Report on the investigation of the

collision between

Hampoel and *Atlantic Mermaid*

in the Dover Strait

on 7 June 2001

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Extract from

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(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.

CONTENTS

GLOSSARY OF ABBREVIATIONS AND ACRONYMS

AB	-	Able bodied seaman
ARPA	-	Automatic radar plotting aid
Caldovrep	-	Mandatory reporting system for Dover Strait
CNIS	-	Channel Navigation Information System
DF	-	Direction finder
GPS	-	Global positioning system
gt	-	Gross tonnage
IMO	-	International Maritime Organization
kW	-	kilowatt
m	-	metre
MCA	-	Maritime and Coastguard Agency
MGN	-	Marine Guidance Note
MRCC	-	Maritime Rescue Co-ordination Centre
RNLI	-	Royal National Lifeboat Institution
TSS	-	Traffic Separation Scheme
UTC	-	Universal co-ordinated time
VHF	-	Very high frequency (radio)
VTS	-	Vessel traffic services

SYNOPSIS

At 0153 UTC on 7 June 2001, the Panamanian-registered refrigerated cargo vessel *Atlantic Mermaid*, collided with the Cypriot-registered general cargo vessel *Hampoel*, off the Varne in the south-west bound lane of the Dover Strait traffic separation scheme (TSS) **(Figure 1)**. An MAIB investigation began that day.

Atlantic Mermaid was on passage from Sheerness to Argentina in ballast. *Hampoel* was loaded with a cargo of peat, bound from Estonia to Italy.

Atlantic Mermaid was the faster of the two vessels and was approaching *Hampoel* from astern. She had altered course to starboard for a ferry off Dover and, once the ferry had passed safely, set a course to bring the vessel further inside the traffic lane.

About 17 minutes before the collision, when the distance between the vessels was about 2.4 miles, the officer on watch on *Hampoel* noticed the approaching vessel astern of his own vessel. At 0149, he made a brief VHF call to the other vessel which went unanswered.

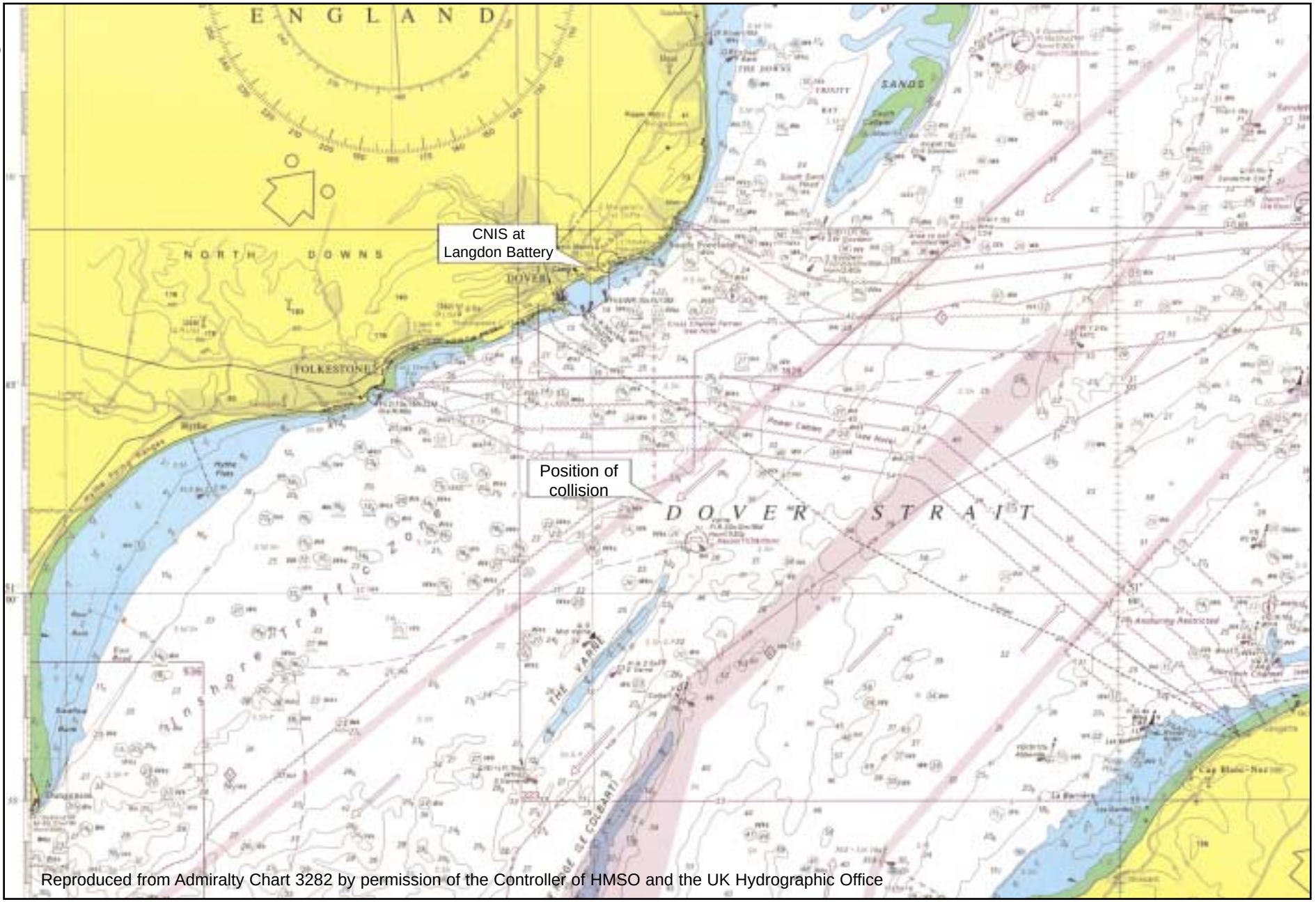
It became apparent that the overtaking vessel was taking no action and that a collision was imminent. The officer on watch on *Hampoel* pushed the main engine overspeed and sounded the general alarm and ship's whistle. As he did so the two vessels collided.

Hampoel suffered damage to her starboard quarter. One seaman suffered slight injuries. *Atlantic Mermaid* sustained damage to her bow.

The cause of the collision was that *Atlantic Mermaid* failed to observe the presence of *Hampoel* which failed to take avoiding action.

A further 13 contributory causes have been identified.

Recommendations have been made which, if implemented, will reduce the risk of a similar accident happening in the future.



Reproduced from Admiralty Chart 3282 by permission of the Controller of HMSO and the UK Hydrographic Office

Figure 1

Chart extract showing Dover Strait and position of collision

SECTION 1 - FACTUAL INFORMATION

1.1 PARTICULARS OF *HAMPOEL* AND *ATLANTIC MERMAID* AND ACCIDENT

Vessel details		*Hampoel*	*Atlantic Mermaid*
Registered owner	:	Wahlstedt	Sealink Champion SA
Manager	:	Meerpahl & Meyer	Elmira Shipping & Trading
Port of registry	:	Limassol	Panama
Flag	:	Cyprus	Panama
Type	:	General cargo	Refrigerated cargo
Built	:	Hamburg 1985	Japan 1992
Classification society	:	Germanischer Lloyd	Bureau Veritas
Construction	:	Steel	Steel
Length overall	:	87.97m	141.80m
Gross tonnage	:	2568	9829
Engine power	:	599kW	9,165kW
Service speed	:	10.5 knots	19 knots
Other relevant info	:	Bow thruster	
Accident details			
Time and date	:	0153 UTC 7 June 2001	
Location of incident	:	51°01.9’ N 001°23’E	
Persons on board	:	7 crew	24 crew
Injuries/fatalities	:	1 minor injury	none
Damage	:	Shift of cargo, damage to starboard quarter.	Damage to bow.

