



Barbados maritime ship registry

M.V. Fluvius Tamar
IMO Number 9501708

**Report of the investigation into the Loss of the
Fluvius Tamar, while on passage from
Eemshaven to Pasajes.**



**on:
Saturday 14th January 2017**

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Issue by: 31st August 2017

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GLOSSARY OF ABBREVIATIONS AND ACRONYMS

AB	Able seaman
AIS	Automatic Identification System
cm	centimetre
CoC	Certificate of Competency
CNIS	Channel Navigation Information System
ECDIS	Electronic Chart Display and Information System
GM	measurement of the initial static stability
GT	gross tonnage
kW	kilo Watt
IMSBC	International Maritime Solid Bulk Cargo
ISM	International Safety Management
ISPS	International Ship and Port Facility Security Code
kts	knots
kW	kilowatt
LR	Lloyds Register (Class Society)
nm	nautical miles
RO	Recognised Organisation
TSS	Traffic Separation Scheme
UTC	Coordinated Universal Time

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1 SUMMARY

- 1.1 The general cargo vessel *Fluvius Tamar* IMO: 9501708, on passage from Eemshaven, Netherlands to Pasajes in Spain, sank with 3962 tonnes of bulk Magnesite on-board, 35 nm northeast of North Foreland in the southbound traffic lane of the Hinder TSS.



Fig 01: Fluvius Tamar IMO: 9501708

- 1.2 At 0025 (UTC+1) on 14th January 2017, The *Fluvius Tamar* broadcast a **MAYDAY**, in position Latitude 50° 40.2'N Longitude 002° 13.6'E, stating the vessel needs assistance as she is sinking.

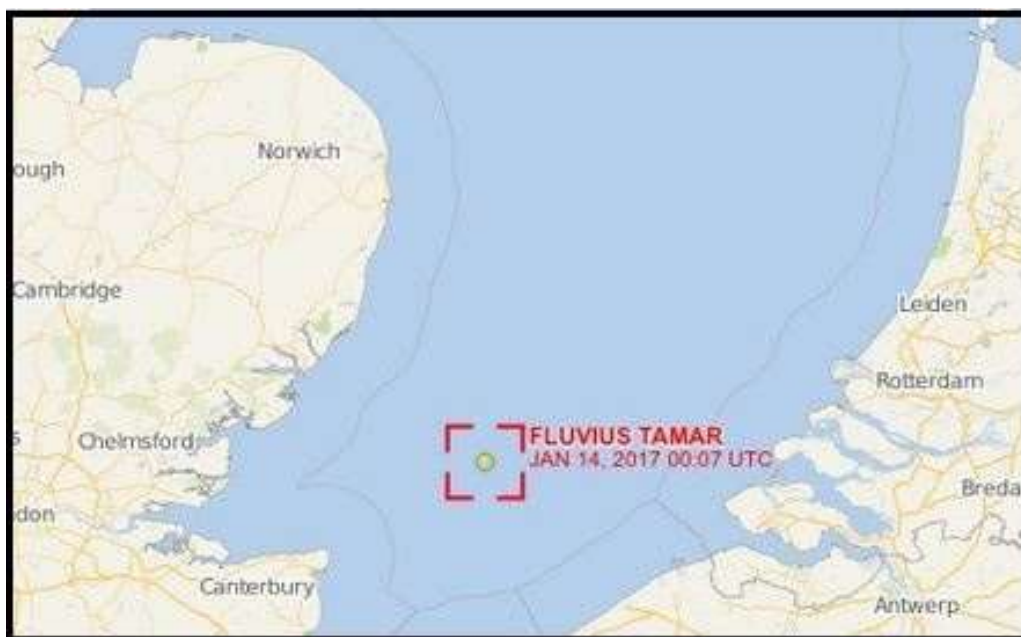


Fig 02: Location of Ship (Picture: SOSREP)

- 1.3 The vessel had been experiencing heavy weather since sailing from Eemshaven on 12th January 2017. The weather at the time of the loss was Wind NW 30 – 40 kts and sea state 3 – 4 metres from the NW. The departure draft was forward 4.90 metre aft 5.40 metre and a GM of 2.90 metres.
- 1.4 The roro cargo ferry – *Norstream* responded to the distress, she was on a voyage from Zeebrugge to Tilbury.



Fig. 03: Norstream

(Picture – Marine Traffic)

- 1.5 The first survivor from the *Fluvius Tamar* was brought on board via the pilot ladder through the pilot door at 0145. The full complement of the *Fluvius Tamar* was rescued, including the Chief Officer and Chief Engineer who spent over an hour in the sea (sea temperature 6°C), all wearing Immersion Suits and Lifejackets.

2 DETAILS OF INVOLVED VESSEL(S) AND OTHER MATTERS

2.1 Vessel Information

2.1.1 The *Fluvius Tamar* (ex Abis Albufeira) is a General Cargo single hold vessel of all steel construction and registered in the port of Bridgetown, Barbados.

2.1.2 The vessel was constructed in 2009 in the Partner Shipyard Yard No: 101 at Szczecin, Poland. At the time of the incident the vessel was under the classification with Lloyds Register (LR). The registered owner is Exe Shipping Ltd. and managed by Shipowners Support BV, the owners having been purchased by the current owners in December 2016.

The principal particulars are as follows:

IMO: 9501708

Build: 2009

Class: LR

Length (BP): 89.90 mtr

Beam: 13.60 mtr

Draught: 5.35 mtr

Gross Tonnage: 2,876mt

Deadweight Tonnage: 4,200mt

2.1.3 The vessel's main propulsion is provided by one MaK diesel engines connected to single Controllable pitch propeller, the total power of 1,520kW delivering a service speed of 11.0knots. In addition, one forward tunnel thruster is available for manoeuvring.

2.2 Ships Certification

2.2.1 At the time of the incident all her statutory certificates were valid. The *Fluvius Tamar* was issued with a Certificate of Compliance with the International Maritime Solid Bulk Cargoes (IMSBC) Code on the 3rd January 2017 which is valid until 11th February 2019. The Cargo Ship Safety Certificate issued by LR in Rotterdam on the 3rd January 2017 and valid until 11th February 2019.

2.3 Port State and Flag Inspections

- 2.3.1 A Port State Control initial inspection was conducted in Hamburg, Germany on the 27th July 2016, following the inspection no deficiencies were found.
- 2.3.2 The initial Flag State Inspection was conducted by an authorised Barbados Inspector at Dordrecht, Netherlands on 30th December 2016.

2.4 Crew

- 2.4.1 The total ships complement of the *Fluvius Tamar* is seven. The vessel was manned with a crew of 7 persons, Master; Chief Officer; Second Officer, Chief Engineer; two Able Seaman and a Cook. All the Officers were in possession of a valid Certificate of Competency and a Barbados Certificate of Receipt of Application (CRA) expiry 30th March 2017, while awaiting the issuance of a STCW Equivalent Competency certificate.

