

Report on the investigation of  
***Emerald Star***  
making contact with ChevronTexaco Number 6 berth  
at Milford Haven  
on the evening of 18 January 2006

Marine Accident Investigation Branch  
Carlton House  
Carlton Place  
Southampton  
United Kingdom  
SO15 2DZ

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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**

ALRS	-	Admiralty List of Radio Signals
CCTV	-	Close Circuit Television
COLREGs	-	International Regulations for Preventing Collisions at Sea 1972 as amended
CPS	-	Crown Prosecution Service
FVNP	-	Fishing Vessel Navigation Permit
IALA	-	International Association of Lighthouse Authorities
ICES	-	International Council for the Exploration of the Sea
IMO	-	International Maritime Organization
INS	-	Information Service
LNG	-	Liquefied Natural Gas
MCA	-	Maritime and Coastguard Agency
MGN	-	Marine Guidance Note
MHPA	-	Milford Haven Port Authority
MOP	-	Marine Operational Procedure
MSN	-	Merchant Shipping Notice
NAS	-	Navigation Assistance Service
OJT	-	On the Job Training
PEC	-	Pilot Exemption Certificate
PIMS	-	Port Information Management System
PMSC	-	Port Marine Safety Code
SMCP	-	Standard Marine Communication Phrases
SMS	-	Safety Management System
SOLAS	-	International Convention of Safety of Life at Sea
STCW	-	Standards of Training, Certification and Watchkeeping for Seafarers
TOS	-	Traffic Organisation Service
UK	-	United Kingdom
UKHO	-	United Kingdom Hydrographic Office
UTC	-	Universal Co-ordinated Time
VHF	-	Very High Frequency
VLCC	-	Very Large Crude Carriers
VOL	-	Volume
VTS	-	Vessel Traffic Services

Figure 1



*Emerald Star*

## SYNOPSIS



All times are UTC.

At 1900 on 18 January 2006 the Belgian beam trawler, *Emerald Star*, left Milford Docks after being given all necessary clearances from both Milford Port Control and Pier Head. Fifteen minutes later she ran, head on, into ChevronTexaco Number 6 berth, at almost full speed.

There were no injuries to the crew, and the damage to both vessel and jetty was minor. Fortunately there was no oil tanker lying alongside at the jetty at the time, otherwise the outcome could have been much worse.

Milford Haven Port Authority recently gained approval to berth Liquefied Natural Gas carriers in the port, and facilities are currently being built to accommodate these vessels and their cargo. A collision with one of these vessels could have alarming consequences.

After her impact with the jetty, *Emerald Star* headed back to the north side of the estuary and then seawards, passing very close to other inward bound vessels, before the duty marine officer at MHPA Port Control told her to return to the dock.

Once back in the port, but after some considerable delay, *Emerald Star's* skipper was breathalysed for alcohol concentrations and was found to be over the legally prescribed limit. Before and after being breathalysed, he was left alone for periods of time, during which he consumed more alcohol, thus compromising the validity of the alcohol sampling. The skipper was arrested some time later and imprisoned in Haverfordwest police station. He was subsequently released on bail pending the results of the blood sample analysis to confirm alcohol levels. Following the results of the blood tests, the Crown Prosecution Service decided to prosecute the skipper under section 78 of the Railways and Transport Safety Act – *Navigating a vessel under the influence of drink*.

Milford Haven Port Control houses a Vessel Traffic Service centre, providing a Traffic Organisation Service (TOS), whose purpose is “... to prevent the development of dangerous marine traffic situations and to provide for the safe and efficient movement of vessel traffic within the VTS area.” The VTS centre monitors traffic 24 hours a day with the aid of VTS radar equipment. VTS operatives inform shipping of pertinent situations and developments within the Port Authority area. Where necessary, the VTS operatives can intervene to prevent dangerous occurrences developing, being ever mindful that they can not give direct conning instructions, but that any advice or instruction they give will be “result orientated” leaving the master or skipper to decide how he/she achieves the required result.

On the evening of the accident, the VTS team were distracted from their primary function (monitoring and controlling marine traffic), and failed to notice *Emerald Star* deviating from her expected route until it was too late, therefore no intervention took place that might have averted the accident. Following *Emerald Star's* collision, the VTS centre did not inform other traffic that a “rogue” vessel was at large, and routine communications carried on as normal.

The MAIB has concluded that the cause of the accident was impaired judgment of *Emerald Star's* skipper, probably brought about by alcohol consumption.

Although Milford Haven's VTS centre played no part in causing the accident, action could have been taken to intervene and possibly prevent it.

Some of the safety issues identified by the MAIB during its investigation are as follows:

- *Emerald Star's* skipper's actions and judgment were impaired by alcohol.
- The vessel was travelling at an unsafe speed in relation to the circumstances and prevailing conditions.
- *Emerald Star* had no additional lookout posted in the wheelhouse.
- Milford Haven Port Authority (MHPA) had policies and procedures to ensure that its VTS was run appropriately. On this occasion, these were not adhered to.
- Milford Haven's VTS team were distracted from their main purpose by a routine telephone call to Pier Head and administrative duties.
- Telephones were used as an inappropriate means of marine communications.
- No intervention was made by Port Control to try to prevent the accident.
- No information was promulgated by Port Control to warn other traffic of a "rogue" vessel after the accident.
- VTS radio and radar screens were configured inappropriately.
- MHPA did not have appropriate speed limits in place.

Recommendations have been made to:

- Milford Haven Port Authority regarding the establishment of speed limits within its waters, bridge manning on reporting vessels within the Haven and communications with vessels leaving the dock.
- The Port Marine Safety Code Steering Group regarding task prioritisation and distraction of VTS operators.
- The owners of *Emerald Star* regarding lookout practices.



## SECTION 1 - FACTUAL INFORMATION

### 1.1 PARTICULARS OF *EMERALD STAR* AND ACCIDENT

#### **Vessel details**

Registered owner	:	Private
Port of registry	:	Zeebrugge
Flag	:	Belgium
Type	:	Beam trawler
Built	:	1983, Gebouwd, Belgium
Construction	:	Steel
Length overall	:	37m
Beam	:	8.3m
Gross tonnage	:	296t
Engine power and/or type	:	Wartsila; 882kW
Service speed	:	14 knots

#### **Accident details**

Time and date	:	19:15, 18 January 2006
Location of incident	:	ChevronTexaco berth 6, Milford Haven
Persons on board	:	6
Injuries/fatalities	:	None
Damage	:	Above deck level damage to vessel. Minor damage to jetty.

## 1.2 NARRATIVE

### 1.2.1 Background

*Emerald Star* (**Figure 1**) was privately owned and managed by a Belgian family and skippered by the owner's son. The vessel was a regular visitor to the port of Milford Haven where her catch was landed and sent overland to European markets.

The skipper of *Emerald Star* spent the evening before the accident drinking in various bars, and he drank some wine with a meal on the day of the accident prior to proceeding to sea in the evening.

Milford Haven Port Authority (MHPA) is a Statutory Port Authority providing port facilities to vessels ranging from leisure craft to large commercial vessels, including oil tankers. The port is expected to be handling Liquefied Natural Gas (LNG) carriers by September of 2007.

As part of its port management function, the Port Authority provides a Vessel Traffic Service (VTS) Traffic Organisation Service (TOS) as recommended by the International Association of Lighthouse Authorities. This is a 24-hour service for *preventing the development of dangerous maritime traffic situations and the provision of safe, efficient vessel traffic.*

### 1.2.2 Events leading up to the collision

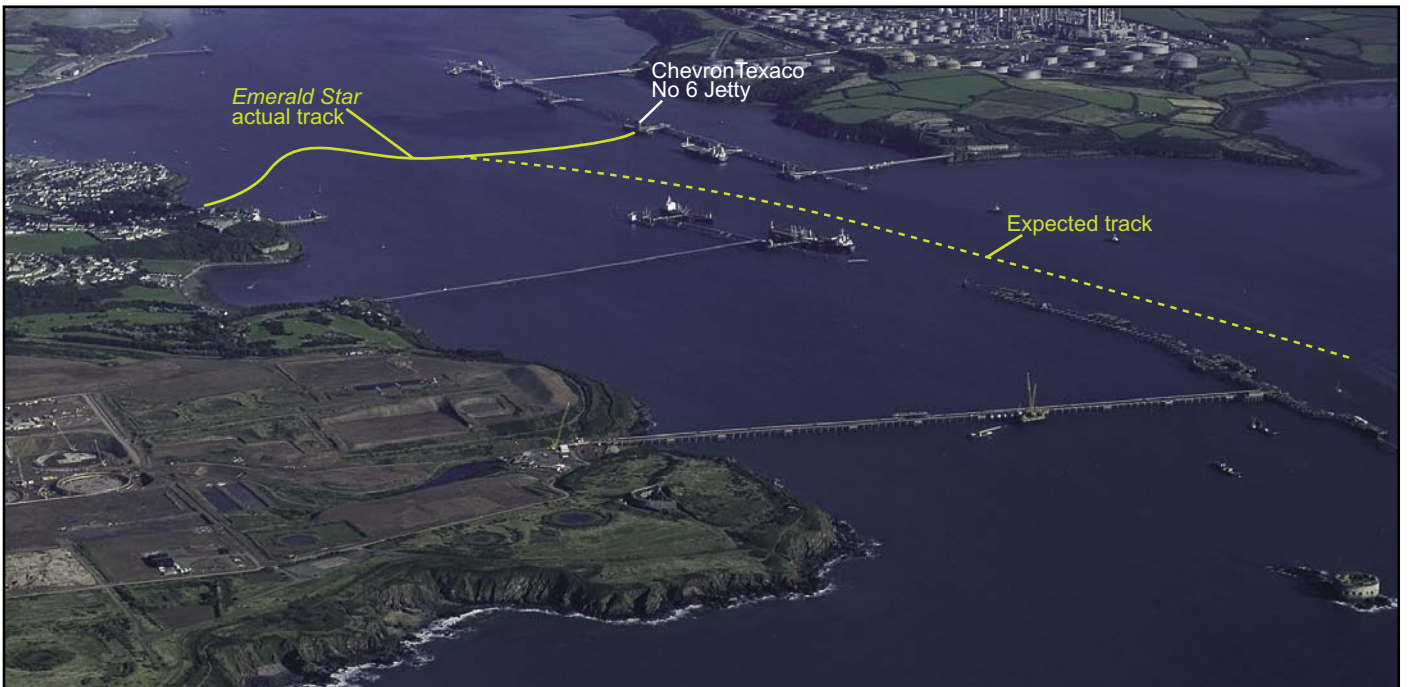
*Emerald Star* left Milford Docks at 1905 on 18 January 2006, with only her skipper in the wheelhouse. She had received all the necessary clearances and had been informed by Port Control of various movements in the area, including the presence of the inbound fishing vessel *De Marie Louise* and coastal oil tanker *Orahope*. *Emerald Star* was the first of three fishing vessels to leave the dock during "freeflow," a period from 2 hours before high water until high water, during which time the dock gates are open for traffic to and from the dock.