1.2 NARRATIVE (ALL TIMES UTC; ALL COURSES TRUE)

Hampoel was on passage from Estonia to Ravenna in Italy with a cargo of 2750 tonnes of peat moss in bulk. Her cargo included peat in pallets on deck. She carried a crew of seven and had a draught of 4.8m. Both radars were in operation with relative trails being used to determine risk of collision. The chief officer normally fixed the ship's position every 2 hours at sea, but every hour when close to the coast. He also made frequent references to the cross-track-error on the GPS to keep the vessel on the course line.

Atlantic Mermaid departed Sheerness at 1900 on 6 June 2001, in ballast, bound for San Antonio in Argentina. Her draughts were 3.30m forward and 6.20m aft. She was ballasting the forepeak on departure, and this continued until the time of the incident. The bridge was manned by the master, third officer and a deck rating. The rating was sent at periodic intervals to sound the forepeak. The master had slept that afternoon in addition to the previous evening, and complained of having a headache.

At 2108, *Hampoel* sent her Caldovrep to Dover coastguard as she was passing the mid-Falls buoy. At 2150, the chief officer came on watch. The master left the bridge shortly after 2200, leaving the chief officer on his own.

At around 2240, *Atlantic Mermaid'*s second officer relieved the third officer on watch, and at 2330 the pilot disembarked. The master retained the conduct of the navigation for the transit of the Dover Strait. At 2343, the vessel sent her Caldovrep as she passed North Foreland. The master increased speed to about 16 knots at 2400.The vessel was in hand steering. No 1 radar (starboard) was on the 12-mile range and No 2 radar on the 6-mile range. The sea and rain clutter were used and frequently adjusted because of persistent showers; the radars were used in off-centre mode for short periods. During the rain showers the bridge window wipers were used.

By 0106, *Atlantic Mermaid* had entered the Dover Strait TSS and was abeam of CS4 buoy in the south-west bound lane. The tide was against her, and she was making good about 13.5 knots. At the same time *Hampoel* was 6.8 miles ahead and just passing Dover, making good a course of 230.5° at 4.5 knots.

At 0124, *Atlantic Mermaid* altered course to starboard for a ferry which had just left Dover. At the same time, the second officer went over to the telex console on the port side of the bridge, separated from the front of the bridge by blackout curtains, to send the departure telexes. The alteration of course, made for the ferry, took the vessel close to the northern edge of the traffic lane. At 0130, the master put the vessel into automatic steering and sent the lookout to the forecastle to sound the forepeak. At about 0134, the master set a course which brought the vessel further back into the traffic lane and made good about 225°. At 0136, *Atlantic Mermaid* and *Hampoel* were 2.4 miles apart. At about this time *Hampoel'*s chief officer saw the approaching vessel visually.

By 0142 the distance between the vessels had closed to 1.5 miles. At 0147 the second officer sent the first of two departure telexes and started preparing the second. At 0148 the vessels had closed to a distance of just under a mile. *Hampoel* was fine on *Atlantic Mermaid'*s port bow. The watchman on *Atlantic Mermaid* had just returned to the bridge after taking a sounding.

At 0149 *Hampoel's* chief officer was becoming increasingly concerned about the approaching overtaking vessel he was observing visually and by radar. He did not want to alter course to port due to the proximity of the Varne and considered a starboard alteration would conflict with any last minute alteration of course which could be made by the overtaking vessel. There were other vessels in the traffic lane but nothing close enough to prevent an alteration. He made a VHF call on channel 16 as follows: *"Ship 0.8 mile away from me, overtaking off Varne buoy, keep safe distance. Are you sleeping or what?"* This call was not heard on board *Atlantic Mermaid* and, so, was not answered.

It became apparent that the overtaking vessel was taking no action and a collision was imminent. The chief officer pushed the main engine overspeed and sounded the general alarm and ship's whistle. As he did so the two vessels collided. The time was 0153.

Atlantic Mermaid struck the starboard quarter of *Hampoel* and passed her to starboard. The master, second officer and watchman on *Atlantic Mermaid*'s bridge felt the impact and, initially, thought they had struck a wave or floating debris; they then saw *Hampoel* moving abaft the port beam.

The watch officer at Dover Coastguard saw the two vessels' echoes merge on radar and began calling them on VHF.

Hampoel's cargo shifted, and she very quickly developed a port list of around 40°. The master came to the bridge. One seaman, who was sleeping in a cabin on the starboard quarter, was thrown from his bunk as part of *Atlantic Mermaid'*s bow struck his cabin bulkhead.

Atlantic Mermaid slowed down and spoke with *Hampoel* and Dover Coastguard by VHF. *Hampoel* also contacted Dover Coastguard and began using ballast to correct the list.

Dover RNLI lifeboat, and the MCA's emergency towing vessel *Anglian Monarch*, were sent to the scene.

At 0335, *Hampoel* entered Dover harbour. She had suffered substantial damage to her starboard quarter **(see Figures 2,3 & 4)**, which included opening the steering gear and engine room to the sea. The sleeping seaman's cabin and the vessel's propeller were also badly damaged. The seaman suffered slight injuries to his foot.

At 0401, *Atlantic Mermaid* anchored off Folkestone. At 0914, she entered Dover harbour. She had sustained a 15cm hole to her bow and some minor buckling **(see Figure 5)**.

At a hearing at Folkestone magistrates' court on 12 June 2001, *Atlantic Mermaid*'s master pleaded guilty to breaching Rule 13 of the Collision Regulations in that he did not keep clear of a vessel he was overtaking. He was fined £2000 plus £5950 in costs.

Figure 2

Figure 3

Hampoel damage

Figure 4

Hampoel damage (looking down from poop)
(Note shape of *Atlantic Mermaid*'s bow embedded in stern of *Hampoel*)

Figure 5

Atlantic Mermaid damage

1.3 ENVIRONMENTAL CONDITIONS

It was spring tides and just over 2 hours after high water Dover at the time of the collision. This gave a north-easterly set of between 2.5 and 3 knots at the position of the collision.

The wind was from the west-south-west force 6 to 7 with a moderate to rough sea state. Visibility was moderate and it was overcast with occasional showers. It was overcast, so no moonlight was visible.

1.4 *ATLANTIC MERMAID*

1.4.1 The ship

Atlantic Mermaid **(see Figure 6)** was a 9-year old 141.80m-long refrigerated cargo vessel, built in Japan in 1992. She had a service speed of 19 knots. She had three large deck cranes all situated on the centreline, forward of the accommodation/bridge.

Figure 6

Atlantic Mermaid

1.4.2 The crew

The master was Greek, 53 years old, and had been at sea for 25 years, of which 12 years were in command. He had considerable experience on large reefer vessels. He had made many transits of the Dover Strait. He joined the vessel in Belgium 3 days before the collision and had taken over command the day before in Sheerness.

The second officer was a 37 year old Filipino, and had been at sea for 15 years. He held a second officer's licence which was issued in the Philippines. He had been serving as second officer for 2 years. He had joined the vessel on March 26. This was his first trip on a reefer vessel. He kept the 12-4 watch at sea.

