibility for determining the degree of competency required and ensuring that sufficient helmsmen are trained to the appropriate level lies with a vessel's owner. [2.8]

3.3 SAFETY ISSUES IDENTIFIED DURING THE INVESTIGATION, WHICH HAVE NOT RESULTED IN RECOMMENDATIONS BUT HAVE BEEN ADDRESSED

1. The pilot was not practiced in providing a commentary on the vessel's passage and, although many pilots and masters prefer the pilot to steer the vessel, this practice discourages the involvement of the bridge team. [2.5]
2. The larger scale charts of the area, produced by ABP Humber are more appropriate than BA 109 for use by vessels navigating on the Trent and it is unfortunate their availability has not been well promulgated. [2.7]

SECTION 4 - ACTION TAKEN

4.1 THE MARINE ACCIDENT INVESTIGATION BRANCH

The MAIB has issued a flyer to industry reminding vessel owners and masters of the need to have sufficient persons on board their vessels who are competent to control the propulsion and steering systems fitted, and emphasising the requirement for embarked pilots to be adequately supported by bridge teams.

4.2 ABP HUMBER

In light of the concerns of its pilots regarding their observed reduction of competence of the crews of visiting ships, the grounding of *Sea Mithril*, and a number of similar accidents and near misses, ABP Humber included in its General Notice To Pilots 05/2008 issued in 14 March 2008:

Following recent events it is now prohibited for pilots to engage as helmsman during this [Channel entry] or, indeed, any critical manoeuvre on the river. As elsewhere, if the master cannot supply a competent helmsman, VTS Humber should be informed and arrangements can be made to return the vessel to an anchorage.

It also conducted a survey to gather information on key aspects impacting on the conduct of pilotage in its waters, including:

- Passage planning and the pilot/master exchange
- Pilot's assessment of the bridge team
- Technical ability of crew
- Availability, identity and competence of a helmsman
- Crew availability in restricted visibility.

The survey took place from 21st April to 31st May 2008. The results are intended to be used to assist with the identification of any additional control measures as part of the CHA's ongoing risk assessment of upper river operations.

4.3 UNITED KINGDOM HYDROGRAPHIC OFFICE

The United Kingdom Hydrographic Office intends to include a note referring to the locally produced charts of the Humber, Ouse and Trent, and how copies can be obtained, on a new edition of chart BA109 which is scheduled to be published in September 2008. In addition, Sailing Direction (NP28), which already includes reference to the local charts, will also be amended to include details of how copies of the local charts can be obtained.

4.4 TORBULK LTD

The vessel's manager, Torbulk Ltd, has implemented measures to help ensure that its instructions to its masters have been received and followed. It has also stated its intent to amend its safety management system to emphasise the importance of the exchange of information between the master and pilot, and the liaison between the bridge team and pilot when a pilot is embarked.

SECTION 5 - RECOMMENDATIONS

All United Kingdom Competent Harbour Authorities are recommended to:

M2008/157 Ensure sufficient controls and/or procedures are established to enable embarked pilots to assess the ability of vessels to navigate within harbour limits. Factors to be taken into account when making this assessment include:

- The support that can be provided to the pilot by the ship's crew
- The prevailing weather conditions and, when applicable, the likely effectiveness of the bridge organisation in restricted visibility
- The availability and use of large scale charts for passage planning
- The time and sea room required for a meaningful and effective master and pilot interchange.

The United Kingdom Major Ports Group (UKMPG) and British Ports Association (BPA) are recommended to:

2008/158 Encourage their members to:

- Develop and share guidance on the minimum levels of support pilots should expect from ships' bridge teams.
- Promulgate the availability of locally produced large scale charts for their area of responsibility.
- Conduct surveys of all ships using pilotage services, similar to the survey conducted by ABP Humber, to identify vessels which are unable to provide the necessary support required by a pilot.

The United Kingdom Maritime Pilots' Association (UKMPA) is recommended to:

2008/159 Urge its members to work with ports and harbour authorities to:

- Identify the minimum acceptable levels of support required from bridge teams to support pilots and which are necessary to ensure the safety of navigation in varying conditions.
- Conduct the surveys identified above in 2008/158.

Torbulk Ltd is recommended to:

2008/160 Review its safety management system and auditing procedures to ensure:

- Crew nominated to act as helmsmen on vessels fitted with an azimuth propulsion system are trained to a defined standard.
- Passages under pilotage are carefully planned by vessels' crews.

**Marine Accident Investigation Branch
September 2008**

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