As *Emerald Star* progressed from the dock, she increased speed. She was detected by VTS radar at 1907. Visibility, which was variable at the time, had fallen to about 0.5 nm at sea level; at Milford Haven VTS (height of eye 70 metres) visibility dropped suddenly to 0.2nm. The skipper of *Emerald Star* could see the haze of the lights on the jetty at the other side of the estuary, but could not make out the jetty. *Emerald Star* cleared the fairway and swung to starboard to pick up the main channel. She built up speed, but instead of holding the north side of the channel, she gradually veered to port, crossed towards the south side of the channel, where she came upon the inbound *De Marie Louise*, which was proceeding slowly eastwards to approach the dock fairway. As *Emerald Star* closed on *De Marie Louise*, the latter vessel switched on her deck lights.

The skipper of *Emerald Star* continued his port swing, thereby crossing ahead of *De Marie Louise* at some 15m distance, with the intention of turning between *De Marie Louise* and the ChevronTexaco jetty; at this time *Emerald Star's* speed was approximately 12 knots. Once across the bows of *De Marie Louise*, *Emerald Star's* skipper realised there was not enough room to turn and, despite going astern, hit the jetty. The noise of the contact was heard through the open window of the VTS control room, which was approximately 0.75 mile away. A chart of the area and the vessel's track is shown on **Figure 2**.

Figure 2

Reproduced from Admiralty Chart 3274 by permission of the Controller of HMSO and the UK Hydrographic Office



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Milford Haven VTS initially observed *Emerald Star* on radar, following a suitable course as she cleared the dock fairway. However, the VTS marine operator became distracted from further continuous observation by telephone demands, and the team made no intervention by radio as the dangerous situation developed.

The VTS centre<sup>1</sup>, which uses the title “Milford Haven Port Control”, was manned by two people, a duty marine officer and a marine operator, the senior operative being the marine officer. *Emerald Star* collided with the jetty just over an hour into their 13 hour watch programme.

The marine officer, who was in charge of traffic, had VHF channel 12, the port’s working channel, selected on radar, but unfortunately did not have the busiest area of Milford Docks displayed on his work station radar screen. Instead, he had the approaches to the port and the anchorages on screen. The marine operator was monitoring the dock area and port approaches at his station, but he was unable to transmit on VHF channel 12 because it was already selected at the other VTS station.

On recognising the unusual disposition of *Emerald Star*, the marine operator called to the marine officer to “*Call Emerald Star on channel 12!*” The duty marine officer left his position to look at the appropriate screen, and took some seconds to interpret the display. At first, he wanted to believe that it was a double trace echo, but the vector, target and the tell tale on the radar confirmed that it was indeed *Emerald Star* heading towards the ChevronTexaco berth. By that time, *Emerald Star* had crossed close ahead of *De Marie Louise*. By the time the marine officer reached his desk, some 2 metres away, and called *Emerald Star*, she had hit the jetty, which was confirmed by the noise of the contact being heard in the control room 0.75 mile across the estuary.

*Emerald Star* collided with ChevronTexaco Number 6 berth at Milford Haven on the evening of 18 January 2006 at approximately 1915. The damage to the vessel (**Figures 3a, b, and c**), and the berth (**Figures 4a and b**), was not particularly serious. However, had an oil tanker been lying alongside Number 6 berth, the consequences might have been very different.

### 1.2.3 Post collision events

After the accident, *Emerald Star* headed back to the north side of the channel, at speeds of up to 7 knots, crossing close behind *De Marie Louise*. She then proceeded seawards towards the inbound ballasted oil tanker *Orahope*, which she passed, slowly, at a distance of about 9 metres.

Milford Haven VTS succeeded in contacting *Emerald Star* by radio, and established that she had, indeed, collided with the berth (there was some confusion in the VTS room as to whether she had hit a jetty or a moored tanker). They instructed *Emerald Star*’s skipper to return to the dock. No enquiry was made regarding the condition of the vessel or her crew. During the process of contacting *Emerald Star*, other fishing vessels sought, and were given, permission to leave the dock and proceed to sea. No announcement was made by VTS to advise or inform Haven traffic of a “rogue” vessel in the area, or that an accident had occurred. Routine communications with vessels navigating the dock carried on as normal.

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<sup>1</sup> Milford Haven VTS centre is known as Milford Haven Port Control. Any reference to Milford Haven VTS in this document also refers to Milford Haven Port Control and vice-versa.



Damage to vessel



Damage to berth

Following the accident, Milford Haven VTS immediately sent out a pilot vessel to guide and escort *Emerald Star* back to port as her skipper seemed somewhat confused and disorientated, in the poor visibility. The pilot vessel was later dispatched to inspect the damage to the jetty, and Texaco was notified of the accident.

At 1955, *Emerald Star* was back alongside in the dock, where she was met by the duty harbourmaster, who had been advised of the incident by port control. The duty harbourmaster inspected the vessel for damage, and briefly spoke to her skipper and, under the Port Byelaw number 12 (*Powers of the Harbour Master*) detained the vessel from sailing. The duty harbourmaster recognised that *Emerald Star's* skipper was distraught and was unlikely to be able to give him meaningful information. He therefore decided not to interview the skipper at that time. The duty harbourmaster had no indication that the skipper might have been drunk, as his speech and movements seemed unimpaired.

Some confusion then occurred between the harbourmaster and the duty harbourmaster regarding the interpretation of the Railways and Transport Safety Act 2003. This resulted in the skipper not being tested for alcohol consumption until 2110, almost 2 hours after the accident. *Emerald Star's* skipper gave a positive result when the local police breathalysed him for alcohol, with the duty harbourmaster in attendance. The police left the skipper on board the vessel, under the impression that MHPA were going to deal with the situation under maritime and port byelaws.

MHPA notified the MCA information line of the incident at 2320, some 4 hours after the accident. This information was then passed to the MCA duty surveyor who, in turn, notified the duty enforcement officer.

At approximately midnight on 18 January, the MCA Enforcement Unit contacted the police and MHPA to establish the circumstances of the incident. After being informed that the earlier breathalyser test was positive, the MCA asked what had become of the skipper. When told that he was still on board *Emerald Star*, the MCA advised that, under the Railways and Transport Safety Act, he should have been arrested and taken into custody. At 0200 on 19 January, almost 7 hours after the accident, the harbour authorities and police went back on board *Emerald Star*, woke the skipper from his sleep, and breathalysed him again for alcohol; this test was also positive. The skipper was duly arrested and taken to Haverfordwest police station, where he was obliged to give further breath tests using enhanced equipment. The results of two consecutive breathalyser tests indicated 43 and 42 microgrammes of alcohol per millilitre of breath; the legal limit being 35 microgrammes. The skipper then agreed to blood sampling to establish the level of alcohol in his blood stream. The blood sample was sent for analysis to enable the authorities to work back in time and estimate the level of alcohol in the skipper's blood stream at the time of the accident, also taking into consideration any further alcohol consumed during the intervening period. The blood sample from *Emerald Star's* skipper was tested for alcohol, but not for any other substances.

At 1600 on 19 January, *Emerald Star's* skipper was released from police cells on 6 weeks bail. This was extended for a further 6 weeks, during which time his blood tests were completed, and the Crown Prosecution Service (CPS) charged him under section 78 of the Railways and Transport Safety Act 2003 – *Navigating a vessel under the influence of drink*.

Milford Haven Port Authority prosecuted the skipper of *Emerald Star* under the Port's Byelaws (numbers 20 and 30) which are: "*Vessels to be Navigated With Care*" and "*Navigating Whilst Drunk*". At trial on 20 February, the skipper of *Emerald Star* was found guilty of manoeuvring a boat "*in a manner as to cause damage, danger or inconvenience to other users*"; the drinking charge was dropped because the skipper had been left unattended at various times in his wheelhouse and cabin, allowing him to consume more alcohol.

An MCA surveyor inspected *Emerald Star* on 19 January, and put a detention order on the vessel on the grounds that she was unsafe to go to sea due to the damage caused by her contact with the jetty. Subsequently, the vessel was repaired and allowed back to sea. The skipper was also allowed to leave the country under his bail conditions.

Inspectors from the MAIB visited the vessel and MHPA VTS on 19 and 20 March. A test of the steering gear was carried out to establish whether the steering gear may have jammed during the accident. The test found the gear to be fully functional.

#### **1.2.4 Environmental conditions**

It was dark at the time of the accident. Estuary waters were calm with a 1 knot eastward setting tide at midstream. Visibility was variable from moderate to poor; immediately prior to the accident visibility dropped to 0.5nm at sea level, whereas at the port control it fell to just 0.2nm.

