

Report on the investigation of
a close-quarter situation between

Costa Atlantica

and

Grand Neptune

in the Dover Strait on 15 May 2008

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Report No 20/2008
November 2008

Extract from
The United Kingdom Merchant Shipping
(Accident Reporting and Investigation)
Regulations 2005 – Regulation 5:

“The sole objective of the investigation of an accident under the Merchant Shipping (Accident Reporting and Investigation) Regulations 2005 shall be the prevention of future accidents through the ascertainment of its causes and circumstances. It shall not be the purpose of an investigation to determine liability nor, except so far as is necessary to achieve its objective, to apportion blame.”

NOTE

This report is not written with litigation in mind and, pursuant to Regulation 13(9) of the Merchant Shipping (Accident Reporting and Investigation) Regulations 2005, shall be inadmissible in any judicial proceedings whose purpose, or one of whose purposes is to attribute or apportion liability or blame.

Front cover photograph of *Costa Atlantica* courtesy of Fotoflite.

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GLOSSARY OF ABBREVIATIONS AND ACRONYMS

AB	-	Able Seaman
AIS	-	Automatic Identification System
ARPA	-	Automatic Radar Plotting Aid
BCR	-	Bow crossing range
BCT	-	Bow crossing time
BRM	-	Bridge Resource Management
BTM	-	Bridge Team Management
CNIS	-	Channel Navigation Information Service
COLREGS	-	The International Regulations for the Prevention of Collisions at Sea 1996 (as amended)
CPA	-	Closest Point of Approach
grt	-	gross registered tonnage
ISM Code	-	International Management Code for the Safe Operation of Ships and for Pollution Prevention
kW	-	kilowatt
MCA	-	Maritime and Coastguard Agency
MGN	-	Marine Guidance Note
nm	-	nautical mile
OOW	-	Officer of the Watch
RINA	-	Registro Italiano Navale
RPM	-	revolutions per minute
SMS	-	Safety Management System
STCW	-	International Convention on Standards of Training, Certification and Watchkeeping, incorporating the 1995 amendments
TCPA	-	Time to closest point of approach
TSS	-	Traffic Separation Scheme
UTC	-	Universal co-ordinated time

Times: All times used in this report are UTC +1 unless otherwise stated

SYNOPSIS



At 0257 on 15 May 2008, the Panamanian registered car carrier, *Grand Neptune*, was on passage in the Dover Strait Traffic Separation Scheme when she was manoeuvred hard to starboard and completed a 360° turn to avoid the Italian registered passenger cruise ship *Costa Atlantica*. *Costa Atlantica* was on passage from Le Havre to Harwich with 1697 passengers on board at a speed of 16 knots.

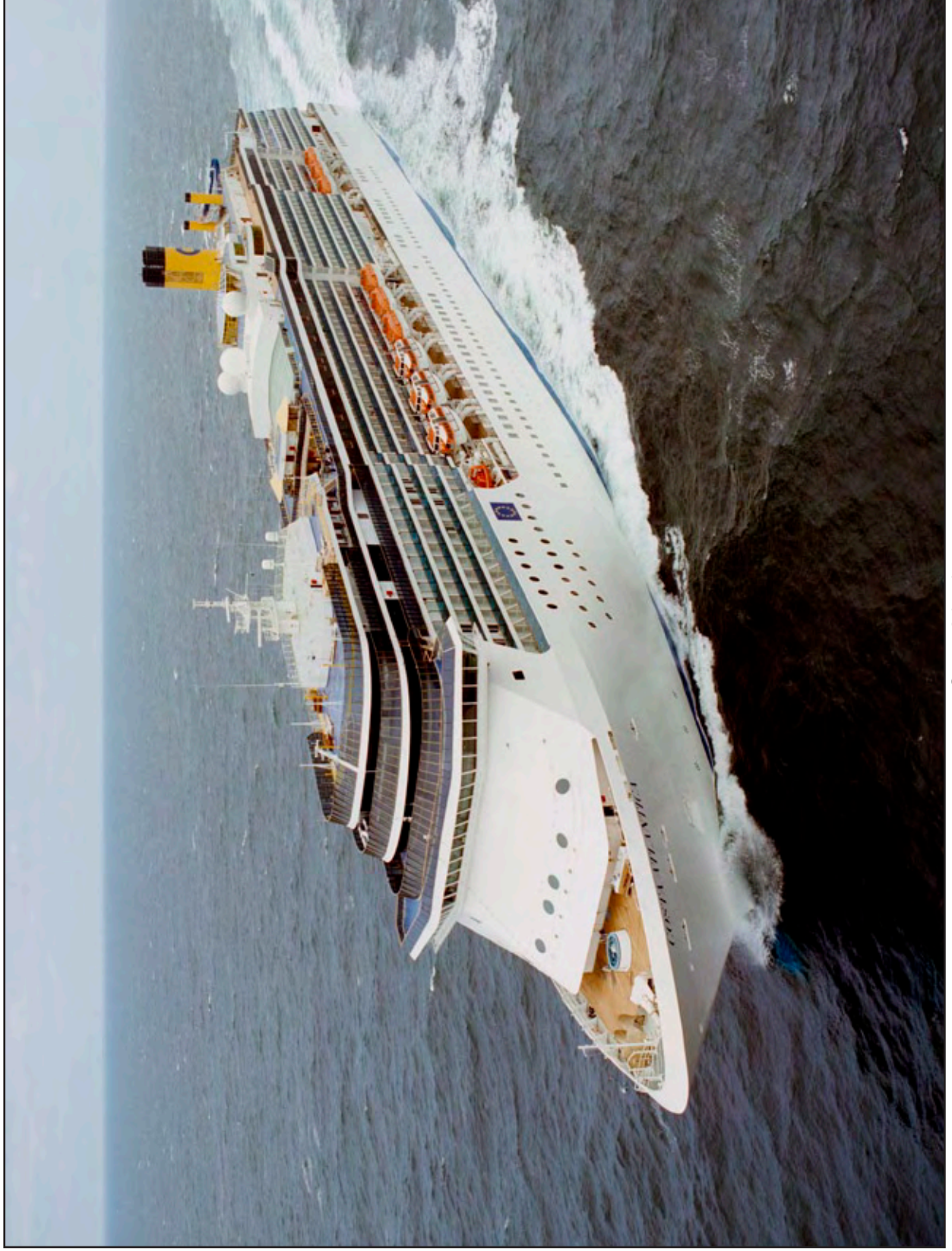
The incident occurred as the passenger ship crossed the separation scheme between *MSC Serena* and *Grand Neptune*, both of which were transiting the south-west traffic lane at speeds of 18 and 17 knots respectively. The distance between the south-west bound vessels was less than 3nm.

The investigation identified a number of factors related to the decisions and actions taken by the bridge team on board *Costa Atlantica* which contributed to the development of the close-quarters situation, including:

- The information on which *Costa Atlantica*'s master based his decision to cross the south-west traffic lane was inaccurate. It was derived from the results of an ARPA radar 'trial manoeuvre' with which neither the master nor the OOW were familiar.
- The manoeuvring of *Costa Atlantica* during the vessel's crossing of the south-west traffic lane was potentially confusing, and the intentions of her master were not readily apparent to other vessels.
- The bridge team on board *Costa Atlantica* were slow to appreciate the risk of collision with *Grand Neptune*.
- The bridge team on board *Costa Atlantica* did not appreciate the possible inaccuracy of ARPA data when manoeuvring.