- 2.4.2 Bridge Watchkeeping:

0000 – 0400 and 1200 - 1600	Second Officer
0004 – 0800 and 1600 - 2000	Chief Officer
0800 – 1200 and 2000 – 2400	Master
Day worker and as required	Chief Engineer

- 2.4.3 The crew members joined the vessel prior to the purchase of the *Fluvius Tamar*. Although they were all new to the vessel, they all had extensive experience of this ship type, operating worldwide.

2.5 Drills

- 2.5.1 A Fire Drill and a Boat Drill were last carried out on the 3rd January 2017, during the Flag State Initial Annual Inspection and found to be satisfactory.

NARRATIVE OF EVENTS

All times given in the narrative are ship time (*Fluvius Tamar* - UTC+1) and as provided by crew members during interviews held in Southend, UK within 48 hours of the incident. Since all ship-board records were lost with the ship, this narrative is largely based on the recollections of crew members expressed during these interviews.

Photographs taken of the *Fluvius Tavy* used for illustration purposes only.

Additional information has been provided by the rescue ship *Norstream*, SOSREP, Salvors and TMC Ltd.

3.1 Crew join ship and preparation.

- 3.1.1 The crew of 7 persons – 4 Russian officers and 3 Cape Verde ratings joined the *Fluvius Tamar* on Thursday 29th December 2016 at Gravendeel, Netherlands. At the time, the *Fluvius Tamar* was moored alongside the *Fluvius Tavy* IMO: 9501710. These two vessels had recently been purchased by new owners.
- 3.1.2 During the next few days, the crew were assigned various duties. The cargo hold was washed down and cleaned, the two-moveable bulkhead and the cargo hold were inspected. The hold bilges and strum boxes were emptied, cleaned and hosed down, removing all debris from the bilges. The cargo bilges alarm systems were successfully tested by the Chief Engineer prior to the bilges being pumped out. In addition, crew time was spent cleaning and painting the *Fluvius Tamar* and undertaking familiarisation of the vessel.
- 3.1.3 Meanwhile the Deck Officers examined and tested all the ships equipment and machinery, while the Chief Engineer carried out a comprehensive inspection of the Engine Room, this included testing of the high-level bilge alarms in the Engine Room and the Cargo Hold.
- 3.1.4 On Wednesday 4th January 2017, the *Fluvius Tamar* left her berth at Gravendeel on the Dordtsche Kil and proceeded the 10 nm to Bolnes shipyard on the Nieuwe Maas, in preparation for mooring the vessel on a slipway.
- 3.1.5 Prior to dry docking the vessel's ballast was pumped out
- 3.1.6 During the vessel's stay in Bolnes, in preparation for her forthcoming voyage, the new ships markings – Ships Name; Port of Registry and IMO number, were cut into the hull. The hull was cleaned and painted, the draught marks were repainted. The second officer commented that he hadn't seen any damage to the hull. At this time, the hull was also inspected by Class (LR) and an Immediate Survey carried out. All ballast tanks were opened for inspection and ventilated prior to entry. Once the Surveyors was satisfied with the condition, all tanks were closed having renewed the rubber seals and the inspection plates replaced.

- 3.1.7 All the tanks were found to be in a satisfactory condition, no condition of class was issued and the appropriate certificate duly issued.
- 3.1.8 During the survey, it was noted the bridge columns had RAM-NEK tape covering the base of the column, small cracks (25mm) were visible on the columns, allowing water to enter the engine room bilges. The column of the *Fluvius Tamar* refers to the 5 metres retractable bridge, which when retracted allows for the vessel to sail under restricted air draught bridges.
- 3.1.9 An audit of the Safety Management System (ISM Code) and International Ship and Port Facility Security (ISPS Code) was conducted by Bureau Veritas on behalf of the Flag State on the 5th January 2017 and the appropriate certificates issued.
- 3.1.10 On the 9th January, the Master received instructions from the managers to proceed to Eemshaven as soon as possible. Once the vessel returned to the water, the ballast water was pumped into the tanks.
- 3.1.11 Prior to departure all the bridge, machinery and steering equipment was tested and found to be working correctly. The *Fluvius Tamar* sailed from Bolnes with 1650 tonnes of water ballast on-board, only the Aft Peak tank was empty. The departure draft being forward: 2.90 metres, aft: 3.45 metres.

Capacity of Water Ballast (RHO=1.025)		
R118	Aft Peak	65.159
R301	DB Tank Fr95-111 CL	154.092
R303	L Tank Fr76-85 SB	179.383
R304	L Tank Fr76-85 PS	179.383
R307	L Tank Fr42-61 SB	166.225
R308	L Tank Fr42-61 PS	166.225
R309	L Tank Fr23-42 SB	156.468
R310	L Tank Fr23-42 PS	156.468
R401	S Tank Fr101-113 SB	51.615
R402	S Tank Fr101-113 PS	51.615
R501	Fore Peak	165.118
R502	Deep Tank SB	112.047
R504	Deep Tank PS	111.865
TOTAL		1715.66

Fig 04; Ballast Tank Capacity (m³)

3.2 Passage to Eemshaven

- 3.2.1 The *Fluvius Tamar* sailed from Bolnes, having received instructions to proceed to Eemshaven, Groningen to load Magnesite (High Grade Burned Magnesium Oxide). IMSBC Code describes Magnesite as a natural magnesite calcined at very high temperatures, which results in a non-reactive magnesium oxide, which does not hydrate or produce spontaneous heat.

Characteristics of Magnesite

i	Angle of Repose:	not applicable
ii	Bulk Density:	2.0 t/m ³
iii	Stowage Factor:	0.5 m ³ /t
iv	Size:	Fines to approx. 30 mm
v	Class:	not applicable
vi	Group	C ¹

3.2.2 According to Marine Traffic (AIS), on Tuesday 10th January 2017 the vessel departed from Rotterdam at 1104, on a passage of about 19 hours. On the passage to Eemshaven, the crew prepared the cargo hold for the loading of the Magnesite.

3.2.3 The passage was uneventful although there was a strong north westerly wind and frequent rain. An occasional bilge alarm sounded in the Engine Room, it was assumed to be caused by leakage via the columns (Retractable Bridge) and was immediately pumped out using the ballast pump from the bilges – pump capacity 80 tonnes per hour.

3.3 Loading

3.3.1 The vessel arrived at the port Eemshaven on Wednesday 11th January, in preparation for loading the Magnesite, the holds were surveyed for cleanliness, loading commenced at midday.

