Report on the investigation of

the collision between

mv *Ash* and mv *Dutch Aquamarine*

in the SW lane of the Dover Strait TSS

with the loss of one life

9 October 2001

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

Report No 7/2003
March 2003

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.

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 ACRONYMS

ARPA	-	Automatic Radar Plotting Aid
CNIS	-	Channel Navigation Information Service
Collision Regulations	-	The Merchant Shipping (*Distress Signals and Prevention of Collision*) Regulations 1996
DGPS	-	Differential Global Positioning System
EBL	-	Electronic Bearing Line
ECDIS	-	Electronic Chart Display and Information System
FRC	-	Fast Rescue Craft
GPS	-	Global Positioning System
gt	-	Gross tonnage
IBS	-	Integrated Bridge System
ISM (Code)	-	International Safety Management
kW	-	kilowatt
MCA	-	Maritime and Coastguard Agency
RNLI	-	Royal National Lifeboat Institution
STCW (Convention)	-	*International Convention on Standards of Training,Certification and Watchkeeping for Seafarers, 1978* as amended in 1995
TSS	-	Traffic Separation Scheme
UK	-	United Kingdom
UTC	-	Universal Co-ordinated Time
VHF	-	Very High Frequency (radio)
VRM	-	Variable Range Marker

SYNOPSIS

On 9 October 2001, the 1009gt motor vessel *Ash* was en route from Odense, Denmark, to the Spanish port of Pasajes, with a cargo of steel coils. She had six crew on board and was making a speed of about 6.25 knots over the ground in the south-west traffic lane of the Dover Strait TSS to the south-east of Hastings. The 4,671gt chemical tanker *Dutch Aquamarine* was also on passage in the same traffic lane, en route from Antwerp to Swansea. She had a mixed chemical cargo and a crew of 12 on board. She was making about 12.5 knots over the ground. A number of other vessels were in the vicinity, all of which were bunched towards the northern edge of the lane. Close passing was commonplace.

Ash had been right ahead, or nearly right ahead, of *Dutch Aquamarine* after the latter vessel had passed CS3 buoy. Despite the fact that the weather was fine and the visibility good the watchkeeper on *Dutch Aquamarine* did not notice *Ash* in the period immediately before the collision until she was very close and right ahead. By that time it was too late to take effective avoiding action. The situation was compounded by the watchkeeper on *Ash*, who had noticed *Dutch Aquamarine*'s approach, but had become distracted in the few minutes before the collision.

Ash was holed in the collision, she listed quickly to starboard, capsized and sank. The six persons on board jumped into the water and five of them were rescued by *Dutch Aquamarine*'s fast rescue craft. The sixth crew member, the vessel's master, was eventually located floating face down in the water. Despite rapid transfer to hospital by rescue helicopter, and prolonged attempts to resuscitate him, he was subsequently pronounced dead.

In November 2001, the MAIB published a *Safety Bulletin* which highlighted the problems associated with the bunching of traffic at the northern edge of the south-west traffic lane. Safety recommendations aimed at reducing these problems were directed at shipowners and masters and to the Maritime and Coastguard Agency.

Photograph courtesy of FotoFlite

Photograph 1

Ash, formerly named *Eendracht*

SECTION 1 - FACTUAL INFORMATION

1.1 PARTICULARS OF VESSELS AND ACCIDENT

Vessel details

mv *Ash* (Ex *Eendracht* 9/2/01))

Registered owner	:	Labrador Shipping (9/2/01)
Manager	:	Anglo Dutch Management Services Ltd
Port of registry	:	Kingstown
Flag	:	St Vincent and the Grenadines
IMO No	:	7922350
Type	:	General cargo
Built	:	Netherlands, 1980
Classification society	:	Bureau Veritas
Construction	:	Steel
Length overall	:	65.8m
Gross tonnage	:	1009
Engine power and/or type	:	Diesel, Caterpillar 839kW
Service speed	:	10 knots
Other relevant info	:	Single screw

Photograph courtesy of FotoFlite

Photograph 2

Dutch Aquamarine

mv *Dutch Aquamarine*

Registered owner	:	Koninklijke Vopak N.V.
Port of registry	:	Dordrecht
Flag	:	Netherlands
IMO No	:	9191656
Type	:	Chemical tanker
Built	:	Lemmer, Netherlands 2000
Classification society	:	Lloyd's Register of Shipping
Construction	:	Steel
Length overall	:	117.6m
Gross tonnage	:	4700
Engine power and/or type	:	Diesel, MaK 3840kW
Service speed	:	15.5
Other relevant information	:	Single screw, bow thrust

Accident details

Time and date	:	1620 (UTC+2) 9 October 2001
Location of incident	:	50° 43.4' N 000° 44' E SW lane of Dover Strait TSS
Environmental conditions	:	SW'ly wind force 4, good visibility, daylight
Persons on board	:	*Ash* 6 *Dutch Aquamarine* 12
Injuries/fatalities	:	One fatality – master of *Ash*
Damage	:	*Ash* lost and *Dutch Aquamarine* superficially damaged

1.2 BACKGROUND

1.2.1 General

The Dover Strait is one of the busiest and most congested shipping lanes in the world. In recognition of this, the first internationally recognised Traffic Separation Scheme (TSS) was set up in the area in 1967. The vast majority of the traffic in the Strait is transiting in either a north-easterly or south-westerly direction. The basis of the Dover Strait TSS is to separate this opposing traffic and it is accomplished using the principle that vessels keep to the starboard side of the channel. Traffic transiting the Strait in a south-westerly direction, therefore, is directed to the English side of the Strait.

Since its first inception, the Dover Strait TSS has been extended and modified slightly, and numerous other schemes have been introduced around the world. In 1977, the Collision Regulations were amended to include Rule 10 which is specific to navigation in a TSS.

The Channel Navigation Information Service (CNIS) was established in 1972 and is based in Dover. Its purpose is to monitor the movement of traffic approaching, and within, the Dover Strait TSS, and to provide routine traffic information broadcasts. In 1973, the system was extended and a complementary service was established on the French side at Cap Griz Nez. CNIS Dover is operated by the Maritime and Coastguard Agency. The ability of CNIS to effectively monitor traffic was improved in 1999 with the introduction of a mandatory ship reporting system.

The CNIS is equipped with a sophisticated radar system which not only enables the movement of traffic to be efficiently monitored, but also records the information for analysis after an accident or incident. The CNIS radar system recorded the tracks of both of the principal vessels involved in this collision from the time they entered the area of radar coverage. The tracks of all other vessels which had peripheral involvement were also recorded, enabling a complete picture of the conduct of both *Ash* and *Dutch Aquamarine* to be constructed.

1.2.2 *Ash*

Ash was formerly named *Eendracht* **(see Photograph 1)**. She was transferred to the management of Anglo-Dutch Management Services Ltd in February 2001 and changed name and port of registry at that time. She was a single deck general cargo vessel which operated between European and, occasionally, West African ports. At the time of the collision she had a cargo of 1200 tonnes of steel coils and was on passage between Odense in Denmark and Pasajes in Spain. She had a crew of six officers and ratings. Her passage plan involved transiting the Dover Strait close to the northern edge of the south-west traffic lane.

Ash foundered after the collision and all voyage paperwork was lost with the vessel.

At the time of the accident, *Ash* was manned and certificated in accordance with international regulations. Her last port state control inspection had taken place about three months before the accident and no defects had been detected.

1.2.3 *Dutch Aquamarine*

Dutch Aquamarine was a chemical tanker of 117m length. She was built in 1999/2000 and first came into service in April 2000. She was registered in Dordrecht in The Netherlands, owned by Koninklijke Vopak NV and operated by Vopak Chemical Tankers BV **(see Photograph 2)**. At the time of the accident she was on passage between Antwerp and Swansea with a mixed chemical cargo including 4,400 tonnes of acetic acid. She had a complement of 12 officers and ratings. Her passage plan involved entering the Dover Strait TSS at F3 buoy, and then crossing obliquely to the northern edge of the south-west traffic lane in the region of South Falls buoy. From there, her planned courses followed the northern edge of the lane through the Dover Strait keeping about 0.5 mile south of the lane marking buoys.

Dutch Aquamarine was well equipped and maintained and had a modern integrated bridge system (IBS). She was manned and certificated in accordance with international regulations.

