Report on the investigation of

the aggregates dredger

Donald Redford

colliding with Hythe Pier,

Southampton Water

on

1 November 2003

Marine Accident Investigation Branch
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United Kingdom
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Extract from

The Merchant Shipping

(Accident Reporting and Investigation)

Regulations 1999

The fundamental purpose of investigating an accident under these Regulations is to determine its circumstances and the cause with the aim of improving the safety of life at sea and the avoidance of accidents in the future. It is not the purpose to apportion liability, nor, except so far as is necessary to achieve the fundamental purpose, to apportion blame.

NOTE

This report is not written with liability in mind and is not intended to be used in court for the purpose of litigation. It endeavours to identify and analyse the relevant safety issues pertaining to the specific accident, and to make recommendations aimed at preventing similar accidents in the future.

CONTENTS

GLOSSARY OF ABBREVIATIONS AND TERMS

ABP	-	Associated British Ports
AIS	-	Automatic Identification System
IMO	-	International Maritime Organization
ISM	-	International Safety Management
MCA	-	Maritime and Coastguard Agency
MSN	-	Merchant Shipping Notice
PAVIS	-	Port and Vessel Information System
PEC	-	Pilot Exemption Certificate
RNLI	-	Royal National Lifeboat Institution
SOLAS	-	Safety of Life at Sea Convention
STCW	-	Standards of Training, Certification and Watchkeeping for Seafarers
VHF	-	Very High Frequency
VTS	-	Vessel Traffic Services
VTS(A)	-	VTS Assistant
VTS(O)	-	VTS Officer

Grading	-	The separation of different types of aggregate eg sand and grit

SYNOPSIS

On 1 November 2003, just after 1800 UTC, *Donald Redford,* an aggregates dredger which was en route to her dredging grounds, collided with Hythe Pier, Southampton Water. No one was injured in the accident, but the pier was substantially damaged and put out of use. An MAIB investigation began that evening.

Donald Redford's crew was divided into two teams of three. The senior master commanded one team and the junior master commanded the other. The teams worked 6 hours on and 6 hours off, with the command of the vessel being passed between the masters on handover. The junior master was in command at the time of the accident, and was alone on the bridge, despite it being dark, and being in confined and busy waters.

Before the accident, *Donald Redford* had discharged a cargo of aggregate at Woolston. She departed at about 1750, and headed downriver towards her dredging grounds to the east of the Isle of Wight. After passing under the Itchen Bridge, her track became erratic. Instead of altering course into the small craft channel in Southampton Water as planned, she crossed the main channel, narrowly missed the corner of Hythe Marina and then collided with the pier.

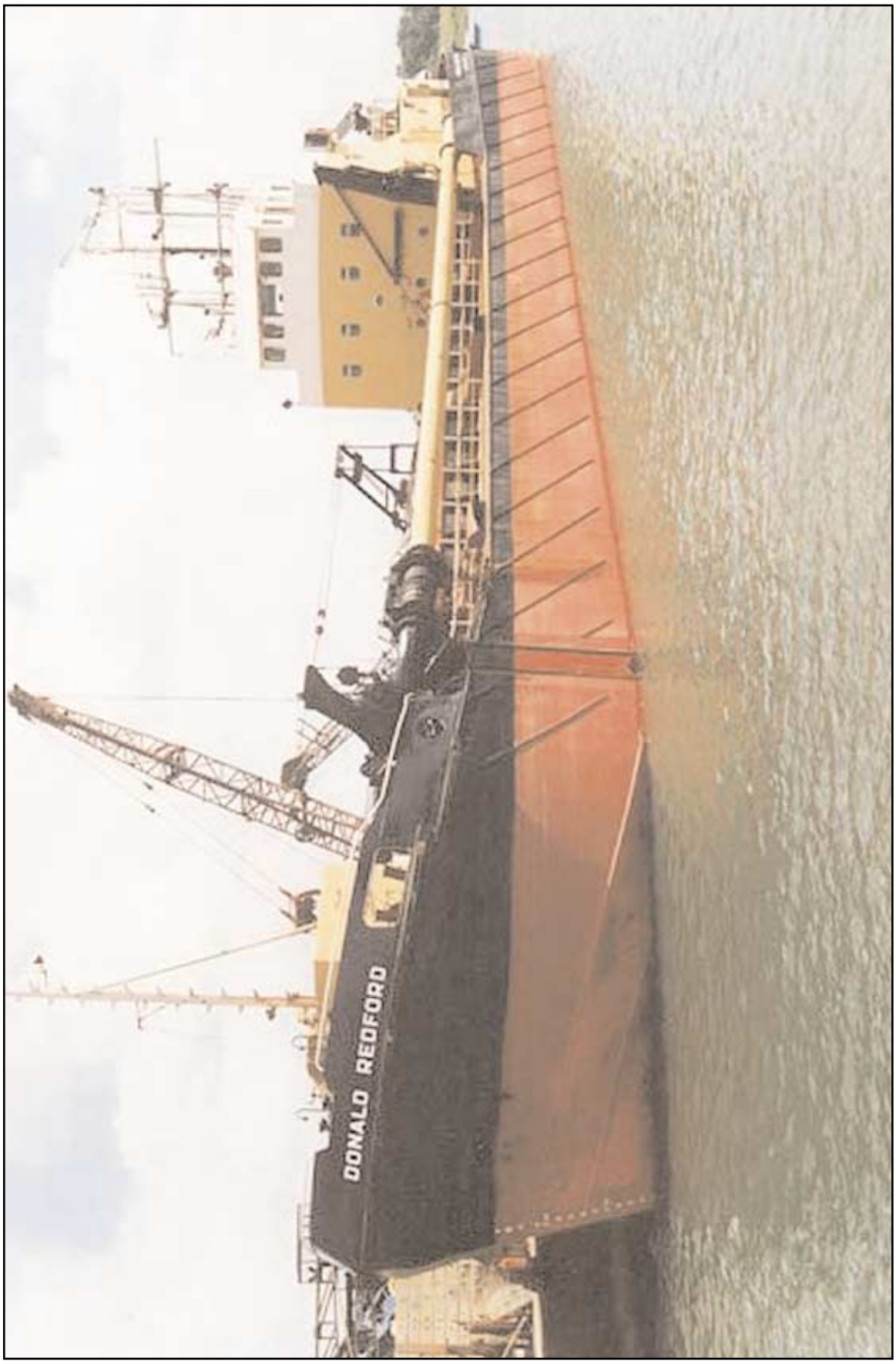
Tests after the accident showed that the junior master had consumed a substantial amount of alcohol. His judgment had also probably been affected by fatigue, and possibly by the effects of a prescribed drug. Neither the owners, nor the Maritime and Coastguard Agency (MCA), were aware that he was taking a prescribed drug. The accident highlighted a culture of tolerance to alcohol abuse in areas of the short sea trade.

Southampton VTS operators noted the junior master's slurred speech, but did not closely monitor the vessel's progress. VTS alerted the vessel on VHF radio when she was crossing the main channel but, in the event, the warning was too late to prevent the collision. Associated British Ports (ABP) has taken action to improve the VTS response.

Recommendations have been addressed to the UK Chamber of Shipping regarding the issue of guidance to its members on alcohol misuse, hours of work, and seafarers who are taking prescribed medication.

Recommendations have also been addressed to the British Ports Association, and the UK Major Ports Group on alcohol-related issues and the forthcoming Transport Act, hours of work and bridge manning.

Figure 1



Donald Redford

SECTION 1 - FACTUAL INFORMATION

1.1 PARTICULARS OF *DONALD REDFORD* AND ACCIDENT

Vessel details

Owner	:	Northwood (Fareham) Limited
Port of registry	:	Manchester
Flag	:	United Kingdom
Type	:	Aggregates dredger
Built	:	Ferguson Bros. Port Glasgow –1981
Classification society	:	Lloyd's Register
Construction material	:	Steel
Length overall	:	54m
Gross tonnage	:	681
Engine and propulsion	:	Single main engine driving a fixed pitch propeller. Controlled from the wheelhouse.
Service speed	:	About 8 knots
Other relevant info	:	Carries about 1000 tonnes of aggregate when fully loaded

Accident details

Time and date	:	1808 UTC, 1 November 2003
Location of accident	:	Hythe Pier, Southampton Water
Injuries/fatalities	:	None
Damage	:	None to *Donald Redford*. Pier substantially damaged

A view of *Donald Redford* is shown in **(Figure 1)**.

1.2 BACKGROUND

Donald Redford generally dredged for aggregate in the grounds near Nab Tower, to the east of the Isle of Wight. The cargo was discharged at jetties at Marchwood, Woolston, Fareham, Bedhampton and Langstone, which are all in the Southampton/Portsmouth area. She also occasionally discharged at Littlehampton, which is further to the east. Grading of the aggregate was carried out ashore. The products supplied were for use in the building trade.

Hythe Pier, which is 600m long, was built about 120 years ago to allow ferries to berth in sufficient water at all states of the tide. Most of the piles of the pier were made from cast iron, although some had been replaced using concrete. The ferries which were in operation on 1 November 2003 were called *Hotspur IV* and *Great Expectations*; they carried a maximum of 120 and 160 passengers respectively. The ferries operated from Town Quay on the Southampton side, and provided an important commuter link between Hythe and Southampton. *Hotspur IV* had just ceased operations at the time of the accident, but *Great Expectations* was scheduled to continue the service for the rest of that evening.

1.3 NARRATIVE OF EVENTS

All times are UTC.

Donald Redford left her dredging grounds on 31 October and made passage for Littlehampton. After discharging, she departed for the dredging grounds in the early hours of 1 November. Loading was complete around midday, and the vessel then set sail for Woolston.

The senior master took over the watch slightly early, at 1100, and the junior master went to bed, having been on duty by that time for about 9 hours continuously.

The vessel arrived at Supermarine Jetty Woolston **(Figure 2)** at 1515, and tied up heading downriver. The junior master went ashore at about 1545 to do some shopping, and returned briefly to inspect the discharge. He then went back ashore, at about 1600, to visit a public house which is close to the jetty.

The senior master called the junior master at about 1700, using a mobile telephone, and asked to be relieved as he was, by then, feeling tired. The junior master returned to the vessel at about 1720, by which time the senior master had already gone to bed.

At about 1740, the berth manager came on board to complete the cargo paperwork with the junior master. At this meeting, he smelled alcohol on the junior master's breath and, in a subsequent conversation, informed the ship's senior engineer of this.

After completing the cargo paperwork, the vessel sailed at about 1750.

Figure 2

The Port of Southampton

On departure, the lines were let go and the bow thruster was used to swing the bow out into the river. The berth manager released the ropes from the jetty, and the duty seaman pulled them aboard and stowed them. With the bow by then pointing into the river, the bow thruster was stopped, and ahead power was applied. Shortly after leaving the berth, the dredge pump was run to fill the hold with water. This ballasting operation was necessary to provide sufficient propeller immersion.