3.3.2 The weather during the vessels stay in Eemshaven was described as strong winds and frequent rain showers.

3.3.3 There were three different grades of Magnesite to be loaded, this required the two moveable cargo bulkheads to be relocated in the cargo hold to create three separate cargo compartments.

3.3.4 The Cargo Hold was protected by eleven pontoon hold covers. The appropriate hatch pontoons were removed using the deck crane and the moveable bulkheads positioned as required. In the closed position, the hatch pontoons are secured by six quick acting hatch cover dogs, three on the portside corners and three on the starboard side corners connecting the pontoon to the hatch coaming, while cleats secured each pontoon together, preventing the hatch covers from being displaced.

3.3.5 The forward bulkhead was secured at frame 80, while the after bulkhead was secured at frame 56. Throughout this period of time it had been raining, with the rainwater flowing into the bilges and activating the bilge alarms, the bilges were emptied using the ballast pump.

¹ Group C consists of cargoes which are neither liable to liquefy (Group A) nor to possess chemical hazards (Group B)

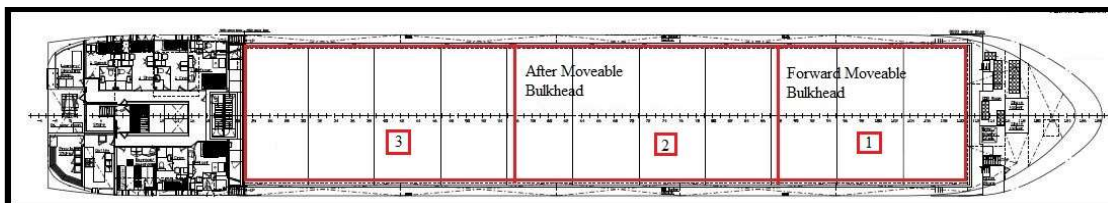


Fig 05: Position of moveable bulkhead

- 3.3.6 The agreed sequence for the loading of the cargo was to commence forward at No.1 section, then No. 2 section and finally No. 3, to accommodate the three grades of Magnesite.
- 3.3.7 Loading commenced on the Wednesday 11th January. During the cargo loading operation only 2 or 3 hatch pontoons were opened at a time, owing to the inclement weather. On several occasion cargo operations were stopped as requested by the stevedores' due to the rain and the cargo hatch covers were closed using the gantry crane. This prevented the Magnesite from getting too wet.
- 3.3.8 The Magnesite was delivered to the quayside by lorry, from where it was lifted by a mobile crane grab and initially lowered onto the tank top. Once a bed of product sufficient to protect the tank top had been loaded, the loading operation then proceeded as normal, dropping the product from below the hatch coaming into the hold. This common practice helped to reduce the amount of dust particles entering the atmosphere.
- 3.3.9 During the cargo operations the water ballast was gradually discharged as the cargo was loaded to prevent excessive stress to the vessel and maintain an even keel.
- 3.3.10 The loading operation was uneventful having taken about 30 hours and was completed on Thursday 12th January at 1830. Upon completion of loading the Chief Officer and Second Officer replaced all the pontoons while the Able Seamen secured the pontoons with dogs and cleats.
- 3.3.11 The ships stability was calculated using windows based CPC 1.9 stability software.
- 3.3.12 Eemshaven departure information:
- | | |
|----------|--|
| Dep: | Thursday 12 th January 2030 |
| Draught: | F: 4.90 metres A: 5.40 metres M: 5.15 metres |
| GM: | 2.90 metres |
| Cargo: | 3962 tonnes |
| | (No.1 - 1250 tonnes; No.2 – 1450 tonnes; No.3 – 1255 tonnes) |

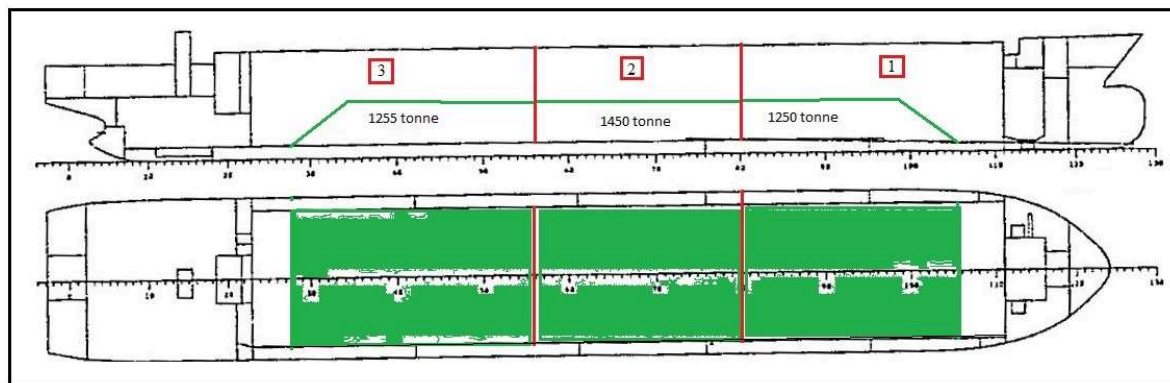


Fig 06: Cargo Plan

Bunkers on Board

Bunkers: Gas Oil: 77 m³
 Lub Oil: 1.7 m³

Fresh Water: 15 tonnes

Ballast: nil

GAS OIL		
Location	Frame	m ³
Fuel Oil Tank – 302	61 - 76	25.0
Fuel Oil Tank – 303	61 – 76	25.0
Day Tank ER - Stbd	10	7.0
Day Tank ER - Port	20	20.0
	Total	77.0
LUB OIL		
ER portside	9	0.6
ER portside aft	8	1.1
	Total	1.7
FRESH WATER		
Engine Room - Port	11 - 18	1.5
	Total	1.5

Fig 07: Fuel and Water on board

3.4 On Passage to Pasajes – Thursday 12th January 2017

3.4.1 Once the vessel was ready for sea, all the bridge, machinery and steering equipment was tested in accordance with the bridge procedures using the pre-departure checklist and found all to be satisfactory. The Master was advised that the vessel was secure for sea and full water integrity had been established. The Master checked the two entrances to the cargo hold, forward and aft confirming that the doors had been closed and dogged.



Fig 08: Ford Cargo Hold Door. (Fluvius Tavy)



Fig 09: Ford Cargo Hold Door. (Fluvius Tavy)

The forward ventilator hatches located on the focsle were secured and checked as required by the checklist. While the Gantry Crane located forward of the bridge was secured.

