



THE COMMONWEALTH OF THE BAHAMAS

CELTIC WARRIOR

IMO Number 8906470

Official Number 720457

**Report of the investigation into
the collision between
CELTIC WARRIOR and
ANNEGRET
on
07 December 1997**

CELTIC WARRIOR

IMO Number 8906470

Official Number 720457

Report of the investigation into the collision between CELTIC WARRIOR and ANNEGRET on 07 December 1997

Report Reference : 2278

Bahamas Maritime Authority
10 Chesterfield Street
LONDON W1X 8AH
United Kingdom

Date of Issue : 17 January 2000

The Bahamas Maritime Authority investigates incidents at sea for the sole purpose of discovering any lessons which may be learned with a view to preventing any repetition. It is not the purpose of the investigation to establish liability or to apportion blame, except in so far as emerges as part of the process of investigating that incident.

It should be noted that the Bahamas Merchant Shipping Act, Para 170 (2) requires officers of a ship involved in an accident to answer an Inspector's questions fully and truly. If the contents of a report were subsequently submitted as evidence in court proceedings relating to an accident this could offend the principle that a person cannot be required to give evidence against himself. The Bahamas Maritime Authority makes this report available to any interested parties on the strict understanding that it will not be used as evidence in any court proceedings anywhere in the world.

CONTENTS

1. **Summary**
2. **Particulars of Vessel**
3. **Narrative of events**
4. **Analysis**
5. **Conclusions**
6. **Recommendations**

List of Appendices:

- I. Extract of Chart B.A. 1093 showing the tracks and positions of the two vessels.

1. **SUMMARY**

- 1.1. The Bahamas registered container vessel CELTIC WARRIOR was on passage from Piraeus, Greece to Beirut, Lebanon. The Antigua and Barbuda registered general cargo vessel ANNEGRET was on passage from Istanbul, Turkey to Taranto, Italy. At 0123 hours (Greek time) 07 December 1997 the two vessels were in a crossing situation when they collided at position 37° 21.8' North, 023° 59.3' East – about 6.5 nautical miles South South East from the South Eastern end of the Greek island of St. Georgios in the Saroric Gulf.
- 1.2. ANNEGRET struck CELTIC WARRIOR on the port side of the cargo hold, about five metres aft of midships. The vessel took an immediate port list from which she never recovered. She was abandoned by her crew at about 0215 hours and observed to have sunk at 0800 hours local time.
- 1.3. Under the provisions of the International Regulations for Preventing Collisions at Sea, 1972, Rule 15, ANNEGRET should have been the giving way vessel and CELTIC WARRIOR should have maintained her course and speed, until such time when action of the giving way vessel, alone, could not have avoided the collision. She should then have taken evasive action to avoid the collision. Such action was taken BY CELTIC WARRIOR but did not have sufficient effect to avoid the collision.

ANNEGRET failed to take any action to alter course. It was claimed by her officer of the watch that the main engine propeller pitch control was altered from full ahead to full astern shortly before the collision. This also did not have sufficient effect to avoid the collision.
- 1.4. The Master and crew of CELTIC WARRIOR were picked up by the crew of ANNEGRET. There was no loss of life but many of the deck stowed containers from CELTIC WARRIOR broke adrift to become a hazard to navigation. A number of these containers were washed ashore on the coasts of nearby islands. Some light pollution, assumed to be Diesel Oil, was observed but was seen to evaporate and dissipate over a comparatively short space of time.
- 1.5. ANNEGRET proceeded to Piraeus where she landed the Master and crew of CELTIC WARRIOR. The Second Mate of CELTIC WARRIOR was later diagnosed to have suffered a form of cardiac arrest and was hospitalised in Piraeus until he was deemed fit enough to return to his home in Poland. The cardiac arrest occurred very close to the time of the collision but is not considered to have been contributory to the cause of the incident.

2. PARTICULARS OF VESSEL

2.1. CELTIC WARRIOR

2.1.1. CELTIC WARRIOR was a gearless general cargo and container ship registered at Nassau, Bahamas, of welded steel construction having a raised forecastle and poop. The accommodation and machinery spaces were situated aft of the single hold. She had the following principal particulars:

•	Length overall	-	92.80 metres
•	Length BP	-	84.55 metres
•	Breadth	-	17.10 metres
•	Depth	-	8.20 metres
•	Gross Tonnage	-	3,779 tons
•	Net Tonnage	-	1,731 tons
•	Deadweight	-	5,878 tonnes
•	Call Sign	-	C6K16
•	Container capacity	-	300 teu

2.1.2. She was powered by an MaK type 8M453C main engine that developed 2,650 kW (3,603 bhp) and which drove a single variable pitch propeller. She was fitted with a forward transverse thruster and had four main generators that developed a total of 1630 kW. She was classed to operate with periodically unmanned machinery spaces.