#### **1.2.5 Milford Haven**

The port of Milford Haven includes the whole of the Haven and its approaches. The area extends from the inner limits on the upper reaches of the River Cleddau, to the outer seaward limits some 6 miles south-east and south-west of St Anne's Head. It is a major oil port, and is one of the few in the UK accessible to fully laden Very Large Crude Carriers (VLCCs) with draughts up to 20m. Aggregates and general cargo are handled at Pembroke Dock, where there is also a ro-ro ferry terminal, for services to and from Ireland.

In 2004, Milford Haven Port Authority gained approval for Liquefied Natural Gas (LNG) carriers to discharge into specialised terminals currently being built within the port. The LNG will be stored in containers ashore and it will be used to supplement UK gas supplies. It is thought that by the year 2010, approximately 30% of the UK's gas requirements will be imported through Milford Haven. The first supplies of LNG are expected to be delivered in September of 2007.

Excluding fishing vessels and leisure craft, MHPA averages 15 vessel movements per day; on a busy day this can be as high as 30 movements.

Pilotage is compulsory within the port limits for all vessels over 50 metres in length, with exemptions and exceptions for certain, specified vessels and conditions. In 2001, the Authority reviewed its Pilotage Directions, which are limited by the Pilotage Act 1987 to ships of 20 metres or more in length, or fishing vessels of 47.5 metres or more in length. The review concluded that very few ships of 20 to 50 metres used the port, none of them tankers, and only two fishing vessels between 47.5 and 50 metres had utilised the port in the previous 5 years. The Authority therefore concluded that the 50 metre limit for compulsory pilotage remained appropriate.



MHPA has experienced problems with fishing vessels leaving Milford Docks. These have typically been caused by vessels leaving at night, turning to starboard too soon, and keeping too far to the north, such that they could go behind (inshore of) the northern jetty (Total Jetty) and collide with its oil carrying pipelines. Such accidents have been prevented through the stationing of a pilot boat (when available) near the Cunjic buoy, and by implementing a Fishing Vessel Navigation Permit (FVNP) system. Although a pilot boat was available, it was not deployed by the Port Control Duty Officer on the night of the accident to warn fishing vessels away from the danger area.

The FVNP is described as an informal Pilot Exemption Certificate (PEC). The skipper of a fishing boat is granted an FVNP following the completion of an onboard briefing given by an MHPA employee (a qualified fishing skipper) followed by provision of a pilot, free of charge, to assess the practical competence of the skipper leaving the dock during hours of darkness. The permit is issued upon positive feedback to MHPA from the pilot. The FVNP system was introduced in February 2003, and since that time, the accident involving *Emerald Star* was the first to be recorded. Prior to the introduction of the system, there were 10 night-time near misses or incidents involving fishing vessels in the port during a 37-month period.

Following concern over the risk of accidents and incidents in the port involving smaller vessels, the MHPA recently applied through the Marine Safety Co-ordination Committee to amend the Pilotage Act to make pilotage compulsory for all vessels in the port over 20m length, including fishing vessels. However, the fishing industry is strongly resisting the application.

Prior to its decline, Milford Docks was, for many years, an important centre for the UK fishing industry. Today, however, the port is used mainly by Belgian, French and Spanish fishing vessels fishing the outlying waters of Cornwall, Wales and Ireland. The majority of catches from these vessels are transported by road for sale in various EU countries. Milford Dock's 2006 fish-related income is estimated at £250,000, with a "spin off" value to the local economy of between £2.5 and £3.0 million.

### 1.2.6 *Emerald Star*

The vessel (**Figure 1**) was built in Belgium in 1983 and owned continuously since that time by the same family. The vessel beam trawled for high quality flat and groundfish.

*Emerald Star* appeared outwardly to be well maintained and manned by a regular crew of six which meets the Belgian Safe Manning requirements for fishing vessels. She also held a valid Certificate of Seaworthiness for a Fishing Vessel of 24m and over in length.

As a consequence of an assertion that the steering had jammed to port during the accident, the vessel's steering was inspected by MAIB inspectors. Although it was found that the tiller control knob was loose, and could be removed from its position, no evidence could be found of the steering jamming. Although VTS radar playback showed *Emerald Star's* track altering to port, this was a gradual swing through a 110 second period from an initial heading of 237° to a final 191° when she hit the jetty. The latter stages of the alteration being slightly more pronounced as *Emerald Star* altered for *De Marie Louise*. The radar recording showed no indication of the vessel altering back to starboard after crossing *De Marie Louise*.

The damage to the vessel was restricted to minor distortion of her bulwark bow plating and whaleback rails. There was no breach of the hull below deck level (**Figures 3a, b and c**). The damage to *Emerald Star* was minimised by the configuration of the berth platform, which allowed her to become wedged between the supports and under the platform, thus absorbing the impact. Damage to the jetty is shown in **Figures 4a and b**.

*Emerald Star's* wheelhouse equipment included two radars which were both operational, but not used, despite the reduced visibility at the time.

The vessel's track plotter was also not in use during the transit of the estuary.

No attempt was made by *Emerald Star's* skipper or crew to establish the extent of any damage to her following the collision with the berth until after they had returned to Milford Dock.

### **1.2.7 Skipper**

The skipper of *Emerald Star* was a 32 year old Belgian national who had sailed on her since leaving school. He had skippered the vessel for the previous 10 years, and had a good knowledge of the port of Milford Haven, having been in and out of the port on numerous occasions.

The skipper held a Belgian Fishing Captain's Licence (restricted). This allowed him to skipper fishing vessels of any size in sea areas IV, V, VI, and VII of the International Council for the Exploration of the Sea (ICES). He also held a FVNP issued by MHPA in February 2003 – this was suspended after the collision with the jetty.

*Emerald Star* arrived in Milford at 1900 on Monday 16 March. After discharging her catch, the skipper went to a quayside bar for an hour before going to bed. The following day was taken up with working on the fishing gear until about 1700. At about 2100, the skipper went ashore and spent from then until 0045 drinking beer in local bars with his crew. It was estimated that he drank between 10 and 15 bottles of beer over the period. The following day the skipper drank 2 glasses of wine during a late lunch.

The skipper was alone in the wheelhouse when the vessel collided with the berth. The rest of the crew were either in the mess room, engine room or, in some cases, already in bed.

*Emerald Star's* skipper was involved in a minor incident in Milford Dock in June 2005. This was a contact between *Emerald Star* and another fishing vessel while manoeuvring in dock, and culminated in a heated exchange between the skippers.

### **1.2.8 Collision Prevention Regulations**

The International Regulations for Preventing Collisions at Sea, 1972, as amended (COLREGs) lay down rules which are applicable to all vessels, to enhance safe navigation.

Rule 5 of the above regulations requires that *all vessels at all times maintain a proper lookout by all available means*.

Rule 6 of collision prevention regulations requires that *all vessels proceed at a safe speed at all times*.

Rule 7 requires that *proper use of radar equipment shall be made if it is fitted and operational.*

Rule 8 of the Regulations states that, as an action to avoid collision, a vessel should *slacken her speed to allow more time to assess the [collision] situation.*

Additionally, Rule 19 requires that in restricted visibility, *every vessel shall proceed at a safe speed adapted to the prevailing circumstances and conditions.*

Seconds before contact with the berth, *Emerald Star's* speed was shown by the VTS radar recording to be 13 knots, but it did reduce slightly before actual contact, probably as a result of the skipper, belatedly, trying to effect a crash stop.

MHPA's byelaws require that vessels are to be navigated with care and not "*... in such a manner or speed as will or may cause damage, danger or inconvenience to other users of the Haven.*"

### **1.2.9 Speed limit**

There are no upper speed limits within MHPA waters other than speed restrictions for vessels passing terminals which are undergoing maintenance from craft alongside; high speed restrictions in the upper reaches beyond Lawrenny Yacht station and also for the ro-ro ferry to Ireland; the latter has a phased speed limit from her berth to the sea to limit wash. MHPA recognise that to maintain effective steerage, minimum safe speeds will depend on the characteristics of the vessel and the environmental conditions prevailing at the time.

Even in restricted visibility, the port does not impose speed limits, but it leaves this to the discretion of individual masters. However, "reporting vessels" (vessels of more than 20m in length overall or vessels engaged in towing) are not allowed to enter or move within the Haven if visibility falls below a cable (0.1 nm). There are more stringent restrictions imposed on vessels, dependent on their size, which are carrying dangerous substances, or polluting goods in bulk.

Once LNG operations commence, in late 2007, a speed limit of 6 knots will be applicable to all reporting vessels when passing the LNG terminals, but not when passing other terminals.

### **1.2.10 Vessel Traffic Services**

Resolution 10 of the *International Convention on the Standards of Training, Certification and Watchkeeping for Seafarers in 1995 (STCW95)* call for provision to be drawn up for the training of maritime pilots and VTS personnel. Subsequently, the International Maritime Organization's (IMO) Resolution A.857 (20) *Guidelines for Vessel Traffic Services* were adopted. In response, the International Association of Lighthouse Authorities (IALA) completed and published its *Standards for Training and Certification of VTS Personnel, V103.*

In the UK, the MCA assumes the role of Competent Authority for overseeing and ensuring consistency of basic VTS training standards.

In following IALA guidelines, MCA guidance, and the requirements of the Port Marine Safety Code (PMSC), Statutory Harbour Authorities are required to carry out a Formal Risk Assessment to establish the need for VTS or provision of Port Information. The risk assessment is also used to establish what category (if any) of service should be offered. As a minimum a VTS should offer an Information Service (INS). Additionally a VTS may offer a Navigation Assistance Service (NAS); and/or a Traffic Organisation Service (TOS).