The junior master was alone on the bridge as the passage to the dredging grounds began. He was joined by the duty seaman as soon as the mooring ropes had been stowed. *Donald Redford* did not require a pilot or PEC holder for this passage in the Port of Southampton as she was less than 61m in length. The vessel passed under the Itchen Bridge at 1753 **(Figure 3)**. She then drifted over to the starboard side of the river and, at 1757, nearly hit the quayside on the south side of the entrance to Ocean Village **(Figure 4)**. The duty seaman commented that they were a bit far over to starboard; the junior master's reply was dismissive. The seaman then left the bridge to carry out other duties.

Information was exchanged between the vessel and Southampton VTS, in accordance with local reporting requirements. During these exchanges, VTS were informed of the junior master's intention to take the small craft channel[1] to the east of the main shipping channel in Southampton Water. Also during these exchanges VTS noted the junior master's slurred speech.

As *Donald Redford* continued down the Itchen River, she strayed across to port and nearly hit a buoy **(Figure 5)**. She did not turn into the small craft channel but, instead, turned to starboard **(Figure 6)** making to cross Southampton Water. The vessel continued across the main shipping channel towards Hythe Marina and shallow water.

VTS called the vessel in an attempt to establish if she was aware of her position. The junior master, probably alerted by the call from VTS, turned the vessel to port and narrowly missed the corner of Hythe Marina **(Figure 7)**, but could not avoid a collision with Hythe Pier **(Figure 8)**.

The duty engineer and seaman were stowing stores just before the collision. The engineer was in the steering flat and could not see where the vessel was heading. The seaman was on deck, handing drums down to the engineer, and was concentrating mainly on the job in hand. However, when the vessel started heading towards Hythe Pier, the seaman said to the engineer that they had better go and find out what was going on. The seaman made his way up to the bridge, but the collision occurred before he arrived. The junior master asked the seaman to call the senior master.

[1] It should be noted that the "small craft channel" is not officially recognised on the chart or by the Port of Southampton. This is a route to the north-east of the main channel, outside the green buoys, which is used by small craft, predominantly when the main channel is busy with larger ships.

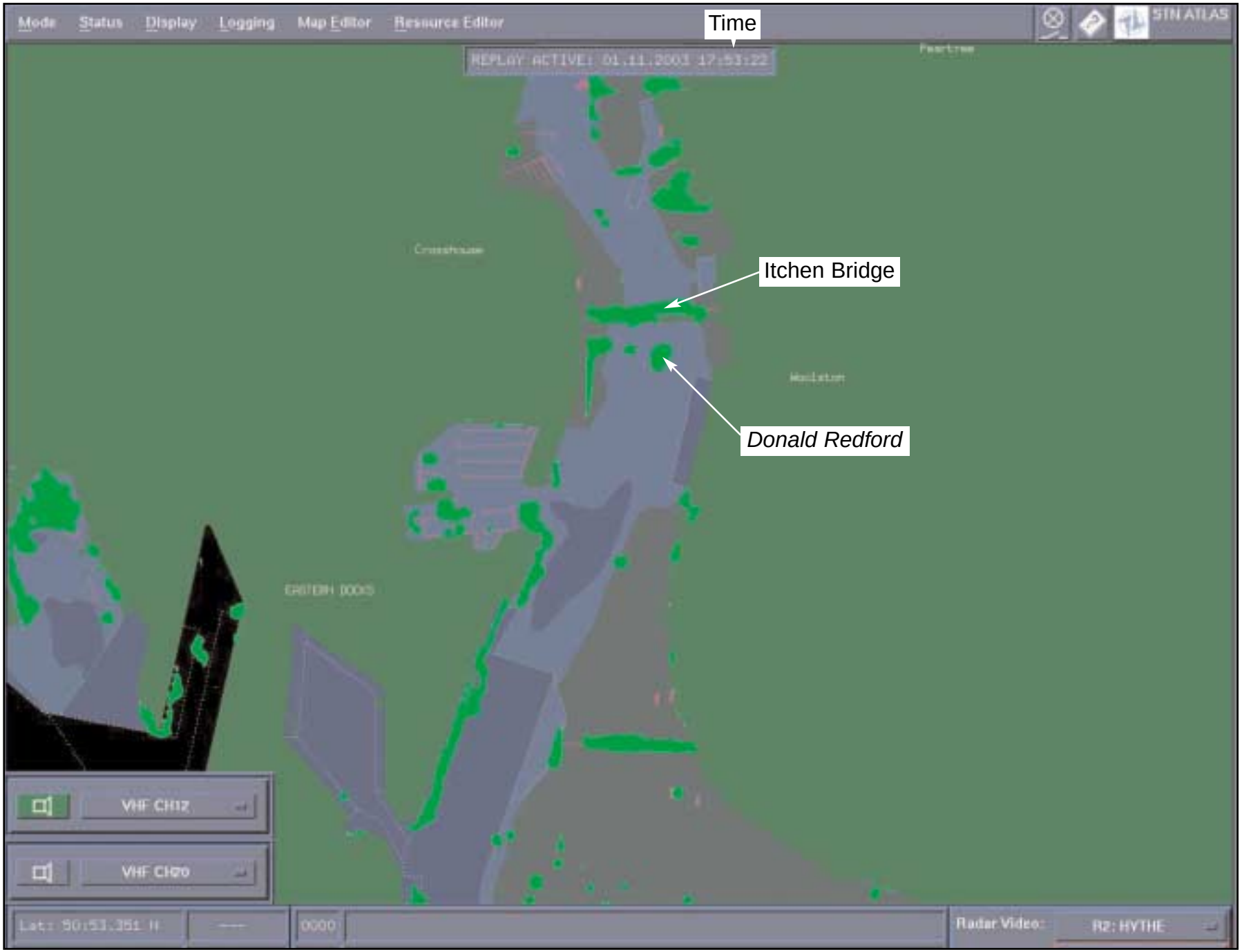


Figure 3

Magnified section of VTS radar screen

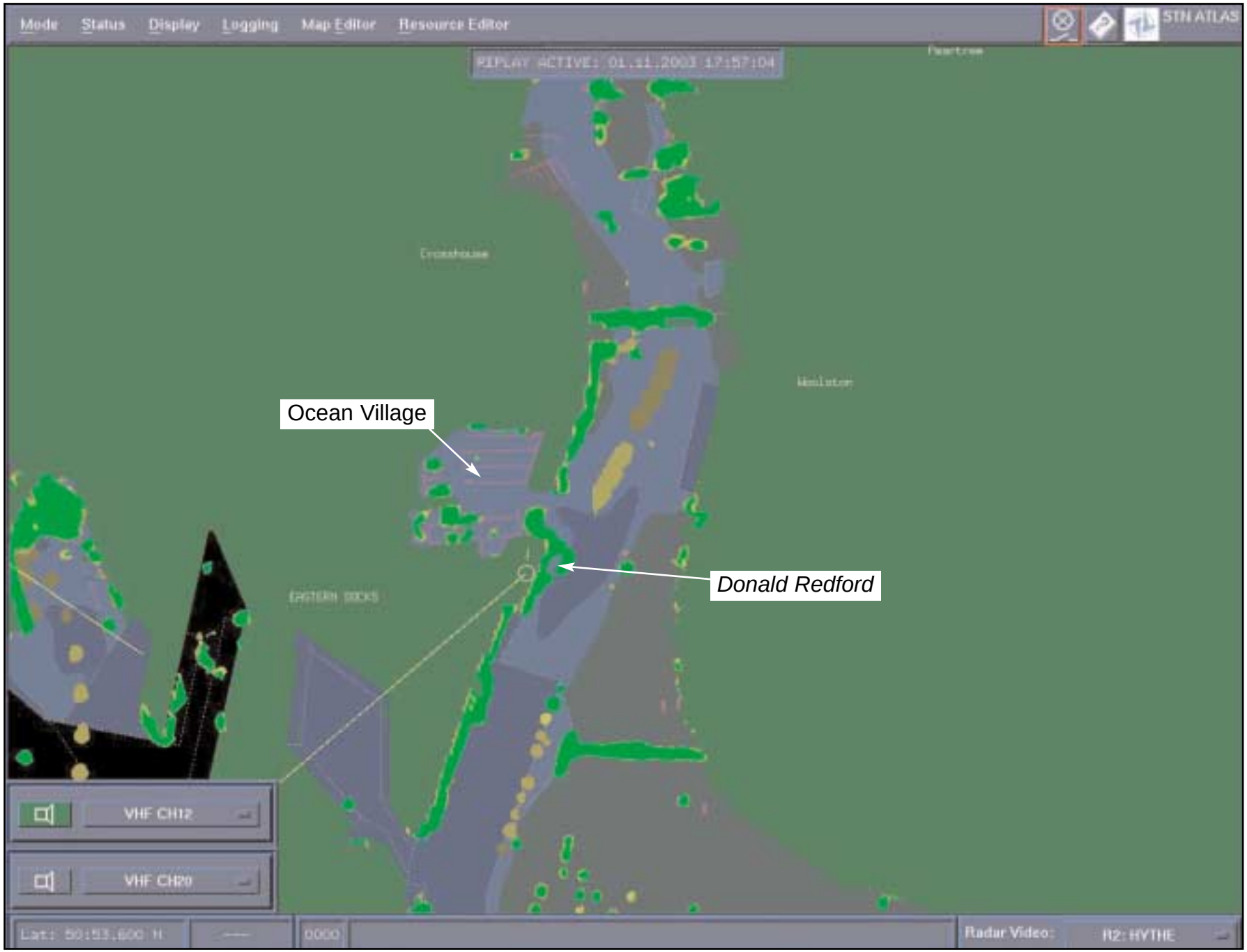
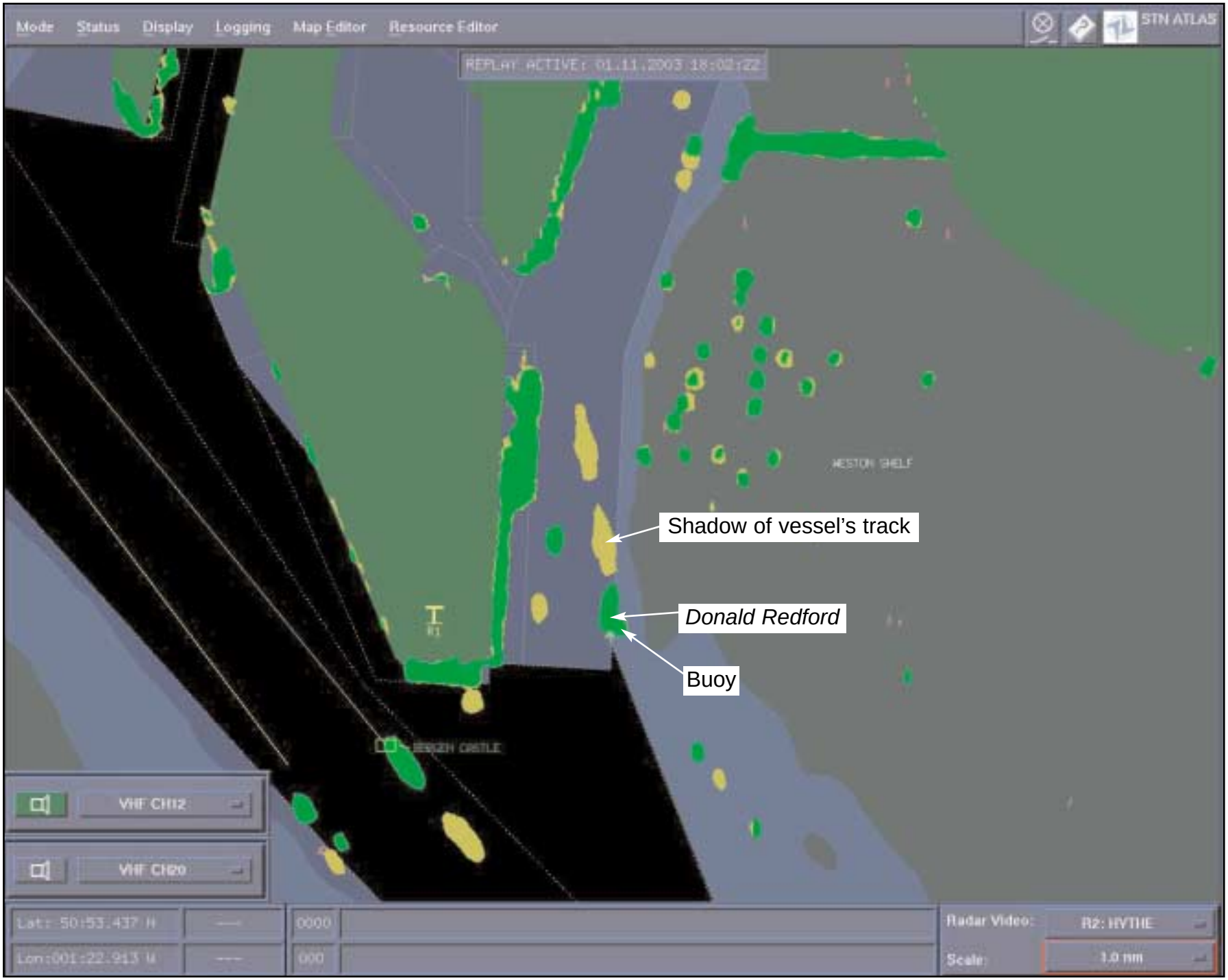