2.1.3. The vessel was built in 1991 at the Madenci Gemi Sanayil shipyard. She had previously been named Celtic Warrior, prior to changing name to Euro Merchant. At the time of the incident she was owned and managed by Charles M Willie & Co (Shipping) Limited.

2.1.4. The vessel was first registered under the Bahamas Flag in 1992 and was entered with Lloyds Register Classification Society. At the time of the incident she complied with the all statutory and international requirements and certification.

2.1.5. CELTIC WARRIOR was manned in accordance with the Safe Manning Document issued by the Bahamas Maritime Authority. The crew consisted of a Master, Chief Mate, Second Mate, Chief Engineer, Second Engineer, three Seamen and a Cook. They were all of Polish Nationality.

2.2. **ANNEGRET**

2.2.1. ANNEGRET was a geared general cargo and container ship registered at Antigua and Barbuda of welded steel construction having a raised forecastle and poop. The accommodation and machinery spaces were situated aft of the single hold. She had the following principal particulars:

•	Length overall	-	107.43 metres
•	Length BP	-	98.60 metres
•	Breadth	-	19.25 metres
•	Depth	-	10.60 metres
•	Gross Tonnage	-	5,780 tons
•	Net Tonnage	-	3,152 tons
•	Deadweight	-	8,224 tonnes
•	Call Sign	-	V21W
•	Container capacity	-	461 teu
•	Official Number	-	2206
•	IMO Number	-	8919879

2.3. She was powered by an MAN type 7L40/54 main engine that developed 4,235 kW (5,758 bhp) and which drove a single controllable pitch propeller. She was fitted with a forward transverse thruster and had four main generators that developed a total of 1,194 kW.

2.4. The vessel was built in 1991 at the J J Sietas shipyard, Hamburg. She was entered with Germanischer Lloyd Classification Society. At the time of the incident it is understood that she complied with the all statutory and international requirements and certification.

3. NARRATIVE OF EVENTS

3.1. Time Zones and Weather

3.1.1. Unless specifically noted in the text time used throughout this narrative is Greek Time, which was utc +2 hours. This was also the ship's time used on board CELTIC WARRIOR throughout the events leading up to the casualty and on ANNEGRET up to soon after midnight, shortly before the collision. Thereafter ANNEGRET had retarded clocks on board by 20 minutes, as a portion of retarding the clocks by a total of one hour during the night of 06/07 December. The local time on board ANNEGRET at the time of the collision was utc +1 hours 40 minutes. (See paragraph 4.3.)

3.1.2. The weather at the time of the incident was reported to be good with North Easterly winds of Beaufort force 3 or 4, a sea state of 3 or 4 and good visibility. After CELTIC WARRIOR was evacuated a report indicated that the winds and sea state had each increased by about one unit.

3.2. Passage of CELTIC WARRIOR (Please see the Chart attached in the Appendix)

3.2.1. CELTIC WARRIOR sailed from Piraeus, bound for Beirut, at about 2145 hours, 06 December 1997 with a full load of containers underdeck plus an additional 20 or 30 units stowed on the hatch cover. She also had on board about 110 tonnes of Gas Oil and 9.5 m³ of Lubricating Oil. Having disembarked the Pilot at about 2205 hours, the Master kept the remainder of the watch up to midnight. By then the course being steered was 144° and the vessel was in a position about 6 miles South South East of the southern end of the Piraeus approach Traffic Separation Scheme. At midnight the Master handed over the watch to the Second Mate. The vessel was steering by automatic pilot and a radar, fitted with an automatic plotting device, was running. The vessel was making good a speed of about 11 or 11½ knots.

3.2.2. A vessel, later to be identified as ANNEGRET, was first observed on the radar at about 0045 hours. The bearing was not recalled by the CELTIC WARRIOR officer of the watch but it was at a broad angle on the port bow at a range of about 10 miles.