The AB on watch was a Filipino, and had been at sea for 10 years. He had joined the vessel 3 weeks before the incident. This was his first trip with the company.

1.4.3 Navigational equipment

Atlantic Mermaid was equipped with the following:

- A manual and automatic steering position
- Magnavox MX 100 GPS Navigator
- Furuno LC 90 Loran-C Navigator
- 2 Anritsu RA724UA-6 3cm plotting radars

Although not ARPA radars they were capable of acquiring and tracking targets. They were situated next to each other at the front of the bridge, to starboard of the centreline. No 2 radar (port) **(see Figure 7)** had had an intermittent fault for at least the 12 months before the collision. The fault occurred apparently only on ranges below 12 miles and on short pulse. Stabilisation became lost and, with the heading marker remaining in the correct position, all targets rotated clockwise around the screen. Entries concerning No 2 radar were made in the radar logbook at periodic intervals; the last entry before the collision was made by the second officer at 0001 on 6 June stating: *"poor reception on short range".*

Figure 7

Atlantic Mermaid - radar no 2

Service engineers had attended the vessel on an unspecified date in Singapore, and on 3 August 1999 in Tokyo.

The MAIB informed the vessel's manager of the fault on 13 June 2001.

A warning regarding use of the rain and sea clutter controls was given in the radar operating manual as follows: *"excessive clockwise rotation may eliminate small targets on the screen".*

A pilot who had recently been on the vessel described the radars as "*appalling*" and *"difficult to use".* He had observed the sea clutter controls on both radars full on without reducing any clutter on No 1 and having only some effect on No 2. He described the overall quality of radar picture as "*poor*" and had to work on longer ranges than he normally would have, to obtain a clear picture. He said that if he had been on the vessel in restricted visibility he would have considered anchoring the vessel because of the condition of her radars.

1.5 *HAMPOEL*

1.5.1 The ship

Hampoel was a 16 year old general cargo vessel of 87.97m length. She had a single cargo hold, with accommodation and bridge aft. Visibility from the bridge was virtually all round with large windows facing aft. It was the practice to keep the after deck lights on at sea, during the hours of darkness, because of the vessel's slow service speed.

1.5.2 The crew

The chief officer was Polish, 27 years of age and had been at sea for 5 years. He held a second officer's licence which allowed him to sail as chief officer on a vessel of *Hampoel's* size. He had spent 10½ months as chief officer. He had been 2½ months on *Hampoel*, his first time on the vessel. He kept the 12 to 6 watch at sea in conjunction with the master who kept the 6 to 12 watch.

1.5.3 Navigational equipment

The ship was equipped with the following:

- Leica AP Navigator MK9 differential-GPS
- Dantronik AP navigator GPS
- A manual and automatic steering position
- Kelvin Hughes Nucleus 5000R radar
- Koden MD-3010 radar

Both radars were capable of acquiring and tracking but were not ARPA radars.

A watch alarm was fitted which had to be answered every 12 minutes when it sounded; if not, the general alarm would sound within one minute.

1.6 STATUS OF VESSELS WITH REGARD TO THE COLLISION REGULATIONS

Both vessels were power-driven and under way, as defined in Rule 3 of the *International Regulations for Preventing Collisions at Sea* (Collision Regulations) and, at the time of the collision, they were making way through the water.

Given the circumstances of the collision, the following Rules applied to both vessels:

Rule 2 - *Responsibility*

> *(a) Nothing in these rules shall exonerate any vessel, or the owner, master or crew thereof, from the consequences of any neglect to comply with these rules or of the neglect of any precaution which may be required by the ordinary practice of seamen, or by the special circumstances of the case.*

Rule 5 - *Look-out*

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

Rule 7 - *Risk of Collision*

> *(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.*
>
> *(b) Proper use shall be made of radar equipment if fitted and operational, including long-range scanning to obtain early warning of risk of collision and radar plotting or equivalent systematic observation of detected objects.*

The following Rule applied to *Atlantic Mermaid*:

Rule 13 - *Overtaking*

> *(a) Notwithstanding anything contained in the Rules of Part B, Sections I and II, any vessel overtaking any other vessel shall keep out of the way of the vessel being overtaken.*

The following Rule applied to *Hampoel*:

Rule 17 - *Action by stand-on vessel*

(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.

Rule 34 - *Manoeuvring and warning signals*

(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 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.

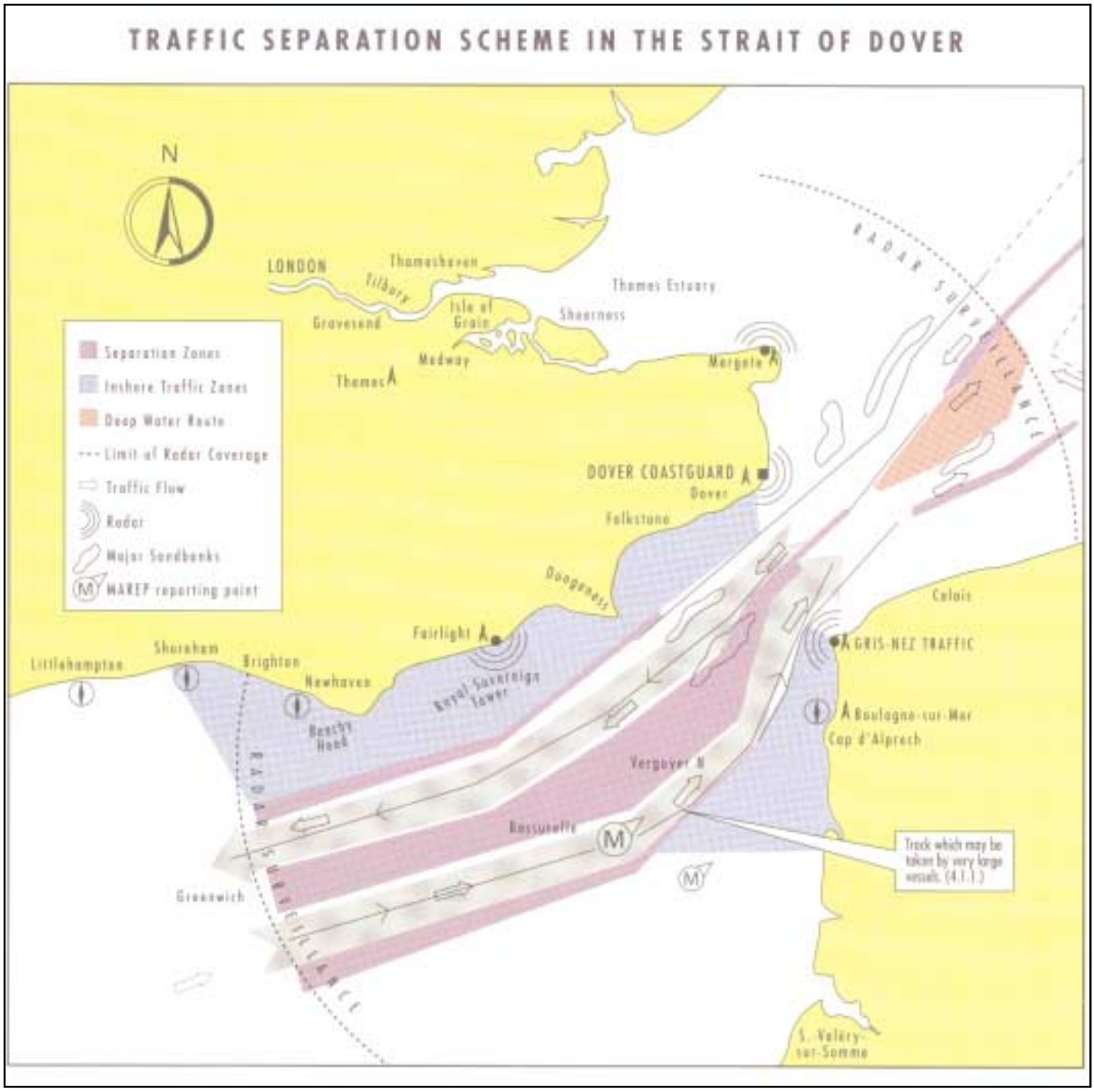
1.7 MGN 137 (M+F)