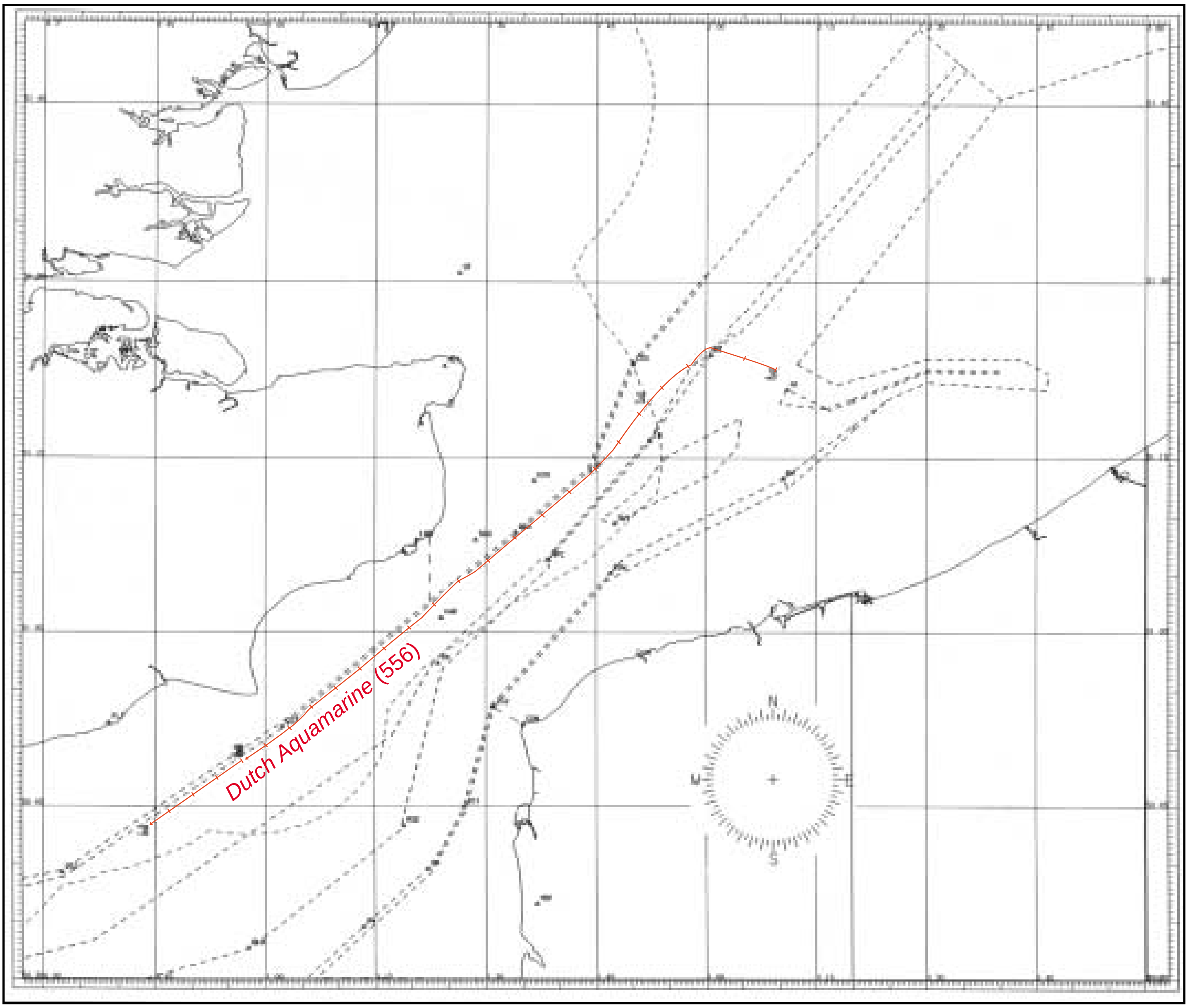
1.3 NARRATIVE

(Times given are ship's time, as used on both vessels (UTC +2))

Dutch Aquamarine left the berth at Antwerp at 0210 on 9 October. She had a pilot on board for the outbound river passage. The pilot disembarked at Wandelaar at about 0700 and course was set for the first leg of the passage to Swansea. The passage plan had been entered into the vessel's STN Atlas NACOS IBS before the voyage began. When she had settled on course, the IBS's track control system was switched on. The master handed over the con to the chief officer but remained in the wheelhouse to send telexes and do paperwork.

At 1200, the chief officer handed the watch over to the second officer. *Dutch Aquamarine* had just entered the south-west traffic lane of the Dover Strait TSS in the vicinity of F3 buoy. The master left the bridge soon afterwards to go to lunch.

Dutch Aquamarine's planned route took her across the traffic lane to the South Falls buoy, from there through the Dover Strait close to the northerly limit of the lane, so as to pass about 0.5 mile south of CS4 and CS3 buoys **(see Plan 1)**.



Extract from CNIS plot showing track of *Dutch Aquamarine*

The master returned to the bridge to carry on with his paperwork at 1345, as the vessel was approaching the Varne.

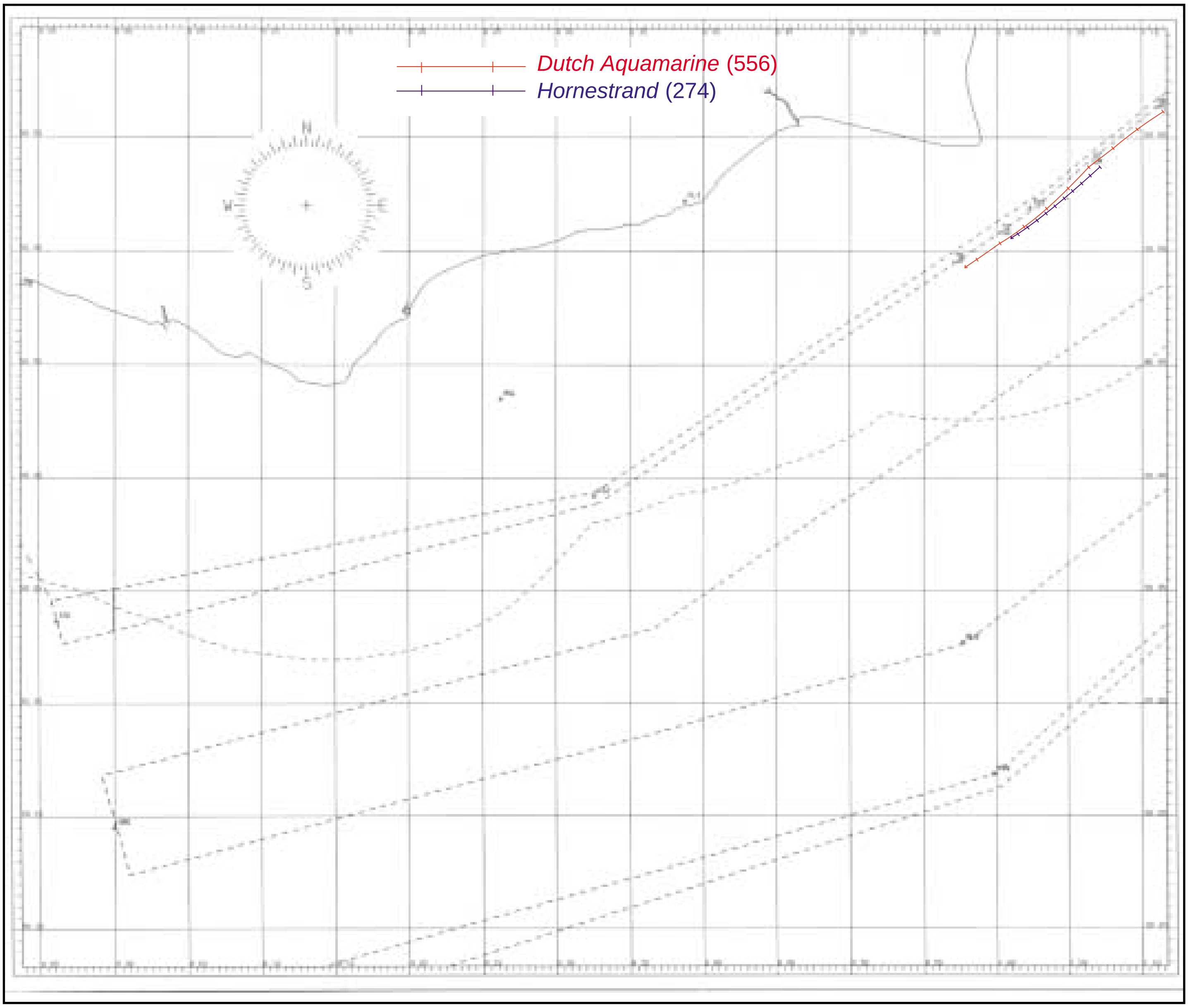
There were a number of other vessels with the same or a similar route through the Strait. *Dutch Aquamarine* was faster than many of them and, therefore, was overtaking frequently. Due to bunching of traffic along the northern edge of the traffic lane, close passing was commonplace. At about 1440, *Dutch Aquamarine* altered course to starboard to overtake two vessels, mv *Lapad* (6.5 knots); and one of an unknown name (6.5 knots). This gave each of them a clear passing distance of about 0.3 mile.

The master went below to his cabin to rest just before 1500.

At about 1508, as soon as she was clear of the vessels that had been overtaken, *Dutch Aquamarine* returned to her planned track. At 1512, she overtook mv *Hornestrand* (5 knots) at a distance of about 0.15 mile on her port side **(see Plan 2)**. She was about 0.5 mile south of CS3 buoy at this time.

At 1554, she overtook *Danica Four* (5 knots) at a distance of about 0.15 mile on her port side and, at 1607, *Rambler* (7 knots) on her starboard side at 0.2 mile. At this time, *Ash* was right ahead or nearly right ahead at a range of about 1.5 mile.

Plan 2



Extract from CNIS plot showing the tracks of *Dutch Aquamarine* and mv *Hornestrand*

Ash had left Odense, Denmark, at about 0000 on 4 October for a voyage to Pasajes in Spain, with a cargo of 1200 tonnes of steel coils. She had made an average speed of about 7.5 knots in bad weather, and had anchored in Margate Roads at about 1700 on 7 October to resecure her cargo. She resumed passage, and entered the Dover Strait TSS at about 0800 on 9 October.

The master had kept the bridge watch between 0600 and 1200, at which time he handed over to the chief officer. The master went below at 1215 to have a meal and then rest.

At 1400, *Ash* was about 0.5 mile south of CS3 buoy when the chief officer made a planned alteration of course to 235° using the autopilot. The vessel maintained a steady course over the next 2 to 3 hours (to the time of the collision) at a speed of about 6.5 knots over the ground. She was overtaken by a number of vessels during this time, including one at a distance of about 0.1 mile on her port side.

After passing CS3 buoy at 1508, *Dutch Aquamarine* maintained a steady course of about 235° and a speed of about 12.8 knots over the ground.

A cadet was on *Dutch Aquamarine*'s bridge, in addition to the second officer. He was making entries in the planned maintenance log and had no part to play in the navigation of the vessel. The watch alarm was turned off. Immediately before, and at the time of the accident, the cadet was standing behind the chart table and did not notice *Dutch Aquamarine* closing on *Ash*.