Following the incident, the owner of *Costa Atlantica* conducted an internal investigation which identified similar safety issues. Accordingly, to prevent similar accidents from occurring in the future, it has taken a number of actions aimed at promulgating the safety lessons learned to its fleet, providing more detail in its bridge procedures, and improving the performance of its bridge teams. In view of the actions already taken, the MAIB has issued no recommendations.

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Costa Atlantica

SECTION 1 - FACTUAL INFORMATION

1.1 PARTICULARS OF VESSELS AND ACCIDENT

Costa Atlantica

Registered owner	:	Costa Crociere S.p.A.
Manager(s)	:	Costa Crociere S.p.A.
Port of registry	:	Genoa
Flag	:	Italy
Type	:	Passenger ship
Built	:	1998 Finland
Classification society	:	RINA
Construction	:	Steel
Length overall	:	292.5 m
Gross tonnage	:	85619
Engine power and/or type	:	35200 kW Diesel electric 2 x Azipod drives
Service speed	:	22 knots
Other relevant info	:	1697 passengers 859 crew



Grand Neptune

Grand Neptune

Registered owner : Dynamic Advantage Marine S.A.
Manager(s) : Cido Shipping Ltd
Port of registry : Panama
Flag : Panama
Type : Pure car carrier
Built : 2005 Japan
Classification society : Korea register of shipping
Construction : Steel
Length overall : 199.9 m
Gross tonnage : 59217
Engine power and/or type : 14280 kW Mitsui-MAN
Service speed : 19.8 knots

Accident details

Time and date : 0257 UTC +1 15 May 2008
Location of incident : 51° 11 N and 001° 41 E
Dover Strait
Injuries/fatalities : None
Damage : None

1.2 NARRATIVE

1.2.1 *Grand Neptune*

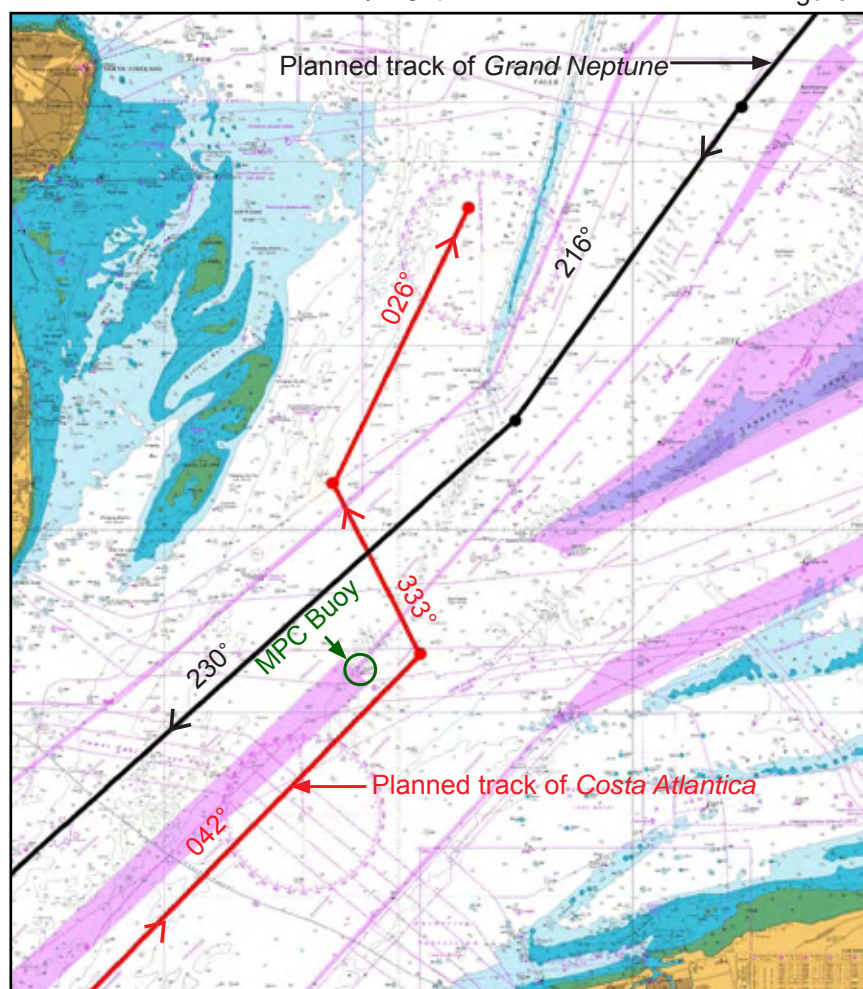
Grand Neptune sailed from Antwerp on 14 May 2008 loaded with vehicles bound for the Middle East. Her river pilot disembarked at Wandelaar pilot station at 2355 on 14 May 2008, and the con was handed to the deep sea pilot by the master. Through his night orders, the master advised the bridge team that the deep sea pilot was in charge of the passage to Southampton.

At 0155 *Grand Neptune* entered the south-west traffic lane of the Dover Strait traffic separation scheme (TSS) and steadied on a course of 225° at a speed of 17 knots. The autopilot steering was engaged and the helmsman delegated to lookout duties. *MSC Serena* was 1.7nm ahead and was on a similar course at a speed of 18 knots.

At 0211, *Grand Neptune* altered course to 216° and at 0245 to 230° in accordance with her passage plan (**Figure 1**). At 0249 the target of *Costa Atlantica* was acquired by radar when at a range of 5nm (**Table 1**). At 0253, the ARPA alarm sounded warning the bridge team of a dangerous target; *Costa Atlantica* was now 2.89nm away, with a CPA of 0.21nm in 5.12 minutes (**Figure 2**).

Reproduced from Admiralty Chart BA 323 by permission of the Controller of HMSO and the UK Hydrographic Office