Figure 4

Magnified section of VTS radar screen



Magnified section of VTS radar screen

Figure 5

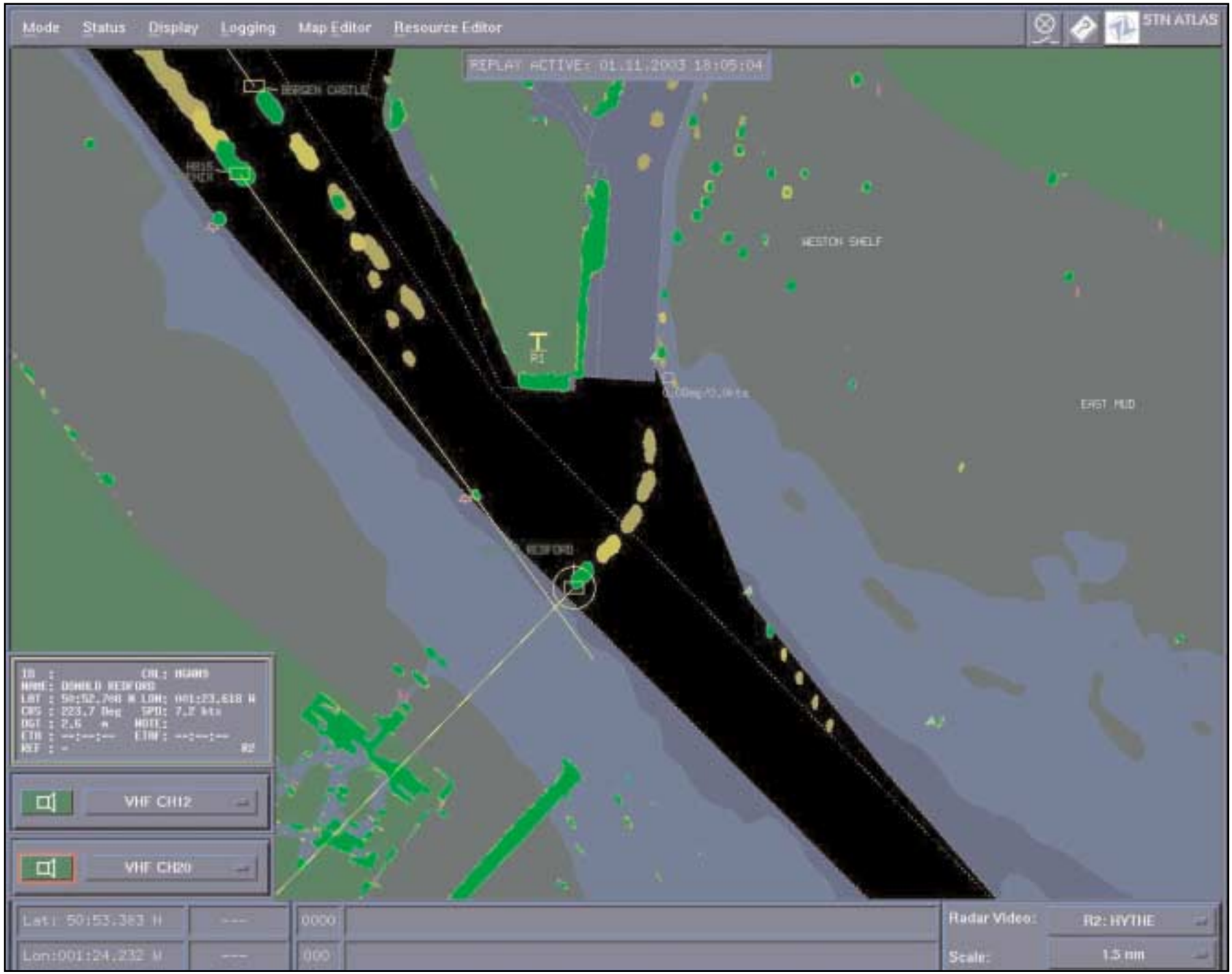


Figure 6

Magnified section of VTS radar screen

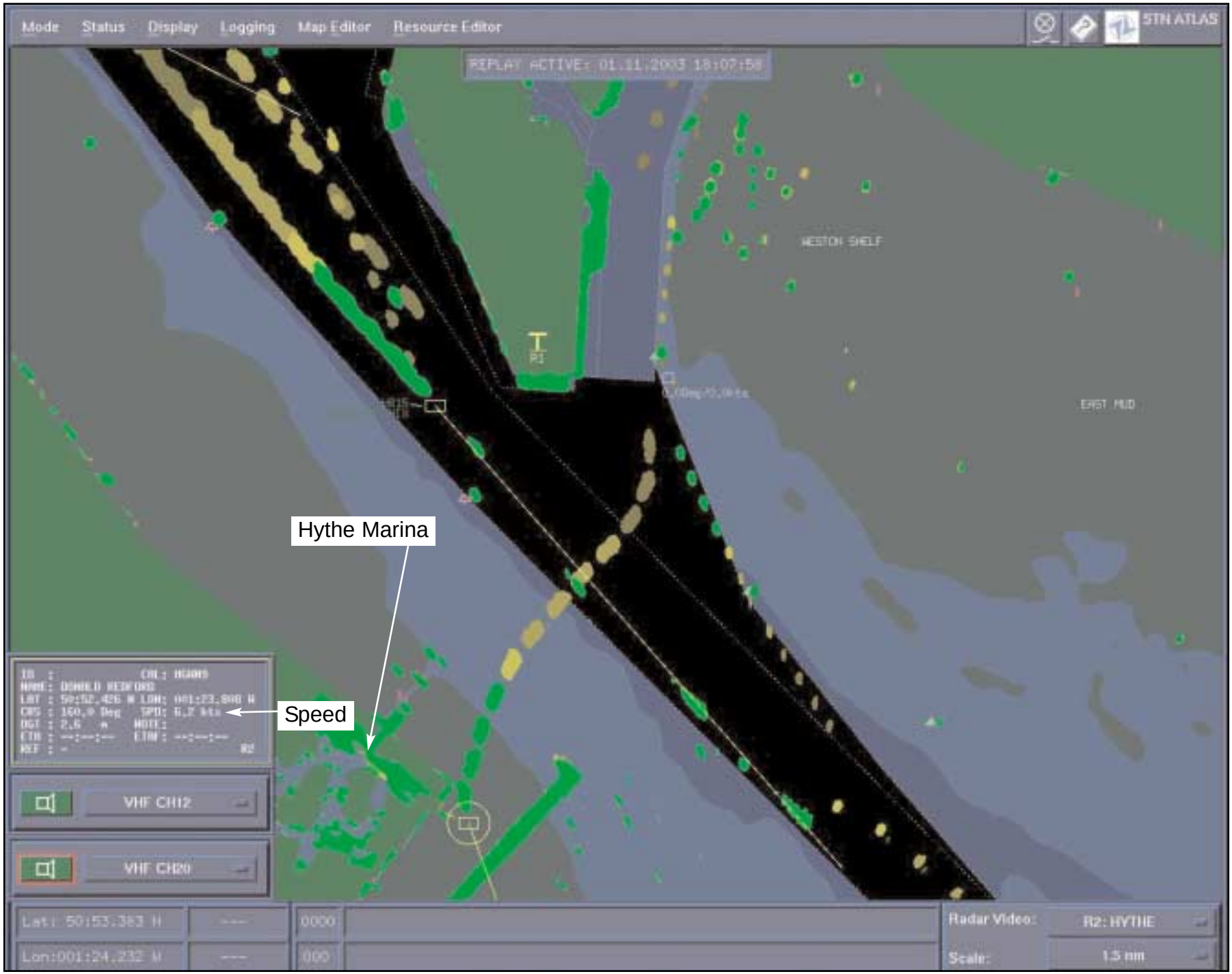


Figure 7

Magnified section of VTS radar screen

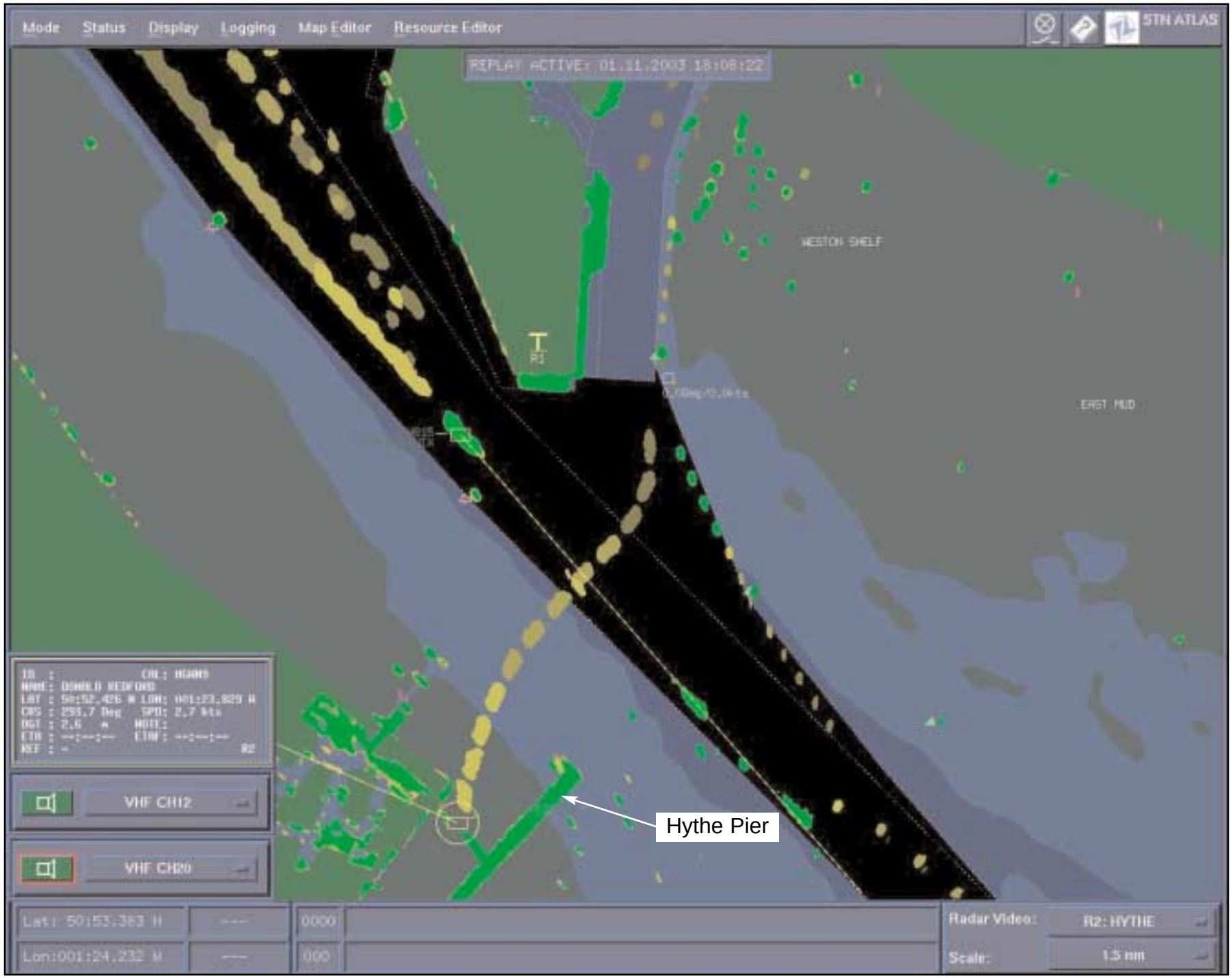


Figure 8

Magnified section of VTS radar screen

When the senior master arrived, the junior master was at the wheel and was looking out of the forward bridge windows. The vessel was full astern and the rudder was hard to port. The senior master took control and asked the junior master to go to his cabin, which he did.

An extensive search by coastguard, RNLI and Port Authority boats and a helicopter ensued, but it was discovered later that nobody had been on the pier at the time.

The junior master was escorted ashore on a Port Authority launch at about 1935, and later taken to Lyndhurst Police Station where he voluntarily gave a breath sample for analysis.

Donald Redford was refloated at about 0255 on 2 November. Subsequent inspections revealed that she had received only minor scratches during the accident. However, the pier had been substantially damaged. Nobody had been injured.

1.4 ENVIRONMENTAL CONDITIONS

Sunset occurred at 1641, and it was dark when *Donald Redford* left her berth. The visibility was good. The light wind was westerly, with a speed of about 7 knots gusting to 14. It was slack water and nearly high tide.

1.5 *DONALD REDFORD* - THE VESSEL

Donald Redford's certificates ie Load Line, Safety Construction, Pollution Prevention, Safety Radio, Safety Equipment and Safe Manning, were all current at the time of the accident.

The vessel was in good condition for her age.

Donald Redford, by virtue of her operation, was a non-SOLAS ship and was not, therefore, subject to the International Safety Management (ISM) Code. However, the owners were compiling an operations manual, in preparation for voluntary compliance.

1.6 DUTY ROUTINES AND HOURS OF WORK

The six crew were divided into two teams, each consisting of a master, an engineer and a seaman. Command was effectively passed from one master to the other at watch handover. The officers were referred to as senior master, junior master, senior engineer and junior engineer.

The crew generally worked 6-hour watches and, usually, after 6 hours on duty, they could expect 6 hours off, but this pattern could be varied. Some pilotage operations, including that for the port of Littlehampton, were difficult, and some of the off-duty crew were required to assist. Each crew of six rotated with another six on a 2 weeks on/2 weeks off basis.