Ash's chief officer had seen *Dutch Aquamarine* approaching through an aft facing window by the chart table. He noted that she had been about 1 mile away when he went to the centre of the bridge to answer a telephone call. The call had been from the vessel's charterer. The chief officer was still talking on the telephone when he heard shouting from one of the crew on deck.

Dutch Aquamarine's second officer did not notice *Ash* in the period immediately prior to the collision until she was very close and right ahead. At about the time that *Dutch Aquamarine* struck the starboard quarter of *Ash*, the second officer put *Dutch Aquamarine*'s helm hard to starboard and the engines full astern. The collision occurred at 1620 and after the initial impact *Dutch Aquamarine* scraped up *Ash*'s starboard side **(see chart extract)**.

The shouting on *Ash* had been followed soon afterwards by a crunching sound. *Ash* swung quickly to starboard and initially heeled to port. The master arrived on the bridge and asked what had happened. At that time the chief officer did not know. The chief officer saw the bow and red hull of *Dutch Aquamarine* right on the starboard beam. The master ran to the VHF radio to transmit a distress message, and the chief officer put the helm to port to try to stop the swing. There was a second contact and *Dutch Aquamarine* became wedged in *Ash*'s side just forward of her superstructure.

Chart Extract

Reproduced from Admiralty Chart 2675 by permission of the Controller of HMSO and the UK Hydrographic Office

Dutch Aquamarine remained wedged for only a short time before her astern engine movement took effect. She moved astern and clear of *Ash*.

Ash was listing to starboard as water was entering her cargo hold. *Ash*'s crew had congregated on the bridge. They were all wearing lifejackets (two had been stowed in the wheelhouse). The master ordered them to "jump".

The chief officer went quickly to his cabin and then returned to the bridge. The vessel had developed a severe starboard list. The three ratings had jumped into the water and the master had slipped from the bridge wing and fallen on to the open deck below. With some difficulty the chief officer helped the master to the side from where they both jumped into the water. The chief engineer, meanwhile, had also jumped into the water. The chief officer's lifejacket had not been secured properly. It came off when he entered the water but he was able to grab and hold on to it. He saw the master in the water with his lifejacket floating some 20m away from him. He noted that the master was trying to hold on to one of the steel hollow-section hatch covers.

Ash capsized and sank by the bow. She remained vertical with her stern out of the water for some minutes before she finally disappeared beneath the surface. Her position was 50° 43.5' N, 000 44.12'E.

The three ratings were quickly rescued from the water by *Dutch Aquamarine*'s rescue boat, manned by her chief officer and cadet. The boat was unable to safely carry more than five persons in the moderate sea conditions, and first took them to *Dutch Aquamarine* before returning for the others. *Dutch Aquamarine*'s chief engineer who, using a pair of binoculars, was looking out for survivors, was, through the master, directing the crew of the boat. In this manner, they were able to locate the chief officer and chief engineer, who were recovered from the water. They could not see *Ash*'s master. They searched for some minutes, but *Ash*'s officers were beginning to suffer from the cold.

The surviving officers were embarked on to *Dutch Aquamarine* and the rescue boat returned to continue searching for the master. The crew searched among the floating equipment, which included the hatchcovers and, by this time, an inflated liferaft but did not see him. The boat was returning slowly to *Dutch Aquamarine* when, finally, the crew saw the master floating face down in the water. They tried to pull his unconscious body on board the boat but found it impossible. A coastguard rescue helicopter had been alerted and was close to their position, so the crew turned him over and held him until it arrived.

At about 1705, the master was lifted into the helicopter and taken to Hastings Hospital. Despite attempts to resuscitate him on the aircraft and ashore he was later pronounced dead.

The surviving crew members were transferred to Hastings RNLI lifeboat for transport ashore. An ambulance took them to Hastings Hospital where they were treated for shock and hypothermia and later released.

Dutch Aquamarine was directed to proceed to anchor off the Isle of Wight, where an MCA surveyor boarded her. She was later permitted to continue her voyage to Swansea. She had suffered only superficial damage in the collision.

1.4 ENVIRONMENTAL INFORMATION

The visibility was good; it was sunny and there were a few clouds. The wind was from the south-west force 4. The sea state was moderate.

At 1620 the sun's altitude was nearly 24° and its azimuth 223°.

The tidal stream was flooding at about 0.5 knot from the west-south-west.

1.5 *ASH*

1.5.1 Ship management

Labrador Shipping Company bought *Eendracht* just before Christmas 2000. She was then renamed *Ash* and re-registered under the St Vincent and the Grenadines flag. Anglo Dutch Management Services Ltd, which had close connections with Labrador Shipping Company, managed the vessel's operations along with two other similar trading vessels, *May* and *Elm*. Two further vessels of the fleet were laid up and were not trading at the time of the accident. Despite her change of ownership, *Ash* remained on long-term time charter with Hartle Shipping of The Netherlands.

Anglo Dutch Management Services Ltd produces comprehensive, but broadly stated, standing orders and was in the process of obtaining certification under the International Safety Management (ISM) Code.

1.5.2 Bridge equipment and navigation

The bridge equipment on *Ash* included a Decca Bridgemaster radar, one fixed and three portable VHF radios, a gyro compass and an auto pilot. All her bridge equipment was fully operational at the time of the accident and there was no significant blind arc on the radar.

When the accident occurred, the chief officer was keeping watch using radar and visual observation. The radar was set on the 6-mile range scale. The vessel was being steered by autopilot.

1.5.3 Manning

Ash carried a crew of six, which was one more than was stated on her Minimum Safe Manning Certificate issued by her flag state of St Vincent and the Grenadines. The normal voyage contract time for officers was 6 months, but the arrangements were flexible and officers sometimes chose to stay on board longer. Officers were employed through manning agencies.

Anglo Dutch Management Services Ltd has employed able seamen from the Cape Verde Islands for a number of years. The ratings generally work longer voyage contracts than the officers, usually nine months. A number of them have worked for Anglo Dutch Management Services Ltd for many years.

Ash's master was German. He held a German Master's Certificate of Competency. He had worked on vessels managed by Anglo Dutch Management Services Ltd for about 2 years, having been on mv *Elm* before joining *Ash* on 20 June 2001. At the time of the collision he was in his cabin resting.

Her chief officer was a 38 year old Russian. He joined *Ash* on 25 May 2001 for his first voyage with Anglo Dutch Management Services Ltd. He held a Russian Deep Sea Navigator's Certificate which was endorsed for service as a chief officer. He had worked at sea for 15 years. At the time of the accident he was on watch alone on the bridge.

The chief engineer was also Russian, and was aged 51 at the time of the accident. He was working in the ventilator room on the bridge deck and could see *Dutch Aquamarine* as she approached from astern.

Ash's three able seamen were from the Cape Verde Islands. One was preparing a meal in the galley, and the other two were cleaning in the accommodation at the time of the accident. The ratings, although designated able seamen, had no role in bridge watchkeeping on *Ash*.

1.5.4 Actions

Ash had been making a steady course of about 235° during the period leading up to the collision. She had maintained a steady speed of about 6.5 knots over the ground during the same period.

The chief officer first became aware of *Dutch Aquamarine* when she had been 5 miles astern. He noticed her again when she was 1 mile astern, but thought there was no cause for concern at that time. Immediately before the collision he had been speaking on the telephone, and had not monitored *Dutch Aquamarine*'s final approach. When he heard shouts from on deck he did not connect them with the vessel he had previously seen astern.

The chief officer did not become alert to the risk of collision with *Dutch Aquamarine* until after the first contact had been made with *Ash*'s starboard quarter, thus no attempt was made to attract the attention of *Dutch Aquamarine*'s watchkeeper, either by sound signals or any other method. He was unable to move out of *Dutch Aquamarine*'s path.

1.5.5 Damage sustained

Divers from a salvage company visited the wreck on 16 October 2001 and again on 20, 21, 22 and 23 October. *Ash* was found to be upright on the seabed in a depth of water of approximately 43 metres. Some of her cargo of steel coils, and a number of her hatch covers, lay on the seabed near the wreck.