At approximately 0100 hours, local time, when about 2.2 miles abeam of the light house at the South Eastern end of the Saint Georgios Island (Nisidha Ay. Yeóryios,) a scheduled, navigational course alteration was made from 144° to 136°. The radar trace of ANNEGRET then indicated her to be about six miles distant, at a relative bearing of between about 70° and 80° on the port bow and, importantly, on a collision course. The appropriate navigation lights were also observed. The officer of the watch recalled that he started to call the other vessel on the VHF after the range had closed to about three miles but no reply was heard. Those on board ANNEGRET claimed not to hear this message.

The CELTIC WARRIOR officer of the watch stated that he saw ANNEGRET make a small course alteration to starboard when the range was about two miles but it was corrected by a similar alteration to port when the range had reduced further to about one mile. These alterations were observed visually by the change in appearance of the navigation lights and by a bearing change, detected on the radar. The CELTIC WARRIOR officer of the watch repeated his radio warning message and, shortly before the collision put the helm to hard to starboard. This radio message was again not heard on the other vessel.

- 3.2.3. Soon after that CELTIC WARRIOR was struck on the port side by ANNEGRET. It is not apparent whether CELTIC WARRIOR had altered course, away from 136°, prior to the collision, despite having made the helm alteration.

The officer of the watch estimated that the initial angle of blow was about 60° abaft the beam of CELTIC WARRIOR. Other contradictory evidence, from ANNEGRET is noted in paragraph 3.3.4 and is discussed in paragraph 4.4.8.

- 3.2.4. The officer of the watch clearly recalled being in considerable pain from his chest in the moments after he had made the helm order but before the collision occurred. He later firmly believed that he had continued to carry out his responsibilities and duties despite that pain and discomfort. He recalled switching on the general alarm and the "Not Under Command" lights before the Bosun, Chief Mate and then the Master entered the bridge.

He continued to suffer chest pains and took no further action in the management of the situation after the collision. He was later assisted in the evacuation and, once on board ANNEGRET, given medication to relieve the apparent symptoms of a heart attack.

3.3. **Passage of ANNEGRET** (Please see the Chart attached in the Appendix)

- 3.3.1. ANNEGRET sailed from Istanbul at 0130 hours, local time (utc +2 hours) 06 December 1997, on passage to Taranto, Italy. Various courses were steered up to 2354 hours ship's time that evening when the heading was altered from 236° to 212° at a position of 37° 41.5' North, 024° 14.5 East. The vessel was steaming at about 15 knots. The watch was handed over from the Master to the Second Mate at Midnight ship's time (still utc +2 hours.) One other person, a Cadet, was also keeping the same watch.

A position was noted on the chart at 0008 hours ship's time. This placed the vessel 4.3 miles East South East of A K Angalistros Lighthouse. Two radars were running and operational but CELTIC WARRIOR was not yet visible, either on radar or by sight.

A target, later confirmed to have been CELTIC WARRIOR, was observed by radar at a range of about six miles at about 0050 hours (utc +2 hours). It was recalled as having been ahead and on the starboard side. Some time later, the officer of the watch of ANNEGRET stated he decided the target was following an almost parallel course in an overtaking situation. At 0115 hours (utc +2

hours) the target was about one mile forward and between about a half and one mile to the starboard side. The cadet on watch, however also stated that he first observed the red sidelight of the other vessel at about this time, thus contradicting the ANNEGRET officer of the watch. Neither person reported that there were any visual signals (flashing light), radio signals or communications between the two vessels before the collision.

- 3.3.2. The ANNEGRET officer of the watch, in the company of the Cadet then left the wheelhouse to go to the chart area to plot a position. This was timed on the chart as 0055 hours (utc +1:40 hours, the ship's clocks having been retarded by 20 minutes during the first part of the watch.) He estimated that he returned about two minutes later (at 0117 hours, Greek and CELTIC WARRIOR time - utc +2 hours) and found that CELTIC WARRIOR had altered course to port, showing her port (red) sidelight. She was now in a dangerously close crossing situation. He stated that the distance apart was too close to make any effective course alteration so he just placed the main engine pitch control from full ahead to full astern maintaining the same heading.
- 3.3.3. The two vessels collided at 0123 hours (Greek and CELTIC WARRIOR time: utc +2 hours.) That was 0103 hours ANNEGRET's ship time, 07 December 1997. In the reported sequence of events this equates to about six minutes after the ANNEGRET officer of the watch recalled returning to the wheelhouse, seeing CELTIC WARRIOR and placing the propeller pitch to full astern.
- 3.3.4. Had both vessels maintained their courses up to the moment of collision the angle of blow from the bow of ANNEGRET into the hull, somewhere abaft the centre of CELTIC WARRIOR, would have been at least 76°. This was the difference between the courses of the two vessels: 212° - 136°.

