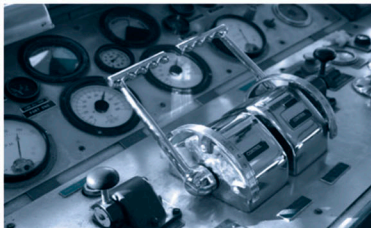
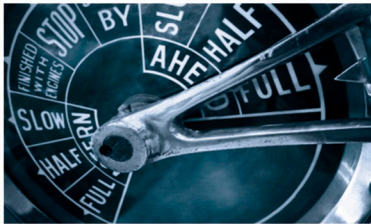
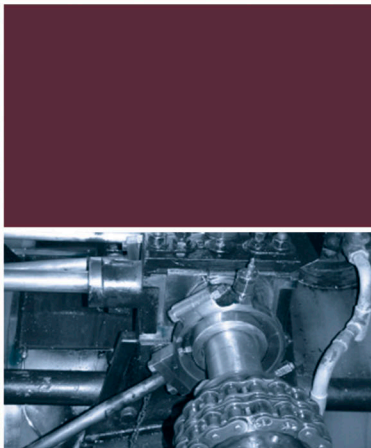


TECHNICAL REPORT A-30/2012

Investigation of the collision between high speed ferry MILENIUM DOS and bulk carrier NEW GLORY in the Straits of Gibraltar on 13 January 2012



GOBIERNO DE ESPAÑA

MINISTERIO DE FOMENTO

SUBSECRETARÍA

COMISIÓN PERMANENTE DE INVESTIGACIÓN DE ACCIDENTES E INCIDENTES MARÍTIMOS

Technical report

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NOTICE

This report has been drafted by the Standing Commission for Maritime Accident and Incident Investigations, CIAIM, regulated by article 265 of the consolidated text Law of the National Ports' (Puertos del Estado) and the Merchant Navy (Marina Mercante), and approved by Royal Decree 2/2011, dated 5 September and by Royal Decree 800/2011, of 10 June. Whose functions are:

1. To carry out the investigations and technical reports of all very serious maritime accidents in order to determine the technical causes that originated them and make recommendations for the purpose of implementing the necessary measures to prevent them from occurring in the future.
2. To carry out the technical investigation of serious accident and maritime incidents when lessons learned can be obtained for maritime safety and for preventing marine pollution from vessels, and to produce technical reports and recommendations on the same.

In accordance with Royal Decree 800/2011, the investigations will not be conducted to determine responsibilities or fault. However, CIAIM will report the causes of the maritime accident or incident even though from its results, the fault or responsibility of individuals or legal entities may be inferred. The drafting of the technical report will in no way pre-judge the decision that may fall upon the courts of law, nor will it seek the assessing of responsibilities or determination of culpabilities.

The investigation included in this report has been conducted with no other fundamental purpose than to determine the technical reasons that may have caused the maritime accidents or incidents and make recommendations for the purpose of improving maritime safety and the prevention of vessel pollution in order to prevent maritime accidents from occurring in the future.

Therefore, the use of the investigation results with any purpose other than the one described is subject in all cases to the aforestated premises and must not, therefore, prejudge the results obtained from any other report that, in relation with the accident or incident, may be initiated in accordance with current legislation.

The use made of this report for any purpose other than for the prevention of future accidents may lead to erroneous conclusions or interpretations.

COOPERATION AGREEMENT

This investigation has been conducted as per the cooperation agreement of 18 January 2012 between Spain and Marshall Islands relative to the maritime safety investigation of the collision between vessels NEW GLORY and MILENIUM DOS that occurred in the Straits of Gibraltar on 13 January 2012.



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GLOSSARY OF ABBREVIATIONS, ACRONYMS, SYMBOLS AND TERMS

AB	: <i>Able Bodied seaman.</i>
AIS	: <i>Automatic Identification System.</i> In Spanish, Sistema de Identificación Automática, and may also be listed as SIA.
ARPA	: <i>Automatic Radar Plotting Aids.</i>
CECEM	: Regional emergency coordination centre of the Ministry of the Interior.
TSS	: Maritime traffic separation scheme.
ECDIS	: <i>Electronic Chart Display and Information System.</i>
EVISEST	: Straits monitoring station from the Ministry of Defence.
MMSI	: <i>Maritime Mobile Service Identity.</i>
MSC	: <i>Maritime Safety Committee.</i>
IMO	: International Maritime Organization.
OS	: <i>Ordinary Seaman.</i>
Paris - MOU	: Paris Memorandum of Understanding on Port State Control (Paris MOU). A harmonized vessel inspection system for the purpose of ensuring that vessels operating at European and North Atlantic ports, comply with international safety and environmental requirements, as well as ensuring that the crew lives and works under the proper conditions.
RDT	: Trip data recorder.
COLREG	: Convention on the International Regulations for Preventing Collisions at Sea of 1972.
SASEMAR	: Spanish maritime safety and rescue agent.
SOLAS	: International Treaty for Safety and Human Life at Sea.
STCW	: <i>International Convention on Standards of Training, Certification and Watch-keeping.</i>
TMPA	: <i>Tangier-Med Port Authority.</i>
VHF	: <i>Very High Frequency.</i> Radio frequency range between 30 and 300 MHz. Among other things it is used for communications, warnings and emergencies.
VTS	: <i>Vessel Traffic System.</i>



Chapter 1. SUMMARY

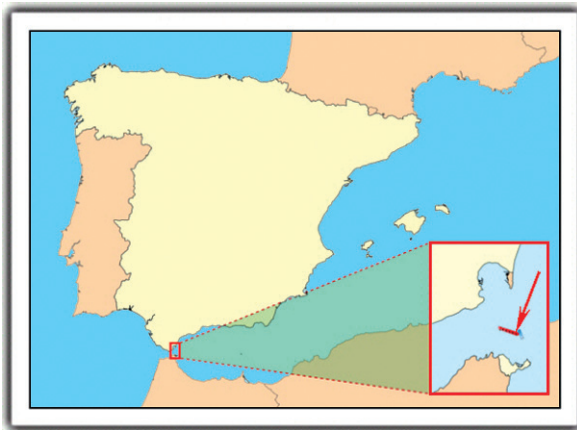


Figure 1. Location of the accident

At 19:59 local time in Ceuta on 13 January 2012, the high speed catamaran ferry MILENIUM DOS, which was in route between the Spanish ports of Algeciras and Ceuta and the bulk carrier vessel NEW GLORY, which was in route from Casablanca (Morocco) to Malta Free Port (Malta), collided in the Straits of Gibraltar at approximately 5 miles north of Ceuta.

During the collision a 26 m long and 6 m high hole was inflicted to the starboard side of ferry MILENIUM DOS, causing damage to the garage

deck, empty spaces 4, 5 and 6, and to two fuel tanks, which resulted in a fuel spill. The passenger deck only suffered minimal damages and the vessel stayed afloat.

Only six passengers needed medical attention due to injuries. One of the passengers had to be evacuated by helicopter to the university hospital of Ceuta due to an open fracture of the tibia and fibula on his right leg. No other serious injuries occurred and several days later, all the passengers were discharged.

There were no injuries to personnel on board the vessel NEW GLORY, which suffered minor damage to her bow.

At 02:00 hours on the 14th of January a tug was used to separate the vessels involved in the accident. Both vessels were able to navigate by their own means, although vessel MILENIUM DOS only had propulsion on her port side after the accident.

At 03:50 hours, vessel MILENIUM DOS docked at the port of Ceuta.

At 05:03 hours, vessel NEW GLORY anchored at the port of Ceuta's anchorage area.

* * *



Chapter 2. OBJECTIVE DATA

2.1. Vessel data

Table I. Main characteristics of the vessels

Vessel name	MILENIUM DOS	NEW GLORY
Flag country	Spain	Marshall Islands
Type	High speed ferry	Bulk carrier
Builder	Incat Tasmania Pty. Ltd.	Oshima Shipbuilding Co. Ltd.
Country where she was built	Australia	Japan
Year built	2003	2001
Classification company	Det Norske Veritas	China Classification Society
Hull material	Aluminium	Steel
Owner	Acciona Trasmediterránea, S.A.	Transmar Shipping Co.S.A.
Operator	MILLATRES 2003, S.L.	World Gates S.A.
IMO number	9237644	9244269
Call sign	ECCX	V70V4
MMSI	224239000	538003166
Port of Registry	Santa Cruz de Tenerife, Spain	Majuro, Marshall Islands
Length overall	97.220 m	189.330 m
Length between perpendiculars	81.600 m	180.600 m
Moulded Breadth	26.160 m	30.950 m
Moulded draught	3.192 m	10.650 m
Maximum draught	3.436 m	11.739 m
Depth to the main deck	7.693 m	16.400 m
Summer freeboard	1.391 m	4.660 m
Gross Tonnage (GT)	6554	26555
Net tonnage (NT)	2498	16450
Maximum number of passengers	866	Not applicable
Minimum safety crew	16	19
Total crewmembers	16	21
Propulsion	4 diesel engines and 4 waterjets in two engine rooms	Diesel engine with a conventional propeller
Maximum power	4 x 7080 kW	8600 kW
Maximum speed	38 knots	14.5 knots