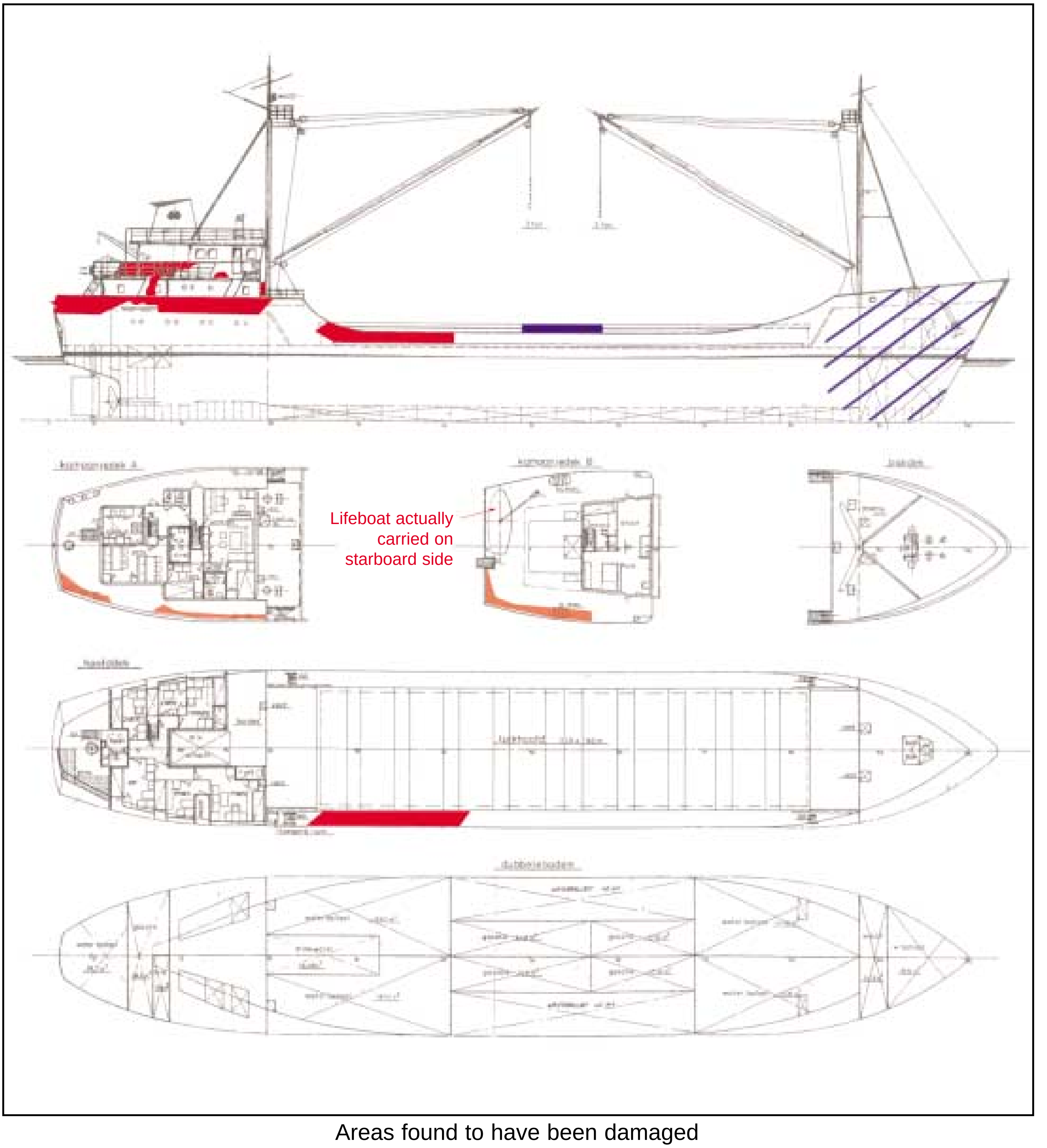
Ash was found to have been damaged in four main areas: the starboard quarter, including the starboard side of the bridge deck and mooring deck; just forward of the superstructure in way of the main cargo hold; an area of buckling at about mid-length; and severe damage in the bow area **(see Figure 1 overleaf)**.

The damage on the starboard quarter included signs of an impact right aft where the bulwark in the mooring area was found to be bent in and over the three adjacent fairleads. This impact apparently damaged the lifeboat davit arm on the bridge deck which was bent inboard to an angle of 30°. Part of the lifeboat was recovered from the water after the accident **(see Photograph 3)**. The boat had been stowed bow to starboard across the after end of the bridge deck in way of this impact area. It can be seen from the photograph that the bow of the lifeboat is missing. A few metres further forward, the railings on the starboard side of the bridge deck were discovered to have been bent inboard, and there were signs of another impact.

A major area of impact was seen just forward of the superstructure in way of the cargo hold.

Photograph 3

Part of the lifeboat recovered after the accident



Areas found to have been damaged

1.5.6 Lifesaving appliances

Once *Dutch Aquamarine* had moved astern, leaving *Ash* listing dangerously with her cargo hold open to the sea on the starboard side, there was nothing *Ash*'s crew could do to save their vessel. They had little time and their priority was their own survival. The master ordered the others to jump. They had no time to launch the lifeboat or liferafts. In any case, the lifeboat had been sited across the after end of the boat deck, and the boat and her davits had been damaged in the initial contact with *Dutch Aquamarine*. All the crew managed to don lifejackets, although the master and chief officer did not get theirs on properly and both came off when they jumped into the water. The chief officer was able to keep hold of his lifejacket, but the master lost his.

When *Ash* finally sank, one of her liferaft hydrostatic releases worked effectively and the liferaft came to the surface and inflated. However, the vessel had remained afloat in a vertical position with her stern out of the water for some minutes before sinking, so that the liferafts which had been stowed on the superstructure at the stern, were not released immediately. The surviving crew were all rescued, or in the process of being rescued, by the time the liferaft was released. By then, it is likely that the master was already unconscious, unaware of the liferaft or unable to reach it in the moderate sea conditions. *Ash*'s other liferaft had been stowed on the starboard side of the bridge deck in an area that was subjected to damage in the collision. That liferaft remained with the vessel when she sank.

1.6 *DUTCH AQUAMARINE*

1.6.1 Ship management

Vopak Chemical Tankers BV manages a large fleet of modern chemical tankers from its offices in Dordrecht, The Netherlands. The company has a well-established safety management system which is compliant with the International Safety Management (ISM) Code.

Vopak Chemical Tankers BV generally employed Dutch officers but unusually, due to recruitment problems, it had employed the second officer, who was Irish, through a manning agency.

The principal language used on board *Dutch Aquamarine* was Dutch. The Spanish and Portuguese crew could speak enough Dutch to make this arrangement workable. The second officer did not speak Dutch, so English was used to communicate with him. The ISM and technical manuals on board were available in both Dutch and English.

1.6.2 Bridge equipment and navigation

Dutch Aquamarine was equipped with an STN Atlas NACOS Integrated Bridge System (IBS) incorporating a modern suite of navigational instruments. These included:

- Two ARPA radars.
- An Electronic Chart Display and Information System (ECDIS) display and planning computer.
- Two Multipilot displays which were capable of showing Radar/ARPA or ECDIS.
- A navigation control console which was a central indicator of navigation data.
- An adaptive autopilot that could be selected to work as a track control system.
- A watch alarm system which had been set on 15 minutes, and which could be cancelled by touching any controls on the IBS. The watch alarm was switched on only when a watchkeeper was alone on the bridge. It was off when the accident occurred.
- Two DGPS navigators.
- Speed log.

Since delivery of the vessel, there had been an intermittent electronic problem which affected the operation of both ARPAs and their ability to track targets. The problem manifested itself occasionally when targets would be lost without warning, leaving the ARPA target indication to wander over the screen giving false information.

At the time of the accident, the ARPA function of the radars was not being used. This was the personal choice of the second officer who considered it better to be without the system, than to use one which was unreliable. Some officers preferred to operate the ARPA while watching out for the fault and comparing the information on the screen with the visual situation. The master was content to leave the decision to the professional judgment of the individual officers concerned. The system manufacturer had tried to cure the problem on several occasions, but had been unable to identify the root cause.

On the day of the accident, the second officer was navigating by eye and using the standard functions of the radar, including the VRMs, EBLs and target trails, to identify whether risk of collision existed.

The fleet orders contain instructions regarding the track control system. The orders indicate that the system may only be used with the express permission of the master. The orders also state that, when in use, after an evasive manoeuvre, the bridge watchkeeping officer must ensure that…. *the GPS gives the autopilot a course to return the ship as quickly as possible to the track to be sailed between the set waypoints.*

Dutch Aquamarine's master and officers had found the track control system to be very useful indeed, and it was used routinely when the vessel was not in pilotage waters. On this occasion, the master had engaged the system soon after the pilot had left the vessel at Wandelaar and it had remained in use since that time. When in track control mode, the autopilot maintained the vessel precisely on the predetermined track, using navigational data gained from the IBS. The system was set to alert the officer of the watch before planned course alteration points were reached. When alerted, the officer could switch over to manual steering to carry out the alteration of course manoeuvre, or elect for the system to do it for him. The track control system was capable of carrying out such a manoeuvre accurately, using a pre-set rate of change of heading.

If a deviation from the track became necessary, for collision avoidance for instance, the watchkeeper could take control immediately by simply operating the tiller. Once the manoeuvre was completed, the watchkeeper could let the system revert to track control mode. In this case the system would take the vessel back to her original planned track quickly using a course that could not be predetermined. Alternatively, the watchkeeper could steer the vessel using the tiller until the cross track error indication became close to zero before letting the system take control once more. The latter option was preferred by most officers as they could keep better control and steer the vessel back to her original track more gradually. Although the system gave the officer a third choice - to choose a new track directly to the next waypoint from the deviated position - this was a function that was not generally used.

1.6.3 Manning

Dutch Aquamarine's crew comprised a master, chief officer, second officer, chief engineer, second engineer, assistant engineer, cook, bosun and four able seamen. All the officers (except the second officer) and the cook were Netherlands citizens, and the ratings were Spanish and Portuguese.

The master was aged 53 and had worked for Broere Shipping (later becoming part of Vopak Group) since 1980. In 1985, he had obtained a certificate of competency which entitled him to sail as chief officer on vessels of less than 6000gt. He obtained an endorsement to sail as master on vessels of less than 6000gt in 1999, and was first appointed master in October of that year. He joined *Dutch Aquamarine* for the first time on 2 October 2001 (7 days before the accident). He had not sailed with a NACOS IBS before, but had sailed with a

Racal Decca IBS while chief officer on *Dutch Spirit*. He had received training in the Racal Decca IBS before joining *Dutch Spirit* in 1995, and all officers working on vessels of the Vopak fleet received 1.5 days training on the NACOS system in October 1999. The master did not keep a regular bridge watch on *Dutch Aquamarine* and he was in his cabin resting when the accident occurred.

The chief officer was aged 38. He held a certificate of competency which allowed him to sail as master of vessels of less than 6000gt. He joined *Dutch Aquamarine* on 16 September. The chief officer had undergone 1.5 days training in the NACOS IBS system in 1999 but had not sailed with the system before joining *Dutch Aquamarine* on this occasion. He was aware of the problem with the radars but chose to use the ARPA system carefully rather than not use it all. He had handed the watch to the second officer at 1200 and was in his cabin resting at the time of the accident.