The Merchant Shipping (Hours of Work) Regulations 2002, Statutory Instrument 2002 No 2125, requires, in Regulation 5(1)(a), that the minimum hours of rest shall not be less than 10 hours in any 24 hour period.

The record of the hours that the junior master worked is shown in **(Figure 9)**. This document indicates that in the 24 hours up to 1800 on 1 November 2003, ie just before the accident, he worked 17 hours. He began his morning shift early, to undertake a pilotage out of Littlehampton, and he started his afternoon shift early because the senior master was tired. However, the senior master did relieve the junior master at 1100 on 1 November, so, in fact, 16 hours in 24 were worked before the accident.

1.7 THE JUNIOR MASTER

The junior master held a Class IV Certificate of Competency. He started his career working on fishing vessels, but, in about 1999, after a brief period working ashore, he began employment with Northwood (Fareham) Limited, working as mate on aggregate dredgers. He became qualified as master in 2001, and was promoted to this role in the company shortly after. There were no previous disciplinary offences recorded with the company.

Aggregate Supplies operate the Woolston site, which is referred to as the Supermarine Quay Depot. The junior master was well known and well regarded by the staff there; he appeared to take a pride in his work.

1.8 ALCOHOL AND DRUGS

Donald Redford's managers, Northwood (Fareham) Limited, had a drugs and alcohol policy. This stated that no alcohol was allowed on board the vessel and that the crew should be *fit for duty*. Thus, under the policy, crew members could drink alcohol ashore provided that they were *fit for duty* on return. No random breath testing was undertaken, and no attempt was made to define what constituted being *fit for duty* in this respect.

The Railways and Transport Safety Act was in the process of becoming law at the time of the accident. In broad terms, Part 4 of the Act subjects seafarers to the same limits of alcohol consumption as those for road transport users, and police will have the right to test merchant vessel crew members who they reasonably suspect are committing, or have committed, an offence. The owners put a copy of this Act on board *Donald Redford* in September 2003.

When the Act is in force, a port official will have the power to detain a vessel if he/she reasonably suspects that a member of the crew is, or has, committed an offence related to alcohol consumption. The detention can be applied until a police officer arrives to provide a breath test.

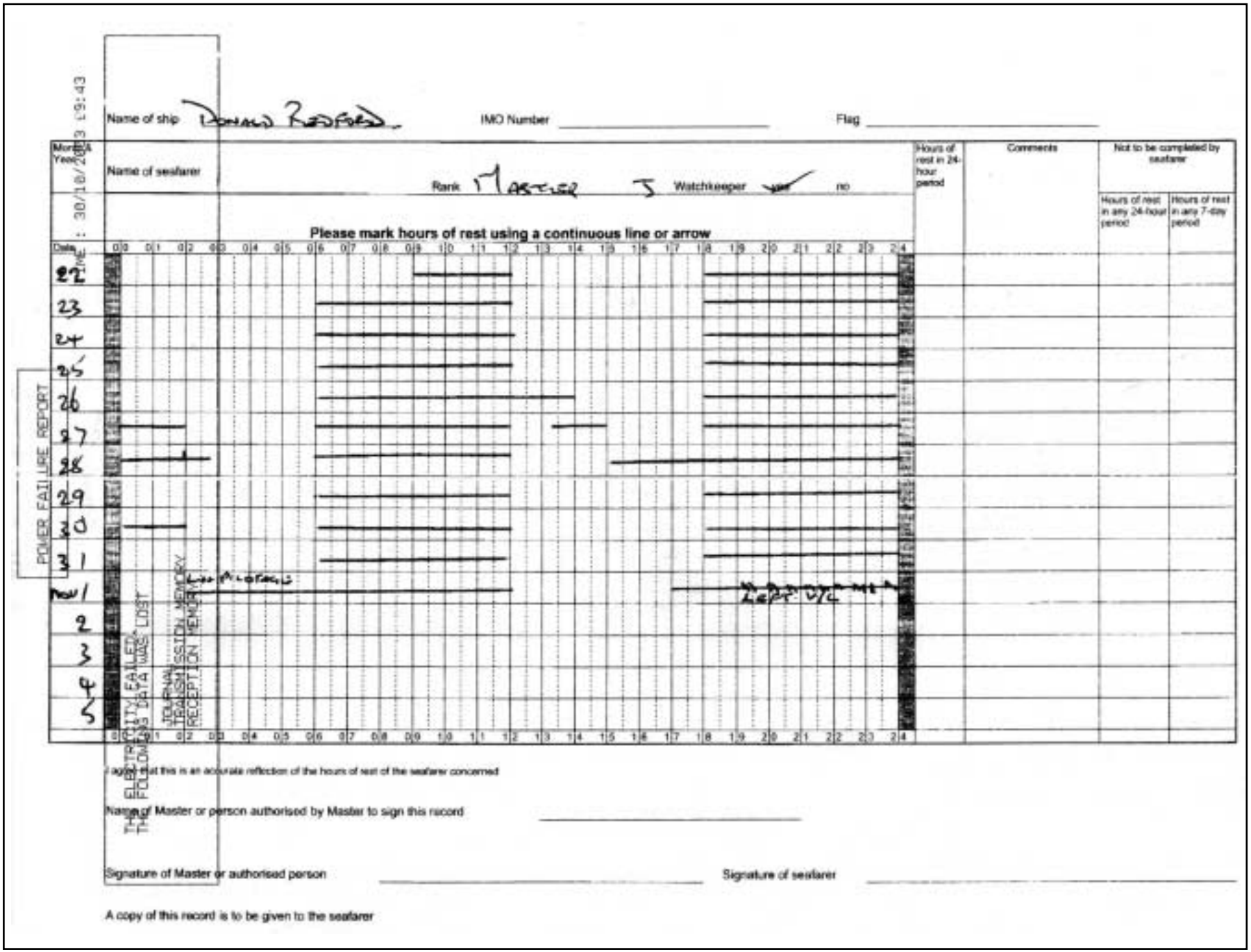


Figure 9

The junior master's record of hours worked

The Transport Act was not in force at the time of the accident, and the junior master could have refused to be breath tested. However, he submitted to the tests voluntarily.