Marine Guidance Note 137 (M+F) issued by the Maritime and Coastguard Agency is a reminder to all UK ships, wherever they might be, and to other ships operating in UK territorial waters, of the legal requirements for keeping a proper lookout, especially during the hours of darkness. It strongly advises all vessels in UK territorial waters not to operate with the officer of the navigational watch acting as the sole lookout during the hours of darkness.

1.8 DOVER STRAIT TSS

The Dover Strait and its approaches is one of the busiest waterways in the world, and it poses severe safety problems to ships because of the density of traffic and the proximity of navigational hazards. In 1977, the traffic separation scheme (TSS) in the Dover Strait and adjacent waters, became compulsory **(see Figures 8 & 9)**.

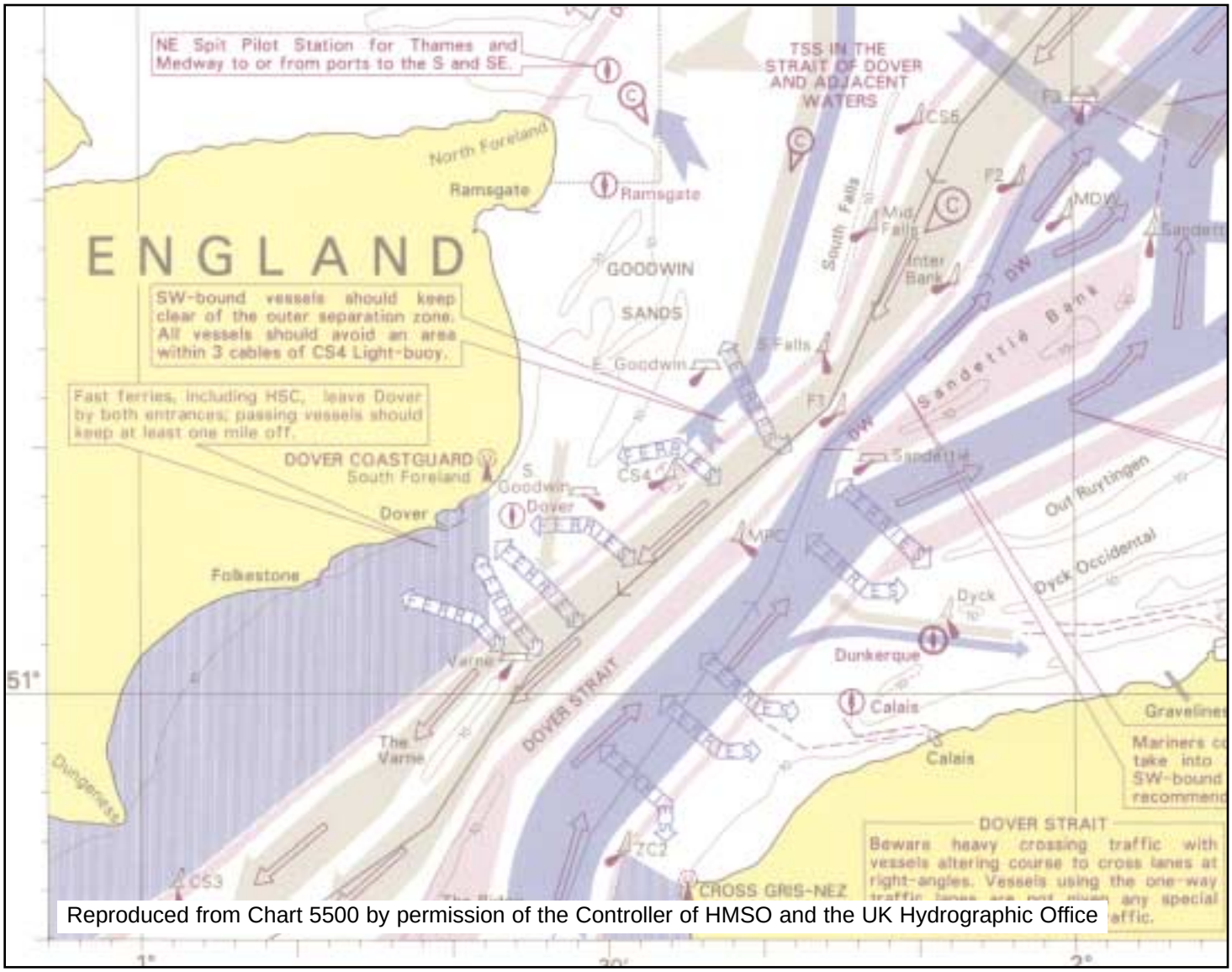
This collision was the third in 9 months involving vessels using the south-west lane of the TSS and proceeding in the same direction.



On 25 September 2000, the Cypriot-registered bulk carrier *Kinsale* collided with the Irish-registered general cargo ship *Eastfern*. Both vessels were damaged. There were no injuries. The MAIB published a report on this accident in May 2001. (Report no 18/2001)

On 2 January 2001 the Panamanian-registered cargo vessel *Star Maria* collided with the Netherlands Antilles-registered cargo vessel *Unden*. There were no injuries. *Star Maria* sustained substantial damage.

Figure 9



Reproduced from Chart 5500 by permission of the Controller of HMSO and the UK Hydrographic Office

Extract of chart 5500

All three collisions occurred within a 7-mile stretch of water close to the Varne. All six vessels were heading south-westerly and involved a slower vessel being struck from astern by an overtaking vessel. The MCA successfully prosecuted two of the three overtaking vessels.

At the time of writing this report, a fourth collision occurred in the same traffic lane but further to the south-west, about 9 miles south-east of Hastings, on 9 October 2001; the Netherlands-registered chemical tanker *Dutch Aquamarine* collided with the St Vincent and the Grenadines-registered general cargo vessel *Ash*. *Ash* subsequently sank and her master died. The MAIB is still investigating this accident as of March 2002. MAIB Safety Bulletin 2/2001 **(see Annex)** was issued as a result.

Vessels using the south-west lane of the TSS tend to pass to the north of the Varne as this is the most direct route to follow and does not involve an additional waypoint and course alteration as would be required if passing to the south of

the Varne. This results in “bunching” in the TSS to the north of the Varne which is, at its narrowest, only 1.5 miles wide. The difference in distance between both “routes” is minimal.