MHPA offers a TOS, which is defined as “*a service to prevent the development of dangerous marine traffic situations and to provide for the safe and efficient movement of vessel traffic within the VTS area*”. As part of the process, the Competent Authority (MCA) may assist with the evaluation process to assist in ensuring compliance with UK best practice and international recommendations. Statutory Harbour Authorities providing a VTS are expected to follow IALA guidelines and Marine Guidance Notices issued by the MCA, including the provision of physical resources and appropriately trained operators.

Once a VTS has been implemented, the Statutory Harbour Authority is required to notify the MCA and the UK Hydrographic Office (UKHO) of the service offered. The MCA then adds this information to the UK VTS database, while the UKHO promulgates the appropriate details in the Admiralty List of Radio Signals Volume 6.

#### **1.2.11 VTS communications and results**

The primary functions of a TOS are carried out by VTS personnel using all equipment available to the centre, and are promulgated to marine traffic via VHF radio communications. Where appropriate, VTS personnel are expected to prefix such communications using terms contained in the IMO Standard Marine Communication Phrases (SMCP), such as: Information, Advice, Warning, Question etc. This leaves the listener under no doubt about the message that is to follow.

MHPA's Operational Memo 15/2003 (**Annex 1**) is specific in its instructions to Port Control staff regarding intervention communications. The end product of VTS communication is required to be “result orientated,” i.e directions can be given to the master of a vessel, but how he achieves the required result is down to him. It is considered inappropriate for a VTS operator to advise and/or instruct a master to “*stop your vessel,*” as this is a conning instruction and could lead to other problems. However, it would be appropriate to advise him to “*reduce to a safe speed,*” thus leaving the master to determine what is a safe speed, and how this is to be achieved.

#### **1.2.12 Shipping communications**

All reporting vessels moving within the port authority area are required to communicate by VHF radio with Port Control, and keep a continuous listening watch on channel 12.

Dedicated VHF channels used for port purposes are:

- 9 and 15 - berthing;
- 11 - internal;
- 12 - general traffic and navigational information;
- 14 - emergency situations;
- 18 - dock pierhead.

Channel 18 is used specifically for vessels transiting the dock. With the exception of fishing vessels, Port Control relies on telephone notification from the dock pierhead of outward bound vessels; likewise the pierhead is notified of inward bound vessels from Port Control by telephone, prior to their arrival at the dock entrance.

Fishing vessels leaving the dock are required to notify Port Control of their movements. *Emerald Star* did call Port Control before leaving the dock and was duly notified of traffic movements and given all necessary clearances to proceed.

### 1.2.13 VTS training

IALA Recommendation V-103 established international standards for training and certification of VTS personnel and is supported by four IALA model courses:

V-103/1 – VTS Operator Basic Training

V-103/2 – VTS Supervisor Advancement Training

V-103/3 – VTS On-the-Job Training - VTS Operator – VTS Supervisor

V-103/4 – VTS On-the-Job Training Instructor

IALA Recommendation V-103 and its supporting model courses V-103/1 and V-103/3 were used to develop the UK's National Occupational Standards for VTS Operators. The UK's VTS training and certification strategy, developed by the MCA in consultation with stakeholders, enables VTS operatives to hold recognised qualifications in VTS.

IALA recommends that VTS staff should be trained to the level of V-103/1 or higher. This specialist training is offered by various MCA approved establishments. The training provided depends very much on the background of candidates, and ranges from a 2 week course for master mariners, to 10 weeks training for people with no seagoing experience. Training includes exercises, emergency and otherwise, conducted on specialist VTS simulation equipment. These exercises are of a generic nature, but are, nevertheless, effective in putting candidates under realistic pressures. Exercises require operators to multitask, i.e monitor and interact with several vessels simultaneously, populate databases and also to deal with external matters such as telephone calls etc.

On successful completion of the college based basic training course, candidates apply to the MCA to be issued with a VTS Operator Certification log book. On return to their VTS Centre, they undergo further on-the-job (OJT) training. In following good practice, VTS authorities have developed in-house training programs based on V-103/3. OJT is specific to the VTS area and is aimed at developing competence in local knowledge and skills necessary to work in the VTS centre. Such local knowledge should include:

- Shipping traffic regulations;
- Topography and geography;
- Hydrological and meteorological characteristics;
- Marine traffic characteristics;
- Equipment;
- Watchkeeping responsibilities;
- Routine procedures;
- Special circumstances;

- Allied services;
- Emergency procedures; and
- Other activities aimed at improving local knowledge and skills.

In line with good practice, OJT is managed by a qualified On-the-Job Training Instructor who, in addition to holding VTS qualifications, has successfully completed an approved OJT Instructor training course in accordance with IALA model course V-103/4.

OJT Instructors are qualified in the task for which training is being conducted and assessment is being made. It is expected that they will have an appropriate level of knowledge and understanding of the competence to be assessed. OJT may, however, be supported by instruction from subject matter experts who may not be qualified as VTS OJT Instructors. Every candidate undergoing OJT must have opportunities to perform various assignments and tasks in an operational environment under the direct supervision of an OJT Instructor.

On successful completion of OJT, candidates' VTS Certification Log books are endorsed by their employing VTS Authority stating the level of service (i.e. INS, TOS, NAS) that an individual is authorised to offer. Only after the local endorsement can a person be considered as a qualified VTS operator for that specified VTS Centre. Should an individual leave that centre for another, the whole process of OJT must be repeated, to ensure that an operator has local knowledge of the specific area and equipment in use.

Before this accident, MHPA had already implemented a training program for a VTS OJT Instructor. This training, in accordance with IALA model course V-103/4, is now complete and the OJT Instructor is now qualified and in post.

#### **1.2.14 Operator selection process**

IALA Recommendation V-103 suggests a selection process for potential VTS operators to ensure that they have the abilities to undertake the responsibilities set out by the VTS Authority. This process includes aptitude testing, carried out before candidates are put forward for initial training.

IALA recommends that aptitude tests should be designed to determine the ability of candidates to:

- pick out relevant information from a variety of information;
- combine auditory and visual information;
- demonstrate spatial and situational awareness;
- act alertly and decisively in busy situations; and
- carry out several tasks simultaneously.

The tests should also demonstrate that candidates can:

- carry out routine work without getting bored;
- show initiative while working within a framework of standards, regulations and structured procedures;
- be vigilant; and
- have good verbal communication skills.

Milford's VTS personnel selection process was achieved by utilising existing members of staff with mostly nautical backgrounds. These people already had local knowledge and marine qualifications plus experience, and were thus accredited with prior learning. After interview, MHPA's selected Operators underwent a minimum 6 week training and evaluation process. Once in post they were subject to a standard 6 month probationary period. V-103 basic training then took place as soon as practicable to fit around college schedules.

### 1.2.15 Milford Haven VTS

MHPA embraced IALA's VTS guidance and recommendations and, as such, provides a VTS Traffic Organisation Service. The VTS centre is situated on top of the main port authority building, overlooking the Haven estuary on the western outskirts of the town of Milford Haven. The facility is manned 24 hours a day, 7 days a week, by a duty marine officer and a marine operator who are trained, as a minimum, to the recognised standards of V-103/1. MHPA has a total of 14 qualified VTS staff, including 10 operatives and 4 managers. Most of the VTS operators are ex-seafarers, who have been with the Port Authority in this role for a number of years.

Milford Haven port control is an accredited TOS with the UK's Competent Authority, the MCA. This service provides radar and radio coverage for monitoring vessels' movements within the confines of the Haven and its approaches.

Milford Haven's VTS (**Figure 5**) consists of 4 radar screens, 2 database screens, 4 VHF radios, 2 telephones, a fax machine and a selection of CCTV cameras placed at various strategic positions throughout the Haven, including the dock entrance. The right-hand side of the room is a duplicate of the left, with all equipment divided

Figure 5



Milford Haven's VTS

equally. However, it is not possible for operators to speak on the same VHF channel on separate sets due to their close proximity resulting in feedback and interference between the sets. VHF transmitting aerials are currently sited on a mast above Port Control. Receiving aerials are located on a separate mast some 400 metres to the North.

As part of the TOS, a number of VHF channels are selected for the purpose of advising, informing, instructing and directing marine traffic. The two main channels used by Milford Haven Port Control are:

- Channel 11 for pilot communication;
- Channel 12 for general traffic communications.

All vessels underway or at anchor are obliged to keep a watch on channel 12 at all times.

The VTS centre records information from radars, radios and telephones, which allows the Authority to play back information for confirmation purposes when needed. The storage and recall of this information played a crucial role in assisting the MAIB with this investigation. The sequence of *Emerald Star*'s plotted course as displayed and recorded on the VTS operative's screen, is shown in **(Figures 6a, b, c and d)**.

#### **1.2.16 Radar equipment**

MHPA has six radar scanners covering the main areas of the port. Two scanners (X and S band) positioned on St Ann's Head cover the approaches to the Haven; a scanner on Great Castle Head covers the anchorages and Dale Roads area; Popton Fort covers from Dale Roads up through the terminal jetties, the dock area towards Wear Point; a scanner on the Authority building covers a similar area, but from the north side of the estuary, and a scanner on Patrick's Hill covers from the dock area eastwards towards Pembroke Reach.

In the VTS centre the radar pictures are displayed on 4 screens **(Figure 7)**, allowing operatives to choose which area they wish to focus in on. There is also the option to have the same picture displayed on more than one screen, therefore both the marine officer and the marine operator could be looking at the same image on their individual station.

The VTS radars are self testing, which optimises operational performance; additionally the radars are checked from time to time by MHPA's contract engineer who attends Port Control daily. Double trace echoes are rarely a problem, and if they are seen, it tends to be in the area of Angle buoy, where 4 different scanners sweep over the area simultaneously.

#### **1.2.17 VTS operations**

The VTS centre is manned 24 hours per day with a marine officer and a marine operator. The marine officers hold seniority over marine operators.