Figure 1



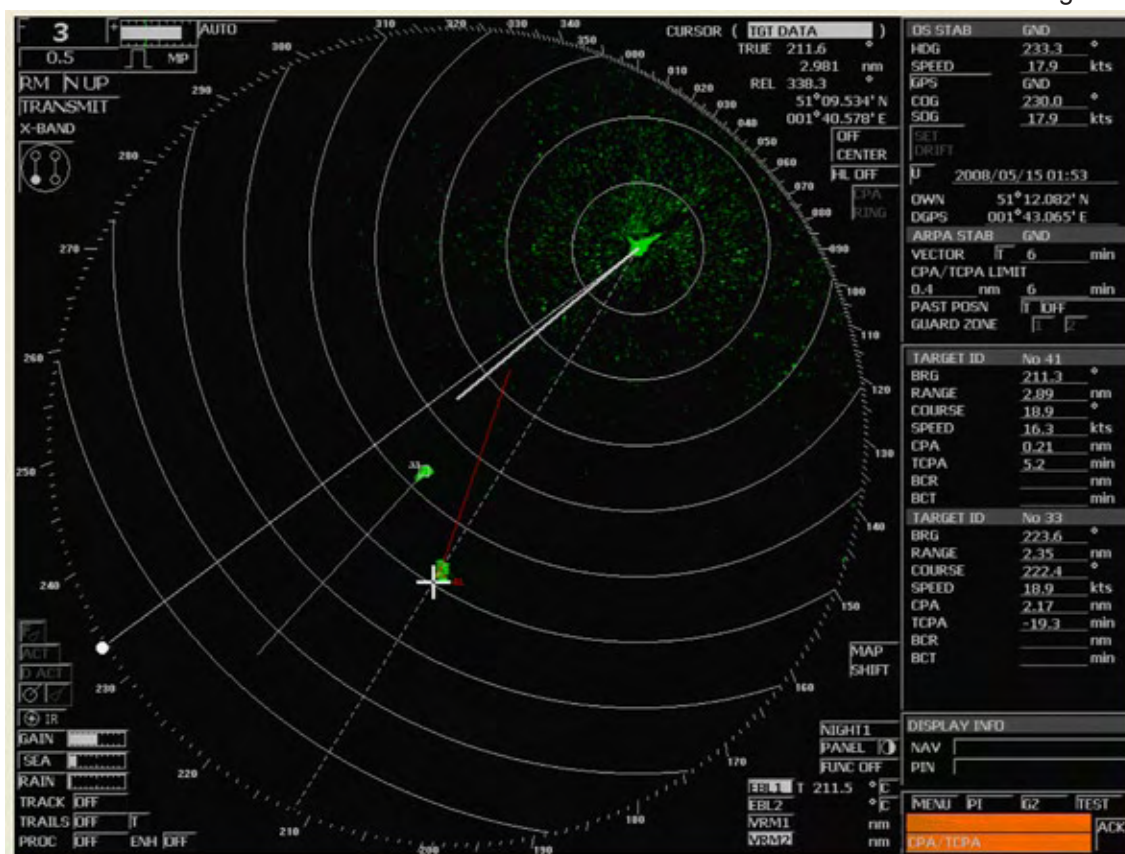
Extract of chart BA 323 - Dover Strait

Table 1

Time	Co	Speed	Range	Bearing	CPA	TCPA	BCR	BCT
02.49.00	232	18	5.1	213				
02.53.00	233	17.9	2.89	211	0.21	5.2		
02.53.45	233	18	2.63	211	0.16	4.7		
02.54.00	233	18	2.38	211	0.08	4.3		
02.55.00	233	18.1	1.99	212	0.02	3.7	0.07	3.5
02.55.46	252	17.2	1.63	213	0.14	3.2	0.29	2.7
02.56.30	275	16.1	1.35	214	0.18	2.8	0.23	2.5
02.57.14	285	16.1	1.16	214	0.13	2.9	0.14	2.7

Extract of radar data from *Grand Neptune*

Figure 2



Grand Neptune - screen shot of radar at 0253

At 0254 the pilot attempted to call *Costa Atlantica* on VHF channel 16. No reply was heard, and at 0255 hand steering was engaged and 'starboard 10' ordered. When the vessel had turned to about 250°, the wheel was returned to amidships.

The pilot then called Dover Coastguard to find out the intentions of *Costa Atlantica*. He also stated:

'He is on a collision course with me. He should pass around my stern. He is determined to cross my bow at zero.'

During the next 2 minutes there was an interchange on VHF radio between Dover Coastguard, *Costa Atlantica* and *Grand Neptune* (**Annex A**) during which the second officer on board *Costa Atlantica* transmitted:

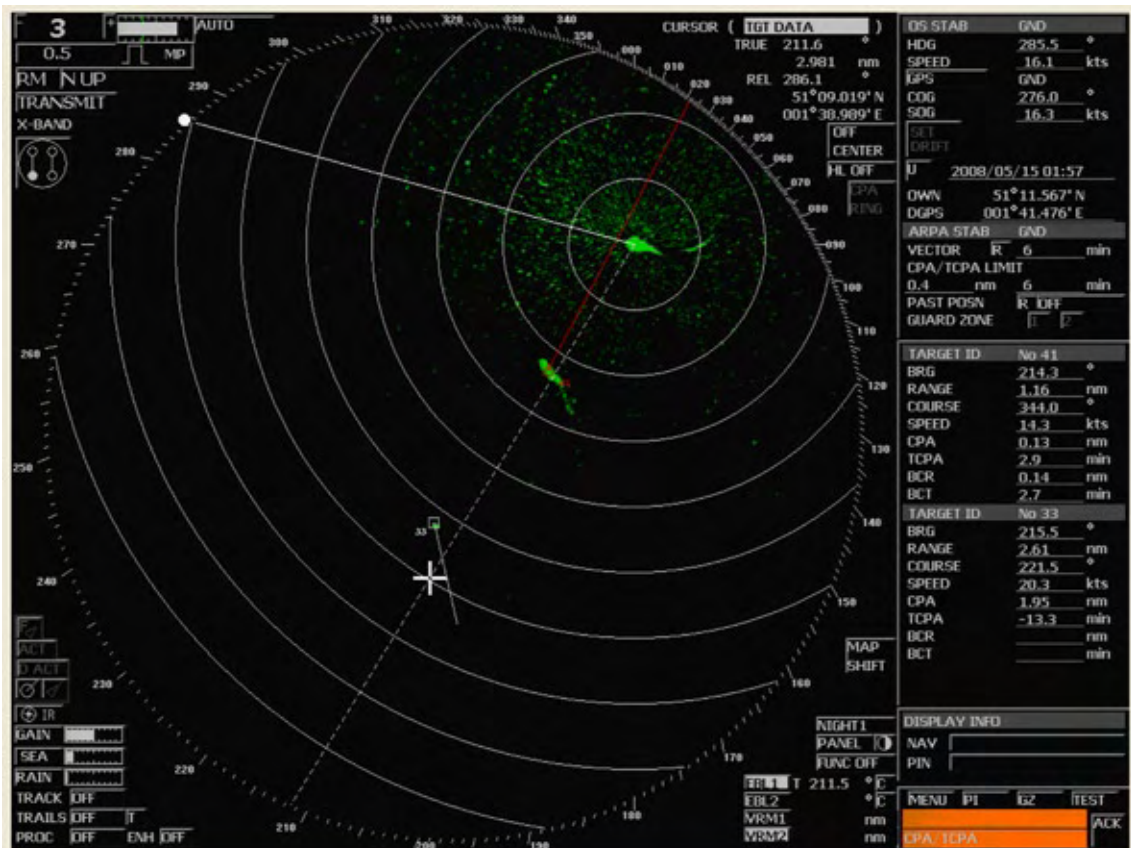
'Yes, we are clear; I am passing you at zero (pause) zero four CPA'

At 0257 the pilot ordered the helm to hard-a-starboard. *Costa Atlantica* was 1.16nm away, with a CPA of 0.13nm in 2.9 minutes (**Figure 3**). He also informed *Costa Atlantica* on VHF radio:

*'You are the give away vessel. Now I am going hard-a-starboard sir.
Hard-a-starboard'*

Grand Neptune completed a 360° turn to starboard and, as a result of this evasive action, her CPA with *Costa Atlantica* was 1nm.