From the perspective of CELTIC WARRIOR, this was an angle of blow, into her port side of at least 104°: 180° - 76°. The difference between this angle and that deduced in paragraph 3.2.3 is discussed in paragraph 4.4.8.

3.4. **The Collision**

- 3.4.1. Both vessels remained locked onto one another for about three or four minutes before separating when the bow of ANNEGRET bumped down the port side of CELTIC WARRIOR.
- 3.4.2. The Chief Mate of CELTIC WARRIOR, who had been asleep in his cabin since 2300 hours the previous evening, was the first officer to arrive on that bridge to assist the officer of the watch, who is now known to have been ill. He placed the propeller pitch control to 'Stop' and then to 'Full Astern.' The vessel very quickly developed a 10° list to port. Her Chief Engineer first attended the engine room where he noted that the main engine was still running. He immediately started two of the three generators and took the shaft generator off line to avoid the possibility of a blackout. At that time he did not observe any water in the engine room. He then went to the bridge where he was requested to stop the main engine and, with the Second Engineer, to start two ballast pumps, discharging water from Nos. 1 and 2 wing tanks.

When the Chief Engineer returned to the engine room to stop the main engine, he observed that water had ingressed into the port side of the engine room. It was thought, by those on board CELTIC WARRIOR, to have possibly come from the secondary damage caused by the bow of the other vessel as it bumped down the port side after the initial impact. Pumps were not directed to extract water from the engine room as all efforts were made to control the water ingress from other parts of the vessel.

- 3.4.3. The Chief Mate of CELTIC WARRIOR, in the mean time, broadcast an urgent advisory message on the VHF radio that included outline details of the collision and an urgent request for assistance. By the time that was finished he estimated that the list had increased to about 25°.
- 3.4.4. The Chief Mate then organised an inspection of the damage on the port side. It was reported to consist of a hole in the port side ship's hold, about 4 or 5 metres aft of midships, generally between container bays 07 and 09. A hole in the side was observed to have been about 50 cm high and 40 cm wide. Initially this was seen to be at or around the seawater level but as the list increased it became submerged. The deck in that area had also been set in or deformed to such an extent that no access was possible along the port side. This inspection was timed at about 0200 hours.
- 3.4.5. As the list increased to about 35°, the Master ordered the crew to prepare to evacuate the vessel. The Chief Mate broadcast a MAYDAY distress message on the VHF Radio, including details of the increased list, the water ingress into the hold and the imminent disembarkation of the crew into a liferaft. The Chief Engineer believed this to be at about 0215 hours (utc + 2 hours.)
- 3.4.6. There had been a brief exchange of information between the two ships on the main VHF radios after the collision. After the evacuation no further VHF communication was established although the crew of CELTIC WARRIOR had attempted to use the two portable VHF radios that were in their liferaft. The crew managed to manoeuvre the liferaft away from the listing hull of the ship. After some time there had still been no contact with any other ship, including those of the ship that they had been in collision with, so three red parachute flares were set off. After a further period, estimated to have been between 15 and 30 minutes, a search light was seen from a boat that, it transpired, had been launched from ANNEGRET. The liferaft was towed clear and the crew eventually transferred to the other ship.
- 3.4.7. About 30 minutes after the survivors were taken on board ANNEGRET the vessel sailed for Piraeus. It arrived at about 1100 hours, 07 December 1997.
- 3.4.8. It is understood that CELTIC WARRIOR finally sank at 0600 hours utc, 0800 hours local time, in position 37° 19' North, 023° 58' East. A large number of containers were still reported to be floating in that area and to have been deemed to be a danger to navigation.

- 3.5. The damage to ANNEGRET, noted after her arrival at Piraeus, was confined to:
- heavy setting in of the bow and forecastle structure with a sharp indentation near to the 6.3 metre draft mark, immediately to starboard of the bulbous bow running aft,
 - fracture of the bulbous bow plating
 - fracture of the forecastle plating immediately below the forecastle deck, 1½ metres to the port side from the centre line of the vessel and
 - various minor scratches, mainly to the starboard side bulwarks.
- 3.6. An unknown number of the deck stowed containers from CELTIC WARRIOR broke adrift to become a hazard to navigation. Many of these containers were washed ashore on the coasts of nearby islands. Some light pollution, assumed to be Diesel Oil, was observed but was seen to evaporate and dissipate over a comparatively short space of time.