Figure 2. High speed catamaran ferry MILENIUM DOS

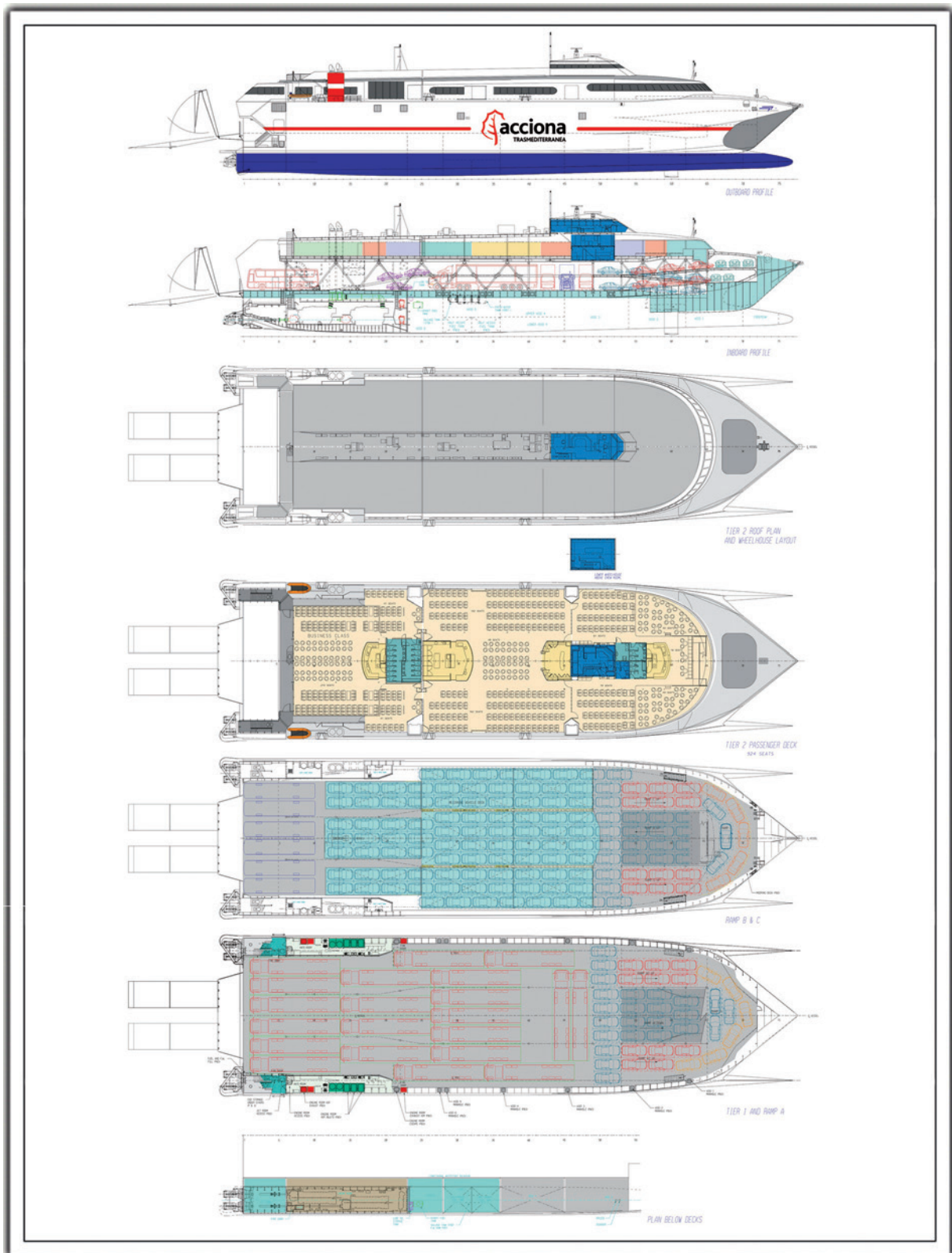


Figure 3. General arrangement of ferry MILENIUM DOS



Figure 4. Bulk carrier NEW GLORY

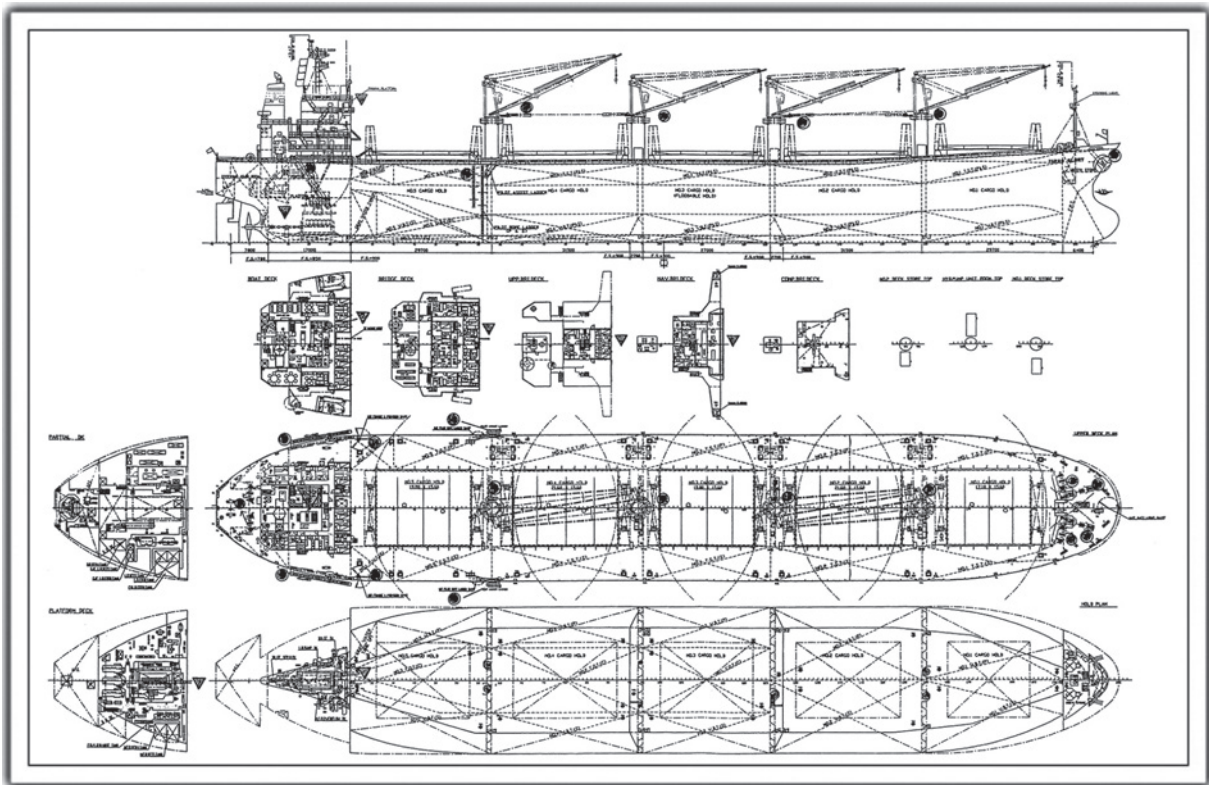


Figure 5. General arrangement of bulk carrier NEW GLORY



2.2. Details of the voyage

Table 2. Details of the voyage

Vessel name	MILENIUM DOS	NEW GLORY
Port of departure	Algeciras, Spain	Casablanca, Morocco
Port of destination	Ceuta, Spain	Malta Freeport, Malta
Type of trip	National	International
Information relative to the load	37 cars 2 motorcycles 1 pet (not included in the boarding control 1 trailer and 3 platforms)	43634 t of phosphate rock in bulk
Passengers	185 passengers	Not applicable
Crew	16	21
Certificates and documentation	In order	In order

2.3. Information relative to the maritime accident

Table 3. Information relative to the maritime accident

<i>General Information</i>			
Date and time	13 January 2012, 19:59 hours local in Ceuta		
Type of maritime accident	Collision - Serious		
Location of the accident	Straits of Gibraltar - 35°59,19'N 005°20,24'W		
Outside environment	Wind	Direction	E
		Average speed	10 knots
		Force	Beaufort 3
	State of the sea	Smooth waves	
Visibility	Good. Night.		
<i>Specific information</i>			
Vessel name	MILENIUM DOS	NEW GLORY	
Damaged area of the vessel	Centre of the vessel - Starboard	Bow	
Deceased	0	0	
Injured	6 + suffered contusions	0	
Damages	(Figure 6) Important damage to the centre of the vessel on her starboard side, from frame 22 to 43 (26 m) and vertically from the garage deck to the passenger deck (6 m). Damage to starboard empty spaces 5 and 6 and the high part of space 4. Damage to the starboard fuel tanks under empty space 5, causing an undetermined fuel leak into the ocean.	(Figure 7) Damage to the port bow, from hatch 1 to midway to the bow. Bent handrail, ventilation torn out, damage to the platform and the flag post was knocked down. Capstan and stopper bent. Port deck dented.	



Table 3 (Continuación). Information relative to the maritime accident

<i>Specific information (Continued)</i>		
Environmental impact	Fuel spill of a non-determined amount.	Not detected
Vessel operation	Normal service, crossing the traffic separation scheme	Normal service, in the traffic separation scheme
Trip segment	Navigation	Navigation
Persons on board	201	21
Passengers	185	Not applicable
Crew	1 Master 1 First Officer 1 First Engineer 1 Second Engineer, 1 Boatswain 4 AB Seamen 1 Oiler 2 Shipboard Attendants 4 Temporary Shipboard Attendants	1 master 1 First Officer 1 Second Officer 1 Third Officer 1 Chief Engineer 1 First Engineer 1 Second Engineer 1 Fourth Engineer 1 Electrician 1 Boatswain 3 AB Seamen 2 OS Seamen 3 Oilers 1 Cook 2 Waiters
Cargo	37 cars 2 motorcycles 1 mascot (not included in the boarding control 1 trailer and 3 platforms)	43634 t of phosphate rock in bulk
Did she sink?	No	No
Did she have to be towed?	No	No



Figure 6. Damage to vessel MILENIUM DOS



Figure 7. Damage to vessel NEW GLORY

**2.4. Involvement of the authorities on shore
and the emergency services response****Table 4** Involvement of the authorities on shore and the emergency services response

Entities that participated in the emergency	<ul style="list-style-type: none"> – Tarifa Maritime Rescue Coordination Centre (Tarifa Traffic) – Tangier Maritime Rescue Control Centre (Tangier Traffic) – Madrid Maritime Rescue Coordination Centre – Rabat Maritime Rescue Coordination Centre – Algeciras Maritime Rescue Coordination Centre – Tarifa Straits Monitoring Station – Ceuta Straits Monitoring Station – Ceuta Maritime Authority – Algeciras Maritime Authority – Civil Guard Services Operations Centre of Algeciras – Civil Guard Services Operations Centre in Ceuta – Customs Surveillance Service – CECEM of Cádiz – Emergency Services from the Autonomous City of Ceuta – Ceuta Heliport owned by AENA S.A. – Spanish Red Cross – National Police – University Hospital of Ceuta – Gibraltar Port Authority – Port Authority of the Tangier-Med Port
Resources used during the emergency	<ul style="list-style-type: none"> – SASEMAR resources: <ul style="list-style-type: none"> SALVAMAR GADIR rescue vessel LUZ DE MAR tug boat HELIMER 206 rescue helicopter SALVAMAR ALKAID rescue vessel SALVAMAR DUBHE rescue vessel – Resources from the Customs Surveillance Service: <ul style="list-style-type: none"> ALCOTAN II patrol vessel – Civil Guard resources: <ul style="list-style-type: none"> GCM 18 patrol vessel – Private tug boats: <ul style="list-style-type: none"> V.B. VICENTA C
Response time	<ul style="list-style-type: none"> – Time it took for the rescue units to arrive after the accident: <ul style="list-style-type: none"> HELIMER 206 helicopter: 29 minutes SALVAMAR GADIR vessel: 54 minutes – The rescue was completed 8 hours after the accident.
Actions taken	<ul style="list-style-type: none"> – The rescue vessels and helicopter were dispatched to the location of the accident. – HELIMER 206 helicopter checked the condition of the vessels and detected contamination in the area. – HELIMER 206 helicopter evacuated the passenger who had broken a leg. – LUZ DE MAR tug boat attempted to separate the vessels by pulling from the NEW GLORY's bow. – The NEW GLORY's forepeak was ballast. – LUZ DE MAR tug boat once again pulled from the NEW GLORY's bow and was able to separate the vessels.
Obtained results	<ul style="list-style-type: none"> – The vessels were separated and returned to Ceuta by their own means.