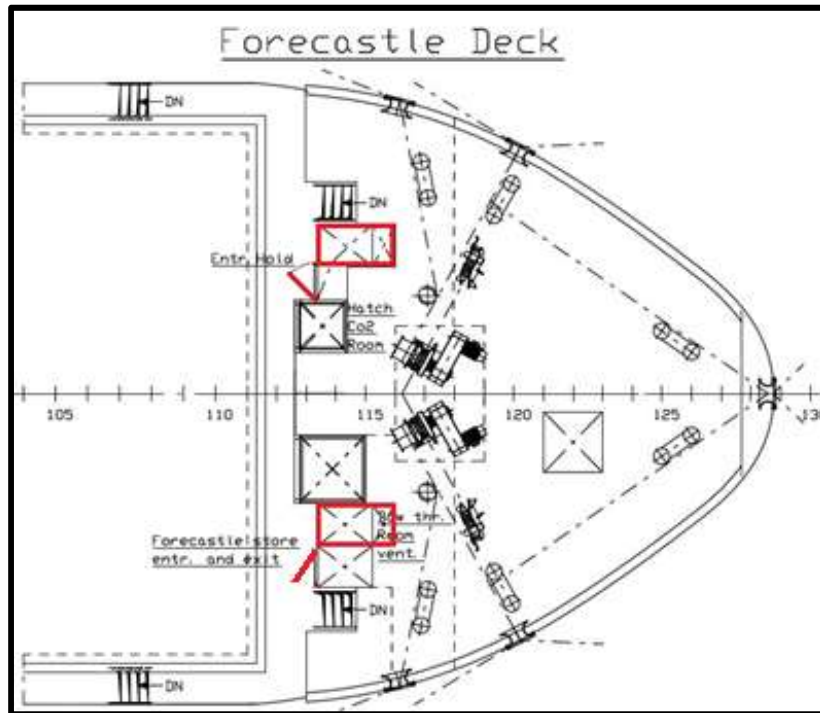


Fig 10: Location of Ford Ventilators



Fig 11: Location of Ford Ventilators

(Fluvius Tavy)



Fig 12: Cargo Hold Ventilators

- 3.4.2 The vessel left the berth with the pilot on board, where the ship commenced swinging in order “swing the compass”, to compare the magnetic compass against the Deviation Card, this was successful. Once the Pilot had disembarked via the pilot ladder, the AB stowed the pilot ladder and secured the anchors. Once complete, the AB reported to the Master on the bridge that everything was secured before retiring to his cabin.
- 3.4.3 The Second Officer in his statement spoke “of some spray was coming from the focsle over the hatches and main deck but nothing significant”.
- 3.4.4 The sea passage commenced Thursday 12th January 2017 at 2030, with an ETA for arrival at Pasajes of Tuesday 17th January 2017.
- 3.4.5 The prepared passage plan from Eemshaven to Pasajes, Spain, being a distance of 960 nm, the steaming time to the next port being about 4 days. The planned voyage was to enter the westbound German Bight TSS and proceed via the Vlieland TSS and Texel TSS before heading towards the North Hinder TSS. The vessel would then advance to the Dover Strait TSS in the south west lane and through the English Channel to Ushant and across the Bay of Biscay to Pasajes.
- 3.4.6 The weather forecast at the time for German Bight was decreasing Force 5/6, but increasing later. While the forecast for sea area Humber was for a North Westerly wind, Force 6/7 increasing to Force 8, occasionally Force 9. The tide in the area off Borkum was on the flood, high water being at 2322 with a predicted height of 3.5 metres.
- 3.4.7 The passage plan had been approved by the Master and was entered into the ECDIS by the Second Officer. The *Fluvius Tamar* carries two ECDIS systems.

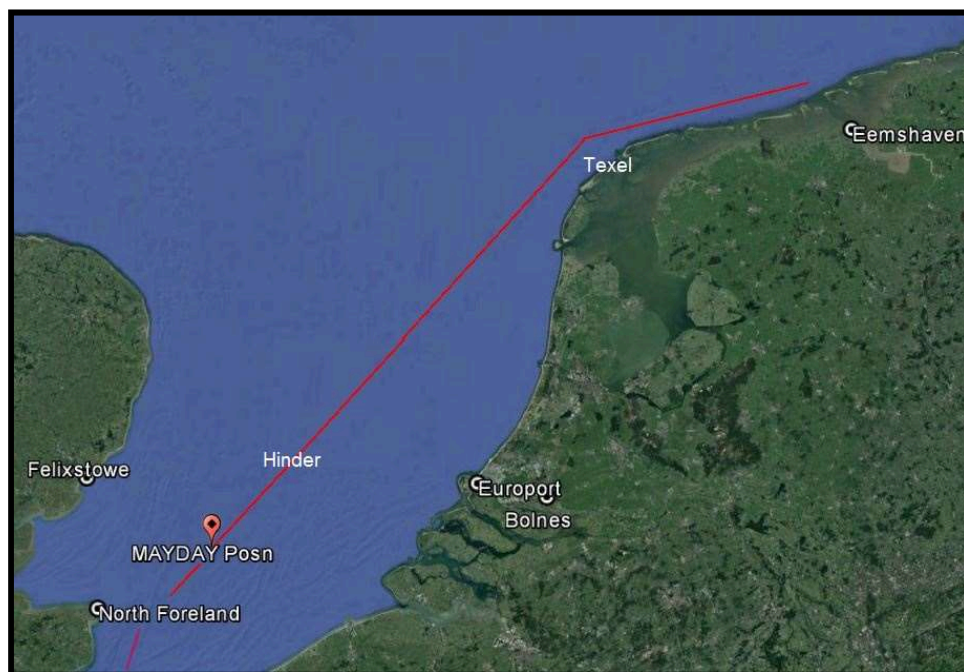


Fig 13: North Sea Passage

- 3.4.8 On departure from the pilot station the engine was initially running at 85% power output, while the Chief Engineer monitored the cylinder temperatures, the vessel speed was 10.5 kts. The Master recalls “a few alarms sounded, these may have been the lube oil pressure or cylinder temperature”. There are alarm panel displays on the bridge and the engine room, while the alarms are accepted and reset in the Engine Room. The propeller pitch was reduced to 80% and subsequently to 78%.

3.5 On Passage to Pasajes

- 3.5.1 During the Master bridge watch (2000 – 2400) on passage to the Texel TSS, the column bilge alarm sounded, the Chief Engineer pumped out this water. The AB reported that during his rest period he heard frequent Engine Room alarms, which were immediately accepted by the Chief Engineer. The Chief Engineer recalls pumping the hold bilges for about 20 minutes. Further Engine Room alarms occurred through the night of the 12th/13th January. On each occasion the crew believed all alarms were weather related
- 3.5.2 The Masters statement reported “on passage the vessel was pitching and rolling slightly, spray was coming from the focsle over the hatches and the main deck, but nothing substantial.
- 3.5.3 By noon of Friday 13th January it was estimated the vessel was about 25 miles off Den Helder, Netherlands heading towards the North Hinder TSS.
- 3.5.4 A confirmed position available (AIS) was at 13th January 1926utc – Latitude 52° 04.8’ N, Longitude 002° 51.2 E. The passage duration was about 24 hours, in that period an estimated 170 nm were covered at an average speed of 7.1 kts.