Figure 3



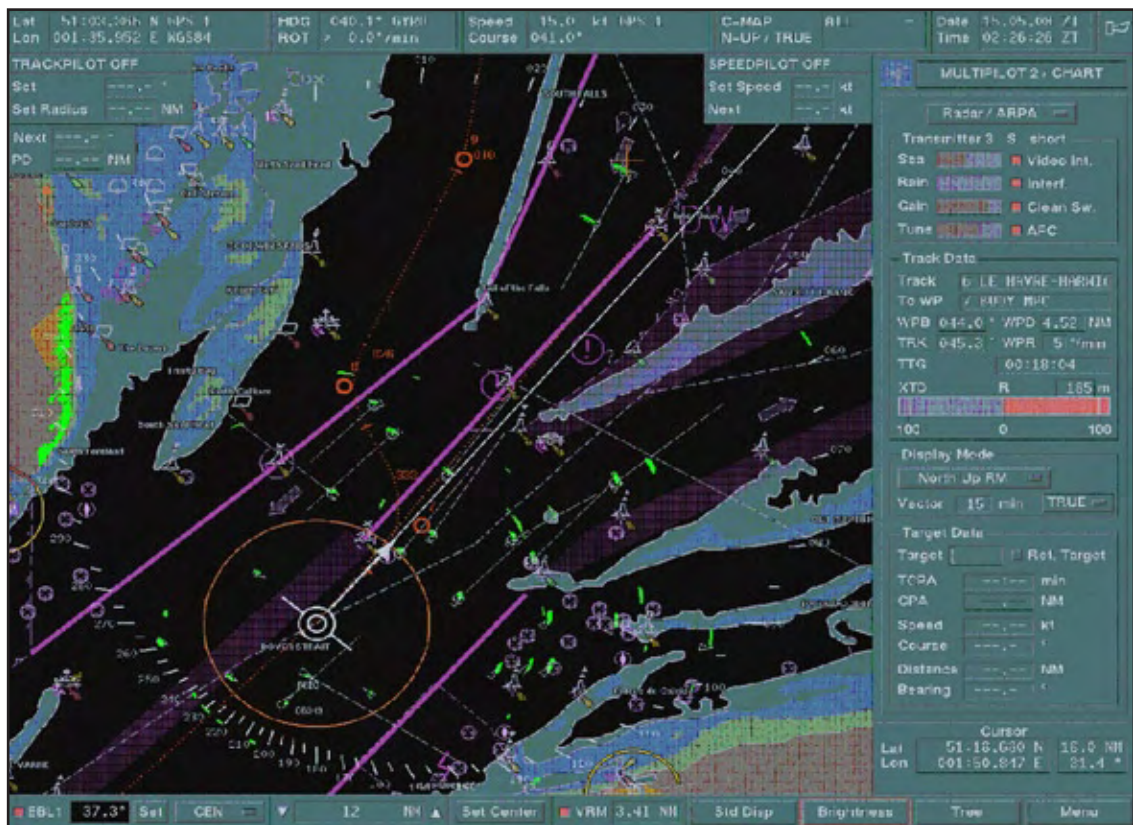
Grand Neptune - screen shot of radar at 0257

1.2.2 Costa Atlantica

Following the winter season cruising in the Mediterranean and Caribbean, *Costa Atlantica* departed Savona, Italy on 7 May 2008 for a positioning voyage to Amsterdam, calling at Malaga, Cadiz, Lisbon, Vigo, Le Havre and Harwich. The vessel departed Le Havre with 1697 passengers at 1706 on 14 May 2008. At 1742, the master handed the con to the officer of the watch (OOW) with instructions to keep the engines on standby as the vessel entered the Dover Strait and to call him 15 minutes before arriving at the MPC buoy (**Figure 1**). The vessel was proceeding at economical speed to arrive off Harwich pilot station before 0600 the following morning.

After being called by the OOW, as instructed, *Costa Atlantica's* master arrived on the bridge at 0225. The second officer was the OOW, and retained the con with the third officer assisting with the navigation. The vessel was in hand steering and on a course of 042° at a speed of 15 knots following the north-east lane of the Dover Strait. The next planned course alteration to 333° , which took the vessel across the south-west traffic lane, was 3.4nm ahead, beyond the MPC buoy. In preparation for the alteration, the master and second officer viewed the radar on the 12nm range scale, which was also offset towards the south-south-west, and assessed the traffic situation. At 0226, two radar targets were acquired by ARPA, both of which were following the south-west traffic lane; *MSC Serena* was at 16.1nm and *Grand Neptune* at 18nm (**Figure 4**). The radar range scale was then reduced to the 6nm range scale.

Figure 4



Costa Atlantica - screen shot of radar when *Grand Neptune* acquired

At 0229, the second officer called up Dover Coastguard and stated:

'Just to inform you that in about 10 minutes I will be abeam of the MPC buoy and we are going to cross the sea lane'

At 0233 speed was increased from 91 to 98 revolutions per minute (RPM), to achieve a faster crossing. Between 0228 and 0236, the course was progressively adjusted from 042° to 025°, and as the MPC buoy came abeam the second officer advised the master that he wanted to start to cross the TSS as *Costa Atlantica* would safely pass ahead of *MSC Serena* and *Grand Neptune*.

The master instructed the second officer to carry out a trial manoeuvre¹ on the ARPA radar to accurately assess the situation before committing to an alteration of course. This was conducted by the second officer at 0239 (**Figure 5**) and was witnessed by the master, who was standing to the left of the second officer (**Figure 6**). No time delay was entered. The master and second officer read the CPA information displayed at the bottom right hand side of the screen, which indicated *MSC Serena* had a CPA 0.87nm in 13.5 minutes, and understood it to be the results of the trial manoeuvre.

In line with the company's recommended practice, the master intended to cross the south-west lane using a slow rate of turn to achieve a 3nm radius (**Figure 5**). The master estimated that, by the time the vessel had completed her turn to port, the CPA of *MSC Serena* would have reduced significantly. Accordingly, the second officer was told to initially adjust the course to pass close astern of *MSC Serena*, and continue the alteration to port to pass ahead of *Grand Neptune*.