This “bunching” is compounded by the use of modern navigational systems, including cross-track-errors and track control autopilots linked to GPS receivers and electronic chart systems with stored passage plans. This results in many vessels following exactly the same course line to the north of the Varne, while the wider space to the south of the Varne goes largely unused. Further, where circumstances force a deviation, there appears to be a tendency to return to the original track, instead of revising the passage plan. This serves to cause and maintain the bunching of traffic.

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 Routing 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*.

1.9 CHANNEL NAVIGATION INFORMATION SERVICE

The IMO’s resolution A.578 (14) defines VTS as:

> *Any service implemented by a competent authority designed to improve safety and efficiency of vessel traffic and the protection of the environment. The service shall have the capability to interact with marine traffic and to respond to traffic situations developing in the VTS area.*

The following are extracts from the IMO resolution A.857 (20) Guidelines for VTS:

.9.1 An information service is a service to ensure that essential information becomes available in time for on-board navigational decision-making.

.9.2 A navigational assistance service is a service to assist on-board navigational decision-making and to monitor its effects.

.9.3 A traffic organization service is a service to prevent the development of dangerous maritime traffic situations and to provide for safe and efficient movement of vessel traffic within the VTS area.

2.1 The purpose of VTS is to improve the safety and efficiency of navigation, safety of life at sea and the protection of the marine environment and/or the adjacent shore area, worksites and offshore installations from possible adverse effects of maritime traffic.

2.1.2 The type and level of service or services rendered could differ between both types of VTS; in a port or harbour VTS a navigational assistance service and/or a traffic organization service is usually provided for, while in Coastal VTS usually only an information service is rendered.

2.3.4 When the VTS is authorised to issue instructions to vessels, these instructions should be result-orientated only, leaving the details of the execution, such as course to be steered or engine manoeuvres to be executed, to the master or pilot on board the vessel. Care should be taken that VTS operations do not encroach upon the master's responsibility for safe navigation or disturb the traditional relationship between master and pilot.

As suggested in 2.1.2 above, there are two types of VTS: port/harbour and coastal, which can be found throughout the world. The former is a service provided for ships entering and leaving the confines of a port and/or transiting within harbour limits, and the latter is concerned with traffic passing through an area outside harbour limits.

When entering the area covered by the Dover Strait TSS all ships over 300gt report to Dover Coastguard, which deals with south-west bound traffic, or to Gris Nez Traffic (in France), which handles north-east bound traffic. The reporting system is mandatory, and the short title for the system is Caldovrep.

The following description is from the IMO's publication *Ship's Routeing*:

> *The CNIS processing and display system receives inputs from the radar and VHF DF equipment, processes the information and presents it on any or all of six displays. Each display shows processed images (tracks) from any of the three radar inputs overlaid on a synthetic map of a selected area. New targets entering radar range are automatically tagged with a unique track number. The position course and speed information of up to 300 racks is automatically updated and recorded, for each of the three radars, throughout the vessel's passage through the CNIS area, giving the CNIS a 900-track capability.*
>
> *DOVER COASTGUARD maintain a continuous watch on traffic in the Dover Strait/Pas de Calais. Operators can add vessel information to the information processing and retrieval system database (such as name and cargo) and can display that supporting information on a separate screen. CNIS is capable of providing an automatic alarm to identify any track, which strays into an unauthorised area. VHF DF vectors appear when a VHF radio transmits on the frequency selected on the VHF DF equipment. Recording equipment automatically stores information from all tracks which can either be replayed on the system or specific track movements can be plotted onto an A0-size sheet of paper.*

CNIS was introduced in 1972. It provides a 24-hour radio service for all shipping in the Dover Strait and is operated from the MRCC at Langdon Battery near Dover.

CNIS broadcasts on VHF radio channel 11, every 60 minutes (every 30 minutes in poor visibility), and gives warnings of navigational difficulties and unfavourable conditions likely to be encountered in the Dover Strait. These include adverse weather conditions, exceptional tides, misplaced or defective navigational aids, and hampered vessels such as oil-rigs or deep-draught tankers. The positions, course and speed of those vessels, which contravene Rule 10 of the Collision Regulations (in particular those vessels travelling in a traffic lane in the opposite direction to that of the general flow), are broadcast to all stations. The vessels are also reported to their flag-states for action to be taken in accordance with IMO Resolution A432 (XI).

1.10 MGN 167 (M+F)

MGN 167 (M+F) refers to the use of VHF radio in collision avoidance. An extract is given below:

3. Valuable time can be wasted whilst mariners on vessels approaching each other try to make contact on VHF radio instead of complying with the Collision regulations.

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 COLLISION

2.2.1 *Atlantic Mermaid*

Atlantic Mermaid was ballasting the forepeak throughout her passage through the Dover Strait, and had been doing so during the entire 4½ hours pilotage. There had been discussions on the bridge regarding why it was taking so long to fill. The watchman, once automatic steering was engaged, left the bridge at periodic intervals to sound the forepeak. The sounding point for the tank was inside the forecastle. The vessel was trimmed quite heavily by the stern on departure Sheerness, and this trim was being reduced by the ballasting operation as the passage proceeded. The trim was estimated to be 1.2m by the stern at the time of the collision. This, and the vessel's ballast condition, produced a blind area ahead of the bow of around 50 to 70 metres.

Atlantic Mermaid was the faster of the two vessels, and was proceeding in the same direction as *Hampoel.* Under Rule 13 of the Collision Regulations *Atlantic Mermaid* was the overtaking vessel and obliged to keep out of *Hampoel*'s way. To comply with this requirement, *Atlantic Mermaid*'s master had to be aware, firstly of *Hampoel*'s presence, and secondly of the situation. The master had the conduct of the navigation throughout, with the second officer and a helmsman/lookout making up the rest of the bridge team. However, none of the three persons on *Atlantic Mermaid'*s bridge saw *Hampoel* before the collision.

The second officer operated the telex machine, behind the blackout curtain, from 0124 until the time of the collision. He was, therefore, not involved in keeping a lookout during this period, even though he was physically on the bridge. At 0124, the vessel was in the middle of the Dover Strait, and in the area of the most heavily concentrated traffic. This was not an ideal time or place for the bridge team to be reduced for the purpose in question. The master was, therefore, burdened with entering the chart room to put the vessel's position on the chart, and ensuring she was on the course line, in addition to keeping a lookout, since the second officer was performing non-navigational duties.

When the lookout left the bridge to sound the forepeak, after coming off the wheel at 0130, the only person keeping a lookout was the master. His acting as the sole lookout was contrary to the advice in MGN 137(M+F). He checked the radars, situated to starboard of the centre line at the front of the bridge, frequently. When standing by the radars, a watchkeeper cannot visually see

vessels fine on the port bow, because they are obscured by the deck cranes **(see Figure 10)**. It is likely that the master, intentionally or otherwise, spent a large proportion of his time in the vicinity of the radars, and therefore was prevented from seeing vessels fine on the port bow.

Figure 10

Atlantic Mermaid - view from radars

During the rain showers the windscreen wipers were on. Although reported as working well, windscreen wipers can, because of their movement, hinder a visual lookout through their movement and "smearing" of the window surface. The port side bridge wing door was open, but during the showers those on the bridge were naturally reluctant to go outside. At the time of the collision the watchkeeper had just returned to the bridge and while walking up and down the main deck had not noticed, nor was especially looking for, other vessels. The visibility was moderate, and might have been as little as 2 or 3 miles in rain. *Hampoel,* apparently, had her aft deck floodlights and navigation lights on. These were not seen by those on the bridge of *Atlantic Mermaid*.