- 3.5.5 The weather at this time was reported by the crew as being Force 8, occasionally Force 9 from the North West. The sea conditions had increased over the previous 12 hours “from moderate to rough”, the vessel now pitching and rolling heavily. There was no slamming, although the waves were hitting the starboard side of the vessels beam, causing her to shake occasionally.
- 3.5.6 On the morning watch the sea spray was over the focsle, by the afternoon spray and occasional heavy seas came over the hatches, this continued through the afternoon watch. Meanwhile during this period, the Master was on the bridge obtaining the latest weather forecasts, checking the prevailing weather conditions and the progress of the passage.
- 3.5.7 At 1600 the Second Officer was relieved by the Chief Officer. The Chief Officer reported the conditions as wind from the North West, Force 7 to Force 8, with sea conditions being 3 to 4 metres and the visibility of 6 miles.
- 3.5.8 The Chief Officer reported several Engine Room alarms sounding during his watch, these included the bridge column bilge alarm which was pumped out and various engine alarms.
- 3.5.9 At changeover of watch at 2000, the course was 217° with a speed of 6.5kts.
- 3.5.10 Searchlights are fitted to each bridge wing, at 2000 a searchlight was used to inspect the fore deck, focsle and the direction of the waves, the fore deck and focsle, all appeared to be sound. The weather was described as force 7 gusting to Force 8, with 2 to 3 metre sea, with the ship’s speed varying between 8.5 and 10 kts. The ship was rolling 10° to 15°.
- 3.5.11 At 2200 the 2nd Officer, who was sleeping in his cabin, was awoken by a sudden change in the vessel’s motion.
- 3.5.12 Again at 2200, the Master on watch switched on the searchlight. The weather conditions appeared unchanged and the vessels condition and trim had not changed and according to the Master both the forward Cargo Hold door and the focsle door appeared to be closed. The vessel was now in the North Hinder TSS, maintaining a speed of 8 kts.

3.6 Final hour

- 3.6.1 The watch handover at 0000, the Second Officer arrived on the bridge shortly before midnight. He was advised by the Master the vessel was proceeding southbound in the North Hinder TSS on the starboard side of the lane, her course was 217°. Discussions were held regarding the Dover Coastguard CNIS reporting point before leaving the bridge.
- 3.6.2 Shortly after the Master had left the bridge, the Second Officer switched on the starboard searchlight to check the sea conditions, it was apparent the vessel was now trimmed by the head. The focsle “was just above the water” and main deck awash. He then used the port searchlight and observed water “over

the portside main deck”. The poop deck was now awash, with waves striking the starboard rescue boat.

- 3.6.3 The officer of the watch – Second Officer – immediately called the Master to the bridge, while the Chief Officer was called to the bridge at 0010 arriving one minute later. The Master asked for confirmation from the Chief Engineer that all the ballast valves were shut and also asked for the state of the bilges in the cargo hold.
- 3.6.4 The Chief Engineer confirms ballast valves were closed, the hold bilge alarms were last sounded on the 13th January between 0500 – 0600. Meanwhile the Second Officer and two AB’s attempted to get onto the poop deck via the accommodation door. It was apparent that the situation was perilous and the attempt was abandoned. The AB’s were sent to the bridge, while the Second Officer went to the Engine Room, water was on the bottom plates with about 10 cm of water in the bilges. The Chief Engineer had already started two pumps, the water appeared to be entering the Engine Room at mid-deck level.
- 3.6.5 The Master was on the bridge by 0020, having been with the Chief Engineer in the Engine Room. An immediate alteration of course was made to the North West, head to wind, to check the draft. It was apparent the vessel was in taking on water but on an even keel. The Master then announced to prepare to abandon ship. All crew donned their immersion suits and lifejackets.
- 3.6.6 The Chief Engineer informed the bridge of the situation, the Master ordered him to the bridge, where all crew were also assembled.
- 3.6.7 At about 0025 on 14th January 2017, the *Fluvius Tamar* declares an emergency and broadcast a **MAYDAY**, in position Latitude 50° 40.2’N Longitude 002° 13.6’E, stating the vessel is sinking and needed urgent assistance on VHF Channel 16. Contact was established with Dover Coastguard at 0030. Dover Coastguard immediately coordinated an extensive search and rescue operation, utilising several maritime assets. The Master altered course back to a heading of 217°



Fig. 14 Tracks of Fluvius Tamar & Norstream

(CNIS)

- 3.6.8 At 0035 the Master ordered the crew to prepare the 12 man throw over liferaft on the portside. The sea was now washing over the hatch covers. The Master went to his cabin to collect ships' and crew papers. On returning to the bridge, he stopped the engine, set the propeller pitch to zero and activated the emergency stop.
- 3.6.9 The water was now over the focsle and awash of the bridge column. With all the crew now assembled on the poop deck, the port liferaft was launched into the water, the starboard liferaft having been released automatically by the hydrostatic release unit. As the crew were about to jump into the raft, two waves hit the poop deck, resulting in the crew being washed overboard.
- 3.6.10 The crew swam towards the port liferaft, the Master, Second Officer, 2 Able Seamen and the Cook all managed to board the liferaft despite the rough seas. There was no sign of the Chief Officer and Chief Engineer.
- 3.6.11 The last AIS transmission from the *Fluvius Tamar* was 14th January 2017, 0007utc, (0107 ships time).