VTS shift patterns are from 0700 until 1800, and from 1800 until 0700. Shift rotas are: 2 day shifts on duty, 24 hours off duty, followed by 2 night shift duties followed by 4 days off. Marine officers also have 10 days free of duty approximately every month, whilst Marine Operators have 18 days free of duty every 7 or 8 weeks.



Figure 6a and 6b

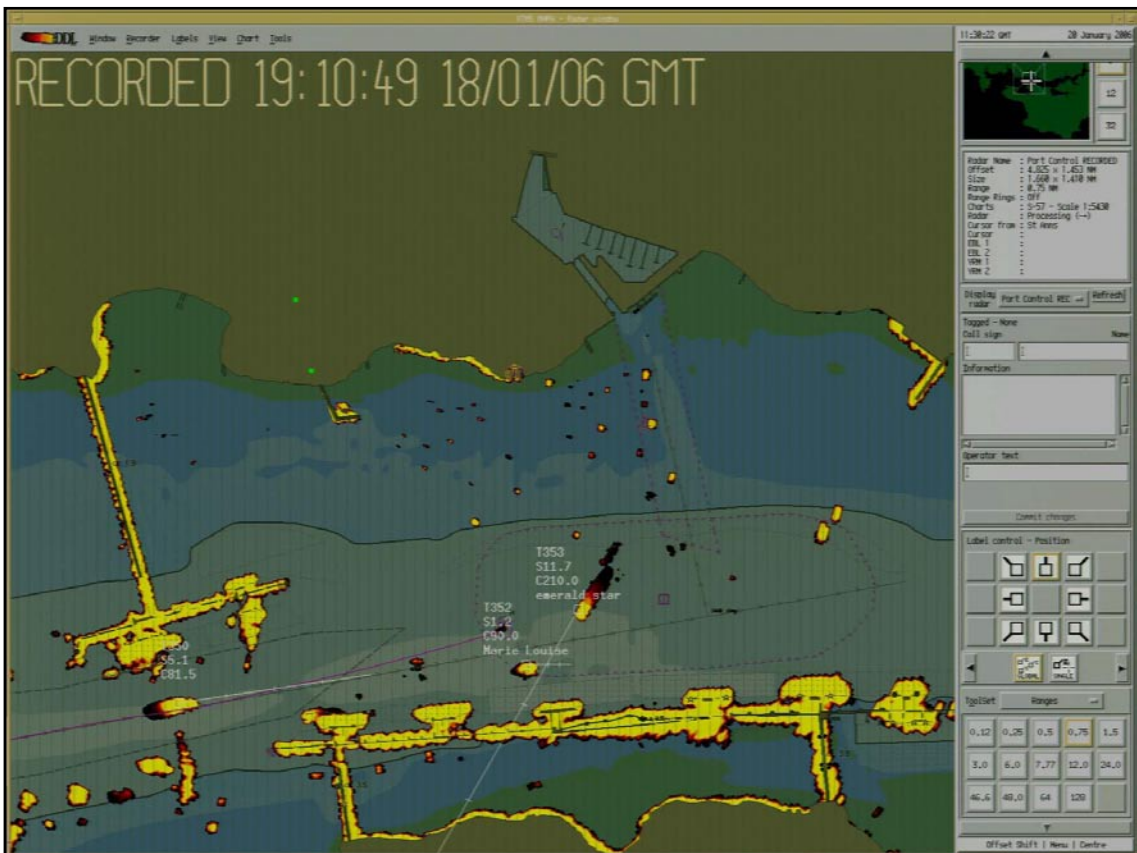
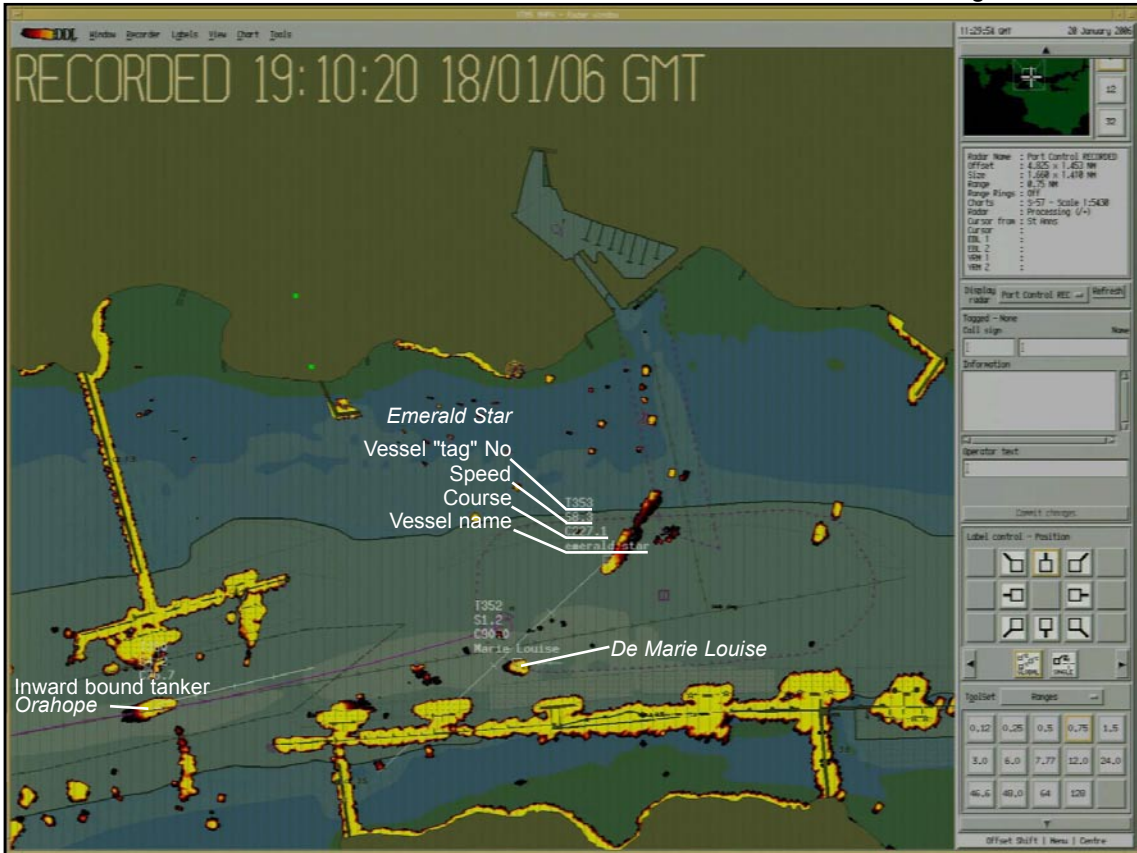
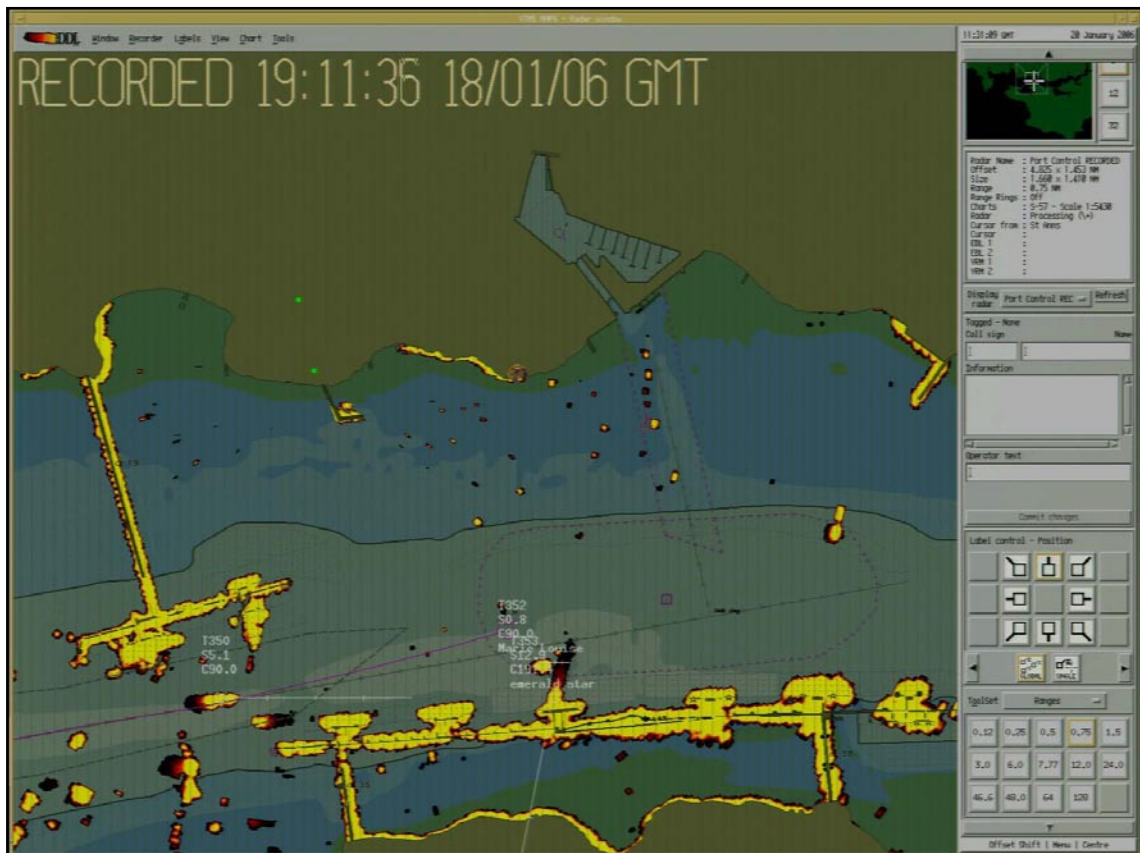
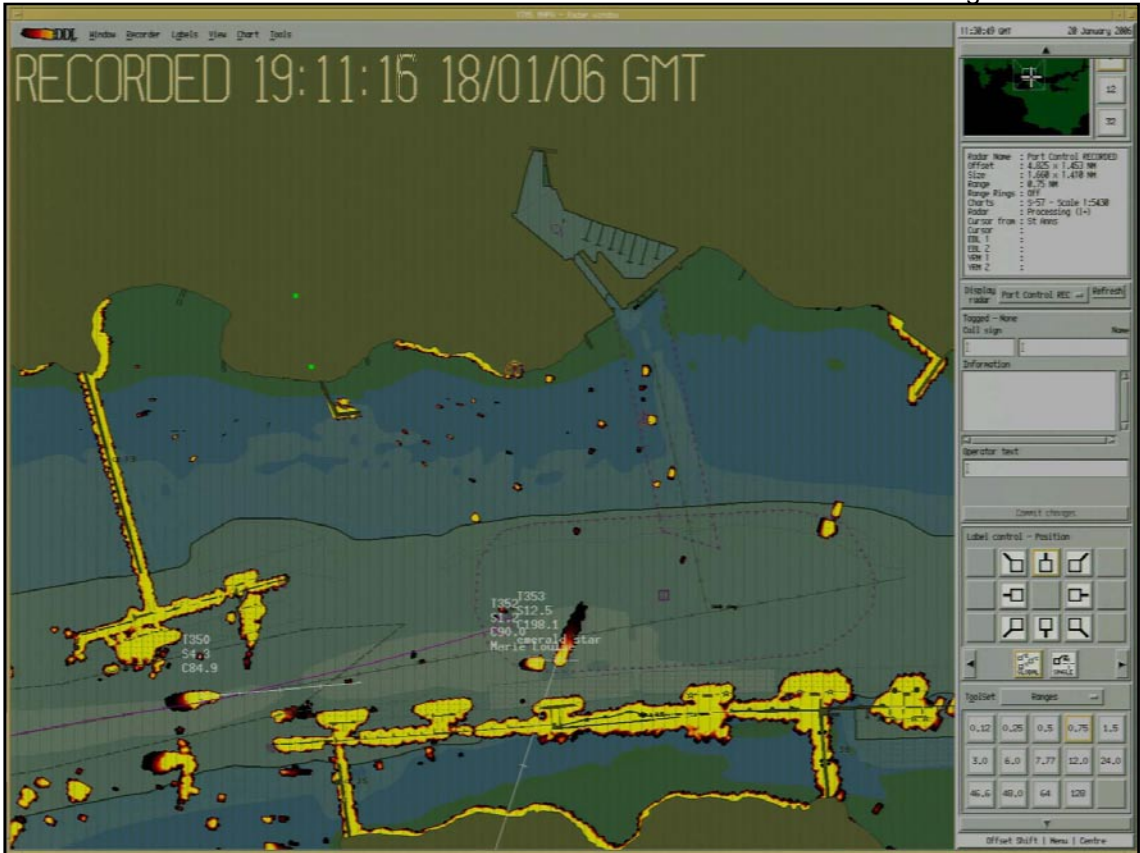