The junior master had drunk alcohol during the afternoon and the intoximeter tests indicated that he was about 2½ times over the legal road driving limit at the time of the test (4 hours after the accident).

Since December 2001, the junior master had been taking the prescribed drug Fluoxetine, which is an anti-depressant. He took two weeks sick leave at the beginning of this time. The owners knew that this sick leave was due to personal problems, but they were not aware of the drug that had been prescribed.

1.9 BRIDGE WATCHKEEPING

The junior master was alone on the bridge after the duty seaman left at about 1757. It was dark, and *Donald Redford* was in confined waters. In the time leading up to the accident, the duty seaman was employed in stowing stores.

The IMO STCW Code, dated 1995, states in Section A-VIII/2 paragraph 15 that: *The officer in charge of the navigational watch may be the sole lookout in daylight*. The implication of the statement is that the officer in charge of the navigational watch may not be the sole watchkeeper during the hours of darkness.

To clarify this, in the UK, the MCA reminds masters, owners, and operators in paragraph 21.2 of Merchant Shipping Notice MSN 1767 (M), that *the UK does not consider it safe for the officer of the navigational watch to act as sole look-out during periods of darkness*.

The STCW Code goes on, in the same paragraph, to explain under which circumstances a dedicated lookout need not be posted in daylight. The circumstances include: *When full account has been taken of all relevant factors, including, but not limited to, state of the weather, visibility, traffic density and the proximity of dangers to navigation*.

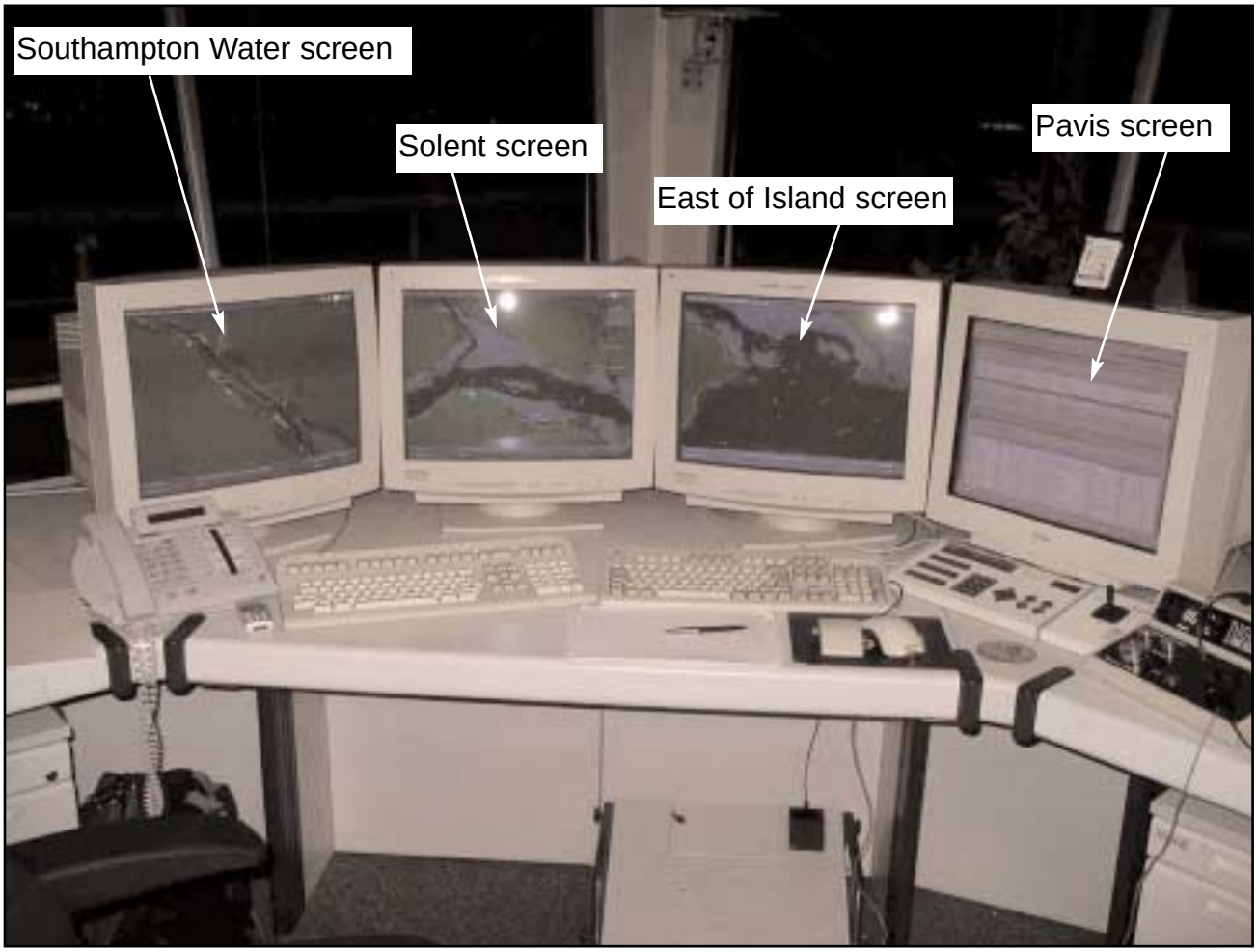
On 1 November, at the time of the accident, *Donald Redford* was navigating at night, within metres of dangers to navigation, in one of the busiest port areas in the UK.

1.10 VESSEL TRAFFIC SERVICES (VTS)

The VTS operations room was manned by four staff at the time of the accident. This was the normal complement. A VTS officer (VTS(O)), usually a master mariner, oversaw the work of three VTS assistants (VTS(A)s). Two of the VTS(A)s alternated 2 hours on/2 hours off, monitoring VHF Channel 12, the normal port working channel, as well as three radar screens **(Figure 10)** which cover Southampton Water, the Solent, and the area to the east of the Isle of Wight. The off-duty Channel 12 VTS(A) had specific clerical duties to perform, including entering data on the Port and Vessel Information System (PAVIS). The third VTS(A) was fully occupied with duties mainly associated with the placing of pilots.

In addition to overseeing and prioritising the work of the VTS(A)s, the principal work of the VTS(O) was to integrate and amend vessel passage plans for the port. This task was difficult, important and time-consuming. He also handled the more complex telephone enquiries. Additionally, the VTS(O) was expected to monitor any emergencies or potential emergencies, and delegate or delay his other work to enable him to do this.

Figure 10



The VTS(A)'s work station

At the time of the accident, the VTS(O) on watch was a qualified master mariner and had served as a master at sea. He had worked for Southampton VTS as a VTS(O) since 2000.

The time leading up to the accident was busy, as is usually the case on a Saturday night in the Port of Southampton. At busy times, the four staff in the operations room can find it difficult to cope with the workload. During weekdays, the VTS(O) has the option of calling for assistance from a member of VTS staff working elsewhere in the building. The VTS(O) has had cause to do this in the past. However, this is not an option outside of normal working hours, when the only recourse is to call the duty harbourmaster at home. This may not help with an immediate problem as, in all likelihood, the situation will have passed by the time the duty harbourmaster reaches the operations room.

Southampton VTS routinely record radar and VHF audio data for use in subsequent analysis of incidents and accidents. This information has been invaluable to the MAIB investigation.

Vessels must report to VTS using VHF Channel 12 at various stages of their passage through the port area, when passing certain specified points. A VTS(A) took the initial call from *Donald Redford*, which was made just before she left Woolston. The junior master reported that he would be sailing *east of the greens* and that the draught of the vessel was 2.6m. The VTS(A) acknowledged this, and advised *Donald Redford* about other current movements in the port. After this, the junior master repeated that he would be *east of the greens all the way down* **(Figure 2)**. The VTS(A) was concerned about the person calling from *Donald Redford*, as his speech was slurred, so the VTS(O) was informed. The VTS(A) expressed the opinion that the vessel should be monitored closely.

The junior master called again, at the reporting point, when *Donald Redford* was clear of the Itchen Bridge **(Figure 3)**. The VTS(A) acknowledged receipt and passed more traffic information. The junior master stated once again that his vessel would make passage *east of the greens*. By restating that he would be *east of the greens*, the junior master probably intended to re-emphasise that he would be out of the main channel in Southampton Water. After this conversation, the VTS(A) again expressed his concerns to the VTS(O), because the speech of the junior master was significantly slurred. The VTS(O) was listening to Channel 12 at the time, so would have heard the junior master's voice.

About four minutes later, *Donald Redford* nearly hit the quayside to the south of the entrance to Ocean Village **(Figure 4)**. The Channel 12 VTS(A) was monitoring three radar screens, which were on their normal settings to monitor the entire VTS area **(Figure 10)**. The one screen which covered Southampton Water was set on a small scale **(Figure 11)**, so the event would have been difficult to see clearly. The duty Channel 12 VTS(A) changed at about that time.