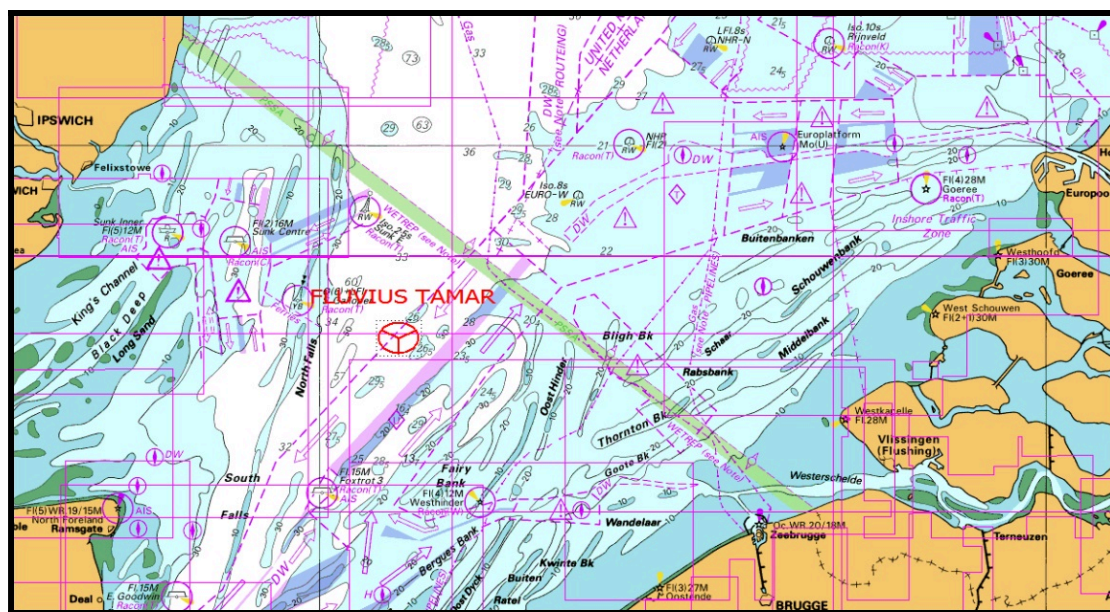


Fig. 15 Location of sinking

(SOSREP)

3.7 Rescue Ship – Norstream

- 3.7.1 The *Norstream* IMO: 9186194 is a Finnish registered Ro Ro Cargo vessel of 20,296 Gross Tonnes. She is chartered to P&O Ferries Ltd. and engaged on a service operating between Zeebrugge, Belgium and Tilbury, UK. The weather conditions were reported by the vessel as wind: NW 30 – 40 kts, sea state: 3 – 4 metres from the north west, visibility good.



Fig. 16: Norstream

(Marine Traffic)

- 3.7.2 The *Norstream* was bound for Tilbury and was heading westbound crossing the North Hinder TSS, when she received the MAYDAY alert at 0052, on VHF channel 16. At 0100, the *Norstream* vessel contacted Dover Coastguard CNIS offering their assistance as she was only 1.8 nm away on the starboard bow. Both visual and radar observations of the *Fluvius Tamar* had been established.
- 3.7.4 The *Norstream* sighted the sinking of the *Fluvius Tamar* at 0110 on 14th January 2017.
- 3.7.5 At 0125 the vessel was advised by Dover Coastguard that the SAR helicopter was 20 minutes away.
- 3.7.6 The first survivor from the *Fluvius Tamar* was brought on board via the pilot ladder through the pilot door at 0145. By 0200 all the crew of the *Fluvius Tamar* was rescued, including the Chief Officer and Chief Engineer who spent over an hour in the sea (sea temperature 6°C), all wearing Immersion Suits and Lifejackets.
- 3.8 SOSREP and Salvage**
- 3.8.1 Following the loss of the *Fluvius Tamar*, the SOSREP² was involved from the initial stages of the incident.,
- 3.8.2 The Trinity House Vessel *Patricia* was tasked to locate and buoy the wreck, to survey the area, ascertain the depth of water, clearance depth and aspect of the *Fluvius Tamar*.
- 3.8.3 The *Fluvius Tamar* was in 36 metres of water with an underwater clearance of 17 metres. lying upright on a heading of 350°.

² SOSREP – Secretary of State’s Representative for Maritime Salvage & Intervention

- 3.8.4 A full underwater survey was carried out by a specialist team towards the end of January 2017 in order that a Salvage / Removal Plan be developed to the satisfaction of the SOSREP.
- 3.8.5 This Salvage / Removal Plan was actioned, with the removal of all oils on board and discharge of the bulk cargo to barges before recovering the *Fluvius Tamar*.



Fig 17 Fluvius Tamar (Ardent Salvage)

- 3.8.6 Having been declared a Total Constructive Loss the *Fluvius Tamar* was towed to Dordrecht, Holland for scrap, arriving in Dordrecht on the 27th July 2017.



Fig 18 Fluvius Tamar under tow (Monique Davis-Mulder)

3.9 Inspection of Salvaged Vessel

3.9.1 Forward Cargo Hold Door

- 3.9.1.1 The entry to the cargo hold is by way of rear facing watertight door forward of the cargo hold as indicated below. The door has a central single closing handle on the outside of the door, connected to four quick acting dogs on the inside with a similar closing handle on the inside of the door. The closing handles when in a horizontal position indicate a closed position and when

vertical the door is open. The hinges on the cargo hold door are located on the starboard side of the door, when closed.

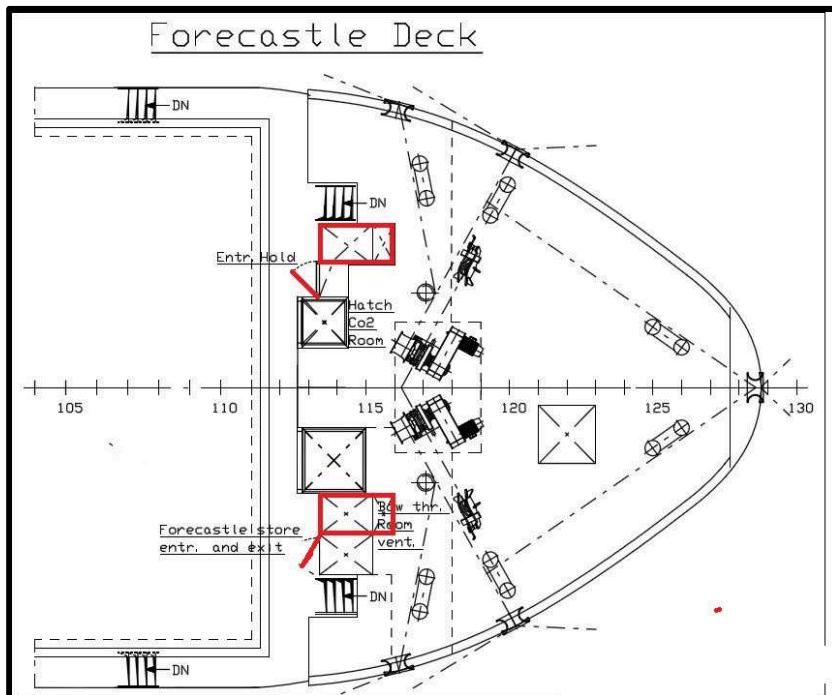


Fig 19 locations of Cargo Hold & Focsle Doors



Fig 20

(Fluvius Tavy)

3.9.1.2 Divers were engaged to carry out an underwater survey of the *Fluvius Tamar*. A photograph taken on the 25th January 2017 at 1740 56 seconds., identified the watertight door was located at the focsle break.



Fig 21 Open Door identified by Divers

(Fluvius Tamar)

3.9.1.3 Subsequent inspection of photographs taken from the *Fluvius Tavy*, Divers photograph of the open door and the photograph taken once the vessel was salvage, confirmed the open door was the for'd cargo hold door.