The second officer was aged 38. He was Irish and held a UK Certificate of Competency Deck Officer Class 3. He had worked at sea since leaving school, first as a navigating cadet and then as a deck officer. At the time of the accident he was employed through a manning agency, Denholm Ship Management Ltd. He had recently been offered a contract directly with Vopak Shipping. He had worked on vessels in the Vopak fleet since October 2000. The first of these had been *Dutch Emerald*, which was a sister ship to *Dutch Aquamarine* and was also fitted with an STN Atlas NACOS IBS. Although not given specific training, he had learned about the system during 8 weeks aboard that vessel. He joined *Dutch Aquamarine* on 2 October in Dordrecht, having left another Vopak vessel, *Stella Pollux*, in Dublin, the previous day. He had taken over the bridge watch at 1200 and was on the bridge at the time of the accident.

The bridge of *Dutch Aquamarine* was designed for "one man bridge" operation, but the charterer had insisted that it should not be used as such. The fleet standing orders identified categories of situations when the seaman watchkeeper should be employed as a lookout. With reference to this accident there were two possible applicable categories, namely:

A1 More than two miles vision and quiet traffic intensity, and/or absence of "difficult passages".

B More than two miles vision and excessive traffic intensity, and/or "difficult passages".

The master had decided that category A1 was applicable to the passage through the Dover Strait TSS. In a category A1 situation/area:

"In daylight, only the navigating officer needs to be on the bridge. The seaman on watch duty is available for when the duty navigating officer is at work elsewhere. In hours of darkness the seaman on watch duty is on the bridge as lookout."

When the accident occurred it was daylight, and the second officer was keeping the bridge watch alone in accordance with those instructions.

The chief and second officers shared the duty of bridge watchkeeping officer, working a 6 hours on/6 hours off routine. The master carried out pilotage duties and generally supervised and backed-up the bridge team as necessary. Occasionally, the master took a watch on the longer sea passages. This allowed the second officer to carry out maintenance or other duties. On the day of the accident, the master had been on the bridge continuously between leaving the berth at Antwerp at 0210, until about 0700, when the pilot was disembarked. After this he remained in the wheelhouse doing paperwork, although the chief officer had the con. The master finally left the bridge at 1210, by which time the second officer had taken over the watch. The master had lunch and returned to the bridge at 1345 to do more paperwork. He left and went to rest in his cabin just before 1500.

At the time of the accident, the able seamen were carrying out maintenance duties on deck. However, one rating was designated as the duty watchkeeper and could have been called to the bridge by the second officer had the need arisen.

1.6.4 Actions

As *Dutch Aquamarine* was approaching other vessels to overtake them, the second officer had used EBLs, VRMs and target trails on his radar to establish whether risk of collision existed. Shortly before the collision, he had noticed two vessels, one on his port bow and one on his starboard bow. He judged that his vessel would pass clear of them both, and that one would pass about 0.5 mile on his starboard side, and the other about 0.5 mile on his port side.

Dutch Aquamarine's course and speed was not varied except as the track control system found necessary to maintain her on her track. When the first of the vessels passed about 0.5 mile clear as he had predicted, the second officer was content that his judgment had been correct and that therefore the other vessel would also pass clear. One of these vessels was probably *Rambler* which *Dutch Aquamarine* overtook at 1607.

It is unclear precisely what the second officer did after passing *Rambler* in the few minutes before the collision. However, the track plots from Dover Coastguard's Channel Navigation Information Service show that *Ash* had been right ahead, or nearly right ahead, of *Dutch Aquamarine* ever since the latter had altered on to a course of about 235° when off CS3 buoy at 1508 **(see Plan 3)**. Clearly, the second officer did not notice *Ash* during the 12 minutes between passing *Rambler* and realising that *Ash* was very close, right ahead.

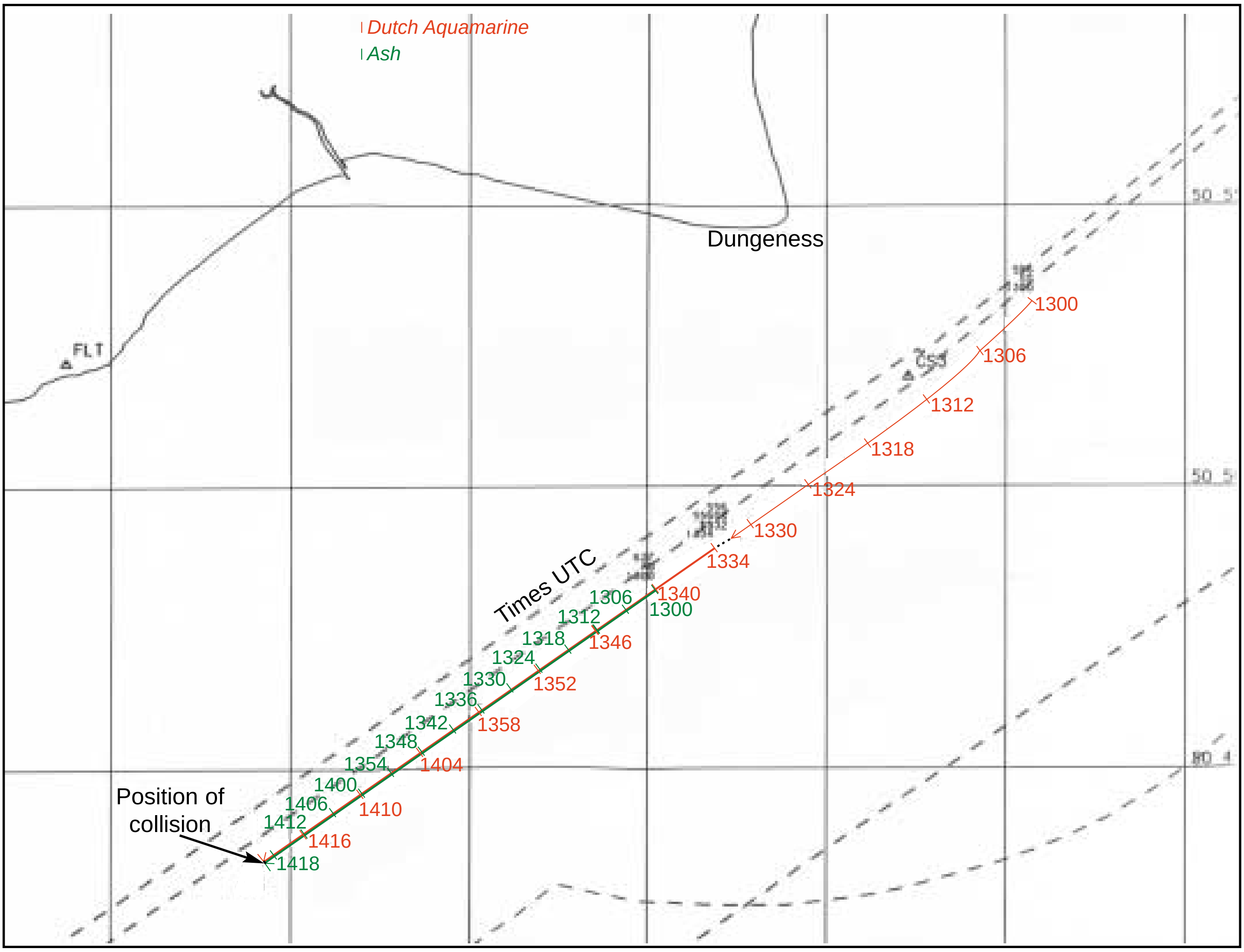
When the second officer did notice *Ash* it was too late to avoid a collision. It was not until about the time of the first contact, *Dutch Aquamarine*'s port bow with *Ash*'s starboard quarter, that he slowed or attempted to alter course.

At no time before the collision did the second officer sound any warning signals or make any attempt to contact *Ash*.

1.6.5 Damage sustained

Dutch Aquamarine suffered only minor damage to the port side of her bow, including the forecastle head bulwarks.

Plan 3



Extract from CNIS plot showing the tracks of *Dutch Aquamarine* coincident with that of *Ash.* Marks at 6 minute intervals.

1.7 FATIGUE AND ALCOHOL

Dutch Aquamarine's second officer had had no duties outside his watch schedule in the week since joining the vessel. Generally, he slept well on board and had slept normally the evening before the accident. He had kept the midnight to 0600 watch and after coming off watch at 0600 on 9 October had watched the news on the television in the lounge and had gone to bed at about 0700 and slept until 1125.

Alcohol was available on board and the second officer often drank a beer, or sometimes two, after his afternoon watch. He never drank alcohol before going on watch at midday and did not do so on the day of the accident.

The chief officer of *Ash* rarely drank alcohol at sea, and then only beer sometimes when the weather was very hot. He had not had any alcohol for many days before the collision. He had been working a 6 hours on/6 hours off watchkeeping regime for several days and had slept well in his off-duty periods.

1.8 APPLICATION OF THE COLLISION REGULATIONS

The International Regulations for Preventing Collisions at Sea apply to all vessels on the high seas and in all waters connected therewith navigable by seagoing vessels. The parts of the rules that are most pertinent to this accident are as follows:

Rule 5

Every vessel shall at all times maintain a proper look-out by sight and hearing as well as by all available means appropriate to the prevailing circumstances and conditions so as to make a full appraisal of the situation and of the risk of collision.

Rule 7

(a) Every vessel shall use all available means appropriate to the prevailing circumstances and conditions to determine if risk of collision exists. If there is any doubt such risk shall be deemed to exist.

(c) Assumptions shall not be made on the basis of scanty information, especially scanty radar information.

Rule 8

(a) Any action taken to avoid a collision shall, if the circumstances of the case admit, be positive, made in ample time and with due regard to the observance of good seamanship.

(b) Any alteration of course and/or speed to avoid a collision shall, if the circumstances of the case admit, be large enough to be readily apparent to another vessel observing visually or by radar.

(d) Action taken to avoid collision with another vessel shall be such as to result in passing at a safe distance.

Rule 13

(a) ……………any vessel overtaking any other shall keep out of the way of the vessel being overtaken.

Rule 16

Every vessel which is directed to keep out of the way of another vessel shall, so far as is possible, take early and substantial action to keep well clear.

Rule 17

(a) (i) Where one of two vessels is to keep out of the way the other shall keep her course and speed.