4. ANALYSIS

- 4.1. The weather at the time of the collision and for the preceding period was clear and fine with good visibility.
- 4.2. No reports have been made of any mechanical or equipment failure that may have contributed to the events that led to the collision.

4.3. Time Zones

CELTIC WARRIOR was keeping the same time zone as her last departure port: Piraeus, Greece. This was utc +2 hours.

The time zone kept on board ANNEGRET is less clear. The usual practice is to alter the ship's time in units on one hour so as to keep the working time on board near to the natural time as dictated partly by hours of daylight but also the obvious need to arrive at the next port with the ship's time set to the same zone as that port. Turkey maintains the same time zone as Greece: utc +2 hours. The destination port was however in Italy, which keeps a time zone of utc +1 hour. The logical time at which to change time zones was overnight on 06/07 December 1997. A common practice to alter the ship's time is in three 20 minute stages at some time on each navigational watch. When a vessel is travelling West the clocks are retarded, effectively producing a 25 hour day. This would appear to have been the case on board ANNEGRET.

Positions were charted at 2400 hours, 0008 hours and 0055 hours. The distance between these positions is consistent with a speed of just over 15 knots if 20 minutes is added to the last time. This indicates that the clocks were retarded by 20 minutes between the 0008 hours and 0055 hours charted positions.

The timing of the collision, with respect to CELTIC WARRIOR, is consistent with it having occurred at 0123 hours Greek time (utc +2 hours.) The ANNEGRET ship's time, at the midnight handover of the watch, was also on the same time zone. At the time of the collision, it was utc +1 hour 40 minutes.

4.4. Summary of the Two Vessels' Courses (Please see the Chart attached in the Appendix)

- 4.4.1. Log books, charts and other records from CELTIC WARRIOR were lost with the vessel so the only means of knowing the positions of the vessel are the recollections given in verbal evidence by the various officers that were on the bridge. Despite the illness suffered by the officer of the watch during the final minutes or seconds before the collision, he was able to carry out some of his duties. Excessive reliance cannot, however, be made on his testimony except where it is backed up by other evidence. It does however appear that the onset of this illness occurred very late in the events that led to the collision and most likely the pains that he suffered did not materially affect any of his actions or judgement in respect of the events that led to the collision.

- 4.4.2. The officers of both vessels have stated that their own vessels each maintained their course and speed until only moments before the collision: CELTIC WARRIOR steering 136° at 11½ knots and ANNEGRET steering 212° at 15 knots. Each officer of the watch has also alleged that the other vessel made various alterations of course in the minutes before the collision.
- 4.4.3. The ANNEGRET officer of the watch stated that at 0100 hours the two vessels were already on a collision course although he understood that his vessel was overtaking CELTIC WARRIOR. The latter had, however, made a small navigational course alteration to port of 8° from a heading of 144°. From the perspective of CELTIC WARRIOR, had that been the case, and no other alteration had been made by either ship, then the collision would, most likely, not have happened; CELTIC WARRIOR would have passed slightly astern of ANNEGRET. The fact that a collision did occur infers that either they were not on collision courses at 0100 hours or that one, the other or both vessels made subsequent course alterations. There are no means to determine which scenario actually did occur.
- 4.4.4. The speed CELTIC WARRIOR made good between the reported midnight position and the collision point was about 11½ knots. This is comparable with the recalled estimated speed of the vessel and would indicate that the vessel followed the approximate course lines of 155°, 144° and 136° up to the collision point. There would have been no time, or reason, for the vessel to have adopted a course that firstly went to the North of Saint Georgios Island and then to the South or South West to have produced an overtaking situation in the final period before the collision.

CELTIC WARRIOR was alleged, by the ANNEGRET officer of the watch, to have been steering a course line that was generally similar to that of the latter, creating a situation whereby ANNEGRET was the overtaking vessel. He then alleged that CELTIC WARRIOR, for no apparent reason, altered course to port to create the crossing situation, and the collision. This theory is disregarded primarily because the timing of earlier courses makes such actions impractical, as stated immediately above. There was however a single, small navigational course alteration of 8° to port made by CELTIC WARRIOR at 0100 hours.