Figure 5

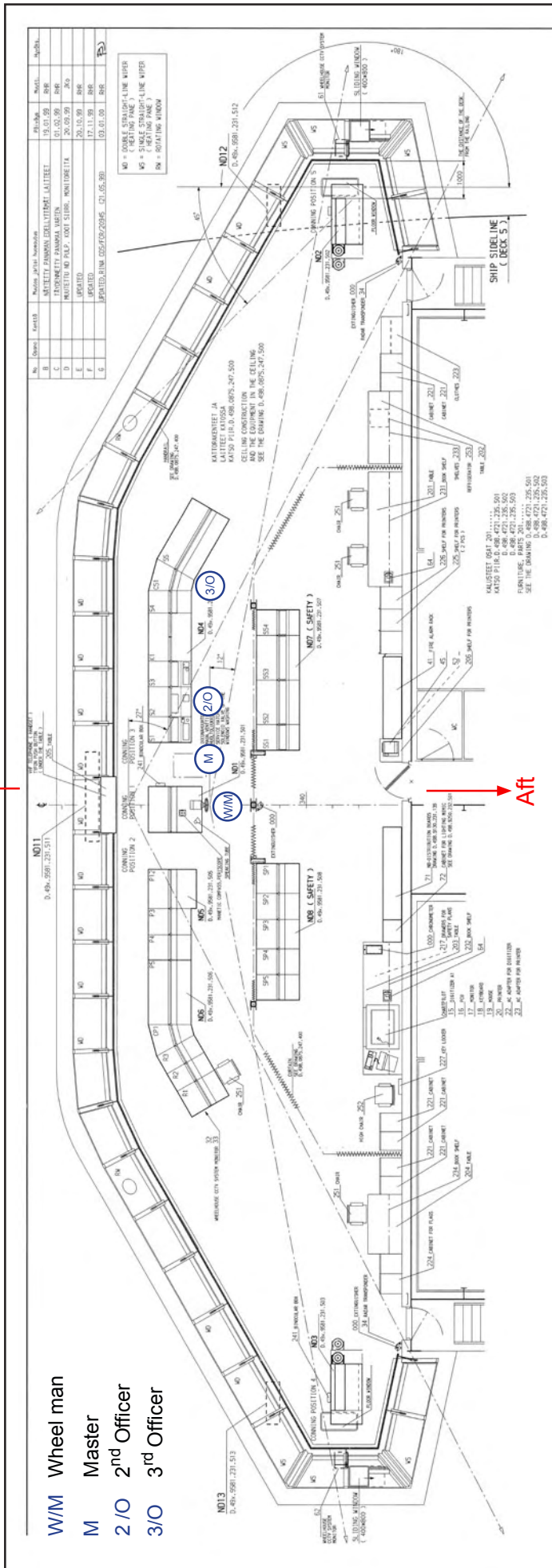


Trial manoeuvre carried out by *Costa Atlantica* at 0239

¹ A trial manoeuvre is a mandatory facility of an ARPA that allows the operator to evaluate the possible navigational consequences on all tracked targets of an own-ship manoeuvre by changing the parameters for course and speed.

Figure 6

Forward



Costa Atlantica - layout of bridge

At 0243 and 0244, two further trial manoeuvres were carried out, and again no time delay was entered. By now, *MSC Serena* was 5.6nm and *Grand Neptune* 7.8nm away. *Costa Atlantica* entered the SW traffic lane at 0245 and started a series of course alterations towards the stern of *MSC Serena* (**Table 2**).

Table 2

Time	Course	New Course ordered
02.45.30	025	020
02.50.01	020	015
02.51.34	015	010
02.52.40	010	000
02.53.30	005	350

Extract of *Costa Atlantica*'s course ordered

As *Costa Atlantica* neared *MSC Serena* at 0254, which was now passing clear, *Grand Neptune* was 2.46nm on her starboard bow with a CPA of 0.06nm in 4.4 minutes (**Figure 7**). *Costa Atlantica* was still under helm to port, but to increase the rate of turn and the CPA with *Grand Neptune*, the second officer ordered port 10 when the heading was 002°, followed by port 5 and, finally, amidships when the heading was 355°. He then gave a series of further orders to continue the vessel's turn to port.

At 0256, Dover Coastguard called *Costa Atlantica* requesting she contact *Grand Neptune* on VHF Channel 16 (**Annex A**). In response, the second officer stated his intention to pass *Grand Neptune* with a CPA of 0.4nm (**Figure 8**).

Costa Atlantica's speed was then further increased from 98 RPM to 103 RPM and she was steadied on a course of 320°; the vessel exited the TSS at 0301 without further incident. The resultant track made good by *Costa Atlantica* from passing the MPC buoy to exiting the TSS is at **Figure 9**.

1.3 ENVIRONMENTAL CONDITIONS

The weather conditions were reported by both vessels to be good. The visibility was excellent with a north-east wind blowing at force 5 and slight seas. High water at Dover was at 0324 and the predicted tidal stream was south-westerly at about 0.5 knot.

1.4 BRIDGE TEAMS

1.4.1 *Grand Neptune*

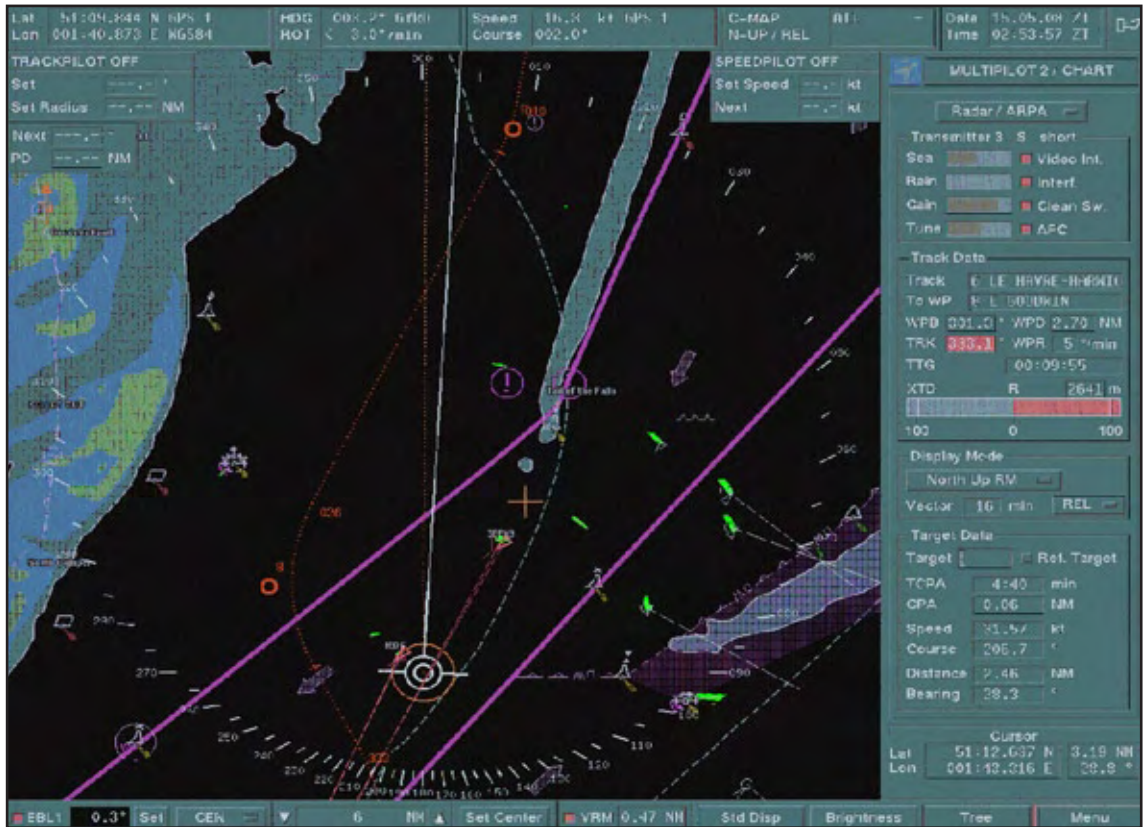
Pilot

The pilot was a British national and held a valid Trinity House deep sea pilot's licence and unlimited master's licence (STCW II/2). He had sailed as a deep sea master for 25 years but had been a deep sea pilot for the last 9. The pilot was employed to stay on the vessel for the duration of her voyage in northern Europe.