During the handover, the first VTS(A) informed the second VTS(A) to pay close

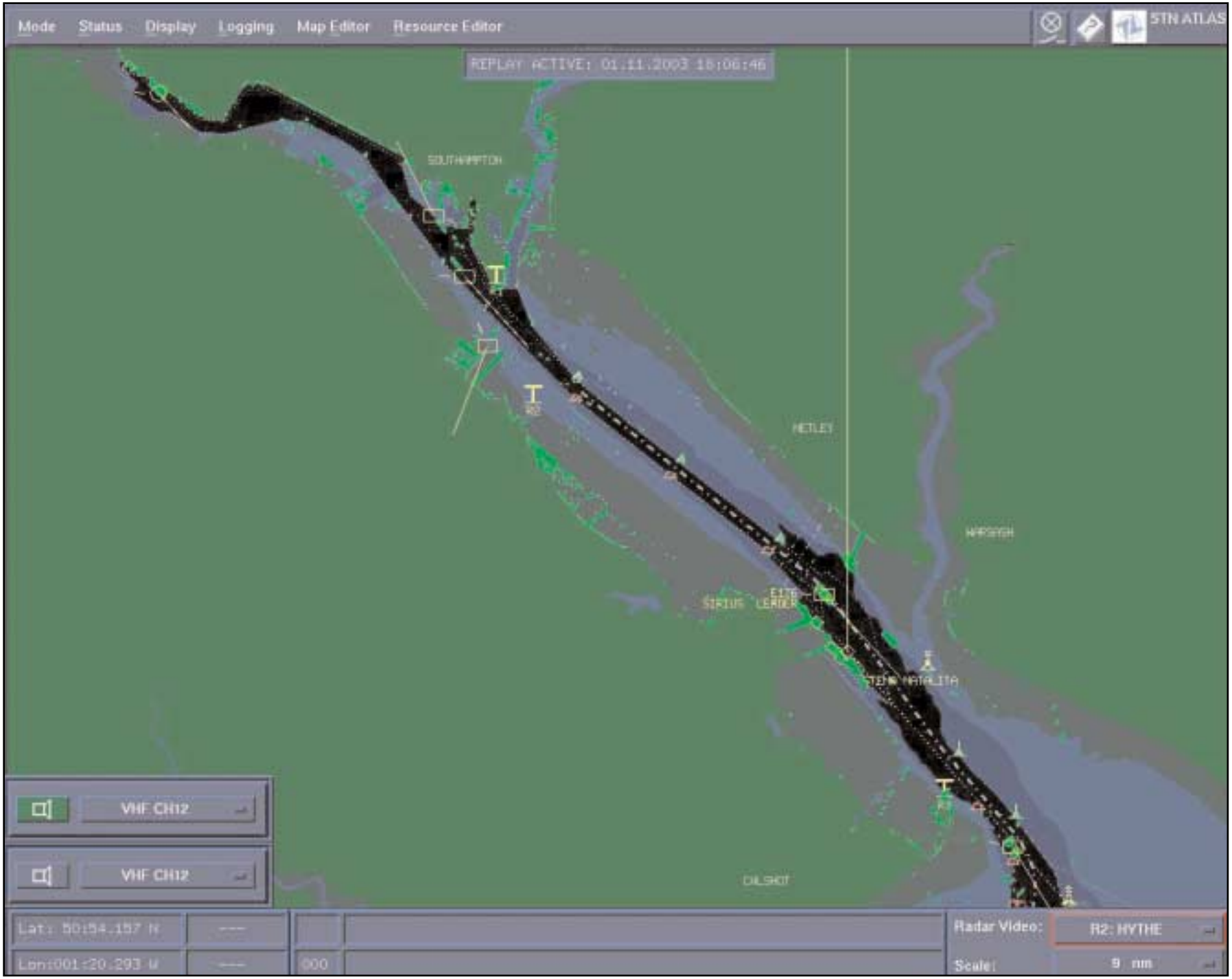


Figure 11

The VTS(A)'s screen showing Southampton Water and the Port of Southampton

During the handover, the first VTS(A) informed the second VTS(A) to pay close attention to *Donald Redford*, as the junior master's speech sounded slurred. After handing over, the first VTS(A) took a short break and did not return to the operations room until after the accident.

Donald Redford went on to cross the River Itchen and, at 1802, she nearly collided with a buoy while passing the VTS building **(Figure 5)**. The vessel then turned to starboard **(Figure 6)**, which indicated that the junior master had changed his mind about using the small craft channel.

In the period leading up to the accident, other ships were calling on Channel 12. The VTS(A) had to deal with these calls, and could not give her undivided attention to *Donald Redford*. When *Donald Redford* was half way across the main shipping channel, the VTS(O) asked the Channel 12 VTS(A) to call the vessel and enquire if they were happy with their position. As a precaution, before making the call, the VTS(A) sought assistance from the other VTS staff in positively identifying *Donald Redford*. The vessel could be seen from the windows of the operations room, but identification was not easy as it was dark and there was backscatter from the lights at Hythe.

Once the identity was confirmed, which only took a short time, the VTS(A) called *Donald Redford*. The junior master's reply was *all attention*. Once contact had been established the VTS(A) asked, with a tone of voice indicating some urgency, *are you happy with your position?* There was no immediate reply and, after a short pause, the VTS(A) called again; the response received was *all attention* again. The VTS(A) then asked *Donald Redford* to go to Channel 20, and the reply was, *Channel 20*. Very shortly after this exchange, a Southampton pilot, on board the outbound vessel *Euro Phoenix*, called to say that he had also noted the danger, and that *Donald Redford* was about to go aground. Even though VTS attempted to make contact with *Donald Redford* again, no further transmissions were heard from the vessel on either Channel 12 or 20, before the accident occurred.

After the accident, the junior master was taken to the VTS building. The assistant harbourmaster noted that he appeared to be drunk; there was a smell of alcohol on his breath, he was staggering, and his speech was slurred.

1.11 THE DAMAGE TO HYTHE PIER

The pier is about 600m long, and has fixed navigation lights at its end. A small electrically-powered train, which could carry up to 50 people, ran along the pier for those passengers who preferred not to walk **(Figure 12)**.

Supporters of Southampton Football Club, which had played at home on the afternoon of 1 November, swelled the normal amount of workers and people returning from shopping trips that evening. A train carrying 24 passengers had run along the pier about 8 minutes before the accident. No one was walking along the pier when the collision occurred.

The depth of water at the collision point was about 4m at the time. After the accident, a coastguard helicopter searched the area using an infrared camera, to make sure no one was in the water.

The pier was severed by the accident. The impact occurred about half way along its length **(Figure 13)**. In the area of the collision, the structure was badly distorted and crumpled **(Figure 14)**. The loss of the pier caused considerable disruption to this important commuter route, especially at the start of the next working week.

Temporary arrangements for the ferries to run from Hythe Marina were put in place until the pier could be repaired.

1.12 THE DAMAGE TO *DONALD REDFORD*

The senior master informed VTS of the collision, and a tug was arranged. The tug *Wyeforc*e was available, and arrived on the scene about 20 minutes after the accident. A line was secured to *Donald Redford'*s port quarter, and *Wyeforce* then pulled her off the pier. The tide was ebbing, but was probably eddying around the corner of Hythe Marina. As she came clear of the pier, the tidal stream swung *Donald Redford*'s bow towards the shore, and she grounded on soft mud. *Wyeforce* tried to pull the vessel clear of the shore, but *Donald Redford* was stuck fast on a falling tide. The amount of water under the keel of *Wyeforce* was reducing, so she departed the scene. With the tug gone, *Donald Redford*'s main engine was shut down and the port anchor was dropped.

Another tug was ordered for the next high tide, and the crew started to deballast the hold, using a stripping pump, to reduce the draught of *Donald Redford*. The crew also checked all the compartments in the vessel for leakage, but none was found. The ballast tanks were also pumped out to lighten the vessel.

At about 0240, on 2 November 2003, the tug *Wyepush* arrived. A towing line was established, and *Donald Redford* was pulled clear and refloated at about 0255. She was then able to make her way to Marchwood, which is a berth to the west of Hythe, under her own power.

There was little damage to *Donald Redford*'s bow **(Figure 15)**. Some scrapes to the paintwork were visible, but it was difficult to know if this occurred during the accident, or as a result of her normal operations. All compartments were thoroughly checked at Marchwood, and no water ingress was found. The draughts of the vessel were monitored, and found not to be increasing. On 2 November 2003, an MCA surveyor attended the vessel and checked the steering and engine controls, which were found to be operating satisfactorily. The VHF radio was also checked, and was found to be working as it should.

Donald Redford returned to her normal operations a few days after the accident.

Figure 12

The train

Figure 13

Hythe Pier looking south-east

Figure 14

The damage to Hythe Pier

Figure 15

The damage to *Donald Redford*

SECTION 2 - ANALYSIS

2.1 AIM

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

2.2 THE ACTIONS OF THE JUNIOR MASTER

2.2.1 Alcohol

The junior master got up shortly after *Donald Redford* arrived at Woolston, and at about 1545 he went ashore alone. He bought a paper and a lottery ticket, and then returned to the ship briefly, to check that there were no problems with the discharge. After this, he went into a public house, apparently to find out about a firework display to which he intended to take his children. He remained there between 1600 and 1700 and it is reported that he drank six pints of lager. He did not remember consuming any other alcohol that day.

The staff at the public house recall that, although the junior master was hyped up, he was not obviously drunk.

At about 1700, the senior master called the junior master by mobile telephone. The junior master left the pub and went out to the car park for better mobile telephone reception. The senior master could see the junior master from the ship. The senior master said that he was tired and he was going to go to bed; the junior master replied that he would return to the ship shortly. During the conversation, the senior master thought that the junior master's voice sounded normal.

The junior master arrived back at about 1720. He entered the mess, and told the senior engineer that they would be leaving shortly. The engineer, too, felt he sounded normal. The senior master had already gone to bed, so there was no face-to-face handover between the masters.

At about 1740, having completed the discharge, the berth manager boarded the vessel and went up to the bridge. While the cargo paperwork was being completed, the berth manager noticed the smell of alcohol on the junior master's breath; the berth manager was concerned about this, and mentioned it to the senior engineer before leaving.

The senior engineer remembers speaking to the berth manager, shortly before he left the vessel, but does not recall any specific reference to alcohol. The engineer interpreted the berth manager's comment about the junior master to mean that he was *on a bit of a high*. The senior engineer had formed the opinion, during the time that he had known the junior master, that he was subject to mood swings; at times he could be hyped up, and on other occasions he could be down. The senior master had also formed the same opinion of the junior master's general behaviour.

At about 1750, just before *Donald Redford*'s departure, the junior master's speech was noted to be slurred by the VTS(A).

At about 1935, the junior master was taken by launch to the VTS building. Police officers saw him there, and he was then taken to a police station, where an intoximeter breath test was administered about 4 hours after the accident. The result of this test was reported to be 89 microgrammes of alcohol in 100 millilitres of breath. The legal limit for driving on the road is 35.

After the junior master left the vessel, his cabin was cleared. No alcohol was reported as being found.

He was accompanied to the VTS building and on to the police station. This would indicate that the only alcohol he had taken that day was consumed in the public house.

2.2.2 Fatigue

The junior master's duty periods are shown in **(Figure 9)**. Along with the rest of the six man crew, he was 11 days into the 2 week duty period. On 29, 30 and 31 October his work pattern had been the normal 6 hours on and 6 hours off. In the early morning of 1 November, a pilotage out of Littlehampton was necessary. The junior master was the only crew member with a Littlehampton PEC, therefore, despite having just completed a 6 hour duty period, he continued on duty. This extra duty could have been avoided, as there was the option of taking a licensed pilot. Examination of the junior master's duty periods **(Figure 9)** shows that in the 24 hours before the accident, he worked 1800-2400 on 31 October, and 0200-1200 plus 1700-1800 on 1 November. However, the senior master recalls releasing the junior master at 1100. Allowing for this, the junior master worked 16hrs (6hrs+9hrs+1hr). The rest periods therefore totalled 8hrs.