- 4.4.5. The speed of ANNEGRET, taken from the plotted positions on the chart of 0008 hours and 0055 hours, was about 22 knots. This is clearly inaccurate. The speed of the ship as recalled by the officer of the watch and the Master was about 15 knots. The use of various time zones, discussed in paragraph 4.3 above, explains the apparent confusion of the times used on board.

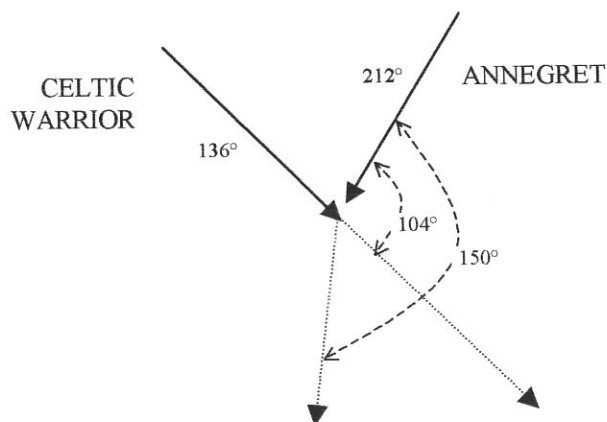
ANNEGRET was alleged, by the CELTIC WARRIOR officer of the watch, to have made a minor alteration firstly to starboard to give the impression that she was taking some avoiding action to prevent a collision. She was then alleged to have made a similar minor alteration to port to regain the original course. This is contradicted by the ANNEGRET officer of the watch and Cadet who both claim to have been absent from the wheelhouse, plotting the 0055 hours position, for some of the time.

The ANNEGRET officer of the watch was also unable to explain his actions in the rest of the six minutes between that position and the time when he suddenly realised that a collision was imminent.