(ii)The latter vessel may however take action to avoid collision by her manoeuvre alone, as soon as it becomes apparent to her that the vessel required to keep out of the way is not taking appropriate action in compliance with these Rules.

(b) When, from any cause, the vessel required to keep her course and speed finds herself so close that collision cannot be avoided by the action of the give-way vessel alone, she shall take such action as will best aid to avoid collision.

(d) This Rule does not relieve the give-way vessel of her obligation to keep out of the way.

Rule 34

(a) When vessels are in sight of one another, a power-driven vessel underway, when manoeuvring as authorized or required by these Rules, shall indicate that manoeuvre by the following signals on her whistle:

- *one short blast to mean "I am altering my course to starboard";*
- *two short blasts to mean "I am altering my course to port";*
- *three short blasts to mean "I am operating astern propulsion".*

(d) When vessels in sight of one another are approaching each other and from any cause either vessel fails to understand the intentions or actions of the other, or is in doubt as to whether sufficient action is being taken by the other to avoid collision, the vessel in doubt shall immediately indicate such doubt by giving at least five short and rapid blasts on the whistle. Such signal may be supplemented by a light signal of at least five short and rapid flashes.

1.9 SEARCH AND RESCUE

After the collision, *Dutch Aquamarine*'s crew very quickly responded to the needs of *Ash*'s crew. Their fast rescue craft (FRC) was launched and manned by the chief officer and cadet, who were both properly attired in lifejackets and survival suits.

Dutch Aquamarine's master set up communication links with, first, *Ash* and, subsequently, Dover Coastguard. A “Mayday relay” was broadcast and vessels in the vicinity responded and moved into the area to assist as necessary.

Other crew on *Dutch Aquamarine* searched with binoculars for survivors in the water, and information was passed to the crew of the FRC. The five survivors were recovered from the water very quickly and taken back to *Dutch Aquamarine* where they were given dry clothing. *Ash*'s master was eventually found floating face down in the water without a lifejacket. Attempts to pull him aboard the FRC were unsuccessful. He was held with his face clear of the water until a rescue helicopter arrived.

1.10 INVESTIGATION NOTES

1.10.1 *Safety Bulletin*

In November 2001, the MAIB issued a *Safety Bulletin* as a result of the preliminary findings of this investigation. These findings revealed that bunching of traffic at the northern edge of the south-west traffic lane contributed to the accident and to three other similar accidents which had occurred in the previous 13 months. The *Safety Bulletin* contained general recommendations directed at shipowners and masters, and a specific recommendation addressed to the Maritime and Coastguard Agency with a view to avoiding more similar accidents.

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 MECHANICS OF THE COLLISION

2.2.1 The vessels' tracks

The principal evidence concerning the tracks of the two vessels before the collision comes from the CNIS radar recordings. The track plots show that *Dutch Aquamarine* and *Ash* had coincident tracks after *Dutch Aquamarine* had altered course off CS3 buoy at about 1508. That they had coincident tracks does not necessarily mean that the two vessels were steering the same heading to achieve those tracks, as external forces such as wind and tide had an effect.

Examination of the environmental conditions prevailing at the time of the accident indicates that the tidal stream was from west-south-west, that is, a few degrees on the starboard bow of each vessel. The vessels' headings were slightly west of the track to counteract this effect. The moderately strong wind, however, was acting slightly on the port bow of each vessel and, therefore, tended to counteract the effect of the tide. For this reason, the influence of wind and tide has been disregarded in this analysis and it is assumed that both vessels were steering close to 235°, which is the direction of their tracks. In the case of *Dutch Aquamarine* it has been possible to confirm she was steering about 234½°(gyro) from a record gained from the vessel's integrated bridge system. The precise error of her gyro compass is not known.

With this in mind, the relative bearing of *Ash* from *Dutch Aquamarine* was right ahead, or nearly right ahead, for the whole period between 1508 and the collision. Additionally, *Ash* showed *Dutch Aquamarine* only her stern and superstructure aspect.

2.2.2 Interaction

As the two vessels became very close it was apparent from witness observations that *Dutch Aquamarine*'s track was, in fact, a few metres to starboard of *Ash*'s. As *Dutch Aquamarine*'s bow approached *Ash*'s stern on her starboard quarter, hydrodynamic interaction caused *Ash*'s heading to alter to starboard. The flare on the port side of *Dutch Aquamarine*'s bow first made contact with the extreme starboard quarter of *Ash*'s bridge deck, causing damage to railings, the lifeboat and its davit arm.

2.2.3 The effect of the initial impact

It is likely that this initial impact caused *Dutch Aquamarine*'s heading to sheer slightly to port in the first instance, before coming back to starboard under the influence of, first, the autopilot and, later, the helm applied by the second officer. *Ash*, on the other hand, swung even more rapidly to starboard across *Dutch Aquamarine*'s bow.

The difference in heading between the two vessels was about 30°, and still increasing, as *Dutch Aquamarine* scraped forward along *Ash*'s starboard side, pushing inboard both the bulwarks on the mooring deck, and the railings on the bridge deck.

2.2.4 The second impact leading to *Ash*'s capsize

As *Dutch Aquamarine*'s stem continued forward beyond *Ash*'s superstructure, the angle between the vessels increased to the extent that her bulbous bow came into contact and penetrated *Ash*'s hull. This opened the cargo hold to the sea.

The forward motion of the two vessels slowed rapidly. *Dutch Aquamarine*'s propulsion had been going astern for a little time and she eventually pulled astern and clear of *Ash*. *Ash* listed heavily to starboard. The vessel's stability reduced as water rushed into her hold, until she capsized and, eventually, sank bow first.

Ash's length was about 23m greater than the water depth. It is considered likely that the bow sank to the seabed, leaving the stern at the surface, temporarily supported by residual buoyancy in the engine room. The area of buckling found at about mid-length is thought likely to have been caused when the bow hit the seabed. The divers who visited the wreck reported extensive damage to the bow area which is also thought to have occurred at this time.

The movement of the cargo occasioned by the capsize, and then the sinking of the bow, caused the hatch covers to be knocked clear of the vessel and some of the cargo to burst out of the hold.

Ash remained almost vertical for 15 minutes or more before progressive flooding caused the stern to sink. It was only when the stern sank that the hydrostatic release unit operated to release one of the vessel's liferafts.

2.3 THE CAUSES OF THE COLLISION

2.3.1 The collision occurred because the two vessels were on coincident tracks and travelling at different speeds

2.3.1.1 Bunching of traffic in the south-west lane of the Dover TSS

That the two vessels were on coincident tracks owes much to chance but, as the vast majority of vessels in the south-west lane choose to stay on the starboard or northern side of the lane, the probability that vessels will find themselves on coincident tracks increases.

Plan 4 shows the tracks of all vessels in the vicinity of the Varne Bank during a 6-hour period between 1200 and 1800 on the day of the accident. It can be seen that only about four south-west bound transiting vessels chose to pass south of the Varne light, whereas between 30 and 40 passed to the north. The width of the available lane to the north of the Varne is about 1.5 miles, but nearly all the 30 to 40 vessels transiting the area chose to be in the most northerly two-thirds (1 mile) of the available width. The evidence also shows that there is little tendency for the tracks to diverge once the Varne Bank is passed. The vast majority of vessels maintain their chosen track, close to the northern boundary of the traffic lane, until altering course off CS2 buoy. (Note: the tracks shown in Plan 4 diverge in the area south-west of CS3 buoy to avoid the wreck of *Ash*.)

There are a number of reasons why so many vessels choose tracks along the northern edge of the traffic lane. These include:

- The mariner's natural tendency to stay on the starboard side of the channel.
- Fewer waypoints and course alterations; it is possible to maintain the vessel's position within the channel on a single course for 34 miles between S Falls buoy and CS3 buoy. A track choice leading south of the Varne Bank is slightly more complex and, although it can be achieved on a single course, this would lead to the vessel's relative position wavering within the channel.
- Smaller vessels choose to stay clear of the deep draught vessels which use the route to the south of Varne Bank.
- Generally, the waypoints which define the most popular tracks are entered into the memory of the vessel's GPS navigator. When forming a passage plan it is common practice to use a previously memorised plan if the whole passage has been travelled before. If it is a new passage, many navigators will nevertheless use any sections of previous plans that are common. This can have the effect of causing vessels to use the northern edge of the south-west lane when transiting the Dover Strait, irrespective of the direction from which they approached the system.