As stated above, according to the senior master, the junior master was relieved at 1100 and was able to get some sleep. *Donald Redford* was making her way from the dredging grounds to Woolston at this time. At about 1515, the vessel berthed and the discharge began. The aggregate was taken out of the hold using a mechanical grab attached to a crawler crane. During the discharge, the grab banged about inside the hold; sleep was difficult in these circumstances. However, the vessel was usually unloaded in this way, so the noise created was nothing unusual.

The Merchant Shipping (Hours of Work) Regulations 2002, Statutory Instrument 2002 No. 2125, states in Regulation 5(1)(a), that the minimum hours of rest shall be not less than "ten hours in any 24-hour period". Exceptions to this are **only** permitted if a workforce agreement, approved by the MCA, is in place. There was no workforce agreement at Northwood (Fareham) Limited.

The long periods of duty that the junior master had undertaken in the 24 hours before the accident are considered to be a contributory factor. The crew should have a minimum of 10 hours rest in every 24 hours, in accordance with the Hours of Work Regulations. It appears that this is not always followed on *Donald Redford*. Northwood (Fareham) Limited should, therefore, remind its crews to adhere to this policy. Masters should request a lay-over on a berth, or at anchorage, if crew members have been deprived of adequate rest.

The junior master felt tired before the accident. Bearing this in mind, despite the noise of the discharge, he should have stayed in his cabin and tried to rest, instead of going ashore at about 1545. The effect of the excess duty hours was exacerbated because he did not maximise the benefit of the off-duty period between 1100 and 1720.

2.2.3 Prescribed drug

In December 2001, the junior master was prescribed the anti-depressant drug Fluoxetine, which he began taking, and continued to take, up until the time of the accident. During this period, his medical condition persisted, and had become more acute before the accident. Northwood (Fareham) Limited were aware of the junior master's medical condition in December 2001, but they were not aware that it had persisted and become more acute again prior to the accident. The junior master had undertaken an MCA medical on 1 February 2001; the certificate was valid for 5 years.

Fluoxetine is commonly referred to as Prozac. The junior master had not experienced any significant side effects of the drug during the 23 months he had been taking it. His employer did not know that he was taking this prescribed medication.

Fluoxetine can cause drowsiness, mood swings and possible memory loss when alcohol is also taken. The drug can cause sleep disturbance, so it is recommended that it be taken early in the morning.

2.2.4 Conclusion

It is considered that the junior master's performance was severely degraded on the evening of 1 November, such that he was effectively incapacitated. This was caused mainly by the consumption of alcohol, but inadequate rest and the effects of a prescribed drug were probably contributory factors.

The UK Chamber of Shipping has published *Guidelines to Shipping Companies on Alcohol Abuse*. The document should be updated to make reference to Part 4 of the Railways and Transport Safety Act. The guidelines should also be revised in light of this accident, and include advice to organisations on how to detect, manage and police alcohol abuse.

When the Railways and Transport Safety Act comes into force, it will considerably strengthen the ability of Port Authorities to prevent ships from sailing if it is suspected that any crew member is, or has, committed an offence related to alcohol consumption. The British Ports Association, and the UK Major Ports Group, should issue guidance to their members on how to enforce this Act.

The Hours of Work Regulations were breached in this case, and the junior master was fatigued. MAIB records show this to be a common phenomenon on coastal shipping. The UK Chamber of Shipping should issue guidance to ship owners that will encourage them to put in place procedures which will provide the master with specific guidance in the event that the hours of work regulations cannot be complied with. This may take the form of, for example, anchoring the vessel so that the crew can be rested.

2.3 MEDICAL FITNESS

The junior master had last undergone an MCA medical in February 2001, 10 months before receiving treatment for his condition. His medical fitness certificate was valid for 5 years.

The reverse side of the medical certificate has the following note for the seafarer: *If you are off sick for more than 30 days or your medical fitness changes significantly, you must contact an Approved Doctor (preferably the one who issued the certificate) for medical review*. The junior master had not been off sick for more than 30 days, but, by virtue of the medication he was taking and the condition suffered, his medical fitness might have changed significantly. However, no change in his circumstances was reported to the MCA, and no medical review took place.

The reverse side of the medical certificate also has the following note for the employer: *Where the validity of this certificate is in doubt, you should send the certificate for investigation to the MCA's Seafarer Health and Safety Branch*. Also, paragraph 8.7 of Merchant Shipping Notice MSN 1765 (M), produced by the MCA, states: *The seafarer who is the holder of a valid medical certificate may at any time be required by the employer or owner or master of a ship to obtain a new medical certificate where, as a result of illness, injury or reasonable cause it is believed the seafarer may no longer meet the appropriate minimum standards*. The validity of this certificate might have been in doubt, but Northwood (Fareham) Limited, though aware of the junior master's condition in December 2001, were not aware of the medication prescribed and therefore did not take any action.

There is no item on the ENG 2 requiring the declaration of any prescribed medication which is being taken. The report used for aviation medicals, and many other similar forms, include this. The ENG 2 includes the specific question: "Is the seafarer now receiving any treatment?" If prescribed

medication is being taken, it should be declared there. However, since the question does not specify “prescribed drugs”, this could be misunderstood. This issue is not a contributory factor in this accident. However, prescribed medication is considered to be an important indication of possible medical problems, and seafarers’ medical fitness examinations might benefit from its specific inclusion.

The system for MCA medical fitness examinations was changed on 1 September 2002. Medical examinations are now required every 2 years for all seafarers over 18 years of age. If this new regime had been in place earlier, the junior master would have required another medical before the accident; the problems that were possibly affecting his fitness might have been detected at this medical.

The reduced interval between medicals, which the MCA has introduced, may help to prevent accidents in the future.

2.4 PRESCRIBED MEDICATION

Northwood (Fareham) Limited was not aware that the junior master was taking prescribed medication. There was no requirement for him to declare this in his contract of employment. Seafarers should be required to inform their employers when they are taking medication under prescription, when the drug in use comes with a warning that patients should not drive or operate moving machinery. The MAIB believes this should form a standard clause in their conditions of service.

This issue may affect many UK ship owners, therefore, the UK Chamber of Shipping should issue guidance to shipping companies which requires seafarers to notify their employer when they are taking prescribed drugs.

2.5 HANDOVER

The senior master handed over his duties to the junior master during a mobile telephone conversation. He was therefore unable to assess with confidence that the junior master was fit for duty. Bearing in mind that the junior master had just left a public house, where, in all likelihood, he would have consumed alcohol, this is considered to have been unwise. The senior master should have conducted a face-to-face handover with the junior master before retiring to his bed.

Three of the vessel’s personnel, the senior master, the senior engineer and the seaman, were probably aware that the junior master was under the influence of alcohol, but they did not take effective action to stop him having control of the vessel. This indicates a degree of tolerance to alcohol misuse on this vessel that needs to be addressed by the ship’s managers. In the opinion of the MAIB, it is likely that the problem exists on other vessels in the short sea trade, and the Chamber of Shipping is recommended to issue suitable guidance to its members to ensure that all companies address this problem forcefully.

2.6 BRIDGE WATCHKEEPING

After the accident, the junior master recalled that it had been his intention to use the main channel **(Figure 2)**. However, on the VTS voice recording, he stated three times that he would be sailing "*east of the greens*", which refers to the small craft channel. The port of Southampton was quite busy at the time of the accident, and it was not unusual for *Donald Redford* to use the small craft channel in such circumstances. It is probable that, by the time he reached the mouth of the River Itchen, he had lost situational awareness and missed the turn into the small craft channel.

The junior master does not recall much about the passage; the shock of the accident might have caused him to shut it out, or his memory might have been affected by the alcohol he had consumed. He remembered seeing the two red lights on the end of Hythe Pier, through one of the port bridge windows, just before the vessel struck the pier at 1808.

Donald Redford could be hand-steered using the wheel **(Figure 16)**, but she could also be steered using the autopilot, the controls for which were mounted on the deckhead above the VHF radio. The junior master vaguely recalls engaging the autopilot in the vicinity of the mouth of the Itchen River. It is probable that the autopilot was engaged, and that the junior master was steering the vessel using the autopilot controls near to where the VHF radio was mounted. During the passage, the junior master was attempting to navigate by eye, was controlling the vessel and dealing with communications.

Figure 16

The bridge on *Donald Redford*

The MAIB believes the junior master was incapacitated but, the fact that he was alone on the bridge, which was clearly contrary to the STCW Code, was a key factor in this accident. A seaman was available, but had left the bridge of his own volition after a dismissive comment from the junior master.

Anecdotal evidence indicates that it was common practice on *Donald Redford*, at times, during the day or the night, for the officer in charge of the navigational watch to be the sole lookout in areas like Southampton Water. Evidence gained from the MAIB database indicates that a number of other small commercial vessels have had accidents which might have been avoided had a dedicated lookout been posted on the bridge. At least 11 such accidents have occurred within port areas in the last 8 years. On each occasion, be it day or night, the officer was alone on the bridge and the vessel either did not require a pilot, by virtue of her length, or the officer was the PEC holder. A watchkeeper may become incapacitated for any one of a number of reasons, and the consequent loss of control of the vessel offers the potential for a major accident.

The MAIB believes that, apart from in exceptional circumstances, in port areas all commercial vessels should have at least two people on the bridge at all times, day and night, while underway.

2.7 MANNING

Donald Redford had a safe manning certificate, which was issued by the MCA, and which indicated that a crew of six was required. When considering what should constitute minimum safe manning on a vessel, flag state authorities, like the MCA, do not consider all the operational requirements arising from the particular trade the vessel follows. In the opinion of the MAIB, a crew of six for *Donald Redford* is barely sufficient. The MAIB also believes that the vessel can only be operated safely with this number if masters are encouraged, on occasions, to adjust her programme to enable the watchkeepers to obtain sufficient rest. At Northwood (Fareham) Ltd, the option to request an adjustment to the programme, for this reason, is already available to masters, and they occasionally use it, but no request for additional time alongside was made on 1 November 2003.

The MAIB is concerned about manning levels, particularly on small coastal vessels. It believes that undermanning, and especially one man bridge operations, is causing accidents.

Over 58% of all collisions and groundings investigated by the MAIB over the last five years can be attributed, in part, to single-handed bridge watchkeeping.

Port Authorities have a role in trying to prevent inadequate bridge manning. Often, the routing of ships makes it impossible to comply with bridge manning requirements and hours of work regulations. This sometimes comes to light when PECs are applied for. Therefore, the British Ports Association, and the UK Major Ports Group, should provide advice to their members on how to deal with this problem.