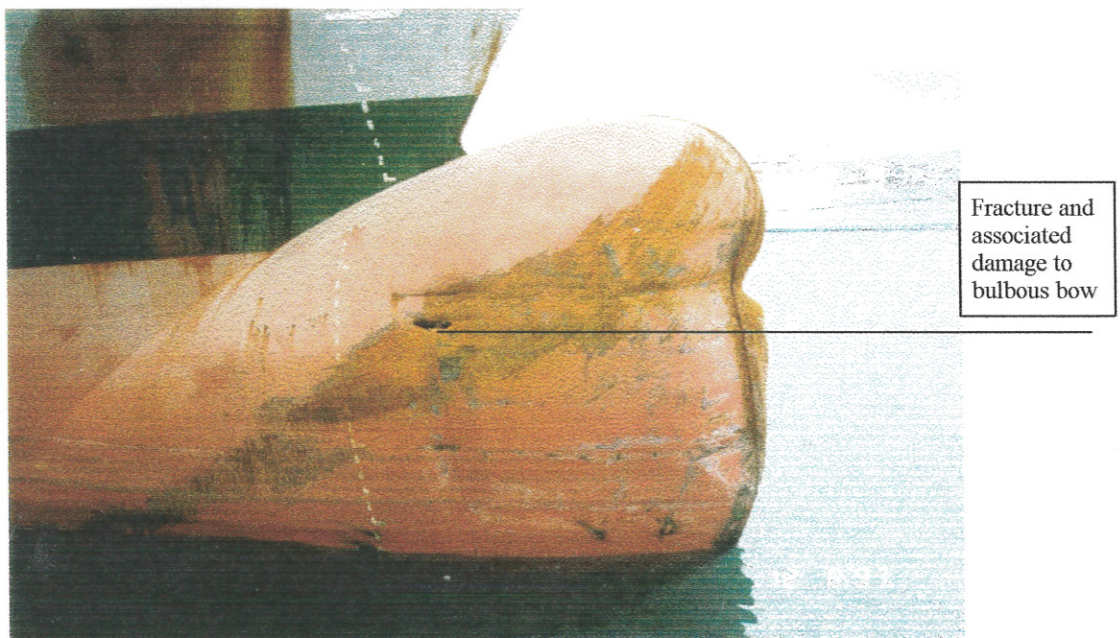
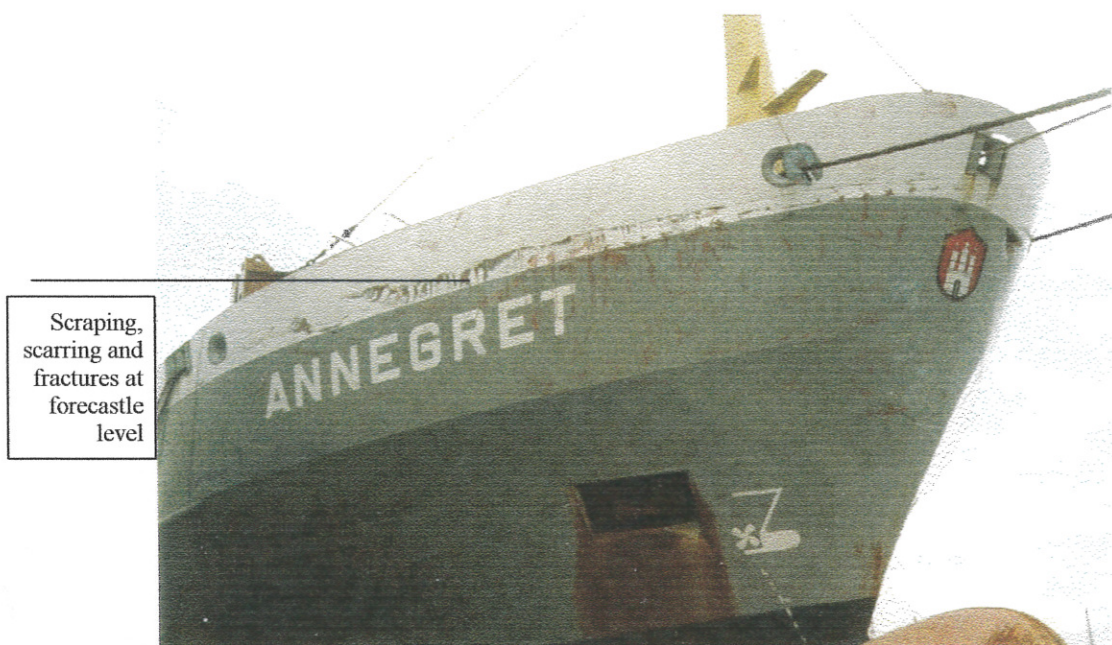
- 4.4.6. The intended tracks of the vessels and the balance of the evidence indicates that both vessels maintained their plotted course lines and sea speeds up to a time just seconds before the collision when CELTIC WARRIOR made a starboard helm order and ANNEGRET placed her propeller pitch from ahead to astern. Neither action, alone or as a joint effort was sufficient to avoid the collision.
- 4.4.7. The timing, on ANNEGRET, of placing the propeller pitch control from Full Ahead to Full Astern is very doubtful. The evidence of the officer of the watch suggests that this was about six minutes before the collision but he nevertheless considered that the two vessels were too close to take any other avoiding action. Any ship, especially one of her type, will be able to make a significant heading change when steaming at full ahead, at a speed of 15 knots, over that period of time. There being no other vessels in the area a course alteration to port would have been sufficient to avoid the collision.

It is therefore most likely that the officer of the watch of ANNEGRET, and the cadet on watch with him, did not emerge from the chart space of the wheelhouse until moments before the collision. Some of that six minute period would have been taken plotting the vessel's position but what they were doing in the remainder of that time was not stated by either man during interviews. The charted position timed at 0055 hours infers that the clocks had already been retarded by then. It is, however, possible that some time was taken up by adjusting the ship's clocks. It is not known whether there was a Master clock on the ship or whether every clock had to be individually altered.

- 4.4.8. The angle of blow, considered as the angle of approach of ANNEGRET at the final moments before contact with CELTIC WARRIOR was at least 104° on the port bow of the latter but, according to the recollections of the CELTIC WARRIOR officer of the watch, was up to 150° (60° abaft her beam.) Considering that CELTIC WARRIOR had commenced an alteration to starboard the most likely final angle of blow at the point of first contact was between 120° and 150° . The following diagram, not to scale, represents those courses and the possible angles of blow.



- 4.5. Immediately after the contact both vessels remained locked onto one another for about three or four minutes before separating. The bow of ANNEGRET then bumped down the port side of CELTIC WARRIOR. This implies that the astern propeller pitch ordered by the ANNEGRET officer of the watch began to take effect before the similar order of the CELTIC WARRIOR Chief Mate on his vessel.
- 4.6. The damage to ANNEGRET was limited to fractures, scarring and indentations to her bulbous bow and her starboard bow/forecastle plating. The reported hole in the side shell of CELTIC WARRIOR was most probably caused by the damaged starboard side of the bulbous bow of ANNEGRET.