* * *



Chapter 3. DETAILED DESCRIPTION

3.1. Chronology of the events

In the following chronology of events, the start times of the paragraphs equate to the local time in Ceuta.

3.1.1. *AEvents that occurred prior to the accident. 13 January 2012*

04:00 Vessel NEW GLORY departed from the port of Casablanca (Morocco) with the pilot on board.

04:42 The Pilot disembarked from vessel NEW GLORY.

17:42 Vessel NEW GLORY contacted Tangier Traffic on VHF channel 69. Her course was approximately 052° and then turned to 085° in order to proceed using the Straits of Gibraltar traffic separation scheme.

17:44 Vessel NEW GLORY was inside the Straits of Gibraltar traffic separation scheme and according to RDT records, she was navigating in manual mode with the autopilot disconnected.

19:00 This was the time scheduled for vessel MILENIUM DOS to depart from the port of Algeciras for her third trip of the day.

19:05 Vessel NEW GLORY was abeam to Tarifa at position 35°55,2'N 005°35,2'W.

19:15 Vessel MILENIUM DOS closed her doors, removed the gangway and cast off the mooring lines. The Master reported the departure from the port to the Algeciras Pilots via VHF channel 13. Inside the port, the vessel reached a speed of 9.0 knots.

The ARPA in band S that was located at the First Officer's station was not activated because that day, the sea conditions and the visibility were optimum and

the Master considered that visual surveillance, the ARPA on band X at the Master's station and the ECDIS were sufficient for navigation. Two safety rings at 0.5 and 2 miles were marked in the ARPA that was active but its alarms were disconnected.

19:30 Vessel MILENIUM DOS reported to the Algeciras Maritime Rescue Centre that they were outside the port using VHF channel 74. The Master increased the speed to 15 knots.

19:34 Vessel MILENIUM DOS crossed parallel 36°008,6' N and then increased her speed to 25 knots, setting course 165° to Ceuta. At that moment the vessel was placed in the automatic steering mode. The master checked the position of passenger vessel PASSIÓ PER FORMENTERA in the ECDIS. Both vessels had the same course set but were at a sufficient distance from each other as to not meet prior to arriving to Ceuta and therefore, the Master decided to maintain the speed.

19:45 On the ECDIS, the Master from MILENIUM DOS located high speed ferry JAUME I, who was approaching head on but clearly passing by the starboard side of vessel MILENIUM DOS. It was not possible to see vessel JAUME I and the First Officer from the MILENIUM DOS focussed on locating her visually and controlling her trajectory.

19:53 The crossing occurred between vessels NEW GLORY and JAUME I. Vessel JAUME I crossed by the bow of vessel NEW GLORY, which they were able to see on their port side.

19:56 Vessel JAUME I passed head on at 0.3 miles starboard of vessel MILENIUM DOS. The First Officer of vessel MILENIUM DOS completed the visual monitoring of the position of vessel JAUME I.



In his ARPA, the Watch Officer from vessel NEW GLORY entered vessel MILENIUM DOS, who was about to enter the safety zone of 1.5 miles, which they had marked in a safety ring. The MMSI of vessel MILENIUM DOS appeared on the equipment but no additional information was available. The First Officer of vessel NEW GLORY visually located vessel MILENIUM DOS, which was approaching at a speed of 25.4 knots; however, he was not able to see her name.

19:57 Information from vessel MILENIUM DOS appeared on NEW GLORY's AIS.

The First Officer of vessel NEW GLORY instructed the AB seaman, who was in the wheelhouse next to the port wing door waiting to be relieved, to grab the signal lamp, go out on the port wing and alert the other vessel.

19:58 The Master of vessel NEW GLORY gave the command to veer full starboard. Ten seconds later the rudder was full to the side but due to the vessel's inertia, the bow did not begin to appreciably veer to starboard until 30 seconds after the command had been given.

19:59 The First officer of vessel MILENIUM DOS suddenly saw NEW GLORY's port crane on the starboard side and sounded the alarm. The Master switched the autopilot to manual mode and positioned the rudder full port in an attempt to avoid the collision. Fifteen seconds later the collision occurred between vessels MILENIUM DOS and NEW GLORY.

Faced with this dangerous situation one of the passengers, who was sitting on the sofa that was located forward of the wheelhouse, decided to return to the passenger deck and fell down the access stairs from the wheelhouse when the vessels collided. As a consequence of the fall, he suffered an open fracture of the tibia and fibula on his right leg. This passenger was the person who usually carried out the calibration of the vessel's magnetic compass.

3.1.2. Events that occurred after the accident 13 January 2012

During the minutes after the accident, the crews of both vessels contacted traffic and rescue services of Tarifa and Tangiers, who assessed the damages caused to the vessels and organized the rescue operations.

The most significant events that occurred during these hours were the following:

20:00 The master of vessel NEW GLORY warned of the collision via VHF channel 16. Then, he called vessel FRISIA LUBECK to inform them that their vessel had collided. The Master of vessel FRISIA LUBECK responded by stating that they were anchored and had not collided with anything. The Master of vessel NEW GLORY contacted Tangier Traffic on VHF channel 69.

The crew of MILENIUM DOS stopped the engines.

20:02 After several attempts, the First Officer of vessel MILENIUM DOS contacted Tarifa Traffic on VHF channel 10.

The Master of vessel NEW GLORY also contacted Tarifa Traffic.

The First Engineer of MILENIUM DOS went down to the garage and to the engine to assess the damage.

The master of vessel MILENIUM DOS went down to the garage on the port side, where he noticed that the fire protection door was deformed. Once in the garage, he could see the bow of vessel NEW GLORY and was able to read the lettering on its hull.

The crew of vessel NEW GLORY began to check the damage and probe the tanks.

20:03 The crew of vessel NEW GLORY made a security copy of the ship's RDT data.

20:04 The Master of vessel MILENIUM DOS went up to the passenger deck to calm the



- passengers. The passengers had taken the initiative to don their life vests.
- 20:07 The First Officer of vessel MILENIUM DOS informed Tarifa Traffic that one of the passengers had been injured.
- 20:08 Tarifa Traffic sent rescue helicopter HELIMER 206 to the scene of the accident and mobilized rescue vessel SALVAMAR GADIR.
- 20:10 The Shipboard Attendant's Supervisor of vessel MILENIUM DOS made a PA announcement to calm the passengers.
- 20:16 The Master of vessel MILENIUM DOS informed Tarifa Traffic that one of the passengers had broken his leg and was being treated by another passenger, who was a nurse.
- 20:25 The First Engineer and the Second Engineer of vessel MILENIUM DOS went up to the wheelhouse to report regarding the damage. Then, the Second Engineer went down once again to disconnect and shutdown all the equipment inside the starboard engine room and leave the port engine room operational.
- 20:28 Rescue helicopter HELIMER 206 arrived at the scene of the accident and after assessing the situation, informed Tarifa Traffic of the damage they had observed.
- 20:32 The Master of vessel MILENIUM DOS asked Tarifa Traffic to evacuate the injured passenger.
- 20:35 Rescue vessel SALVAMAR ALKAID departed towards the scene of the accident.
- 20:36 Civil Guard patrol vessel GCM 18 headed towards the scene of the accident.
- 20:50 Tangier Traffic issued a SECURITÉ warning due to collision for the Straits of Gibraltar.
- 20:53 The evacuation of the passenger with the broken leg began from vessel MILENIUM DOS, with the assistance of the crew.
- 20:54 Tug boat LUZ DE MAR departed towards the scene of the accident.
- 21:12 The crew of vessel MILENIUM DOS informed Tarifa Traffic that they had person with an injured finger on their right hand.
- 21:25 Helicopter HELIMER 206 landed at Ceuta heliport with the injured passenger, who was then transported to the University Hospital of Ceuta.
- 21:31 After receiving and evaluating all the information of the damages to both vessels, the Chief Inspector from the maritime Authority of Algeciras recommended separating the vessels in order for them to proceed to Ceuta. The Harbour Master of Algeciras authorized the vessel separation manoeuvre.
- 21:45 Rescue vessel SALVAMAR DUBHE departed towards the scene of the accident.
- 21:56 The manoeuvre was started to get a tow line from tug LUZ DE MAR to vessel NEW GLORY.
- 22:37 The tow line from T/V LUZ DE MAR was tied to the bow of vessel NEW GLORY and the first attempt to separate the vessels was carried out. Vessel LUZ DE MAR began pulling from the NEW GLORY's bow, which had her engines shut-down.
- 22:50 The tow line provided for vessel NEW GLORY broke.
- 22:58 The crew of vessel MILENIUM DOS made a security copy of the ship's RDT data.
- 23:10 The manoeuvre was started to get another tow line from the bow of tug LUZ DE MAR to the vessel NEW GLORY.
- 23:53 The tow line from T/V LUZ DE MAR was again tied to NEW GLORY's bow.



3.1.3. *Events that occurred after the accident* *14 January 2012*

00:31 To facilitate separating the vessels, NEW GLORY's forepeak was filled.

01:50 Vessel NEW GLORY reported the forepeak ballast at 50%.

Vessel NEW GLORY placed her engines in reverse to facilitate the separation of the vessels.

Tug boat LUZ DE MAR pulled from NEW GLORY's starboard quarter.

02:06 Vessel NEW GLORY completely separated from MILENIUM DOS's hull.



Figure 8. Moment when the vessels were separated

02:10 Vessel MILENIUM DOS continued its trip to Ceuta at minimum governing speed and escorted by tug boat V.B. VICENTA C.

02:20 Vessel NEW GLORY headed for Ceuta, where she was assigned an anchoring spot at the north anchoring area.

03:50 Vessel MILENIUM DOS docked on the starboard side of her docking pier at the port of Ceuta. The gangway was positioned and the passengers and garage vehicles were disembarked.

05:03 Vessel NEW GLORY completed the anchoring manoeuvre.

06:00 The docking pier switching manoeuvre for vessel MILENIUM DOS was initiated.

06:10 Vessel MILENIUM DOS was docked in her new position at the port of Ceuta and an anti-contamination perimeter was set up around her.

Throughout the day of the 14th of January 2012, personnel from the Maritime Authority of Ceuta conducted a Paris - MOU inspection of vessel NEW GLORY and found that everything was in order, with the exception of minor deficiencies.

3.1.4. *Events that occurred after the accident* *16 January 2012*

09:58 Vessel MILENIUM DOS departed from Ceuta with destination to Gibraltar, navigating by her own means and escorted by tug boat SERTOSA 21.

12:03 Vessel MILENIUM DOS was 3 miles south of Europa Point and reported that her new destination was the port of Algeciras.

14:02 Vessel MILENIUM DOS docked at Algeciras, in her normal docking spot at the pier of Isla Verde.

3.1.5. *Events that occurred after the accident* *17 January 2012*

15:00 Vessel NEW GLORY received authorization from the Maritime Authority of Ceuta to continue her voyage.