Second officer

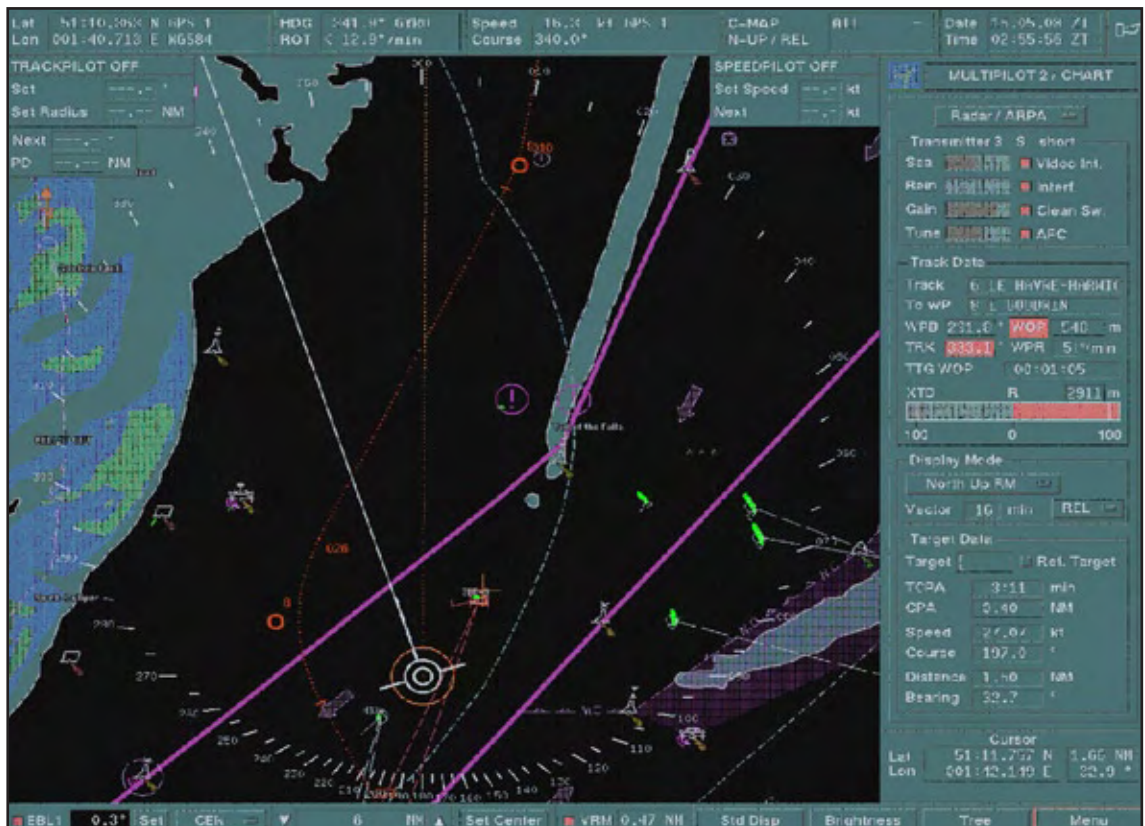
The second officer was a Filipino national who held an unlimited chief officer's certificate of competency (STCW II/2). *Grand Neptune* was his fourth ship in this rank over the past 3 years.

Figure 7

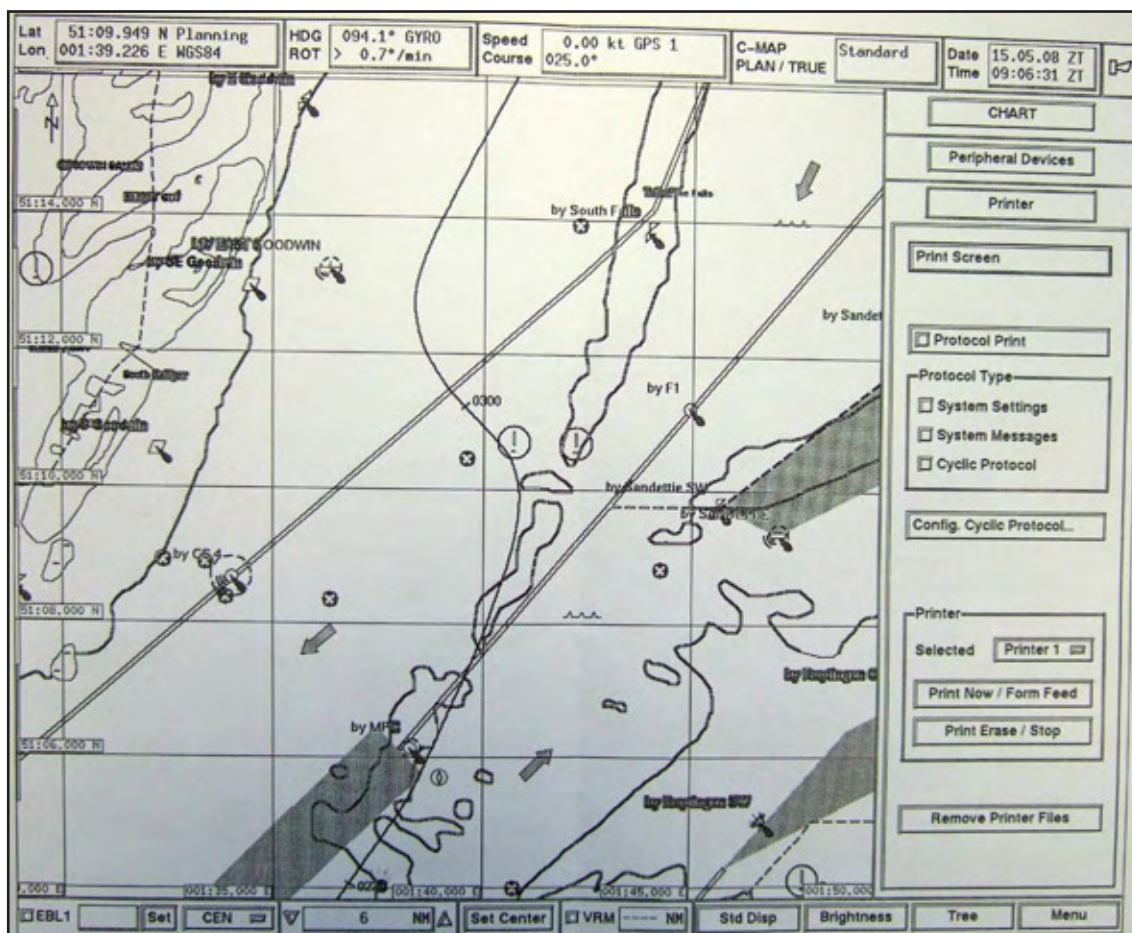


Costa Atlantica - screen shot of radar at 0254

Figure 8



Costa Atlantica - screen shot of radar at 0256

Resultant track of *Costa Atlantica*

Lookout/helmsman

The Able Seaman (AB) was also a Filipino national, and had been on board for 7 months. He was qualified to serve as a rating forming part of a navigational watch (STCW II/4).

1.4.2 *Costa Atlantica*

Master

The master was an Italian national who joined Costa Crociere as a cadet in 1973. He was promoted to staff captain in 1987, and between 1999 and 2000 he helped oversee the construction of *Costa Atlantica* in Finland and sailed on the vessel's maiden voyage as a staff captain.

As a staff captain, his involvement in navigation was largely limited to providing assistance to masters during arrival and departure. He attended a Bridge Resource Management (BRM) course in 1999 and a Bridge Team Management (BTM) course in 2005.