The radars' pictures required attention because of the rain showers, and the rain and sea clutter were frequently adjusted. A warning regarding use of the rain and sea clutter controls was given in the operating manual stating: *"excessive clockwise rotation may eliminate small targets on the screen".* It is possible that the clutter controls had been turned up to an extent where a small vessel at close range could not be detected.

No 2 radar (port) had an intermittent fault for at least the 12 months before the collision. Apparently the fault occurred only on ranges below 12 miles and on short pulse. Stabilisation became lost and, with the heading marker remaining in the correct position, all targets rotated clockwise around the screen. Attempts made to correct the fault had been unsuccessful. Entries were made in the radar logbook at periodic intervals concerning No 2 radar; the last entry before the collision was made by the second officer at 0001 on 6 June stating: "*poor reception on short range".* Possibly with this fault in mind, the master was operating the radar on the 12-mile range. No 1 radar was on the 6-mile range.

A small target at very close range might not have been as apparent on the 12-mile range as on the 6-mile range, as the observer's attention would probably be focused away from the centre. No 1 radar, therefore, was the most likely of the 2 radars to detect and indicate the presence of another vessel at close range. It is not known if the master was dividing his attention equally between the two radars. If he was concentrating more on No 2 radar then he might well have missed the target being displayed on No 1 radar. Equally though, he might have been paying more attention to No 1 radar because of the long standing fault on No 2 radar.

The pilot who had recently been on the vessel described the radars as "appalling" and "difficult to use". He said that the overall quality of radar picture was "poor" and that he had to work on longer ranges than he normally would to obtain a clear picture.

From the evidence, it is clear that the radars were not ideal for use in conditions with rain and sea interference, and that their overall condition might have been below that required to enable a satisfactory radar watch to be maintained. It is also possible that *Hampoel* was not detected at all on either radar because of their condition and the effectiveness of the clutter controls.

The master was new to the company and to the vessel, and had been in command of her for just a few hours. He was not familiar with the particular radar control settings and associated problems on this vessel. He was suffering from a headache and, although he had slept the previous night and in the afternoon, it was over 8 hours since his last rest. It was also the early hours of the morning and, having just joined the vessel, the start of a new work routine. As a result of the above, he was probably feeling tired, which, along with the headache, might have impaired his ability to maintain a proper watch. A further possible contributory factor, to his not detecting *Hampoel* visually or by radar, was his reduced vigilance after the vessel had passed through the busiest and narrowest part of the Dover Strait, and also because the traffic around him was travelling in the same direction. The VHF call made by *Hampoel* just before the collision was not heard by those on the bridge, and, so, was not answered.

The courses made good by the two vessels were converging, being 225° for *Atlantic Mermaid* and 230.5° for *Hampoel*. The difference in speed between them was about 9 knots. At 0106, 47 minutes before the collision, the distance between them was 6.8 miles. At 0142, 11 minutes before the collision, the distance was 1.5 miles. The rapid closing speed demanded an early assessment so that effective avoiding action could be taken to ensure a safe passing.

The visual lookouts during the 30 minutes before the collision was reduced in number and impaired by the weather and possibly the deck cranes. The radar lookout was reduced for the reasons stated above. This, along with the other mentioned factors, reduced the bridge team's ability to detect *Hampoel* and to therefore make an assessment of the situation, and take any necessary avoiding action.

Atlantic Mermaid's master was unable to meet his obligations under Rules 5 and 7 of the Collision Regulations, and thereby was unable to meet the requirements of Rule 13.

2.2.2 *Hampoel*

Hampoel was the slower of the two vessels. *Atlantic Mermaid* was, therefore, overtaking her and had a responsibility to keep out of her way under Rule 13 of the Collision Regulations. Nevertheless, because *Hampoel* was a stand-on vessel, the chief officer still had a responsibility to determine if risk of collision existed under Rule 7 and, if so, to take action under Rule 17.

Ships travelling at a relatively slow speed are approached frequently from astern, and it is crucial for them to keep a good visual lookout astern. It was the practice on *Hampoel* to keep her aft deck lights on, in addition to her navigation lights, for this reason.

The chief officer was the sole watchkeeper at the time of the collision. He alternated 6-hour watches with the master, the only other deck officer on board. This is contrary to the advice given in MGN 137 (see section 1.7).

His low frequency of position-fixing suggests a preference to rely on the cross-track-error displayed on the GPS rather than to refer to the working chart for the purpose of monitoring the passage.

The chief officer's lookout astern was sufficient to see *Atlantic Mermaid* visually at 0136 when she was at about 2.4 miles range. He was, apparently, the only person on either vessel to see the other vessel before the collision. He observed the approaching vessel and waited for her to take avoiding action. At 0149, he was becoming increasingly concerned and made a brief VHF call on channel 16 which was not answered. It then became apparent to him that a collision was imminent; he pushed the main engine overspeed and sounded the general alarm and ship's whistle. As he did so the two vessels collided.

By Rule 17 (a)(ii) and(b) *Hampoel* was respectively permitted and required to take avoiding action. The VHF call was unlikely to have resulted in an immediate response from the other vessel and was contrary to the advice given in MGN 167 (M+F). A signal light or searchlight, shown astern, as suggested by Rule 34 (d), would have been more likely to have made the approaching vessel aware of *Hampoel*'s presence. The main engine overspeed reduced the 10 knots closing speed only very marginally, and the ship's whistle, as required by Rule 34, was sounded too late.

The chief officer did not want to alter course to port due to the proximity of the Varne. However, the Varne was almost one mile away and, with *Hampoel*'s small turning circle, she could easily have made a substantial and safe alteration to port. It is probable that he failed to appreciate the sea room available to port because of his reliance on the GPS for passage monitoring rather than reference to the working chart. It could also be argued that a mental risk assessment would have shown grounding on a sandy bank was preferable to a collision with a larger, faster vessel. It is understandable that he considered that altering course to starboard would conflict with any possible last minute alteration made by the overtaking vessel. However, he failed to take any action and, therefore, did not fulfil his duties under Rules 17 and 34.

2.3 DOVER STRAIT TSS

Vessels using the TSS tend to pass to the north of the Varne, because this is the most direct route to follow and does not involve an additional waypoint and alteration which would be necessary if passing to the south of it. This results in "bunching" in the TSS to the north of the Varne which is, at its narrowest, only 1.5 miles wide.

This "bunching" is compounded by the use of modern navigational systems which results in many vessels following exactly the same course line to the north of the Varne, while the wider space to the south of it goes largely unused.

Further, where circumstances force a deviation, there appears to be a tendency to return to the original track instead of revising the passage plan. This serves to cause and maintain the bunching of traffic.

Hampoel's chief officer made frequent references to the cross-track-error on the GPS to maintain position on the course line. These vessels travel at various speeds and, during the course of a few hours, many overtaking situations occur.

This bunching, compounded by the precise following of pre-programmed passage plans, has the same effect as that of road traffic, regardless of speed, using the fast, or overtaking, lane on a motorway.

If the traffic situation demands it, watchkeepers should not blindly follow the precise digital read-out given on modern navigational instruments, but be prepared to make a departure from the passage plan. This is good seamanship and in accordance with Rule 2 (a) of the Collision Regulations.