21:00 Vessel MILENIUM DOS departed from Algeciras with destination to the Gibdock shipyard in Gibraltar, navigating there by her own means.

23:00 Vessel MILENIUM DOS was docked at Gibdock shipyard in Gibraltar.

3.2. *Details of the investigation*

This investigation has been conducted within the framework of an agreement between Spain and Marshall Islands in accordance with the accident investigation code adopted by IMO resolution MSC.255(84).



On 17 January 2012 two CIAIM investigators inspected vessel NEW GLORY, which was anchored at the port of Ceuta, and interviewed the following crewmembers: The Master, the first Officer, the Chief Engineer, the AB Seaman that was on watch during the accident and the bartender that was in the wheelhouse.

On 18 January 2012, two investigators from CIAIM interviewed the following crewmem-

bers from vessel MILENIUM DOS in Algeciras. The Master, the First Officer, the First Engineer, the Second Engineer and the Shipboard Attendant Supervisor.

On 19 January 2012, two investigators from CIAIM and one investigator from Marshall Islands visited vessel MILENIUM DOS at the Gibdock shipyard in Gibraltar.

* * *



Chapter 4. ANALYSIS

4.1. Analysis of the manoeuvres and operations that were carried out

Figure 9 shows the headings of vessels MILENIUM DOS and NEW GLORY, highlighting the positions they were in during the 15 minutes prior to the accident. In the figure we can see how both vessels maintained almost constant courses.

- Vessel MILENIUM DOS practically did not vary her course.
- Vessel NEW GLORY turned starboard a minute prior to the accident.
- The dotted silhouette of the vessel shows the positions that vessel NEW GLORY would have had if she had not changed course. In this case, probably vessel NEW GLORY would not have collided with vessel MILENIUM DOS; instead, she would have passed very close to the MILENIUM DOS's bow.

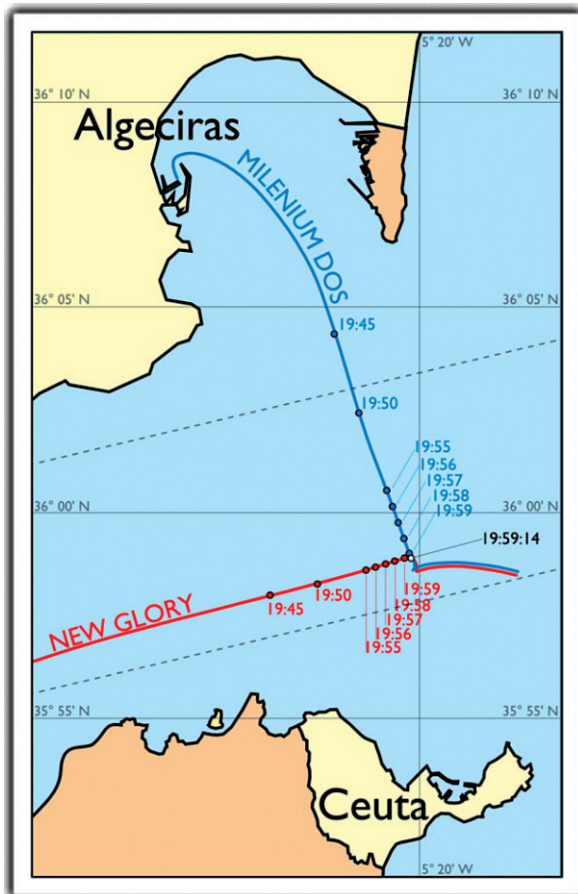


Figure 9. Trajectories of vessels MILENIUM DOS and NEW GLORY

Figure 10 shows a more detailed graph of the manoeuvres carried out by both vessels during the last minute prior to the collision. In this graph we can see the following:

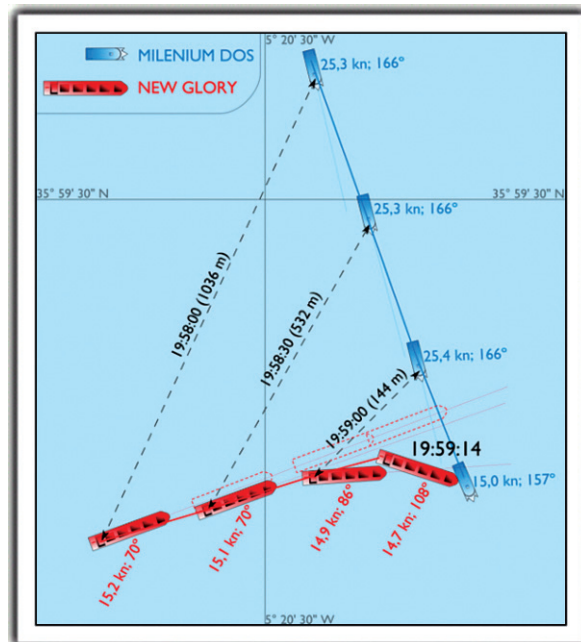


Figure 10. Positions of vessels MILENIUM DOS and NEW GLORY during the last minute prior to the collision

The graph of figure 11 represents the values of the courses and speeds of both vessels during the 15 minutes prior to the collision. From the analysis of this data we can conclude the following:

- Neither of the vessels decreased their speed until the moment of the collision.



Investigation of the collision between high speed ferry MILENIUM DOS and bulk carrier NEW GLORY in the Straits of Gibraltar on 13 January 2012

- Vessel MILENIUM DOS did not manoeuvre until 15 second prior to the accident by turning port.
- Vessel NEW GLORY did not manoeuvre until 1 minute prior to the accident by turning star-board.

This data coincides with the statements provided by the crewmembers.

In addition to the previous data obtained from the vessel's AIS and RDT equipment, the following information has been obtained:

- The Master and First Officer to vessel MILENIUM DOS stated that they did not see vessel NEW GLORY until 15 seconds prior to the accident and at that moment, they manoeuvred to port as quickly as possible. This fact is confirmed by the sound recording of the wheelhouse by the RDT.

At this point the following is worth mentioning:

- Even though they did not see the other vessel, this vessel did clearly appear on the ARPA screen that was recorded by the RDT.
- It has been confirmed that the navigation lights of vessel NEW GLORY were visible from the wheelhouses of other vessels that were navigating in the area at that time.

- The Watch Officers in the wheelhouse of vessel NEW GLORY did not warn of the danger via radio, nor did vessel MILENIUM DOS or Tangier Traffic.
- The Watch Officers on the wheelhouse of vessel NEW GLORY had difficulty in identifying vessel MILENIUM DOS. The data of vessel MILENIUM DOS appeared in the vessel's equipment about two minutes prior to the accident; however, they thought they had collided with vessel FRISIA LUBECK.
- The first Officer of vessel NEW GLORY ordered an AB seaman to alert the other vessel using signal lights from the port wing two minutes prior to the accident.

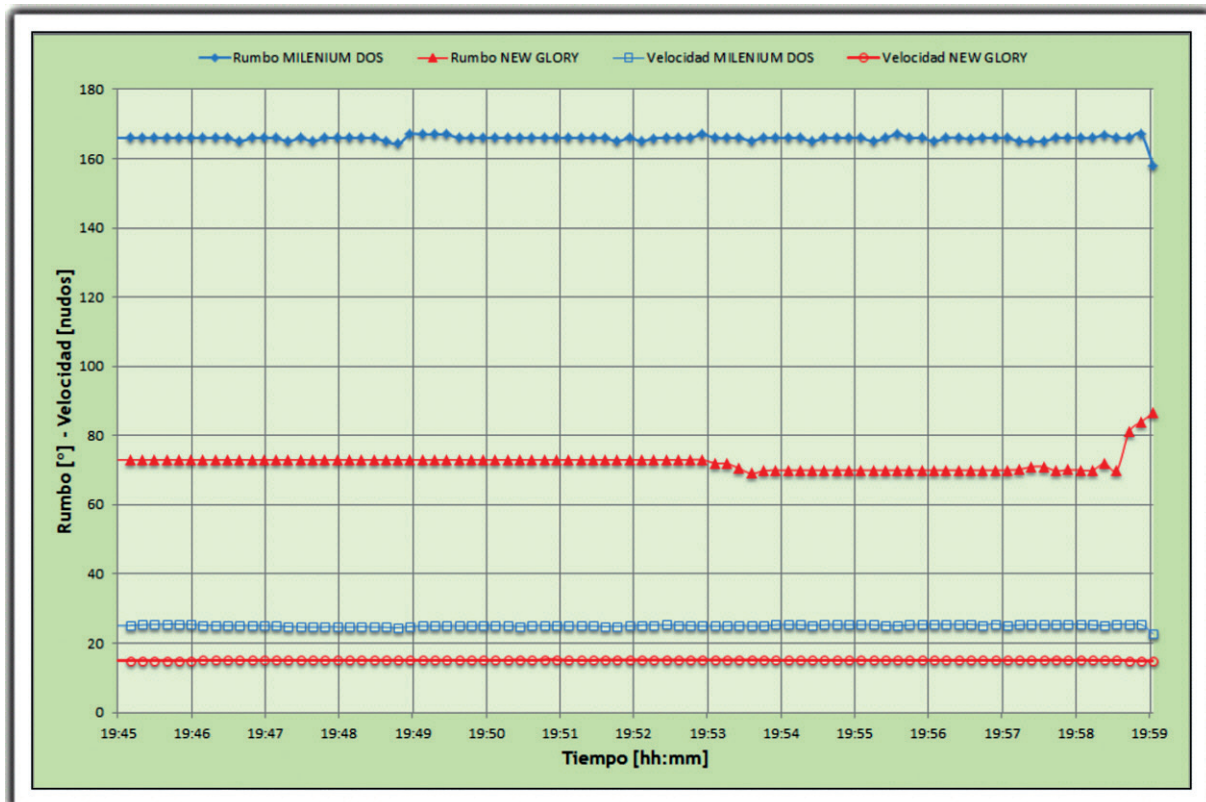


Figure II. Courses and speeds of vessels MILENIUM DOS and NEW GLORY during the fifteen minutes prior to the collision



It is worth mentioning that it has not been confirmed that other vessels that were navigating in the area at the time saw the warning signal lights.

4.2. Analysis of the risk of collision

Rule 7 of the COLREG states: *“In determining if risk of collision exists the following considerations shall be among those taken into account:*

- i) *Such risk shall be deemed to exist if the compass bearing of an approaching vessel does not appreciably change.*
- ii) *Such risk may sometimes exist even when an appreciable bearing change is evident, particularly when approaching a very large vessel or a tow or when approaching a vessel at short range.”*

Until two minutes prior to the collision, the heading did not appreciably change and therefore the risk of collision was evident and vessel MILENIUM DOS should have manoeuvred.

However, as has already been explained, had the vessels continued at the speeds and courses they had two minutes prior to the collision, the accident would probably not have occurred.