Risk assessments have to be undertaken for the proper application of the Port Marine Safety Code. Bridge manning, including the possibility of there being a single watchkeeper, should be a factor in such risk assessments. The British Ports Association and the UK Major Ports Group should provide advice to their members on this issue as well.

At the time of the collision, the duty engineer was stowing stores in the steering flat. Good practice dictates that he should have been on watch in the engine room, as the vessel was navigating in confined waters. This would have enabled him to quickly react to any engineering emergency during this time.

2.8 THE ROLE OF VESSEL TRAFFIC SERVICES (VTS)

A number of large vessels were scheduled to move within the port on the evening/night of the accident. The VTS(O) was occupied integrating the passage plans for these vessels when the emergency with *Donald Redford* started to develop.

After the first call from *Donald Redford*, the VTS(A) expressed his concern about the junior master's speech. As a result, the VTS(O) started listening to Channel 12, and heard all the other calls made from *Donald Redford*, but he did not adjust his radar screen to monitor the vessel's progress. The VTS(O) was not unduly alarmed by the voice of the junior master, as he thought that some accents can make masters sound as if they are slurring their speech. MAIB inspectors have listened to the radio transmissions from *Donald Redford* prior to the accident; in their opinion, the junior master's speech should have caused the VTS(O) to be very concerned about the vessel.

In the MAIB's opinion, the VTS(O) should have put his routine work to one side early in the accident, and given his full attention to the potential emergency. However, it is accepted that it would have been easier for him to give more attention to *Donald Redford* if his workload had been less.

The response of the VTS(O), to the concern expressed by the VTS(A) over the junior master's speech, should have included adjusting his radar screen to enable him to monitor *Donald Redford*'s progress, but it did not. This was a crucial mistake. If he had monitored the vessel closely, he would have seen her nearly hit the quayside to the south of Ocean Village, and later, nearly hit the buoy at the entrance to the Itchen River. It would have been appropriate for the VTS(O) to have contacted the *Donald Redford* at that time with a strong message of concern so as to satisfy himself that the crew were alert and aware of the problems. If necessary, a further call could have been made when *Donald Redford* did not follow the planned route and started to turn to starboard across the main channel. One of those calls might have alerted the junior master to his erratic track, and spurred him to either maintain proper control, or call someone else to the bridge to assist him. VTS have encountered potential emergencies in the past, where positive radio calls, making urgent enquiries or providing strong advice, have averted an accident.

The VTS(O) was experiencing personal problems at the time of the accident. He has said that this did not affect his performance at work, but this is not entirely convincing. The management of the Port of Southampton did not know about these problems. If they had, there is every indication they would have provided assistance, if necessary, to ensure that he could perform his duties safely. The VTS(O) in question should have discussed his problems with his employer.

The Port of Southampton, and all VTS operators, should remain vigilant about detecting staff with medical or personal problems. Staff should be encouraged to disclose such information, and should continue to be given support while the problems persist.

On this occasion, the VTS(O) told the VTS(A) to contact *Donald Redford* as she was crossing the main shipping channel but, the form of the message given, *are you happy with your position*? and the timing of the call, were not effective in preventing the accident. It appears to have been too little too late. In the IMO's *Guidelines for Vessel Traffic Services* paragraph 2.1.3 it is stated that: *The quality of accident prevention measures will depend on the system's capability of detecting a developing dangerous situation and on the ability to give timely warning of such dangers.* Clearly, Southampton VTS detected the developing situation, but failed to give it sufficient priority, and the warning, when it came, was not effective. The MAIB believes that it would have demonstrated good practice, firstly, if the VTS(O) had, himself, contacted the vessel, instead of delegating the task to the VTS(A) and, secondly, if the Standard Marine Navigational Vocabulary had been used in the warning which was given. A warning such as: *You appear to be standing into danger* might have elicited the required level of response.

When VTS operations were established in Southampton, there was no specific training for VTS staff. Recently, more training has become available, and this is now being provided for Southampton VTS staff. The use of the Standard Marine Navigational Vocabulary should increase as more VTS staff receive this training.

Changing communication channels during periods of emergencies is bad practice because, as in this case, communications can be lost at critical times. It would have been appropriate to transfer *Donald Redford* to a different VHF channel at an earlier stage.

2.9 VTS RESOURCES

The MAIB investigated a near miss between the vessel *Pride of Cherbourg* and *Briarthorn* in 2001. The issue of the workload at Southampton VTS was raised in this report, in respect of the amount of traffic using VHF Channel 12. Southampton is one of the busiest ports in the country, and is forecast to become even busier as new facilities are opened. Four staff have manned the operations room since 1988.

The introduction of AIS on ships will enable VTS to more easily identify and track vessels within the Port of Southampton. AIS will reduce the number of radio calls necessary for identification, and therefore should improve the management of traffic on VHF Channel 12. It is of concern to the MAIB that not all regular users of ports like Southampton will be required to fit AIS. Had AIS been fitted to *Donald Redford*, VTS would have been able to respond to the situation sooner. Ship owners, whose vessels may not be required to fit AIS, should seriously consider voluntary installation if their vessels regularly trade in a VTS area.

Regular meetings were held between VTS staff and management, at which safety issues and better ways of working could be discussed. VTS staff had raised the issue of the number of telephone calls that were received in the operations room, and that this was becoming a distraction. As a result of this, the port management had recently addressed the problem by establishing a data centre on one of the floors below the operations room. The data centre receives all initial calls. Although the data centre was manned at the time of the accident, the facility was in its infancy and most calls were still being passed to the operations room, and the workload of the operations staff had not been greatly affected.

As data centre staff gain more experience, they will be able to handle most of the simple enquiries, and fewer calls will be passed through to the operations room.

The complement of four VTS staff can adequately man the operations room when there are normal workloads, however, they can become stretched during busy periods. For this reason, ABP has reviewed the staffing levels of the operations room and has decided to increase the watch complement to five. The additional person will be a senior VTS(A) whose role will be to assist with the integration of passage plans and to deal with some of the more important telephone calls that are currently taken by the VTS(O). The new staffing arrangements for the operations room will be in addition to the provision of the data centre.

Extra operations staff on the night of the accident, might have allowed the VTS(O) to monitor the track of *Donald Redford* without compromising his other duties. Additionally, five staff will make it easier for safe operations to continue in the event of sickness and during periods of staff training.

SECTION 3 - CONCLUSIONS

3.1 SAFETY ISSUES

The following safety issues have been identified from the foregoing analysis. They are not listed in any order of priority.

- The junior master became incapacitated during the passage due the effects of the alcohol he had consumed, probably combined with those of a prescribed drug. (2.2.1, 2.2.3, 2.2.4)

- The junior master's actions were probably affected by fatigue caused by long periods of duty and little rest in the 24 hours preceding the accident. (2.2.2)

- The junior master did not make best use of the time available to him for rest. (2.2.2)

- Neither the vessel managers, nor the MCA, were aware that the junior master was taking a prescribed drug. (2.3, 2.4)

- The declaration signed by seafarers, when they undergo examination for medical fitness, does not include a specific requirement to declare any prescribed medication. (2.3)

- The senior master did not ensure that the junior master was fit for duty before handing control of the vessel to him. (2.5)

- Three of the vessel's personnel probably knew that the junior master was under the influence of alcohol, but took no effective action. (2.5)

- In the opinion of the MAIB, there is a culture of tolerance to alchohol abuse in areas of the short sea trade. (2.5)

- Contrary to the requirements of the STCW Code, the junior master was alone on the bridge at the time of the accident although the duty seaman was available to him. (2.6)

- The manning on *Donald Redford* was barely sufficient to enable her to operate safely although the requirements of the ship's safe manning certificate were complied with. (2.7)

- Bridge manning, including the possibility of there being a single watchkeeper, should be a factor in risk assessments carried out by port authorities under the Port Marine Safety Code. (2.7)

- The VTS(O) had a substantial workload at the time of the accident, and he did not closely monitor *Donald Redford*'s progress. (2.8)
- VTS's warning to *Donald Redford*, when it came, was not effective. It was too little too late. (2.8)
- The VTS(O), being the professional seafarer in the operations room at the time, should have contacted *Donald Redford* personally. Instead, he delegated the task to one of his VTS(A)s. (2.8)
- Standard Marine Navigational Terms were not used in the warning to *Donald Redford.* (2.8)
- The VTS(O) had personal problems at the time of the accident which might have distracted him. (2.8)
- If *Donald Redford* had been equipped with AIS, VTS would have been able to respond to the developing situation sooner. (2.9)
- Not all vessels which regularly trade in a VTS area will be required to install AIS. (2.9)

SECTION 4 - ACTION TAKEN

Northwood (Fareham) Limited undertook a full internal investigation after the accident. Corrective action has been taken including the following:

1. Revising existing procedures.

2. Introducing new procedures and checklists.

3. Reviewing the company drugs and alcohol policy.

4. Initiating the preparation of a policy to identify any crew members who are taking prescribed medication.

5. Engaging an independent organisation to undertake random testing of Northwood crews for drugs and alcohol.

6. Fitting a bridge alarm to *Donald Redford*.

7. Voluntarily proceeding with ISM Code compliance.

8. Appointing and training safety officers for *Donald Redford*, and the other ship owned by the company.

9. Establishing a crisis team.

Associated British Ports (Southampton) has reviewed the staffing of the VTS operations room, and, as a result, the manning will be increased from four to five.

Transport Act 2004 - The introduction of the Transport Act will establish specific alcohol limits for seafarers.

SECTION 5 - RECOMMENDATIONS

The UK Chamber of Shipping is recommended to:

2004/163 Revise the *Guidelines to Shipping Companies on Alcohol Misuse.* Reference should be made to Part 4 of the Railways and Transport Safety Act. The document should include updated guidance on how organisations can detect, manage and police alcohol abuse; it should also give guidance on how to encourage less tolerance, on the part of seafarers, concerning alcohol misuse.

2004/164 Issue guidance to ship owners that encourage them to establish procedures providing the master with support and specific guidance in the event that the hours of work regulations cannot be complied with. This may take the form of, for example, anchoring the vessel so that the crew can be rested.

2004/165 Issue guidance encouraging its members to include, in seafarers' contracts of employment, a requirement for the company to be notified when the medical condition of the seafarer changes, for instance if long-term medication is prescribed that carries a warning that the patient should not drive or operate moving machinery.

The British Ports Association and the UK Major Ports Group are jointly recommended to:

M2004/166 Issue guidance to their members on the application of Part 4 of the Railways and Transport Safety Act.

M2004/167 Issue guidance to their members that, when considering whether to issue a pilotage exemption certificate, due account is taken of statutory hours of work regulations, ship manning levels and the route/trade of the vessel concerned.

M2004/168 Issue guidance to their members that risk assessments, undertaken under the Port Marine Safety Code, should take into account manning levels and should address the requirement for dedicated lookouts on ships operating in their ports.

Marine Accident Investigation Branch
May 2004