- 4.7. The damage to CELTIC WARRIOR was quickly recognised to be serious. A 10° list formed almost immediately. The damage to the port side was so extensive that passage down that side was not possible. The hole in the ship's shell plating was however seen to be an estimated 50 cm high by 40 cm wide, initially spanning the sea water level. This damage, with the increased list, soon submerged allowing a catastrophic ingress of water into the ship. The Master ordered the abandonment within one hour of the collision, by which time the increasing list had grown to 35°. CELTIC WARRIOR later finally sank at about 0800 hours Greek time: utc +2 hours.

4.8. **Regulations**

The International Regulations for Preventing Collisions at Sea, 1972 provide for the correct action of vessels in sight of one another in a crossing situation (Rule 15) and the action of both vessels (Rules 16 and 17.)

The angles of approach of the two vessels were such that the two vessels were crossing one another and ANNEGRET was therefore under the clear obligation, from Rule 15, to keep out of the way of CELTIC WARRIOR and to avoid crossing ahead of her.

She was further directed by Rule 16 to, so far as possible, take early and substantial action to keep well clear. There were no other vessels known to be in the vicinity that morning and so no known reason as to why early action to avoid a risk of collision could not have been taken by ANNEGRET.

Rule 17 details the action to be taken by the stand-on vessel, in this case CELTIC WARRIOR. She is firstly required to keep her course and speed. She was however empowered to take action to avoid collision when she found herself so close that collision could not be avoided by her action alone. Such action should have been made as soon as it became apparent that ANNEGRET was not taking appropriate action in compliance with the Rules. That action was taken by the officer of the watch of CELTIC WARRIOR but it was too late to avoid the collision.

5. CONCLUSIONS

5.1. CELTIC WARRIOR, steering 136°, and ANNEGRET, steering 212°, were approaching each other, on collision courses. The officers of the watch on both vessels saw the other vessel on radar and visually in ample time for ANNEGRET to follow the Collision Regulations, Rule 15, and take appropriate action to avoid a collision. The officer of the watch of ANNEGRET failed to take any such action right up to the moment of impact of the two vessels.

5.2. The officer of the watch of CELTIC WARRIOR made an alteration of course to starboard in the final moments before the collision, in an attempt to avoid contact but this action was too late. The engine of CELTIC WARRIOR was still at full ahead at the time of the collision.

5.3. The officer of the watch of ANNEGRET had not made any alteration of course but shortly before the collision, he had placed the main engine propeller pitch control to full astern. It is not known what effect this had but no witness observed any reduction in the speed of the vessel prior to the contact.

There was a period of six minutes between the 0055 hours position taken on ANNEGRET and the collision. Some of this time was taken in plotting this position but there is a large portion of it that remains unexplained.

5.4. ANNEGRET struck CELTIC WARRIOR on her port side at an angle of between 104° and 150° from the bow of CELTIC WARRIOR at 0123 hours Greek time (utc + 2 hours.) The latter vessel had initiated a course alteration to starboard shortly before the collision but it is not known how much of that had taken effect.

5.5. The collision caused a large hole to be made into the port side shell plating of CELTIC WARRIOR at water level, which allowed seawater to enter into the port side ballast tanks and, it is inferred, the cargo hold. This initiated an immediate 10° list that continued to increase. Attempts to control the list and to stabilise the vessel were not possible and the crew abandoned her, into a liferaft, at about 0215 hours. She later finally sank at about 0800 hours Greek time (0600 hours utc.)

5.6. The officer of the watch of CELTIC WARRIOR suffered chest pains in the moments before the collision. He was alone on the bridge of the vessel and so it cannot be clearly understood the precise time scale of his illness. He was assisted in the evacuation from the vessel and was later diagnosed, in hospital in Piraeus, as having suffered a heart attack. He recovered sufficiently to be able to travel home, under escort, about two weeks after the incident.

6. **RECOMMENDATIONS**

- 6.1. The contents of this report should be made available to the Antigua and Barbuda Ship Registry for their consideration.

APPENDIX I

Extract of Chart B.A. 1093 showing the tracks and positions of the two vessels.