4.3. Analysis of compliance with International Regulations for Preventing Collisions, 1972 (COLREG)

Compliance with the COLREG will be analysed with emphasis on the following criteria: Lookout, safe speed, risk of collision, manoeuvres to avoid collisions, crossing situations, manoeuvring of the yielding vessel, manoeuvring of the stand on vessel and manoeuvre and warning signals.

4.3.1. Lookout

In accordance with rule 5: *“All Vessels will at all times maintain an efficient visual and auditory lookout using all the means available and appropriate to the circumstances and conditions at the moment in order to completely assess the situation and the risk of collision.”*

The Master and First officer of vessel MILENIUM DOS did not maintain said lookout and did not become aware of a risk of collision until 15 seconds prior to the accident occurring.

The Watch Officers on the wheelhouse of vessel NEW GLORY did not maintain an active and efficient lookout enough in advance to allow them to prevent the accident by efficiently evaluating the risk of collision. Even though it has been accredited that the officers in the wheelhouse of vessel NEW GLORY carried out procedures aimed at preventing the accident, these procedures were not carried out with enough in advance to avoid the collision.

Vessel NEW GLORY did not carry the lookout required by the STCW when navigating in manual mode.

4.3.2. Crossing situation

In accordance with rule 15: *“When two power driven vessels are crossing so as to involve risk of collision, the vessel which has the other on her starboard side shall keep out of the way and shall, if the circumstances of the case admit, avoid crossing ahead of the other vessel”.*

Therefore, in this case it was vessel MILENIUM DOS that should have yielded and turned starboard to pass by vessel NEW GLORY’s bow.

4.3.3. Risk of collision

In accordance with rule 7 a): *“Every vessel shall use all available means appropriate to the prevailing circumstances and conditions to determine if a risk of collision exists. If there is any doubt such risk shall be deemed to exist.”*

The Master and First Officer of vessel MILENIUM DOS broke this rule since:

- One of the ARPA units was disconnected.
- The safety ring alarms of the ARPA unit that was operating had been disabled.

In accordance with rule 7 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 Master and First Officer of vessel MILENIUM DOS broke this rule for the same reasons as they had broken the previous rule.

The Watch Officers that were in the wheelhouse of vessel NEW GLORY broke this rule since they were not able to properly enter vessel MILENIUM DOS in their unit.

4.3.4. *Manoeuvres to prevent the collision*

In accordance with rule 8 c): “If there is enough room, the manoeuvre to only change the course may be the most efficient to prevent a situation of excessive approximation as long as it is carried out enough in advance, it is considerable, and does not result in a new excessive approximation situation.”

In this case the manoeuvres were not executed enough in advance by either vessel.

In accordance with rule 8 e): “If necessary for the purpose of preventing the collision or in order to have more time to study the situation, the vessel will reduce her speed or completely cease her propulsion and stop or even reverse her engines.”

In this case vessel NEW GLORY did not reduce her speed nor did she cease propulsion.

Vessel NEW GLORY was required to maintain her course and speed in accordance with rule 17 a) of the COLREG until it became evident that vessel MILENIUM DOS was not acting according to the rules. Although no objective criteria exists to accurately determine the moment in which vessel NEW GLORY should have manoeuvred in compliance with Rule 17 a) ii), this Commission considers that vessel NEW GLORY should have manoeuvred sooner.

4.3.5. *Manoeuvring of the yielding vessel*

In accordance with rule 16: “All vessels are required to maintain themselves away from another vessel’s course; vessels will manoeuvre as

required, with enough anticipation and decision in order to remain clear of the other vessel.

Under the circumstances of the accident, vessel MILENIUM DOS, who should have yielded, broke this rule.

4.3.6. *Manoeuvring of the stand on vessel*

In accordance with rule 17 c): “A power driven vessel which takes action in a crossing situation to avoid collision with another power driven vessel shall not alter course to port for a vessel on her own port side.”

The Master of vessel NEW GLORY followed this rule and turned starboard. However, by doing so he achieved the opposite as desired since he came even closer to the side of vessel MILENIUM DOS, which they would have probably passed extremely close by her bow if they had not manoeuvred as can be seen in figure 10.

4.3.7. *Manoeuvre and warning signals*

In accordance with rule 34 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 will immediately indicate such doubt by giving at least five short and rapid blasts of the whistle. Such signal may be supplemented by at least five short and rapid flashes.”

Vessel NEW GLORY did not give any acoustic signal and therefore did not follow this rule.

4.4. *Analysis of the RDT data*

Both vessels had RDT units capable of recording the following data:

- Date and time
- Latitude and longitude
- Speed and course
- Sound at the wheelhouse and communications
- Radar data



- Main alarms
- Commands to the rudder and its reaction
- Commands to the engine and its reaction

4.4.1. Vessel MILENIUM DOS

The Master and First Officer of vessel MILENIUM DOS made a safety copy of the RDT data on 13 January 2012 at 22:58n hours, 3 hours after the accident during the rescue operations. The safety copy recorded the data relative to 12 hours prior to the accident.

On 14 January 2012 the data recorded in the RDT safety copy was extracted and were partially copied on a CD, where the data recorded by the RDT from 19:49 to 22:58 hours on 13 January 2012 was recorded. In this case the images on the active ARPA screen were captured every 15 seconds. No images are available of the ARPA unit in band S because it was turned off during the navigation.

From the analysis of the RDT data, the following facts are worth mentioning:

- The ARPA images clearly show the echo of vessel NEW GLORY.
- At the moment of the accident, the Officers at the wheelhouse of vessel MILENIUM DOS were talking about subjects other than the navigation.
- Regarding the messages broadcast via the PA to the passengers as recorded in the RDT, all of them were made by the shipboard Attendants Supervisor and were the following:
 - At 20:10 hours: “May I have your attention please. We would like for the passengers to please remain calm. We have collided with a small ship. We are awaiting instructions from the Maritime Authority. Please remain in your seats and wait for instructions. Thank you.”
 - At 20:15 hours: “May I have your attention please. We ask that you please remain calm and seated and follow the instruction provided by the crew”. This message was repeated one minute later in French and in Spanish.
 - At 20:17 hours: “May I have your attention please. We would like to know if there is a doctor on board and if they would be so kind as to contact any member of the crew”.

- At 21:49 hours: “May I have your attention please. The vessel is going to be separated. We ask that you please go to the ship’s bow. Follow the instruction provided by the crew.”

- No PA announcement was made at 22:37 hours at the moment in which the first attempt to separate the vessels was to begin.
- We have been able to verify that the crew remained calm and organized at all times after the accident.

4.4.2. Vessel NEW GLORY

The Master of vessel NEW GLORY made a security copy of the RDT data on 13 January 2012 at 20:30 hours, shortly after the accident. The safety copy recorded the data relative to 12 hours prior to making the recording.

On 14 January 2012 the data contained in the security copy of the RDT was extracted and two videos were generated; one of them with the AIS images and the other one with the images of the screen representing the numeric navigation data. Both videos contain data from between 19:55 and 20:03 hours of 13 January 2012.

Images of the AIS screen captured every two seconds are available.

From the analysis of the RDT data it is worth mentioning that these confirm the difficulty in identifying vessel MILENIUM DOS and that the crew did not make any calls alerting of the risk of collision.

4.5. Analysis of the visibility from vessel MILENIUM DOS

One of the most significant facts in the investigation is that the Officers of vessel MILENIUM DOS did not see vessel NEW GLORY until 15 seconds prior to the collision, even though there is proof that her echo appeared in the ARPA of vessel MILENIUM DOS and that vessel NEW GLORY has her navigation lights on.



The Master of vessel MILENIUM DOS stated that the visibility was good and that they had more faith in visual lookouts than in the navigation aids, in which sometimes small vessels were difficult to detect. This would explain why they did not pay attention to the echo of vessel NEW GLORY on the ARPA.

Several hypotheses that would explain why the crew of vessel MILENIUM DOS did not see the navigation lights of vessel NEW GLORY are provided and analysed below:

- 1st hypothesis: That vessel NEW GLORY had her navigation lights turned off or they were not bright enough.
- 2nd hypothesis: That vessel NEW GLORY was hidden behind another object or was not in the line of sight of vessel MILENIUM DOS.
- 3rd hypothesis: That light pollution was present in the area, which would have caused the

crew of MILENIUM DOS to mistake the navigation lights of vessel NEW GLORY for coastal lights.

- 4th hypothesis: That the crew of vessel MILENIUM DOS would have been busy with another issue, which would have prevented them from becoming aware of the position of vessel NEW GLORY.

These hypotheses will be analysed individually below.

4.5.1. 1st Hypothesis. That vessel NEW GLORY had her navigation lights turned off or they were not bright enough.

This hypothesis is not accepted since other vessels that were in the area at that time stated that they saw the navigation lights of vessel NEW GLORY.

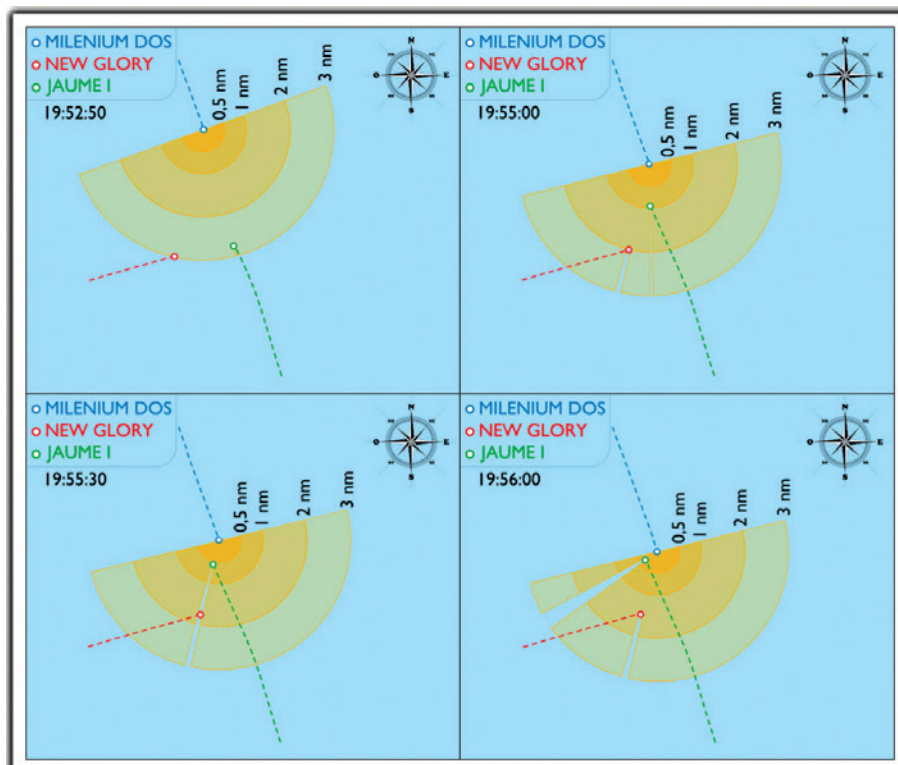


Figure 12. Positions relative to vessels NEW GLORY, MILENIUM DOS and JAUME I, and blind areas as viewed from vessel MILENIUM DOS



4.5.2. 2nd hypothesis: That vessel NEW GLORY was hidden behind another object or was not in the line of sight of vessel MILENIUM DOS

In this case, it is worth analysing if vessel JAUME I was blocking the view of vessel NEW GLORY, preventing the crew of vessel MILENIUM DOS from seeing her. Figure 12 represents four position relative to vessels NEW GLORY, MILENIUM DOS and JAUME I, as well as the blind areas as viewed from vessel MILENIUM DOS.