Figure 6c and 6d





Milford Haven's VTS - photograph showing the 4 screens displaying radar pictures

The daily pattern for a VTS operator includes:

- Monitoring VTS screens for vessel movements and communication with shipping;
- Logging all vessels' movements etc on a database;
- Arranging pilot allocation, planning and programming vessel movements.

Information may come to Port Control via telephones, radio, fax, or more frequently by email. Often, shipping schedules arrive in triplicate: by a fax from the ship; by an email from the ship, and a further copy from the ship's agent. All these items have to be checked to ensure they do not differ. Terminals are regularly contacted to confirm their plans, which frequently change. Hard copy logs are maintained, and an electronic database is populated continuously as part of the overall regime.

During office hours, most of the telephone calls are answered by the MHPA reception, who direct the calls appropriately throughout the building. After office hours, however, telephones are required to be answered by VTS centre staff. Not only are calls taken regarding shipping information, but also public calls are diverted to the VTS centre. These calls can often be trivial, with little to do with shipping information. As an example, a few minutes before the accident to *Emerald Star* occurred, the marine officer was answering a call from a member of the public wishing to give apologies for not being able to attend a meeting being held elsewhere in the building. Although there is an answerphone facility on the telephones, the MHPA Management has requested that all telephone calls made to the Authority are answered in person.

### 1.2.18 Safety Management Systems

MHPA has a comprehensive Safety Management System (SMS) in place as required by the PMSC.

MHPA's Port Control Policy, which is part of that SMS, is shown in **Annex 2**.

MHPA does not have "standing orders", instead, it utilises a system of "Marine Operational Procedures" (MOPs) see **Annex 3**. MOPs are numbered, issued, updated and logged as circumstances dictate. As an interim measure before MOPs are amended, Operational Memos are issued and are required to be signed by those they affect (**Annex 1**).

### 1.2.19 MHPA risk assessment

In March 1997, MHPA, in conjunction with BOMEL Engineering Consultants, carried out a comprehensive formal safety assessment of marine operations at Milford Haven. The high risk areas identified fell into the following categories:

- *Collision*
- *Grounding*
- *Berthing Contact*
- *Fire and Explosion*

"Rogue vessels" however, were not identified as a risk. Resulting from the assessment, risk control options were identified under the following headings:

- *Port Control*
- *Navigation Service*
- *Port Guidelines*
- *Safety Management system (SMS)*
- *Small Vessels*
- *Harbour entrance*
- *Tug resources*
- *Emergency Response Plan*
- *Berthing Controls.*

With regard to *Port Control*, a number of recommendations were made, which included, but were not limited to: an enhanced navigation service; traffic control; the integration of pilot and navigation service functions; enhanced communications; separation of small craft from tankers while undergoing berthing operations and the issue of a port guide for visiting vessels.

In relation to *Navigation Service*, the following recommendations were made: additional training for pilots and PEC holders, and the establishment of a navigational sub-committee which would deal with all navigational issues and standards affecting the Haven.

In relation to *Port Guidelines*, a recommendation was made to develop and adopt port manoeuvring guidelines, and, as part of the safety management system, to be implemented via procedural control. The guidelines covered criteria for the handling of ships, the use of tugs, limitations on the transit of vessels, communications and navigational aids.

In relation to *Small Vessels*, recommendations were made regarding general compliance. These included significantly raising the profile of regulations applying to pleasure craft and fishing vessels, such as regulations pertaining to exclusion zones, use and misuse of VHF radio, and impeding the navigation and manoeuvring of large vessels.

In view of MHPA's interest in maintaining a viable fishing industry at the port, it was to consider a policy of providing undeclared free pilotage for fishing vessels with communication difficulties. Alternatively, it was to consider employing a patrol boat to accompany groups of fishing vessels into Milford Dock, and to consider confining fishing vessels to the east channel.

With regard to the more specific risk fishing vessels posed to larger vessels, predominantly tankers, navigating within the Haven, the following relevant hazards were identified:

1. *Fishing vessel uncontrolled entry and exit to Milford Docks*
2. *No or little control exercised over fishing vessels. Fishing vessels tend not to obey or follow advice given by signal stations, which makes port control and informing other vessels of what is happening in the Haven more problematic.*

In both cases, BOMEL identified control measures, which included:

- *Generating an information booklet about the port.*
- *Improving restriction of vessel movements when bigger vessels are coming in or exiting the port.*
- *Port control system needs to be enhanced to become heart of port operations.*
- *Passage plan from ship to port control received in ample time and ensure vessels demonstrate passage plan has been completed.*
- *Back up port control system by management formally at a high level to provide operators with confidence.*
- *Language courses for port personnel dealing with foreign trawlers should be implemented.*
- *Education of how to communicate and navigate is needed via a port guide for all users. [Sic]*

The above issues were mostly addressed through Marine Operating Procedures (MOPs) numbered 001 through to 006 which are under constant review, with early amendments addressed by Operational Memos.

This risk assessment also became the cornerstone for MHPA establishing and offering a VTS Traffic Organisation Service as per IALA guidelines. This was effectively the same service provided by Port Control before it publicly declared itself as a VTS, TOS.

Further reviews of the risk assessment have been carried out on a regular basis, and consider measures to be taken in the event of pollution, collision, fire etc. The Authority requires that emergency incidents are dealt with through the use of "Emergency Plan Check Cards" – a system showing sequential, pre-considered steps to resolve such situations.

### **1.2.20 VTS team authority**

The harbourmaster's authority is delegated to marine officers, allowing them to act and speak on behalf of the harbourmaster. This authority is not delegated to marine operators. However, the authority of marine officers is delegated to marine operators, allowing the marine operator to act and speak on behalf of the marine officer.

### **1.2.21 VTS operatives**

At the time of the accident, both operatives were very experienced in VTS operations. The accident occurred about 75 minutes after the duty watch began. The duty marine officer was on his second night duty, whereas the marine operator was on the first of his night duties.

The marine officer had worked in Port Control for 10 years, with 10 years prior experience working in Milford Docks; he held a Masters certificate of competency gained during 13 years at sea. His V-103/1 was obtained in December 2004 and was duly endorsed by the VTS Authority.

The marine operator had been with the Authority for 25 years, 13 of these in Port Control. He held a V-103/1 obtained in September 2005 endorsed by the VTS Authority since that time.

## **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**

The skipper of *Emerald Star* was well rested before the accident; he had slept through the previous night and had spent a couple of hours in bed during the afternoon before the accident.

The VTS team had just started a 13 hour night shift. Both men were well rested prior to coming on duty.

Fatigue is not considered a causal factor in this accident.