Fig 22 Cargo Hold Door – after salvage

(Fluvius Tamar)

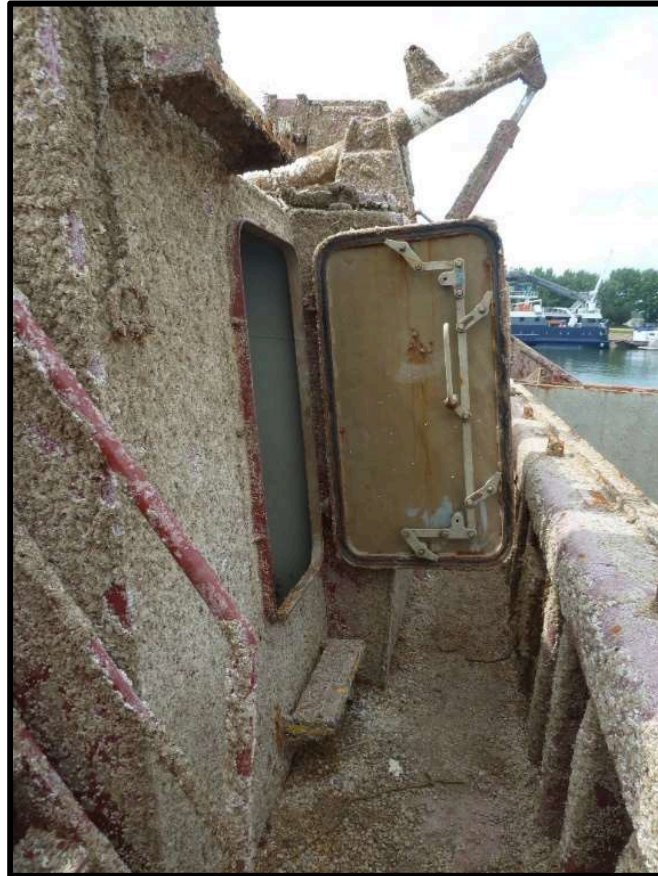


Fig 23 Cargo Hold Door

(Fluvius Tamar)

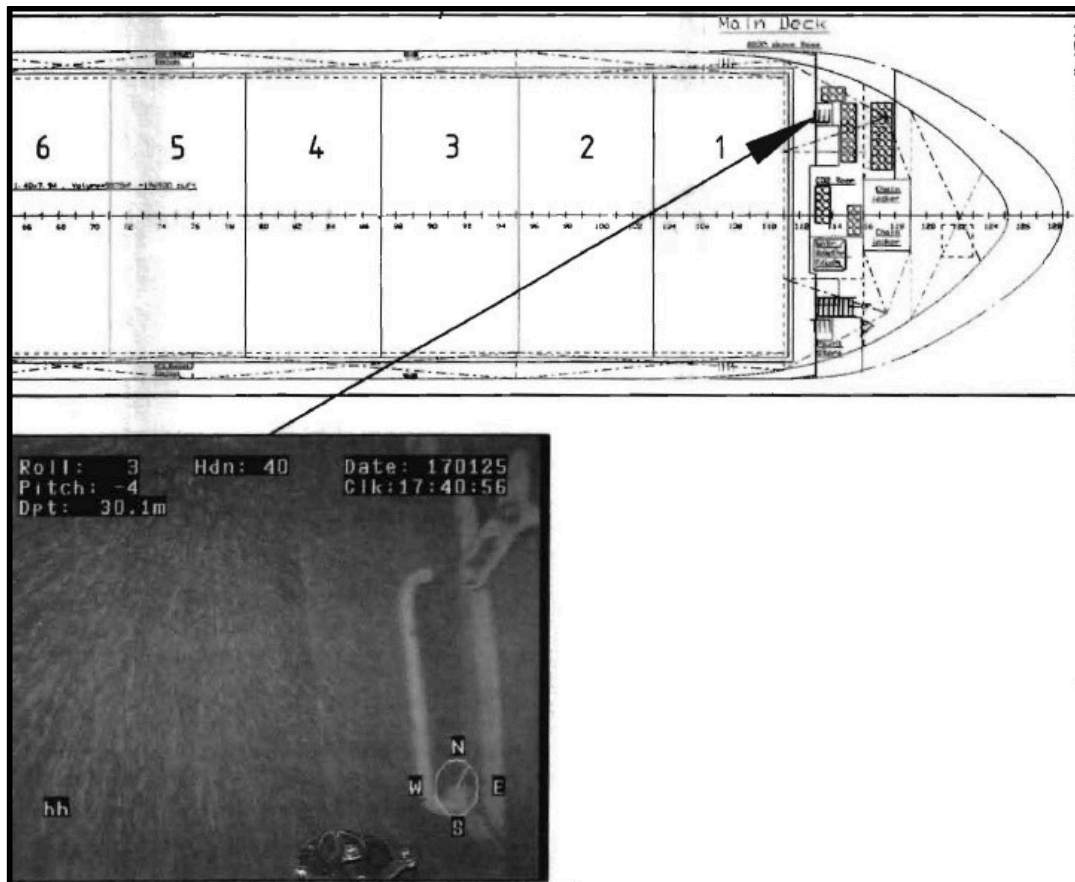


Fig 24 Location of Cargo Hold Door & underwater image

(Fluvius Tamar)

3.1.9.4 Comparison of the doors below and the orientation of the inner closing handle and the upper dog, confirmed the Cargo Hold Door was open at the time of sinking.



Fig 25 Cargo Hold Door

(Fluvius Tamar)



Fig 26 Cargo Hold Door - view from portside

(Fluvius Tamar)

3.9.2 Focsle Door

- 3.9.2.1 The entry to the focsle is by way of rear facing watertight doors forward of the cargo hold. Like the cargo hold door, the door has a central single closing handle on the outside of the door, connected to four quick acting dogs on the inside with a similar closing handle on the inside of the door. The closing handles when in a horizontal position indicate a closed position and when vertical the doors are open. The hinges on the focsle door are located on the port side of the door when closed.



Fig 27 Focsle Door

(Fluvius Tavy)

- 3.9.2.3 Inspection of the focsle door once the ship was raised, revealed that the door seals showing signs of compression with no presence of growth along the seal.
- 3.9.2.4 Further inspection of the focsle door and door frame showed the lower part of the door frame to be set down. We are unable to explain how this damaged occurred, but believe the door was closed at the time of the sinking.



Fig 28 Focsle Door

(Fluvius Tamar)



Fig 29 Focsle Door – distorted bottom of frame

(Fluvius Tamar)

3.9.3 Cargo Hatch Lids

3.9.3.1 The cargo hold removable hatch covers consists of eleven separate panels. The hatch covers are removed by a lifting frame using the ships gantry crane or a shore facility. Each panel is secured to the hatch coaming by six quick acting dogs onto the hatch covers. While each hatch cover is locked to adjacent covers with five cleats.