In accordance with figure 12, the following is concluded:

- At 19:52:50 hours, vessel NEW GLORY was located 3 miles away from vessel MILENIUM DOS, distance from which the crew of vessel MILENIUM DOS had to see NEW GLORY's navigation lights. At this moment vessel JAUME I was not located between both vessels.
- At 19:55:00 hours vessel NEW GLORY was located 2 Miles away from vessel MILENIUM DOS. Vessel JAUME I was located 1 mile away from vessel MILENIUM DOS and did not block the view of vessel NEW GLORY.
- At 19:55.30 hours, vessel JAUME I was between vessels MILENIUM DOS and NEW GLORY, blocking the view of the later from MILENIUM DOS.
- The previous situation only lasted for several seconds and at 19:56.00 hours, vessel JAUME I passed head on at 0.3 nautical miles from the starboard side of vessel MILENIUM DOS.

4.5.3. 3RD hypothesis: That light pollution was present in the area

The area of Ceuta, which was visible behind vessel NEW GLORY from MILENIUM DOS, is normally highly illuminated and some vessel Masters that navigate in the area have stated that sometimes the coastal lights can be confused with that of vessels and vice versa. However, normally these types of mistakes do not last very long because the lights from vessels move and those on land remain fixed.

4.5.4. 4th hypothesis: That the crew of MILENIUM DOS was busy with some other issue

Several psychological studies show that when a person is carrying out a task or attending other objects, he may stop perceiving objects that are in his view. This phenomenon is known as inattentive blindness.

In this accident it is possible than the Officers of vessel MILENIUM DOS did not see the position of vessel NEW GLORY, which was in their line of sight, because they were paying more attention to other issues or objects. Shortly prior to the accident the attention of the officers on the wheelhouse of vessel MILENIUM DOS was focussed on:

1. The conversation they were having relative to matters not related with the navigation.
2. The head on situation encountered with vessel JAUME I. This occurred on the starboard side and two weeks prior to the accident, Tarifa Traffic had called the attention of the crews of vessels MILENIUM DOS and JAUME I because during a head on situation, clear manoeuvres had not been executed and the vessels had passed just a short distance from each other.

4.6. Traffic control in the Straits of Gibraltar

IMO resolution MSC.300(87) was adopted on 17 May 2010, which modified the required notification system for vessels in the Straits of Gibraltar. This resolution, which came into effect at 00:00 UTC on 1 December 2010, establishes the following:

- Vessels navigating westward should notify Tarifa Traffic on the Spanish coast when crossing meridian 005°15,00' W, using VHF channel 10 and VHF channel 67 as an alternate.
- Vessels navigating eastward should notify Tangier Traffic on the Moroccan coast when crossing meridian 005°58,00' W, using VHF channel 69 and VHF channel 68 as an alternate.

This resolution establishes the vessel categories that are required to participate in the notification system and the following exception is provided: "Taking into account that the ferries that



regularly cross the straits, which include high speed passenger vessels, generally publish their schedules, it is advisable to establish special agreements relative to notifications with said ferries on an individual basis, which shall be subject to approval by Tarifa Traffic as well as by Tangier Traffic.”

At 17:42 hours on 13 January 2012, vessel NEW GLORY reported via VHF channel 69 to Tangier Traffic that they were entering the Straits of Gibraltar navigating east as was to be expected.

Vessel MILENIUM DOS did not report their entry into the Straits to Tarifa Traffic nor to Tangier Traffic based on the exception provided in IMO resolution MSC.300(87). After the accident, they contacted Tarifa Traffic on VHF channel 10.

No communications were established with Tangier Traffic nor with Tarifa Traffic by part of the crews of vessels MILENIUM DOS and NEW GLORY, indicating that they were in a risk of collision situation or to request specific information regarding traffic near them.

Neither Tangier traffic nor Tarifa Traffic issued an alert to warn of the risk of collision between vessels MILENIUM DOS and NEW GLORY.

According to IMO resolution MSC.300(87), Tarifa Traffic as well as Tangier traffic were monitoring the navigation on the Straits of Gibraltar traffic separation scheme using radar and AIS. They both periodically emit weather information as well as information relative to the navigation conditions. In addition to said information, they can also inform any vessel of their position, course and speed upon request as well as identify the traffic that is present in their vicinity.

In accordance with rule 12 of chapter V of the SOLAS agreement, the purpose of the vessel traffic management schemes (VTS) is to contribute to:

- Safety of life at sea
- Safety and efficiency of navigation
- Protection of the marine environment

Unlike air traffic controls, the vessel traffic management schemes do not carry out an individualised monitoring of these, nor are they responsible for detecting all risky situations that occur; instead, they are responsible for the overall management of the traffic in order to avoid risky situations. However, as explained in section 7.2.2 of resolution MSC.300(87): “the Tangier Traffic system allows to simultaneously monitor 1000 headings, which can be registered and saved. *Some of the advanced functions include alarms that identify risky situation, the identification of courses that infringe the Collision Regulation Rules, specifically rule 10 (relative to the traffic separation schemes), and the monitoring of anchored vessels.* All situations can be recorded, filed and played back on the screen or printed” However, the Tangier Traffic system did not detect the risky situation prior to the accident.

4.7. Analysis of the crew in the wheelhouse and their hours and working conditions

4.7.1. Vessel MILENIUM DOS

4.7.1.1. Crew in the wheelhouse

At the moment of the accident the Master, first Officer and First Engineer were in the wheelhouse and their positions can be seen in figure 14.

All of them had experience crossing the Straits of Gibraltar in large vessels. The experience they had in their positions on large vessels was 10 years for the Master, 9 years for the First Officer and 7 years in the case of the First Engineer.

The Master and First Officer, who had previously been a Master on other large vessels, took turns steering the vessel and the person sitting in the central station was actually steering the vessel. At the time of the accident it was the Master who was steering the vessel.

At the time of the accident, the aforementioned crewmembers as well as the rest of the crew were in possession of the required titles and certifications.



In addition to the aforementioned crewmembers there was a passenger sitting on the sofa that was located on the port side of the bow. This passenger, who broke his leg during the accident, was normally the person in charge of calibrating the magnetic compass, although on this occasion he had embarked as a passenger.

4.7.1.2. Working hours of the crew in the wheelhouse

In accordance with the vessel's documentation, the crew was in compliance with the required resting periods. Table 5 shows the schedule of the vessel, which the crew operated Monday through Saturday.

The day prior to the accident, the three crewmembers that were in the wheelhouse had finished their work shift at 22:30 after having left vessel MILENIUM DOS docked at the docking pier of Isla Verde where she normally remained overnight. According to their statements, the three crewmembers had rested well that night. Under these conditions, the established rest hour requirements were complied with.

Table 5. Schedule of vessel MILENIUM DOS

Rotation	Port and time of departure		Port and time of arrival	
1	Algeciras	13:00	Ceuta	14:00
	Ceuta	14:30	Algeciras	15:30
2	Algeciras	16:00	Ceuta	17:00
	Ceuta	17:30	Algeciras	18:30
3	Algeciras	19:00	Ceuta	20:00
	Ceuta	20:30	Algeciras	21:30

At 12:00 hours on 13 January 2012 after 11 and a half hours of rest, the three crewmembers arrived at the pier where the vessel was docked; they carried out the start-up procedures and moved the vessel to docking station number 7 of the port of Algeciras, which is from where they

normally operated out of, and finally finished docking at 12.25. Then, the passengers embarked and the first trip of the day began. Table 6 shows the trips that the vessel made on the day of the accident.

4.7.1.3. Working conditions in the wheelhouse

Vessel MILENIUM DOS has a wheelhouse suitable for her operation, where the positions of the First Engineer, the Master and First Officer (images A.2, A.3 and A.4 respectively in figure 14) allow to easily access the information and the controls.

Table 6. Trips made by vessel MILENIUM DOS on 13 January 2012

Rotation	Port and time of departure		Port and time of arrival	
1	Algeciras	13:15	Ceuta	14:15
	Ceuta	14:50	Algeciras	15:40
2	Algeciras	16:15	Ceuta	17:10
	Ceuta	17:55	Algeciras	18:45
3	Algeciras	19:15	Ceuta	04:00 (on the 14 th)

As can be seen in image A.1 of figure 14, the visibility from the wheelhouse was excellent, allowing a view of more than 90° to each side. The vessel has a console for executing the manoeuvres (image B of figure 14), which includes video cameras, sensors and joystick type controls that facilitate operations. It also has a communications area (D in figure 14).

The console of the trip's data recorder, RDT (image C of figure 14) is located on the starboard side. The wheelhouse is located in the highest area of the vessel and is accessed through a stairway (image F of figure 14), which is the one down which the passenger, who was sitting on the sofa that is located on the bow, fell and fractured his leg (image E of figure 14).