### **2.3 SIMILAR ACCIDENT**

At 1800 on 1 November 2003, the aggregate dredger *Donald Redford* sailed from Woolston, on the river Itchen, with the junior master at the helm. There was no one else on the bridge, despite it being dark and in a confined waterway.

Southampton VTS noticed that the junior master's voice was slurred, but did not closely monitor the vessel's progress. After a time, *Donald Redford* was spotted deviating from her designated route, and VTS attempted to intervene. Despite two interventions by VTS and responses from the junior master on the bridge, the vessel carried on across Southampton Water and struck the pier at Hythe. Although there was little damage to the vessel, the pier was severed by the contact, resulting in considerable disruption to commuter services operating from the pier.

The junior master of *Donald Redford* was found to be incapacitated due to alcohol consumption, fatigue and possibly the influence of prescribed medication.

### **2.4 SKIPPER'S ACTIONS**

#### **2.4.1 Alcohol**

The skipper of *Emerald Star* was well qualified and experienced at handling the vessel. He was a regular visitor to Milford Haven and had navigated within the port on many occasions without incident, other than a minor fracas between him and another skipper in Milford Dock in the summer of 2005.

The night before the accident, the skipper consumed a considerable quantity of strong beer, and also drank some wine prior to going to sea. It is highly probable that the effects of this impaired his judgment and orientation when taken into account with the prevailing restricted visibility within the Haven.

#### **2.4.2 Regulations and Byelaws**

The skipper contravened Rules 5, 6, 7, 8 and 19 of the COLREGs.

A proper lookout was not being kept. Given the restricted visibility, confined seaway and close proximity to land, a second person in the wheelhouse to act as lookout (separate from the helmsman) would have been advisable. This is laid down in

the MCA's Marine Guidance Notes, MGN 137 (**Annex 4**) and MGN 202 (**Annex 5**). Likewise, MGN 313 "Keeping a Safe Navigational Watch on Fishing Vessels" (**Annex 6**), recommends that a second person should be in the wheelhouse during dark hours. This is even more appropriate while navigating in confined coastal waters.

**Keeping a Safe Speed:** In calculating a "safe speed", skippers must take into consideration such factors, among others, as: visibility; traffic density; vessel manoeuvrability (stopping and turning distances); background lights and proximity of navigational hazards. Twelve knots could not be considered a safe speed in the restricted visibility and overall prevailing conditions at the time of the accident.

Rule 8 of the COLREGs requires that, if necessary, vessels slacken their speed, "*to allow more time to assess the situation.*" On being dazzled by *De Marie Louise's* deck lights, the skipper of *Emerald Star* should have immediately cut his speed, thus gaining time to assess his situation and in the event of contact, reduce the impact.

*Emerald Star's* skipper did not use his radars, which were switched on, operational and easily seen from the steering position. The topography of Milford Haven, in particular the long straight terminal jetties either side of the river, readily lends itself to radar navigation. Effective use of this navigational aid would have helped prevent this accident.

The errant navigation of *Emerald Star* directly contravened MHPA byelaw number 20. This byelaw requires that vessels are to be navigated with care and not "*... in such a manner or speed as will or may cause damage, danger or inconvenience to other users of the Haven*".

### **2.4.3 Damage inspection**

Following the impact, no inspection of damage to the vessel took place until she had returned to Milford dock. Following an impact, such as in this case, a condition inspection, to establish the extent and effects of any damage, is crucial. Although the vessel was not damaged below deck level, the watertight integrity above deck level was breached; if the vessel had continued out to sea this could have permitted water to enter the whaleback space and allow downflooding to the fo'c'sle, or entrap a substantial weight of water within the whaleback, thus potentially compromising the vessel's stability.

### **2.4.4 Passage planning**

Although a verbal sailing plan was agreed with Port Control, no passage plan was visible in the vessel's wheelhouse. The chart for Milford Haven was buried below several others. Had a passage plan been marked, and positions plotted on the chart, the skipper could have recognised at a glance his deviation from the plan. Where a vessel is regularly using the same port, there is no reason why this plan should not be permanently marked on the chart, thus eliminating the need for a fresh plan every voyage. Even for a skipper such as *Emerald Star's*, with experience of Milford Haven, the passage plan would have served as an aide memoir during passage in and out of port.



## 2.5 ALCOHOL TESTING

There was confusion over the requirement to test the skipper for alcohol impairment. This confusion and associated time delays meant that the skipper was left unattended for considerable periods of time, which allowed him to consume more alcohol and thus compromise the subsequent breathalyser tests. Under the Railways and Transport Safety Act 2003, a marine official (a harbourmaster, or an assistant of a harbourmaster, appointed by a harbour authority), may detain a ship if he reasonably suspects that a person on board the ship is committing an offence under section 78, 79 or 80 of the Act.

MHPA subsequently dropped the charge of *Navigating Whilst Drunk* due to the anomalies created by the procedures adopted to detect alcohol abuse.

The CPS, on the other hand, decided to pursue a similar charge following the analysis of blood tests by scientific calculation, to establish the level of alcohol before the further intake and the time elapsed since previous consumption.

The Railways and Transportation Act 2003 is quite specific in its guidance regarding alcohol consumption and testing. On this occasion, this guidance was not followed. Obviously this failure had nothing to do with the accident, it did however severely hinder the MAIB's ability to establish a specific cause, or indeed, totally eliminate alcohol (or any other substance) as a causal factor.

The skipper was not tested for any substance other than alcohol, prescribed or otherwise. Ideally, some attempt should have been made to eliminate these possibilities early in the proceedings.

MHPA carry out random drug and alcohol screening of its staff. Two people are randomly selected 12 times per year, amounting to about 10% of personnel each year. Following the accident, no Port Control personnel were screened for drugs or alcohol.

## 2.6 MILFORD HAVEN PORT CONTROL

### 2.6.1 Policy and procedure

MHPA has in place a comprehensive SMS, incorporating operational policies and procedures. However, during the events prior to, and following, the accident involving *Emerald Star*, VTS staff did not adhere to documented procedures. To be effective, an SMS needs to be accepted by those working within it and supported by managerial vigilance and employee stimulation. MHPA's recent introduction of an OTJ Instructor will hopefully help in this area.

In January 2003, MHPA implemented a scheme whereby at night time, and subject to availability, a pilot boat would be stationed close to the Cunjic buoy to prevent fishing vessels proceeding too far to the north side of the channel and, possibly, damaging the pipelines on the Total, Fina, Elf (TFE) jetty (Operational Memos 2/2003 and 5/2003, **Annexes 7 and 8**). This directive was later included in MOP 001 (**Annex 3**). This scheme is still in operation; a pilot boat was available, but not stationed, at the time of the accident. The marine officer felt it was unnecessary because, at that time, the outward bound fishing vessels either had skippers with an FVNP or, in one case, a pilot actually on board. The main purpose of the pilot boat being stationed at the buoy is to avert deviations to the north side of the estuary. However, if the boat had been in

place on the night of the accident, its crew might have noticed *Emerald Star's* southern divergence, and taken action to alert both the skipper and Port Control of the unfolding danger.

### 2.6.2 Intervention

The ethos of VTS is to inform, advise, instruct, warn and intervene. MHPA VTS teams are reminded of this by notices displayed above the radar screens in front of MHPA's control room (**Figure 7**). No instruction, warning or intervention took place prior to the accident, and information or advice was not promulgated to traffic after the accident as the "rogue" vessel continued to head towards the sea.

It is highly possible that intervention might have had no effect on *Emerald Star's* skipper's actions; nevertheless, some attempt could have been made to at least attract his attention. While it is appreciated that under IALA VTS guidelines VTS staff can not give direct commands to a vessel's master, a message, such as "*Emerald Star* – this is MHPA Port Control – WARNING! – you are standing into danger – ADVICE – reduce to minimum safe speed", would have been appropriate.

### 2.6.3 Radar

Two of the four VTS radar screens were showing the approaches to Milford Haven. Had two of them been showing the busy dock area instead, the operatives' actions might have been timely, positive and influential.

The radar screen covering the Dock area has the ability to superimpose the charted mid channel line. This line is not used by some operators, who feel it adds confusion on the screen. However, at the time of the accident, it was in use and should have served as an indicator that *Emerald Star* was straying into the south side of the estuary.

MHPA's Marine Operating Procedures and the ALRS Vol 6 advise that no fishing vessel is to go within 100m of any oil jetty. These limits are not synthetically superimposed onto radar screens, had they been so it would have provided the operators with the ability to see, at a glance, infringements of this requirement.

Milford Dock lies three quarters of a mile directly across the estuary from the ChevronTexaco terminal. The inbound *De Marie Louise* was creeping inwards ahead of the tanker *Orahope*, with the intention of waiting by the west side of the dock fairway for all outward bound traffic to clear before entering the dock. Had *De Marie Louise* been directed to wait further up the estuary, beyond the fairway entrance, it would have alleviated congestion at this critical area.

### 2.6.4 VTS operators

The VTS team were appropriately qualified in accordance with IALA's model course V-103/1. MHPA's OJT training structure varied slightly from IALA's guidelines due to the staff's backgrounds and their length of time served in Port Control, prior to formalising their qualifications. Under the Port Marine Safety Code, a centre's system may vary from IALA's provided it is as good as, or better than, IALA guidelines.

The duty marine officer had control of VHF channel 12 traffic communications, and his radar screens were set to display the port approaches and anchorages. Most of the traffic, however, was centred between the South Hook terminal and the dock entrance,

therefore communication compatibility was compromised as the marine operator, who had this area on screen, was not able to communicate directly with the vessels being displayed to him. This would indicate that, on this occasion, either the VTS team was not aware of the potential complications this could create, or a lack of planning following the watch handover an hour earlier.

### 2.6.5 Distractions

As well as controlling traffic within the port, the VTS team was required to carry out all normal functions of a VTS centre, which included programming vessel movements, logging information and taking telephone enquiries. During the daytime, telephone calls were answered by a receptionist. After 1700, however, all telephone calls were routed to Port Control, and the duty team was required to answer these.