He was promoted to master in 2003 and joined *Costa Atlantica* for the first time as a master on 19 January 2008. The master was unfamiliar with north European waters, including the Dover Strait.

Second Officer

The second officer was an Italian national and was first employed by Costa Crociere as a cadet in 2004. He obtained his OOW licence in December 2006 and then sailed as a third officer and, as such, assisted the OOW when employed on bridge watchkeeping duties.

He joined *Costa Atlantica* on 25 April 2008 and was promoted to second officer. This was the first vessel on which he had been given the responsibility for a navigational watch as an OOW, and he had never transited or crossed the Dover Strait while keeping a navigational watch.

The second officer attended a Deck Emergency Management course in March 2008 which included Bridge Team Management in emergency situations.

Third Officer

The third officer was also an Italian national and joined Costa Crociere as a cadet in 2005. He obtained his OOW licence in March 2007 and had then sailed as a third officer for three contracts. As a third officer his duties on the bridge were to assist the OOW. He attended a Deck Emergency Management course in October 2007.

Helmsman

The helmsman at the time of the incident was a Honduran national who was qualified to form part of a navigational watch (STCW II/4).

1.5 PREVIOUS INCIDENTS

On 5 September 2007, *Costa Atlantica* was involved in a close-quarter situation while overtaking a tanker in the south-west lane in the approaches to the Dover Strait. The two vessels were closing on a steady bearing, and *Costa Atlantica* took avoiding action at a distance of 1.1nm by altering her course by 7°. This did not significantly increase the CPA, nor was it readily apparent to the vessel being overtaken. It was only when the vessel being overtaken expressed concern when *Costa Atlantica* was 3 cables and 2 minutes away from CPA that she altered a further 8°. The vessel being overtaken also altered her course and, despite the actions taken by both vessels, the resulting CPA was only 1.82 cables².

Although this incident was not subject to a full investigation, the MAIB highlighted a number of safety issues which were brought to the attention of the management companies of both vessels.

Costa Crociere investigated the incident and circulated a safety report detailing the lessons learned to its fleet. The company's SMS requires such safety reports to be re-read by the ship's staff after a 6 month period so that important lessons are not forgotten.

The company has recorded two other close quarter situations involving its vessels, one in North European waters in 2005 and the other in the Mediterranean in 2006. The three close-quarter situations in north European waters occurred when the vessels were deployed for a short cruising season over the summer months.

² cable: 0.1 nautical miles

None of *Costa Atlantica*'s officers referred to in this report was on board the vessels concerned during these previous incidents.

1.6 COSTA ATLANTICA – OWNERS AND SAFETY MANAGEMENT

1.6.1 Costa Crociere S.p.A.

Costa Atlantica is owned and managed by Costa Crociere S.p.A., an Italian company based in Genoa. Costa Crociere owns and operates a further 20 vessels under three different brands, namely Costa cruises, AIDA cruises and Iberocruceros. The company vessels carried 1.1 million passengers in 2007.

Costa Crociere is fully owned by the Carnival Corporation & plc which is the world's largest cruise operating company. In addition to Costa cruises, Carnival Corporation also operates other well known brands like Carnival cruise lines, Cunard line, Holland America line, Seabourn cruise lines, P&O cruises, P&O cruises Australia, Ocean Village and Princess cruises.

1.6.2 Certification

Costa Crociere held a Document of Compliance to operate passenger ships as required by the ISM code. The certificate was issued on 21 December 2007 following a renewal audit conducted by Registro Italiano Navale (RINA) on behalf of the Italian flag administration.

Costa Atlantica's safety management certificate was issued by the Italian flag administration on 14 January 2008. The last external audit was conducted by RINA, which highlighted six non-conformities and two observations. All non-conformities except one had been addressed. None of the non-conformities identified during the audit were relevant to bridge procedures.

1.6.3 Navigational management

The working language on board *Costa Atlantica* was Italian. Accordingly, most of the written procedures followed on the vessel were in Italian, although some of the procedures were reproduced in English. Costa Crociere promulgated its navigational requirements for its vessels within its navigation management system, which contains written procedures, orders and behavioural standards for its bridge teams. The management system provides comprehensive guidance on most navigational topics. In this case, the following extracts are relevant:

The navigation Officer, when setting the WAYPOINT different parameters in the Multiplot, shall set the turning RADIUS while taking into account the ship's seaworthiness and estimated speed at the time of turning so that the turning may be carried out according to good sea practice, including passenger's and crew safety, preventing dangerous lists. For this reason, with speeds exceeding 15 knots we recommend to set a radius greater than 3 miles. When setting the RADIUS, also the ship's distance from the coastline and the shallows shall be considered, based on the Master's instructions. [Sic]

Deck Officers shall know the limits of the ARPA system, both in general and relating to the particular equipment supplied.

A radar plot for 0254 on 15 May recorded by the CNIS is at **Figure 10**. This shows two vessels which were following *Grand Neptune*, *Seabourn Pride* and *Cervantes*. The distance between *Grand Neptune* and *Seabourn Pride* was 2.9 nm, and the distance between *Seabourn Pride* and *Cervantes* was 6.7nm.

1.8 MCA GUIDANCE

In recognition of the dangers posed to the safety of navigation while transiting Dover Strait, the MCA has published over the years, guidance in the form of marine guidance notes (MGN). The latest MGN 364(M+F) (**Annex B**) provides guidance on the application of rule 10 and navigation in the Dover Strait. In particular, the MGN states:

Radar surveillance surveys show that many vessels proceeding from the NE lane towards the Thames and UK east coast ports cross the TSS in the vicinity of the MPC light-buoy. Masters are recommended to cross the SW lane in compliance with Rule 10(c) anywhere up to approximately 5 miles NE of the MPC light-buoy. In selecting the crossing point regard should be given to traffic in the SW Lane and the need to avoid the development of situations where risk of collision exists.

1.9 THE COLLISION REGULATIONS (COLREGS)

The rules taken from the International Regulations for the Prevention of Collisions at Sea 1972 (as amended), which are considered relevant to this incident, are at **Annex C**.

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 ACTIONS ON BOARD *GRAND NEPTUNE*

Having acquired *Costa Atlantica* by ARPA, the deep sea pilot on board *Grand Neptune* was aware that the passenger ship was closing on an almost steady bearing on his port bow. The pilot correctly assessed that *Costa Atlantica* was the give way vessel and, as the vessels continued to close to within 3 miles at a relative speed of over 30 knots and with a predicted passing distance of about 2 cables, it was not surprising he became increasingly concerned. In view of the lack of action by *Costa Atlantica*, the pilot was justified in his alteration to starboard at 0255 to initiate avoiding action in accordance with Rule 17 (a) (ii) of the COLREGS. However, although by 0257 *Costa Atlantica* had started to alter course to port, this was not readily apparent to the pilot and, as *Costa Atlantica* was now at about 1 mile with a CPA of 0.13nm, the pilot's action to order hard-a-starboard was understandable and entirely justified. In taking this action, the pilot met his obligation under rule 17(b) of the COLREGS.

2.3 ACTIONS ON BOARD *COSTA ATLANTICA*

Crossing a TSS can be a complex and critical operation which requires careful planning, the accurate assessment of other vessels in the vicinity, quick-thinking, and positive and unambiguous execution. This can be extremely demanding and stressful, particularly when a bridge team is inexperienced and not familiar with the area. However, providing bridge teams work effectively and make appropriate use of the navigational aids available, there should be no reason why a safe passage should not result.