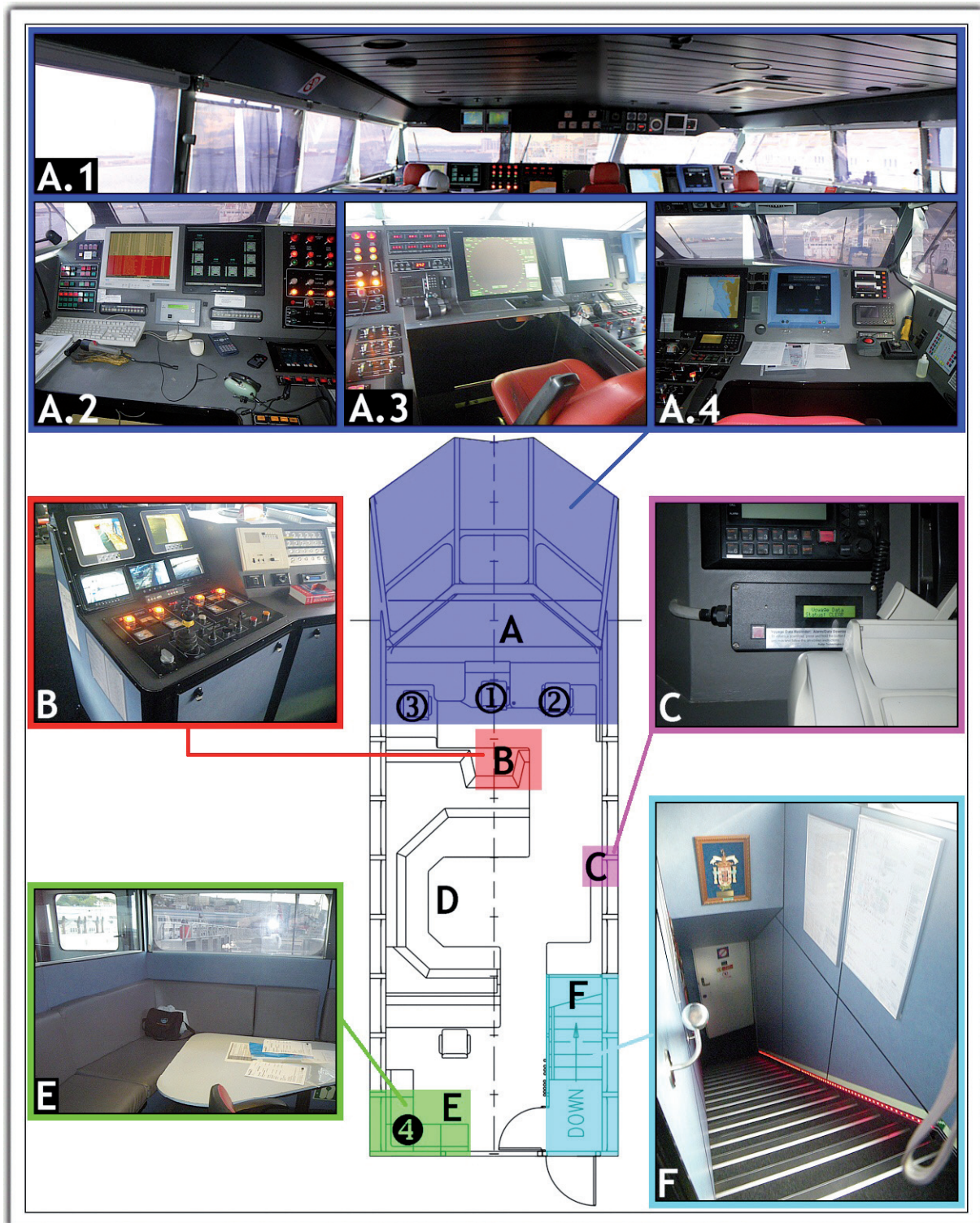


Figure 13. Distribution of the wheelhouse of vessel MILENIUM DOS.

① Master, ② First Officer, ③ Chief Engineer, ④ Passenger.

A.1: general view of the wheelhouse, A.2: First Engineers' station, A.3: Master's station, A.4: First Officer's station, B: Manoeuvres console, C: RDT, D: communications console, E: sofa, F: stairway down to the passenger deck.



4.7.2. Vessel NEW GLORY

4.7.2.1. Crew in the wheelhouse

At the moment of the accident the following crewmembers were in the wheelhouse and their positions can be seen in figure 15.

- The Master.
- The First Officer, on watch at the wheelhouse.
- An AB seaman, on watch at the wheelhouse.
- The Third Officer who was about to relieve the First Officer at 20:00 hours.
- An AB seaman who was about to relieve the other AB seaman at 20:00.
- A Bartender who was observing in the wheelhouse during his rest period because he was working on his AB seaman certification and was receiving on the job training.

At the time of the accident all the crewmembers were in possession of the required titles and certifications. The Master had navigated through the Straits of Gibraltar on other occasions and was familiar with the features of the traffic separation scheme.

4.7.2.2. Working hours of the crew in the wheelhouse

In accordance with the vessel's documentation the crew was in compliance with the required resting periods. Table 7 shows the watch hours stood by the crew at the wheelhouse from the time it left the port of Casablanca (Morocco).

Table 7. Watches of vessel NEW GLORY since she departed Casablanca

Crewmember	Watch time	
	First Officer	Previous
Current		16:00 to 20:00 h
A/B Seaman	Previous	04:00 to 08:00 h
	Current	16:00 to 20:00 h
Third Officer (relief)	Previous	06:00 to 12:00 h
	Next	20:00 to 24:00 h
A/B Seaman (relief)	Previous	08:00 to 12:00 h
	Next	20:00 to 24:00 h

4.7.2.3. Working conditions in the wheelhouse

The arrangement and characteristics of the wheelhouse of vessel NEW GLORY is similar to that of other bulk carriers.

From the port side, at the position of the AB seaman that was relieving the watch, there was a good view of the area where vessel MILENIUM DOS was in (image A of figure 15). Supposedly this seaman used a signal lamp (image D of figure 15) to warn of the danger to vessel MILENIUM DOS.

As can be seen in figure 15, there is a steering wheel in the wheelhouse where the AB seaman that was on watch was standing (③ in figure 15), two ARPA units where the Master and First Officer were standing (① y ②, in figure 15) and the navigation charts located in the chartroom (image C in figure 15).



Investigation of the collision between high speed ferry MILENIUM DOS and bulk carrier NEW GLORY in the Straits of Gibraltar on 13 January 2012

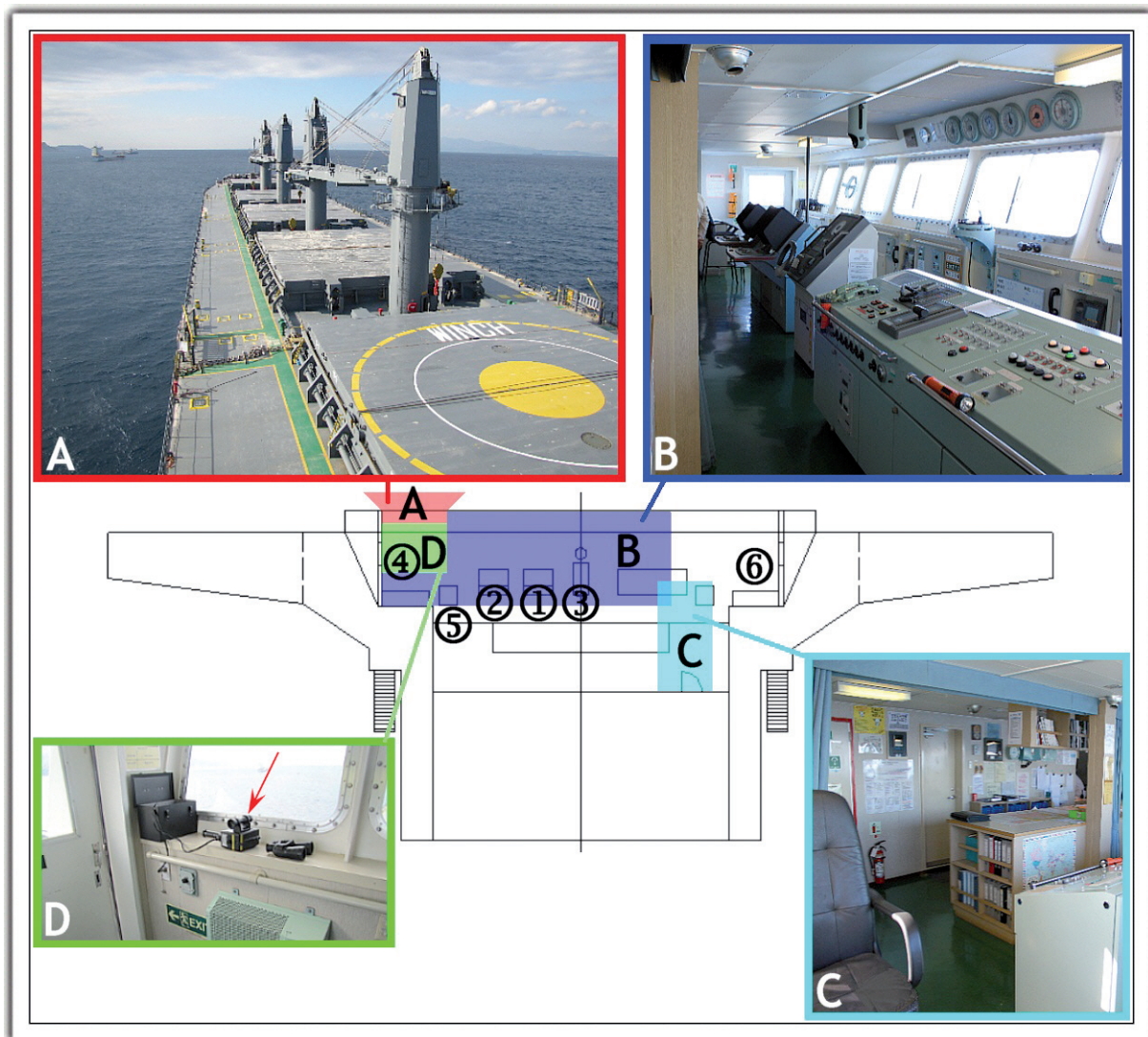


Figure 14. Distribution of the wheelhouse of vessel NEW GLORY.

- ① Master, ② First Officer, ③ AB Seaman, ④ AB Seaman (relief),
- ⑤ Third Officer (relief), ⑥ Bartender.

A: View from position ④, B: general view of the wheelhouse, C: view of the chartroom, D: view of the signal lamp at position ④.



4.8. Analysis of the damages

4.8.1. Vessel MILENIUM DOS

4.8.1.1. Damage to the vessel

Figure 16 shows a diagram of the damage suffered by the vessel, which were primarily a break in the plates and reinforcements of the starboard side at the following locations:

- The garage deck.
- The upper area of empty space 4.
- Empty space 5.
- The gas oil tanks located under empty space 5 (identified by no. 8 in figure 16).
- Empty space 6.

The following occurred as a consequence of the accident:

- Empty spaces 5 and 5 flooded to the flotation line.
- A gas oil spill occurred and the inoperative gas oil tanks flooded with sea water.

4.8.1.2. Injuries to the passengers, the crew and damage to the cargo

Six passengers were injured during the accident, who required medical attention:

- A passenger that was in the wheelhouse at the time of the accident and who broke his

right leg when he fell down the stairs as he attempted to return to the passenger deck at the time of the collision.

- A female passenger who broke a finger of her right hand as a consequence of the accident.
- A passenger that suffered multiple injuries and haematuria.
- An under aged passenger that suffered trauma.
- A passenger with multiple contusions and a cervical injury.
- A passenger with a sprained wrist.

Additionally, several passengers suffered contusions and panic attacks.

None of the crewmembers were injured although it is worth mentioning that the bow of vessel NEW GLORY stopped at less than half a metre from the location where the Second engineer was standing.

No significant damage occurred to the transported vehicles.

4.8.1.3. Contamination

An undetermined fuel spill from the starboard tanks of vessel MILENIUM DOS occurred as a consequence of the accident. At the time of the accident there was approximately 36,000 litres of gas oil in these tanks.