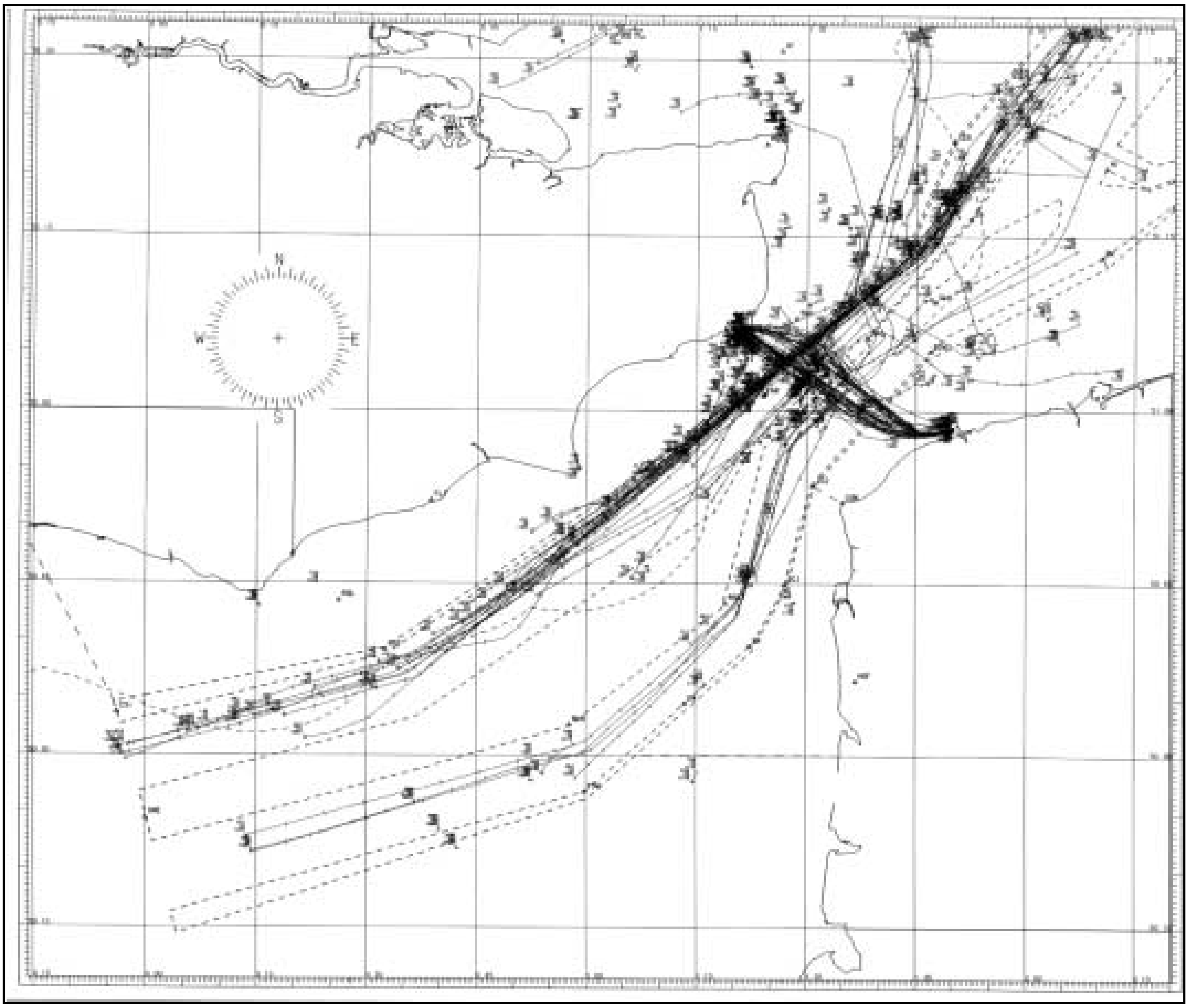
The problem of traffic bunching in the south-west lane of the Dover TSS is well known. The guidance given on Admiralty chart 5500 “Mariners Routeing Guide, English Channel and Southern North Sea” warns that:

- *many vessels keep too close to the north side of the west-bound lane between South Falls and Dungeness*; and,

- *vessels should make use of the full width of the traffic lanes and open waters to reduce collision risks*.

It is apparent that this advice is not being heeded, and four accidents in 13 months may be indicative of a worsening situation.

Plan 4



Extract from CNIS plot showing tracks of all the vessels in the Varne Bank area between 1200 and 1800 on the day of the accident

2.3.1.2 Maintaining the planned track

Once locked on to a track, it would seem that vessels are reluctant to vary the plan, even if forced to deviate for an anti-collision manoeuvre. Navigators appear to prefer to return the vessel to the original planned track rather than, say, parallel it until the next alter-course position, as was common practice before the advent of GPS.

Where a track control system is used, it is, possibly, even more likely that the navigator will want to return the vessel to the planned track quickly after any deviation. It should be noted in this context that Vopak's fleet orders to navigating officers instruct them to ensure that *"…..the GPS gives the autopilot a course to return the ship as quickly as possible to the track to be sailed between the set waypoints."* A graphic example of this occurred when *Dutch Aquamarine* reverted to her original track after passing *Lapad* at about 1505. *Dutch Aquamarine* reverted to her track despite the fact that this meant that she passed *Hornestrand* at 1512 at a distance of only about 0.15 mile **(see Plan 2)**.

Most GPS and track control systems have functions that enable a new course direct to the next waypoint to be selected and steered. It is apparent that many navigators might not be adept at using all the functions of these instruments. On *Dutch Aquamarine*, the second officer had received no formal training in the operation of the IBS, including the track control system.

Collectively, these features of modern marine navigation effectively keep vessels bunched on the same or similar tracks.

2.3.1.3 Variations in speed

Although vessels are choosing and maintaining coincident, or near coincident tracks towards the northern edge of the south-west lane, they would not come into conflict unless their speeds varied. The greater the variation in speed among the vessels choosing this route, the more frequently overtaking situations with potential for conflict will occur.

In the 13 months before this accident, three other collisions occurred in the south-west lane where the overtaking vessel collided with the stern of the vessel being overtaken.

In September 2000, *Kinsale* collided with the stern of *Eastfern*. *Kinsale* was the overtaking vessel, with a speed about 6 knots faster than that of *Eastfern.* In January 2001, the overtaking vessel *Unden* collided with the stern of *Star Maria,* causing substantial damage to both ships. In June 2001, the larger and much faster *Atlantic Mermaid* collided with the stern of the smaller cargo ship *Hampoel. Hampoel* was substantially damaged.

In each of these collisions the overtaking vessel was very much faster than the vessel being overtaken. It was only a matter of chance that these collisions did not have even more serious consequences.

2.3.1.4 Close passing

An unidentified cargo ship overtook *Ash* just before the collision at a distance of 0.1 mile (1 cable) and *Dutch Aquamarine* overtook *Hornestrand* with a passing distance of about 0.15 mile and *Rambler* at a distance of 0.2 mile. These very close distances are not unusual; close passing appears to be commonplace in the south-west lane. For vessels travelling at their full (or nearly full) ahead speeds in relatively open conditions, it is the MAIB's opinion that 1 or 2 cables is not a safe passing distance, as any unforeseen action on the part of either vessel could lead to the unavoidable development of a dangerous situation.

2.3.2 The collision occurred because of poor lookout on *Dutch Aquamarine*

2.3.2.1 Lookout by radar

The second officer had chosen not to use the ARPA function of the radars because of an intermittent fault. He had only been on *Dutch Aquamarine* for one week and was unsure of exactly how the fault showed itself. His decision not to use ARPA is considered to have been prudent in the circumstances. The other facilities on the radars including target trails, EBLs and VRMs were sufficient to maintain a good appreciation of the traffic situation and risk of collision when combined with a good visual lookout. The second officer was using these features to identify risk of collision with vessels that he had identified. Before the collision, he had seen two vessels ahead of him which he estimated would pass, one down his starboard side and one down his port side. Apparently, the first of these passed about 0.5 mile clear of *Dutch Aquamarine* and this gave him some confidence that his estimation was correct. The second officer believed that these two vessels were *Rambler* and *Ash*. However, *Rambler* passed 0.2 mile clear on the starboard side at 1607 and just before that, at 1554, *Danica Four* had passed 0.5 mile clear down *Dutch Aquamarine*'s port side. *Ash* had been on a steady bearing right ahead, or nearly right ahead, of *Dutch Aquamarine* for over an hour before the collision, and could not have given the impression of passing clear. These facts lead the investigation to conclude that the two vessels seen and monitored by the second officer were probably *Danica Four* and *Rambler*, and that *Ash* was not noticed until immediately before the collision.

Given that *Ash* was not noticed until just before the impact, it can be concluded that the non-functioning of the ARPA facility on the radars did not play a significant part in this accident. The identification and manual acquisition of the target is a prerequisite for the use of this facility.

If the second officer saw the targets of *Rambler* and *Danica Four* on the radar, why did he not see the target of *Ash* right ahead, or nearly right ahead? *Dutch Aquamarine*'s radars had no significant blind arc, and the prevailing sea conditions would not have produced excessive sea clutter on the radar screen although clutter may have masked *Ash*'s echo in the last ten minutes immediately before the collision. Before this, the stern aspect of *Ash*, although small and low, would have provided an efficient radar target capable of being detected some miles ahead of *Dutch Aquamarine*. It can be concluded, therefore, that the radars should have picked up and clearly displayed *Ash*'s target echo as *Dutch Aquamarine* approached. This being the case, one possible explanation of why the second officer did not readily notice it might be that it was partially obscured by the heading marker on the radar screen. Indications from the CNIS recordings show that *Ash* would have been right ahead, or nearly right ahead, as *Dutch Aquamarine* approached. Every radar has the facility to temporarily switch off the heading marker on the screen so that operators can detect any targets that might be obscured and it is good practice to do this frequently during a watch.

2.3.2.2 Visual Lookout

The investigation has concluded that the second officer did not notice *Ash* right ahead, or nearly right ahead, despite the fact that he was on the bridge and actively engaged in watchkeeping. However, *Ash* might not have presented a very obvious visual image. Her stern aspect would have been low in the water and, combined with her blue hull colour and white superstructure, it would have blended with the surrounding seascape. Additionally, the sun was quite low in the sky (altitude 24°) and about 10° on *Dutch Aquamarine*'s port bow. These factors made the visual detection of *Ash* more difficult but, despite this, an efficient lookout should have seen *Ash* anytime up to an hour before the collision.

2.3.2.3 Distractions

It is possible that the second officer was distracted from his watchkeeping duties by the presence of the cadet on the bridge. Sporadic conversations did take place between the two, and they may have been in conversation when the second officer first noticed *Ash* seconds before the collision.

2.3.2.4 Lookout conclusion

It is concluded that the second officer on *Dutch Aquamarine* did not notice *Ash* either visually or by radar, despite the fact that she was right ahead, or nearly right ahead, of his vessel for over an hour before the collision. It was daylight and visibility was good. Both radars were operational, although there was a fault with the ARPA function. The second officer had not been keeping a proper lookout on *Dutch Aquamarine* in the crucial minutes leading up to the collision, in contravention of Rule 5 of the Collision Regulations. He, therefore, took no action to avert collision as was required of him under Rules 8, 13 and 16.