2.4 THE ROLE OF CNIS

One of the principles of seafaring is the *freedom* to navigate, not only on the high seas but also in the territorial waters and narrow channels of other states. The concept of freedom of navigation originates from the belief that shipmasters know best how to navigate safely. This is very different from airline captains, who have to submit flight plans before departure and can be told by air traffic control precisely what to do and when to do it.

The CNIS regards the Dover Strait as having freedom of navigation for vessels of all nations, and it is the shipmaster's responsibility to navigate his vessel according to international regulations, which in this case are the *International Regulations for Preventing Collisions at Sea*. As described in section 1.9, if the master does not obey Rule 10 of the Collision Regulations and the transgression is observed by CNIS, then he will be reported. If that vessel enters a UK port he could be prosecuted, but, in any case, a report will be sent to the ship's flag state, under the IMO agreements, for it to carry out any such action as it sees fit.

Nevertheless, collisions do occur in the radar surveillance area of the CNIS, and it has been questioned as to whether CNIS can, or should, intervene to prevent them when necessary.

1. Vessel control

A difference between a coastal VTS (CNIS) and a port/harbour VTS is in the amount of control of shipping (see .9.1, .9.2, .9.3 in section 1.9). A port/harbour VTS can, for example, direct a ship to leave an anchorage at a certain time, to slow her speed down or to enter a certain channel: this is not the remit of CNIS. A port/harbour VTS could have about ten ship movements at any one time, whereas CNIS can, typically, have 250 echoes on its radar screens. Therefore, it would be difficult for CNIS to have the degree of control enjoyed by a port/harbour VTS, with that amount of traffic.

In the case of all types of VTS, giving execution details, such as specific helm and engine orders, is unacceptable because they could be inappropriate, given the limited knowledge of the prevailing circumstances and the particulars of the vessels involved. This could result in legal action against the VTS. This view is supported by section 2.3.4 of IMO resolution A.857(20) (in section 1.9 of this report) which states that *instructions should be result-orientated only*.

2. Limits of control

Despite CNIS being able to attach track numbers and other data to radar echoes, there are some limitations with radar surveillance. It must be remembered that radar is based on the transmission and reception of radio waves, and is subject to interference from atmospherics. In raw radar the echo

is dragged out by the rotation of the scanner, and the size of echo reflects the size of the vessel. In raw radar presentation, the operator can adjust the set for gain and for sea and rain clutter. However, the CNIS radar echo returns are processed, such that all echoes appear to be the same size, and the operator cannot alter the sea and rain clutter automatic control. The system discriminates between a real echo from background noise. If it finds an echo of an object, it will update its decision every six sweeps of the scanner (every 30 seconds) and will automatically assign a track number and display a vector. However, in the case of a small echo moving up and down in a seaway, the system may drop the data it has assigned to it and, at a later time, when it has been reacquired, give it new data.

Sometimes two echoes merge into one, and it appears to an observer that the two vessels might have collided. However, radar frequency length is such that it cannot discern that the two vessels are, in fact, separate and are passing at close range to one another. In the restricted waters of the Dover Strait, the passing distances for vessels is far less than would be expected in open seas. When two echoes merge, the CNIS radar system drops one set of data. However, when the echoes separate the system will, after 30 seconds, automatically attribute a new track number to one of the echoes. In this way, the track numbers are sometimes swapped, which can confuse the radar operator.

Even if a CNIS operator was to give warning by radio of an impending collision, the time taken for ships' officers to respond to the radio, which itself could cause confusion because of possible language differences and radio interference, could make matters worse, rather than improve the situation. Many vessels which pass through the area, at one time or another, come on to collision courses with other vessels. However, collisions are averted routinely, either by navigational alterations of course, or by deliberate avoiding actions under the Collision Regulations. Because of the high traffic density in the Dover Strait, the number of times when vessels are on collision courses is too frequent for CNIS operators to give warnings routinely, given CNIS's current available resources. Even when two vessels are on a collision course, the timing and type of avoiding action can be dictated by circumstances which the operator might not appreciate.

In conclusion (from the discussion above), it is not the role of CNIS routinely to intervene to prevent collisions between vessels, because of the limitations of the radar surveillance system; the impracticalities and dangers of giving warnings and direct instructions, and the desire to maintain the principle of the freedom of navigation, and the CNIS's currently available resources.

SECTION 3 - CONCLUSIONS

3.1 CAUSE

The cause of the collision was *Atlantic Mermaid* failing to observe the presence of *Hampoel* which failed to take avoiding action.

3.2 CONTRIBUTORY CAUSES

3.2.1 *Atlantic Mermaid*

1. The blind area ahead of the bow. [2.2.1]

2. The second officer and, on occasions, the lookout being involved in non-watchkeeping duties which reduced the number of persons keeping a lookout. [2.2.1]

3. The deck cranes obscuring vessels fine on the port bow from where the master probably spent a large proportion of his time. [2.2.1]

4. The visual lookout being hampered by the weather conditions. [2.2.1]

5. The possibility that the radar clutter controls had been turned up to an extent where a small vessel at close range could not be detected. [2.2.1]

6. The overall condition of the radars might have been below that required to enable a satisfactory radar watch to be maintained. [2.2.1]

7. The master was probably feeling tired which, along with the headache from which he was suffering, might have impaired his ability to maintain a proper watch. [2.2.1]

8. The master might have become less vigilant because the vessel had passed through the busiest and narrowest part of the Dover Strait, and also because the traffic around him was travelling in the same direction. [2.2.1]

9. The vessel passing north of the Varne and following the same course line as the majority of vessels which pass north of the Varne. [2.3]

3.2.2 *Hampoel*

1. The chief officer being the sole watchkeeper. [2.2.2]

2. Failing to use a searchlight or signal light astern. [2.2.2]

3. The vessel passing north of the Varne and following the same course line as the majority of vessels who pass North of the Varne. [2.3]

4. The vessel maintaining the course line precisely by use of the cross-track-error on the GPS which increased the risk of a close quarters situation with overtaking vessels using the same course line. [2.3]

5. Failing to appreciate that there was available sea room to port, probably because of his reliance on the GPS for passage monitoring rather than reference to the working chart. [2.2.2]

3.3 FINDINGS

3.3.1 *Atlantic Mermaid*

1. The vessel was ballasting the forepeak from departure Sheerness until the collision. Her condition and trim produced a blind area of around 50-70 metres ahead of the bow. [2.2.1]

2. The second officer was operating the telex machine, behind the blackout curtain, from 0124 until the time of the collision. [2.2.1]

3. The lookout left the bridge to sound the forepeak, after coming off the wheel at 0130, leaving only the master keeping a lookout. This is contrary to the advice given in MGN 137. [1.7, 2.2.1]

4. It is likely that the master, intentionally or otherwise, spent a large proportion of his time in the vicinity of the radars, and therefore was prevented by the deck cranes from seeing vessels fine on the port bow. [2.2.1]

5. The visual lookout might have been hampered by the weather conditions. [2.2.1]

6. It is possible that the radar clutter controls had been turned up to an extent where a small vessel at close range could not be detected. [2.2.1]

7. No 2 radar had an intermittent fault where stabilisation was lost for at least the 12 months before the collision. [1.4.3, 2.2.1]

8. At 0001 on 6 June, the second officer made an entry in the radar logbook concerning No 2 radar, stating: "*poor reception on short range".* [1.4.3, 2.2.1]