Minutes before the accident, and while *Emerald Star* was still within Milford Docks, the marine officer was engaged in a superfluous call from a member of the public, regarding a committee meeting elsewhere in the building. Such public calls serve only to distract the Port Control centre.

Following that call, the marine officer busied himself with routine operations, including amending numerous changes to Texaco's schedule, which had been put through a little earlier, and communicating with outbound fishing vessels (including *Emerald Star*) on VHF channel 12 when required. Very few of the vessels he talked to were on his radar screen.

The marine operator tagged *Emerald Star* at 1907, observed her shaping up on the Cunjic buoy and carried on with database compilation. He did not notice *Emerald Star's* divergence from her expected route.

In the vital 30 seconds immediately preceding the accident, the marine operator was on the telephone to the dock pierhead regarding traffic movements; this is the normal means of communication between the two buildings. Not only was the telephone call itself a distraction, but also it required the operator to turn away from the radar screen to use the telephone on his right-hand side. The period of freeflow will always be a predictably busy time for the operatives within Port Control. During freeflow, and during any other times of high workload, it would seem sensible to utilise an automated telephone answering system to avoid any unnecessary distraction of the Port Control operatives.

Fishing vessels are required to seek permission from Port Control before they leave the dock, which *Emerald Star* did on this occasion. However, there is no requirement for other vessels leaving the dock to individually obtain clearance from Port Control to enter their VTS domain. Clearance is given from Port Control to dock pierhead, who in turn relay this to vessels leaving the dock. Only vessels listening on VHF channel 18 would be aware of these movements; there is no requirement for vessels in the VTS domain to listen on channel 18.

Telephones are a recognised distraction, which can often demand undivided attention and can interfere with people's ability to carry out other tasks simultaneously. If marine communications between Port Control and the dock pierhead were carried out on the radio it could be administered by the Port Control operatives without diverting attention

from the radar screen. This information would also be readily heard by other vessels, and would assist skippers to establish vessel movements as well as confirmation being relayed by Port Control. However, it is recognised that, by using the telephone, it reduces the amount of radio traffic, which at times could be very high, and much of it superfluous to the VTS centre, when leisure vessels are navigating the dock area.

#### **2.6.6 VHF radio compatibility**

After finishing a routine phone call with the dock pierhead, the marine operator returned his full attention to the dock area radar screen and realised *Emerald Star's* proximity to Number 6 berth. However, he was unable to communicate directly with the skipper because he did not have VHF channel 12 selected at his workstation. Instead, he had to tell the marine officer to contact the fishing vessel on his VHF set. For the marine operator to select channel 12 on his set, would have required the marine officer to de-select channel 12 on his radio, otherwise feedback interference occurred between the two radios. The process of select/de-select is cumbersome, but it could be improved by the use of more efficient radio technology.

During the busy freeflow period, the person monitoring the traffic should have compatibility between the dock entrance radar and VHF channel 12. During such busy times, this person should not be distracted by carrying out other routine tasks such as logging information on the database.

#### **2.6.7 Hierarchy**

After being advised by the marine operator to call *Emerald Star*, the marine officer chose to look at the operator's screen to confirm the circumstances and, as he did not have full situational awareness, lost vital seconds in responding. Being familiar with the inappropriate configuration of the radios and radar screens, the marine operator could have physically moved across to the other radio, by urgently asking the marine officer to move aside, and issued a 'Warning' to *Emerald Star*. The fact that this was not done suggests a lack of clarity in the duties and responsibilities of the VTS team and also possible hierarchy inhibitions within the team, despite both men holding the same VTS qualifications and both having several years' service in Port Control operations. In carrying out Port Control functions, the junior person has the authority to act and speak on behalf of the senior, this must be clearly understood by all parties and, in recognising this, help remove potential demarcation barriers.

#### **2.6.8 Speed limit**

Upper speed limits within MHPA-controlled waters are restricted to vessels passing terminals which are undergoing maintenance from craft alongside; high speed restrictions in the upper reaches beyond Lawrenny Yacht station and for the ro-ro ferry to Ireland. MHPA's Byelaw number 20, which states "*Vessels to be Navigated with Care*", is intended to require vessels' masters to exercise their navigational expertise and diligence to ensure safe and efficient control of their vessels when within the confines of the port.

MHPA recognises that larger vessels do require minimum speeds to maintain steerage, however, this should not obviate the need to impose speed limits on other vessels, especially when in the proximity of oil terminals and vessels carrying dangerous cargoes. The imposition of more specific speed limits within the port would enhance skipper assessment and reaction times, reduce any potential impact damage in the event of a collision, contact or grounding, and extend VTS appraisal and reaction times.

## SECTION 3 - CONCLUSIONS

*Emerald Star* collided with ChevronTexaco Number 6 berth after her skipper became confused and disorientated in conditions of reduced visibility. It is highly probable that his actions and decisions were impaired by the consumption of alcohol.

Although MHPA played no part in causing the accident, there were actions that the VTS team could have taken to intervene, and possibly prevent, the accident. However, there is no guarantee that such intervention would have been effective.

### 3.1 RELATED SAFETY ISSUES

The following safety issues are identified as a result of the MAIB investigation. They are not presented in any order of priority:

1. It is highly probably that *Emerald Star's* skipper's actions and judgment were impaired by alcohol. [2.4.1]
2. The vessel was travelling at an unsafe speed in relation to the circumstances and prevailing conditions. [2.4.2]
3. *Emerald Star's* navigational aids were not used to best advantage. [2.4.2]
4. *Emerald Star* had no additional lookout in the wheelhouse. [2.4.2]
5. No inspection for damage was made of the vessel until she returned to dock. [2.4.3]
6. No passage plan was made or used by *Emerald Star*. [2.4.4]
7. MHPA had adequate policies and procedures to ensure that its VTS ran appropriately. However, these were not fully complied with on this occasion. [2.6.1]
8. Milford Haven Port Control staff were expected to answer superfluous telephone calls from the public. [2.6.5]
9. Milford Haven's VTS team could have been distracted from their main purpose by routine telephone calls. [2.6.5]
10. Vessels, other than fishing vessels, entering the VTS domain from the dock are given permission to enter through Pier Head (not direct from Port Control). [2.6.5]
11. No intervention was made by the VTS team to prevent the accident. [2.6.2]
12. No information was promulgated by the VTS team to warn other traffic of a "rogue vessel" after the accident. [2.6.2]
13. Port Control failed to station an available pilot boat as per its Operational Memorandum instructions. [2.6.1]
14. Port Control radio and radar screens were configured inappropriately. [2.6.4]

15. Milford Haven Port Control radios could not be used on the same channel by two different stations, due to feedback and interference. [2.6.6]
16. The VHF radio select/de-select procedure is cumbersome, but it could be improved by the use of more efficient radio technology. [2.6.6]
17. MHPA had no appropriate speed limits in place. [2.6.8]
18. Some doubt existed between the VTS personnel as to their respective responsibility and authority. [2.6.7]

## **SECTION 4 - ACTIONS TAKEN**

### **4.1 MILFORD HAVEN PORT AUTHORITY**

As a result of this accident Milford Haven Port Authority has:

- Rescinded the skipper of *Emerald Star's* FVNP.
- Prosecuted *Emerald Star's* skipper for contravention of MHPA byelaw Number 20.
- Initiated its own investigation into the accident.
- Issued an Operational Memo whereby all Port Control Staff are required to manage their workload to ensure that monitoring of water traffic is given priority and administrative tasks are carried out when more appropriate. Where need be, additional staff may be called in.
- Sent the marine officer for the night of the accident on a week's assessment by an independent establishment. There, he was found to be competent.
- Reiterated to marine officers the requirement to station a pilot boat by the Cunjic buoy (if available) when fishing vessels are outward bound, during hours of darkness.
- Appointed an in-house V-103/4 qualified Instructor to consolidate on-the-job-training.
- Agreed to notify deep sea fishing vessels to have a second person on the bridge when transiting the Haven.
- Taken measures to request the police to breathalyse any fishing vessel skipper involved in an accident, near miss, or oil pollution as a matter of routine.
- Reinforced the need for all staff to make more use of the answer service facility on telephones.
- Implemented an out of hours telephone call monitoring, to establish the level of non-operational calls.

### **4.2 PROSECUTING AUTHORITIES**

Prosecuting authorities have conducted their own investigation into the skipper of the *Emerald Star's* role in this incident.

## SECTION 5 - RECOMMENDATIONS

**Milford Haven Port Authority** is recommended to:

- 2006/203 Consider the implementation of an upper speed limit for all reporting vessels navigating between the seaward and landward marine terminals.
- 2006/204 Review its General Directions relating to Bridge Manning to ensure the master of every reporting vessel, when transiting the Haven, shall have a bridge navigating team of at least 2 people. This revision is to then be duly promulgated to all port users and ship's agents.
- 2006/205 Review radio reporting procedures to ensure there is clear communication between all reporting vessels and VTS when leaving the dock and transiting the Haven. Consideration should be given to the adoption of procedures which avoids routine communication by telephone, on operational issues, between Port Control and the dock pierhead to minimise the potential for distraction of the Port Control duty personnel.

The **Port Marine Safety Code Steering Group** is recommended to:

- 2006/206 Issue clear instructions and guidelines to VTS Authorities regarding prioritisation of tasks during periods of high intensity traffic movement. Particular emphasis should be placed on the avoidance of distractions which may detract from an operator's primary functions.

The Owners of ***Emerald Star*** are recommended to:

- 2006/207 Review their operational procedures to ensure the use of an additional lookout during critical periods of navigation such as night time, during restricted visibility and transiting confined waters.

**Marine Accident Investigation Branch**  
**August 2006**

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