In this case, although *Costa Atlantica's* master's experience of the Dover Strait was limited, he recognised the potential difficulties of crossing the south-west traffic lane, and the inexperience of the OOW. Accordingly, he arranged to be on the bridge and, in preparation for the crossing, the vessel closed the traffic separation line, the radar range scale was increased to assess the risks posed by the vessels encountered, and speed was increased to reduce the crossing time. However, during the execution of the crossing, the decisions and actions of *Costa Atlantica's* bridge team caused the pilot on board *Grand Neptune* to take avoiding action.

2.4 THE DECISION TO CROSS THE TRAFFIC LANE

When the OOW on board *Costa Atlantica* indicated to the master that he intended to alter course to cross the SW traffic lane, the master's decision to verify the second officer's assessment that *Costa Atlantica* would pass ahead of *MSC Serena* by using the 'trial manoeuvre' facility on the ARPA radar was a reasonable precaution. However, in conducting the 'trial manoeuvre' without a time delay, and evidently mistaking the real time CPA data at the bottom right hand corner of the radar display (**Figure 5**) for the CPA following the intended alteration, the information on which the master based his decision to adjust course to pass between *MSC Serena* and *Grand Neptune* was inaccurate. It also demonstrated that neither the master nor the second officer were familiar with the 'trial manoeuvre' function.

It is estimated that had the vessel's course been altered at 0236 as the second officer intended, *Costa Atlantica* would have safely crossed the traffic lane over 1nm ahead of *MSC Serena*. Furthermore, had the master and second officer continued to look ahead for opportunities to cross the traffic lane, it would have been readily apparent that the gap between *Seabourn Pride* and *Cervantes* (**Figure 10**) was considerably larger than between *MSC Serena* and *Grand Neptune*, which was about 3 miles. Although passage between *Seabourn Pride* and *Cervantes* might have required a reduction of speed, it would have allowed *Costa Atlantica* to cross the south-west lane on her planned course of 333° without the risk of a close-quarter situation developing.

2.5 MANOEUVRING

As *Costa Atlantica* entered the south-west traffic lane on a course to take her close astern of *MSC Serena*, she did so at a shallow angle (**Figure 9**). This was far from the 90° to the direction of the traffic flow as required by Rule 10(c) of the COLREGS. Indeed, she was sailing more against the general flow of the traffic, rather than across it. It was therefore not surprising that the pilot on board *Grand Neptune* was unsure of the passenger ship's intentions. In addition, although *Costa Atlantica*'s course was progressively altered to port to pass close astern of *MSC Serena* and ahead of *Grand Neptune*, the rate of turn was incremental, and far too slow to be readily apparent either visually or by radar as required by Rule 8(b) of the COLREGS.

The safety of passengers is naturally of paramount importance to passenger cruise ships when altering course at speed, and the practice of turning using a 3nm radius appears to be a sensible precaution in this respect. However, this may not always be possible without causing confusion to the bridge teams of other vessels when operating in busy shipping lanes such as the Dover Strait. In such areas, a reduction in speed might allow greater flexibility to manoeuvre in accordance with the collision regulations while still ensuring the safety of passengers.

2.6 THE ASSESSMENT OF THE RISK OF COLLISION

Costa Atlantica was on a steady bearing with *Grand Neptune* soon after she entered the south-west lane (**Table 1**). However, this does not seem to have concerned her bridge team until the south-west bound vessel was at a range of 2.46nm with a CPA of 0.06nm (120 yards) in 4.4 minutes (**Figure 7**) when the second officer increased the rate of turn to port. Although this action increased the CPA and would have resulted in *Costa Atlantica* passing ahead of *Grand Neptune* at a distance of about 0.95nm, had the latter vessel maintained her course and speed, it was not readily apparent to the pilot on board *Grand Neptune*.

For an ARPA to display accurate information, a steady tracking state is required for 3 minutes. During this period, the course and speed of both target and own vessel must remain steady. In this case, as *Costa Atlantica* was gradually altering course to port from 0250 onwards, the accuracy of the target data for *Grand Neptune* would have possibly been reduced.

SECTION 3 - CONCLUSIONS

3.1 SAFETY ISSUES DIRECTLY CONTRIBUTING TO THE ACCIDENT WHICH HAVE NOT RESULTED IN RECOMMENDATIONS BUT HAVE BEEN ADDRESSED

1. The decisions and actions of the bridge team on board *Costa Atlantica* caused the pilot on board *Grand Neptune* to take avoiding action. [2.3]
2. The information on which *Costa Atlantica's* master based his decision to cross the south-west traffic lane was inaccurate. It was derived from the results of an ARPA radar 'trial manoeuvre' with which neither the master nor the OOW were familiar. [2.4]
3. The manoeuvring of *Costa Atantica* during the vessel's crossing of the south-west traffic lane was potentially confusing, and the intentions of her master were not readily apparent to other vessels. [2.5]
4. The bridge team on board *Costa Atlantica* were slow to appreciate the risk of collision with *Grand Neptune*. [2.6]
5. The bridge team on board *Costa Atlantica* did not appreciate the possible inaccuracy of ARPA data when manoeuvring. [2.6]

SECTION 4 - ACTION TAKEN

4.1 COSTA CROCIERE S.p.A.

Following the incident, the company carried out an internal investigation in which a number of issues were identified. To ensure similar incidents are avoided, it has:

- Issued a fleet-wide safety report to its vessels with a copy to Carnival Corporation. Following receipt of the report, the vessels are required to undertake a training session in which all the lessons learnt are to be discussed and implemented.
- Amended its SMS procedures, with particular reference to the bridge procedures. These now require:
 - The OOW to avoid passing less than 1nm ahead of another vessel in a crossing situation, and to pass other traffic at a safe distance.
 - The presence of an experienced bridge team when transiting potentially hazardous navigational areas.
 - Familiarity with the operation of all bridge control and navigational equipment by all bridge watchkeeping officers.
- All bridge watchkeeping officers, senior deck officers and masters serving on board vessels that trade in north European waters are required to attend a Bridge Team Management course by 1 July 2009.
- In line with Carnival Corporation's corporate standards, all bridge watchkeeping officers, senior deck officers and masters are required to have undertaken a Bridge Team Management course by 1 July 2011.

4.2 CARNIVAL CORPORATION PLC

On 1 July 2008 Carnival Corporation & PLC issued a Corporate Safety Standard requiring each of its operating lines within the Carnival Group to establish a programme to ensure that all masters and deck officers in charge of a navigational watch have successfully completed a BTM training course by 1 July 2011. In order to meet this requirement Carnival UK (Cunard Line, P&O Cruises and Ocean Village brands), is commissioning a bridge training simulator near Amsterdam, Netherlands, which is expected to be operational by March 2009, with the first course scheduled for May 2009. The courses will be accredited in accordance with IMO model course 1.22 – Ship simulator and bridge teamwork. Although priority will be given to Carnival UK lines, it is anticipated that the training centre will also be made available to other Carnival brands.

SECTION 5 – RECOMMENDATIONS

Due to the actions already taken as a result of this incident, the MAIB has issued no recommendations.

**Marine Accident Investigation Branch
November 2008**