9. A pilot, who had recently been on the vessel, described the radars as *"appalling"* and *"difficult to use"*. [1.4.3, 2.2.1]

10. It is possible that *Hampoel* was not detected at all on either radar because of their condition and the effectiveness of the clutter controls. [2.2.1]

11. The master was new to the company and to the vessel, and had been in command of her for just a few hours. [2.2.1]

12. The master was probably feeling tired which, together with the headache from which he was suffering, might have impaired his ability to maintain a proper watch. [2.2.1]

13. The master might have become less vigilant after the vessel had passed through the busiest and narrowest part of the Dover Strait, and also because the traffic around him was travelling in the same direction. [2.2.1]

14. The VHF call made by *Hampoel* just before the collision was not heard by those on the bridge. [2.2.1]

15. None of the three persons on the bridge saw *Hampoel*, either visually or by radar, before the collision. [2.2.1]

16. The courses made good of the two vessels were converging, being 225° for *Atlantic Mermaid* and 230.5° for *Hampoel*. The difference in speed between them was about 9 knots. [2.2.1]

3.3.2 *Hampoel*

1. It was the practice on *Hampoel* to keep the aft deck lights on, in addition to her navigation lights, during the hours of darkness. [2.2.2]

2. The chief officer was the sole watchkeeper, contrary to the advice given in MGN 137. [1.7, 2.2.2]

3. The chief officer's low frequency of position-fixing suggests a preference to rely on the cross-track error displayed on the GPS rather than to refer to the working chart for the purpose of monitoring the passage. [2.2.2]

4. The chief officer was making frequent references to the cross-track-error on the GPS to maintain the vessel's position on the course line. [2.2.2]

5. The chief officer was, apparently, the only person on either vessel to see the other vessel before the collision. He first noticed *Atlantic Mermaid* about 17 minutes before the collision. [2.2.2]

6. At 0149, the chief officer made a brief VHF call on channel 16 directed to the approaching vessel which was not answered and was contrary to the advice given in MGN 167 (M+F). [2.2.2]

7. The chief officer pushed the main engine overspeed and sounded the general alarm and ship's whistle. As he did so, the two vessels collided at 0153. [2.2.2]

8. The chief officer failed to take any avoiding action. [2.2.2]

SECTION 4 - RECOMMENDATIONS

Elmira Shipping and Trading is recommended to:

1. Ensure that all of its vessels are fitted with radars which are in good working order, such that a proper radar watch can be kept.

2. Ensure that identified deficiencies to navigational equipment on its vessels are promptly and effectively rectified.

3. Ensure that there are sufficient bridge watchkeepers on its vessels at all times.

4. Ensure that the ability to keep a proper watch is not constrained by:

    - Additional tasks to watchkeeping
    - Lack of movement for all round visibility
    - Fatigue
    - Reduced vigilance

Meerpahl and Meyer is recommended to:

5. Comply with the advice given in MGN 137 (M+F) with regard to lookout on its vessels during the hours of darkness.

6. Promulgate the advice given in MGN 167 (M+F) with regard to the use of VHF radio in collision avoidance to all its ships.

7. Advise all its masters of the dangers of over-reliance on GPS for passage monitoring, without due reference to the working chart.

8. Promulgate to all its vessels, the importance of compliance with Rules 17 (a) (ii) and (b) and 34(d) when being overtaken.

NB The MAIB would like to draw the attention of all shipowners and masters to MAIB Safety Bulletin 2/2001 (see Annex).

Marine Accident Investigation Branch
March 2002

Safety Bulletin

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MARINE ACCIDENT INVESTIGATION BRANCH

MAIB SAFETY BULLETIN 2/2001

Collision between

Ash* and *Dutch Aquamarine

south-east of Hastings

in the Dover Traffic Separation Scheme

with the loss of one life

9 October 2001

Issued November 2001

MAIB

INVESTOR IN PEOPLE

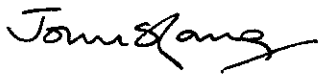
MAIB SAFETY BULLETIN 2/2001

This document, containing Safety Recommendations, has been produced for marine safety purposes only on the basis of information available to date.

The Merchant Shipping (Accident Reporting and Investigation) Regulations 1999 provide for the Chief Inspector of Marine Accidents to make recommendations at any time during the course of an investigation if, in his opinion, it is necessary or desirable to do so.

The Marine Accident Investigation Branch (MAIB) is carrying out an investigation of the collision on 9 October 2001 between the motor vessels *Ash* and *Dutch Aquamarine,* which resulted in the foundering of *Ash* and the death of her master. The MAIB will publish a full report on completion of the investigation.

This accident is the latest and most serious of four similar collisions which have occurred in the south-west lane of the Dover Traffic Separation Scheme in 13 months. The MAIB believes that modern navigational methods and equipment may be contributing to overcrowding in the traffic lanes, and this Safety Bulletin is issued to alert the Maritime and Coastguard Agency (MCA), owners and masters to the potential hazards involved.



J S Lang
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SAFETY RECOMMENDATIONS

Background

On 9 October 2001 the 1,009 gross tons (gt) 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 in the south-west traffic lane 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 and was making about 12.5 knots over the ground. She had a mixed chemical cargo and a crew of 12 on board. There were a number of other vessels in the vicinity, all of which were bunched towards the northern edge of the lane. Close passing was commonplace.

Although the investigation into this accident is still underway, it has been established that *Dutch Aquamarine* had been the overtaking vessel, and her watchkeeper did not notice the developing collision situation until it was too late. *Ash* took no effective last minute avoiding action. The subsequent collision caused *Ash* to founder with the loss of her master.

As part of its investigation the MAIB studied the tracks taken by all vessels on passage in the south-west traffic lane of the Dover traffic separation scheme (TSS) during a six-hour period. This showed that most vessels hug the northern edge of the lane with only two or three choosing to pass to the south of the Varne. Where traffic is bunched in this way, close passing is commonplace. It only requires a brief lapse of concentration to lead to a collision; especially when the speeds of vessels are very different.

This is the latest in a number of collisions that have recently occurred in the Dover TSS. The circumstances in each have been very similar.

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. The MCA has successfully prosecuted those in charge of the overtaking vessels in two of these accidents.

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 Routing 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. The fact that four collisions in overtaking situations have occurred in this area in the past 13 months may be indicative of a worsening situation.

The MAIB believes that a possible explanation lies with the increasing use of Global Positioning Systems (GPS) and electronic chart systems for forming, and then storing, passage plans. Where stored plans are being executed by reference to the GPS navigator, electronic chart system and/or track control system, watchkeepers can be reluctant to stray from the planned track. Further, where circumstances force a deviation, there appears to be a tendency to return to the original track instead of revising the passage plan. This serves to cause and maintain the bunching of traffic, the danger of which is enhanced when the vessels involved have markedly different speeds.

Safety Recommendations

1. **Ship owners and masters** should:
   - i. consider carefully whether their passage planning strategy is adding to congestion in the Dover TSS;
   - ii. 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;
   - iii. 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.

2. **The Maritime and Coastguard Agency** is recommended to:
   - i. conduct research into the extent to which modern navigational practices, together with electronic navigation equipment, is contributing to bunching of traffic in the south-west traffic lane of the Dover TSS; and,
   - ii. on completion of the research, seek to ensure that effective measures are put in place to mitigate the problem.