2.3.3 The collision was not averted due to poor lookout on *Ash*

Ash was the stand-on vessel in the developing collision situation. Her chief officer saw *Dutch Aquamarine* as she approached, but was not concerned. Another vessel had overtaken *Ash* at a distance of only 0.1 mile and he had no reason to suspect that *Dutch Aquamarine* would not do the same or similar. When the telephone rang he answered it, and had no view astern while he did so. He was still talking on the telephone when the collision occurred.

On a vessel of *Ash*'s size and type it is unusual to have a seaman lookout on the bridge during daylight hours. However, the seamen should have been used on the bridge during the hours of darkness, and one of them should have been available to be called to the bridge at short notice should the officer in charge of the watch need assistance during the day. The deck crew on *Ash* were not experienced in watchkeeping and were never used for watchkeeping/lookout duties, in contravention of STCW 95.

The sole watchkeeper on *Ash* had not been keeping a proper lookout in the crucial minutes leading up to the collision, in contravention of the requirements of Rule 5 of the Collision Regulations. He had a duty to monitor the situation as *Dutch Aquamarine* approached. He did not do so and, therefore, took no action to avert the collision as was required of him under Rule 17 of the Collision Regulations.

2.4 HOW COULD THE COLLISION HAVE BEEN AVOIDED?

The fundamental basis for anti-collision manoeuvres is a good lookout. At least one, but preferably both, of the vessels involved needs to be aware of the developing situation. In this instance, the lookout on both vessels was deficient, and neither watchkeeper noticed the final approach and no action was taken to avert the collision until it was too late.

The MAIB believes that in heavy traffic situations like those that exist in the Dover Strait TSS, the posting of a dedicated lookout is a sensible and seaman-like precaution. Had such a lookout been posted, it is likely that the collision would have been avoided.

In this section the report considers the options open to each of the vessels <u>had they been alert to the danger</u>.

Dutch Aquamarine

Dutch Aquamarine was clearly the overtaking vessel under Rule 13 of the Collision Regulations. She therefore had a duty to keep clear of the vessel being overtaken while *Ash* had a duty to maintain her course and speed. As *Dutch Aquamarine* approached *Ash*, she was already past and clear of *Rambler* on her starboard side and could, therefore, have altered to port or starboard to pass a safe distance from *Ash*. There were no other vessels in the vicinity that would have hampered this manoeuvre.

As indicated in Rule 8 of the Collision Regulations, it is vitally important for the give-way vessel to give a clear early indication to the stand-on vessel that proper action is being taken to avoid a collision. *Dutch Aquamarine* should have altered her course as soon as she was able, without affecting other vessels. She could have altered to port any time after passing clear ahead of *Danica Four* at about 1600, and she could have altered to starboard after passing *Rambler* at about 1610. Any alteration of course needed to be large enough to be readily apparent to the watchkeeper on *Ash* (Rule 8) and *early and substantial* under Rule 16.

Dutch Aquamarine was required, under Rule 8, to ensure that she overtook *Ash* at a *safe distance* and to *keep well clear* under Rule 16. The evidence collected for this investigation has shown that a number of overtaking manoeuvres in the Dover Strait result in a passing distance of about 0.1 mile. Such a distance might be considered safe within the confines of a port, when both vessels concerned are proceeding slowly under active pilotage, but it should not be considered safe in an area like the Dover Strait. At such a passing distance an unforeseen occurrence on either vessel at the critical time could result in an unavoidable collision.

In the case being considered, *Dutch Aquamarine* could have easily passed either side of *Ash*, giving her a clearing distance of 0.5 mile without affecting either her own, or any other vessel's, navigation. She should have done so.

Ash

As already stated, *Ash* was the stand-on vessel in the developing situation. As such, her watchkeeper should have closely monitored the approach of *Dutch Aquamarine*, watching particularly to see that *Dutch Aquamarine* was taking appropriate action to pass at a safe distance.

At some stage it would have become apparent to the chief officer on *Ash* that *Dutch Aquamarine* was not taking appropriate action to keep well clear. At that stage he had an option under Rule 17 to take action to avoid a collision. However, it is difficult to know exactly what he could have done to improve the situation. In the event, an alteration of course either way would have been sufficient to avoid the collision, but he had no way of being sure that the watchkeeper on *Dutch Aquamarine* had not seen him and was not planning to alter course at the last minute to pass clear. Any alter-course action by *Ash* in these circumstances might have been counterproductive.

In the absence of alter-course action by *Ash*, it would have been essential for her watchkeeper to ensure that the watchkeeper on *Dutch Aquamarine* had seen his vessel. Under Rule 34(d) of the Collision Regulations, he was required to attract the attention of *Dutch Aquamarine* by sounding five or more short blasts on his whistle, which he could have supplemented with flashes on his signal light, as soon as he became doubtful as to the intentions of *Dutch Aquamarine* or if sufficient action was being taken by her to avoid collision. Additionally, he could have tried to call *Dutch Aquamarine*'s watchkeeper on the VHF radio to alert him to his concerns. With the benefit of hindsight, any of these actions might have served to avert the collision.

Finally, when *Dutch Aquamarine* was so close that she could not have avoided the collision by her actions alone, *Ash*'s watchkeeper had a duty under Rule 17 to take *such action as will best aid to avoid collision*. The appropriate action would have been dictated by the precise circumstances. One possibility might have been an alteration of course to port, which might have served to either avoid the contact or, at least, reduce its effect. This action should have been accompanied by the appropriate sound signal in accordance with Rule 34(a).

SECTION 3 - CONCLUSIONS

3.1 SAFETY ISSUES

1. *Ash* was right ahead, or nearly right ahead, of *Dutch Aquamarine* for over an hour before the collision. It is concluded that the second officer on *Dutch Aquamarine* did not notice *Ash,* either visually or by radar until collision was imminent and that, therefore, he was not keeping a proper lookout. [2.3.2]

2. The watchkeeper on *Ash* saw *Dutch Aquamarine* approaching, but was distracted from lookout duties in the minutes before the collision by a mobile telephone call. He was therefore unaware of the developing situation and unable to fulfil his obligations as the stand-on vessel under the Collision Regulations. [2.3.3]

3. The MAIB believes that in heavy traffic situations like those that exist in the Dover Strait TSS, the posting of a dedicated lookout is a sensible and seaman-like precaution. Had such a lookout been posted, it is likely that the collision would have been avoided. [2.4]

4. The large majority of vessels transiting the Dover Strait in the south-west traffic lane choose tracks which run parallel and close to the northern edge of the lane. This causes bunching of traffic in this area. [2.3.1]

5. It is possible that many navigators might not be fully adept in the use of GPS and track control systems, and this causes them to return to the programmed track after anti-collision manoeuvres. This, in turn, tends to maintain the bunching of traffic on the popular pre-programmed tracks. In the past, when deviation from the charted course was necessary for anti-collision purposes, it was common practice to parallel the required track until the next alter course position was reached. [2.3.1.1]

6. Dangerously close overtaking has become commonplace in the south-west lane of the Dover Strait TSS. [2.3.1.4]

7. The recent history of collisions in the south-west lane indicates that dangerous situations arise where vessels of markedly different speeds are travelling on coincident tracks. [2.3.1.3]

3.2 OTHER FINDINGS

8. There was an intermittent fault within *Dutch Aquamarine*'s IBS which made the ARPA facility of both her radars unreliable. The ARPA facility is used in assessing risk of collision and planning anti-collision manoeuvres. However, the identification and manual acquisition of the target is a prerequisite for the use of this facility.

9. As it has been concluded that the second officer did not notice *Ash* until immediately before the collision and could not, therefore, have acquired the target, it is further concluded that the fault with the ARPA system was not a causal factor. [2.3.2]

10. The able seamen on *Ash* never undertook bridge watchkeeping duties. This was in contravention of STCW 95. [2.3.3]

SECTION 4 - RECOMMENDATIONS

In November 2001, the MAIB issued a *Safety Bulletin* as a result of the preliminary findings of this investigation. The *Safety Bulletin* contained the following safety recommendations:

***Ship owners and masters** should:*

1. *consider carefully whether their passage planning strategy is adding to congestion in the Dover TSS;*

2. *consider whether the way electronic navigation aids are used on their vessels could be reducing the flexibility of watchkeepers to use the whole traffic lane in areas of congestion;*

3. *remind themselves and watchkeeping officers of the advice contained on Admiralty chart 5500, in particular, to make use of the full width of the traffic lanes to reduce collision risks.*

***The Maritime and Coastguard Agency** is recommended to:*

4. *conduct research into why bunching of traffic near the northern edge of the south-west traffic lane of the Straits of Dover TSS occurs and whether, and if so how, modern navigational practices are contributing to the problem; and,*

5. *on completion of the research, put in place effective measures to mitigate the problem.*

Following the completion of the investigation, the attention of **Vopak Chemical Tankers BV** and **Anglo Dutch Management Services Ltd** is drawn to the first three recommendations above.

In addition to the above recommendations,

Anglo Dutch Management Services Ltd is recommended to:

6. ensure that deck crew on vessels under its management are utilised in bridge watchkeeping duties in accordance with the terms of STCW 95.

SECTION 5 - ACTIONS TAKEN SINCE THE ACCIDENT

The Seafarers International Research Centre (SIRC), Cardiff has conducted research into near miss encounters which have resulted from overtaking situations within the south-west bound traffic lane of the Dover Strait TSS in one 24-hour period. The research has been carried out as part of ongoing more general research into the occurrence and causes of near miss encounters within the Dover Strait area. The findings of the research were published in The Nautical Institute's journal *Seaways* in August 2002. The findings concur largely with the findings of this report. The research confirms the concentration of vessels towards the northern edge of the traffic lane and the frequency of close passing. It was not intended to provide an explanation as to why the practice occurs.

Marine Accident Investigation Branch
March 2003