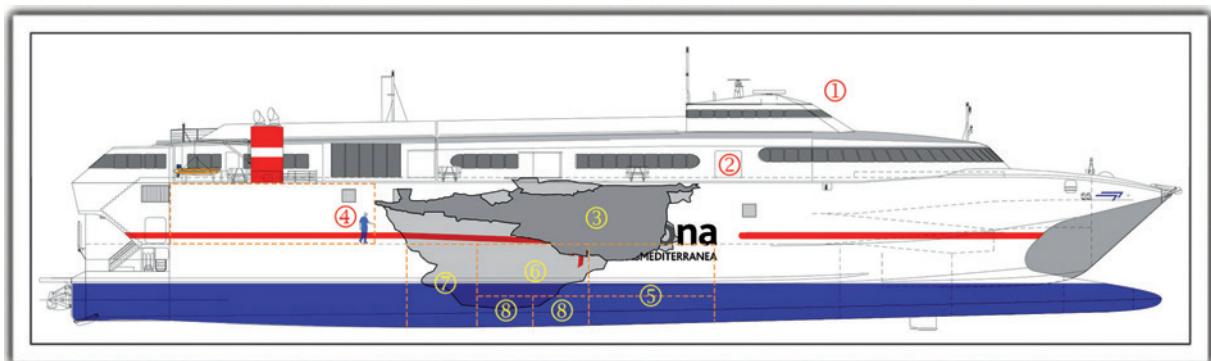


Figure 15. Damage to vessel MILENIUM DOS

- ① wheelhouse, ② passenger deck, ③ garage deck, ④ engine anteroom,
- ⑤ empty spaces 4, ⑥ empty space 5, ⑦ empty space 6, ⑧ gas oil tanks.



4.8.1.4. Structural resistance of the Vessel.

The vessel's structure resisted the impact from NEW GLORY mainly due of the following reasons:

- The forward bulb of vessel NEW GLORY did not collide against the starboard hull of vessel MILENIUM DOS; instead, it remained underneath it as can be seen in the diagram of figure 16.
- The bow of vessel NEW GLORY collided below the passenger deck of vessel MILENIUM DOS, lifting the central block from the superstructure.

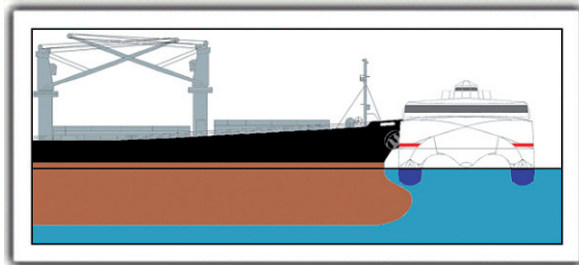


Figure 16. Forward bulb of vessel NEW GLORY under the hull of vessel MILENIUM DOS (figure to scale)

Under other vessel load conditions the consequences could have been much worse.

The structure of this aluminium catamaran type vessel is such that it has a rigid beam below the passenger deck, which extends along the entire length of the vessel and the passenger area is comprised of 3 independent blocks along the ship's length and separated by expansion and watertight seals. Each of these blocks that comprise the superstructure can move up and down independently.

In the accident vessel NEW GLORY raised the central part of MILENIUM DOS's superstructure but it did not affect the rest of the blocks. This way, the bow and stern ends of vessel MILENIUM DOS kept afloat without causing any serious stresses on the superstructure and the central block was suspended over the NEW GLORY's bow and did not transmit any stress to the rest of the structure thanks to the separation joints. Therefore, the structure of vessel MILENIUM DOS did not suffer as many bending moments as it would have if it was constructed of a single block.

The fact that the part of the superstructure that was impacted by vessel NEW GLORY was raised with the vessel's bow had the following effects:

- The superstructure block was raised instead of broken, preventing this area from being destroyed by the impact and preserving the integrity of the passengers.
- No sheers or breaks occurred that would have endangered the integrity of the structure.
- Both vessels became joined until the bow of vessel NEW GLORY dropped as her forepeak filled, and the superstructure block, which had been raised, dropped along with it, freeing both vessels from each other.



Figure 17. Superstructure block of vessel MILENIUM DOS that was raised

4.8.2. Vessel NEW GLORY

Vessel NEW GLORY suffered little damage to the port side of her bow and none of her passengers were injured.



Figure 18. Damage to the bow of vessel NEW GLORY



The damages, which were located forward on the port side and extended longitudinally from hatch 1 to half way to the bow, were the following:

- The railing on the bow was bent.
- Damages occurred to the platform, the ventilation ducts and the beacon.
- The flag pole fell down.
- The port capstan and stopper were bent.
- The port deck was dented.

4.9. Human factor analysis

The following events related with human factors occurred in this accident.

4.9.1. Vessel MILENIUM DOS

The lack of surveillance by part of the officers at the wheelhouse of vessel MILENIUM DOS is human error, which can be classified as a dereliction of routine duties. It was a result of a series of underlying factors:

- The fact that they always operated in the same route and had experience conducting three trips daily between the ports causes the work to become routine, monotonous and repetitive. Routine may result in a lack of attention.
- Inattentive blindness could have occurred where it is possible to not see objects that are in the field of vision because the attention is preoccupied with other objects or events.
- MILENIUM DOS is a high speed vessel with a good behaviour and a large manoeuvring capability, which is why her crewmembers have a lot of faith in her capabilities for handling difficult situations at sea. These capabilities of the vessel, which a priori increase her safety, also increase the trust in her equipment and in the vessel in general, which may cause the crew to assume greater risks with grave consequences.

- There is a large fleet of fast vessels and ferries joining Europe and Africa and crossing the Straits of Gibraltar. These vessels have to cross the traffic separation scheme, which has a high density of vessels in the area navigating with inherent risks. In time these risks become routine and are perceived by the crews as lesser risks.
- Navigation crossing the Straits of Gibraltar causes more stress than other types of navigation due to the number of crossings and head on situations that occur. The generated stress can cause fatigue and lack of attention.
- On the day of the accident the conditions were good for navigating and therefore the complacency on the part of the crew increased, who considered that visual surveillance was adequate and decided to shutdown one of the ARPAs. This complacency in addition to an inadequate perception of the risk favours accidents.
- The delay and fatigue accumulated throughout the day may result in a loss of attention.

4.9.2. Vessel NEW GLORY

- The fact that the accident occurred when the watch was being relieved may have slowed down the decision making process. It is a known fact that the risk of having an accident increases minutes prior to completing a task as the attention is diminished.
- The crew of vessel NEW GLORY perceived the risk of collision inadequately and since they thought that vessel MILENIUM DOS was going to manoeuvre, they decided not to manoeuvre or reduce their speed until it was too late.
- During the accident there were difficulties in identifying vessel MILENIUM DOS even though the data appeared in the ARPA prior to the accident and even though the Officers were in possession of the required qualifications and experience.
- Complacency and inadequate perception of the risk caused them to decide to not reduce their speed or transmit a warning message.

* * *



Chapter 5. CONCLUSIONS

The Commission has concluded that the cause of the collision was the non compliance by both vessels with the COLREGs.

The commission considers that the main cause of the collision was the lack of an effective lookout by part of the Officers in the wheelhouse of vessel MILENIUM DOS, which resulted in not detecting the crossing situation between both vessels until fifteen seconds prior to the collision. By means of an efficient lookout, the risky situation may have been detected at least fifteen minutes prior to the collision. The lack of an effective lookout was due to complacency on the part of the Officers in the wheelhouse of vessel MILENIUM DOS, whose attention was preoccupied on a conversation that was not related with the navigation and the crossing with ferry JAUME I. The underlying factors of this error by part of the crew are listed in section 4.9.1.

The commission considers that another cause of the accident was the slow reaction by part of the crew of vessel NEW GLORY after detecting the risky situation, who did not manoeuvre until two minutes prior to the collision. The underlying factors of this error by the crew are listed in section 4.9.2.

The following contributing factors of the accident have been identified:

- Part of the navigation aids of vessel MILENIUM DOS were turned off.
- The light pollution in the area made it difficult to discern the navigation lights of vessel NEW GLORY.
- Tarifa Traffic control tower did not detect the risky situation.
- None of the vessels requested information relative to the maritime traffic in the area from the traffic control services of Tangiers or Tarifa.

In addition to the main conclusions, this Commission has concluded the following:

Regarding the evasive manoeuvre carried out by vessel NEW GLORY, reducing her speed would have probably been more effective in preventing the accident.

Regarding the management of the crisis situations on vessel MILENIUM DOS, her crew kept calm after the accident and attempted to keep the passengers calm, they were prepared to abandon the ship and quickly and efficiently assessed the damages that had been suffered. In this regard, the following is worth mentioning:

- The passengers had taken the initiative to don their life vests.
- The evacuation of the passenger with a broken leg was carried out efficiently.
- Medical attention was provided on board the vessel by passengers who were health professionals.
- The announcements that were made over the PA were few.
- An attempt was made to calm the passengers although announcements were made stating that "they had collided with a small vessel", which was not consistent with what the passengers were seeing. These types of messages produce a lack of trust and are sometimes counterproductive.
- The passengers were not notified of the exact moment in which the tug was going to pull and separate the vessels even though this was one of the most risky situations after the collision.

Regarding the RDT data of both vessels, good practices dictate to make a copy during the first moments after an accident, which is a task that only takes a few seconds, and not two hours later as occurred in this case.

* * *



Chapter 6. SAFETY RECOMMENDATIONS

In order to prevent similar accidents and as a result of the assessment of the accident involving vessels MILENIUM DOS and NEW GLORY, the Standing Commission for Maritime Accidents and Incident Investigations Plenary recommends the following:

- To passenger vessel companies that operate in routes that regularly cross the Straits of Gibraltar:
 1. To warn their crews of the need to increase the lookouts in said route due to its special navigation conditions, emphasizing the need to keep all existing navigation aids operative.
 2. To establish operational procedures in their vessels requiring their Masters to consult the traffic control centres of Tangiers and Tarifa regarding the existing maritime traffic conditions for each trip.
 3. To study the need to monitor the traffic that affects their passenger vessels in order to detect risky situations and improve navigation safety.
 4. To conduct random internal audits of their vessels to verify compliance with good navigation practices by their crews. The data stored by the RDTs of their vessels shall be used for this purpose.
- To Acciona Transmediterránea, S.A.; company owner of vessel MILENIUM DOS:
 5. To modify their procedures to include clear instructions regarding the contents of the notifications that should be made over the PA system in case of an accident. These procedures must define the person responsible or making the announcements according to the type of announcement that is being made.
- To Transmar Shipping Co.S.A; company owner of vessel NEW GLORY:
 6. To check the equipment that is installed in their fleet to make sure that these can positively identify vessels.
 7. To review their emergency procedures during a risk of collision and train their crews in carrying out the necessary radio transmissions.

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