Fig 30 Open Cargo Hold

(Fluvius Tavy)



Fig 31 Hatch Covers – Dogs and Cleats

(Fluvius Tavy)

3.9.3.2 All hatch covers were found to be in place during the underwater inspection, although hatch cover No:3 was distorted upward by 60 – 80 cm in the middle. As a result, the No: 3 hatch cover was offset 10 – 20 cm to starboard. All quick acting dogs were broken, and the hatch top cleats locking the adjacent hatch covers were also broken.

3.9.3.3 This distortion to No. 3 hatch cover is likely to have occurred as the vessel sank with the hold already full of water via the open Cargo Hold Door. As the

hatch covers were removed in order to discharge the cargo and left on the seabed, no further inspection of the hatch covers was possible.

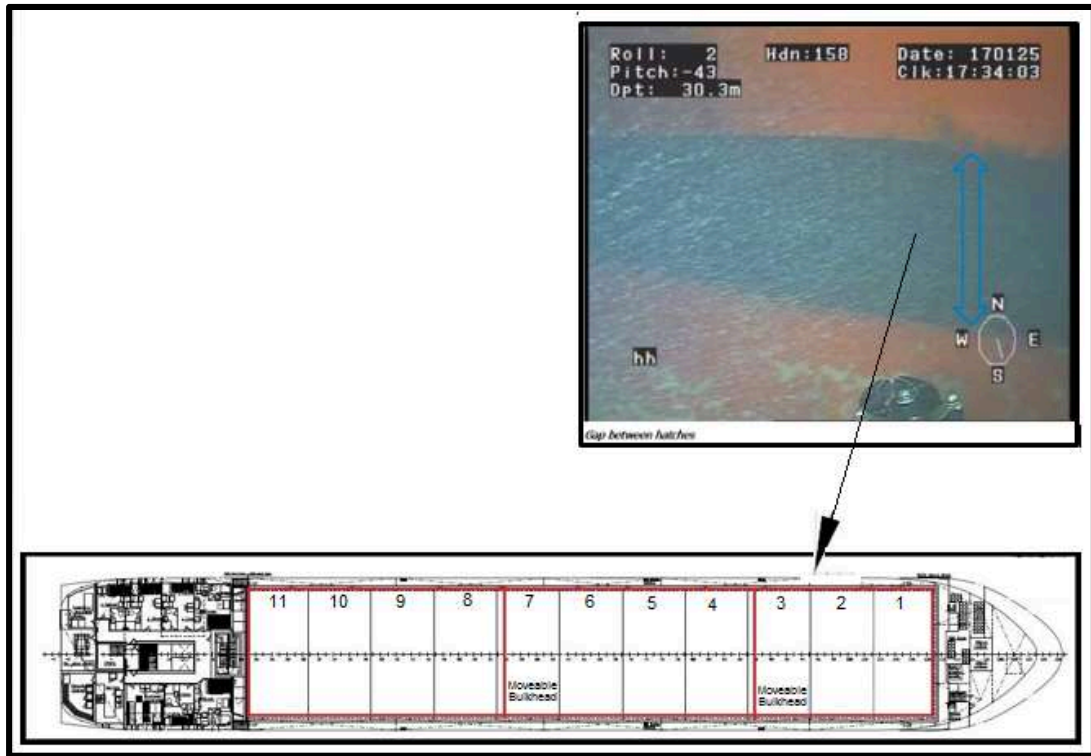


Fig 32 Distorted No. 3 hatch cover

(Fluvius Tamar)



Fig 33 Distorted No. 3 hatch cover

(Fluvius Tamar)



Fig 34 Offset No. 3 hatch cover

(Fluvius Tamar)

3.9.4 Bow Section

3.9.4.1 The bow section of the *Fluvius Tamar* on landing on the sea bed was pushed up. The plating on the bulb was completely deformed, dented with serious cracks, while the bulwarks on the focsle were buckled and the focsle deck severely bowed inwards.

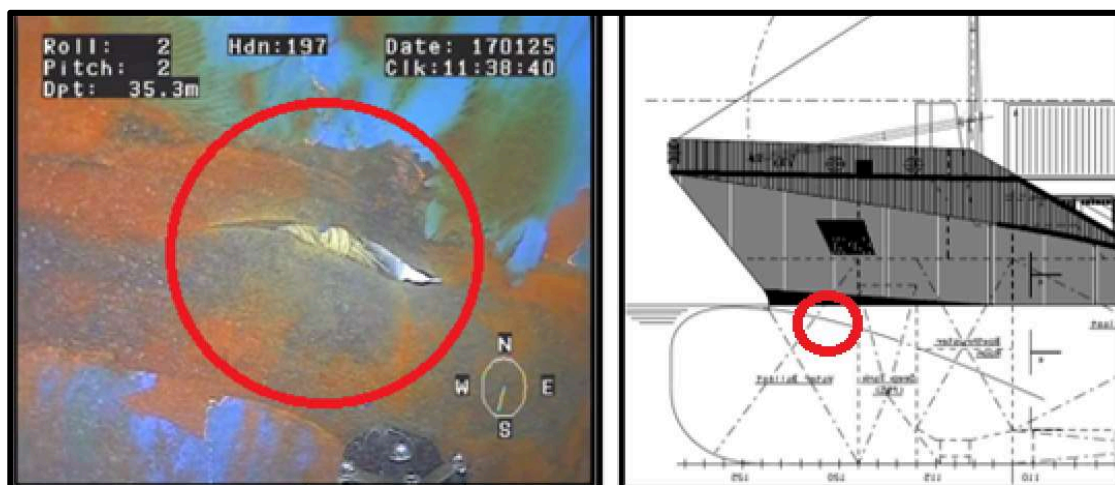


Fig 35. Tear when vessel touched bottom

(DUC Diving)



Fig 36 Damage to Bulb section

(Fluvius Tamar)



Fig 37 Damage to Focsle

(Fluvius Tamar)

3.9.5 Cargo Hold

3.9.5.1 Inspection of the cargo hold after recovering the *Fluvius Tamar*, revealed the hold to be intact, with no sign of significant damage. Damage to the moveable Bulkheads occurred during the discharge of the cargo while the vessel was lying on the seabed.



Fig 38 Cargo Hold

(Fluvius Tamar)



Fig 39 Cargo Hold

(Fluvius Tamar)

3.9.6 Vents and Caps

3.9.6.1 Throughout the salvage operation no evidence was viewed regarding ventilators, ballast valves or sounding pipe covers being defective or left open.



Fig 40 Ballast Tank ventilator

(Fluvius Tamar)

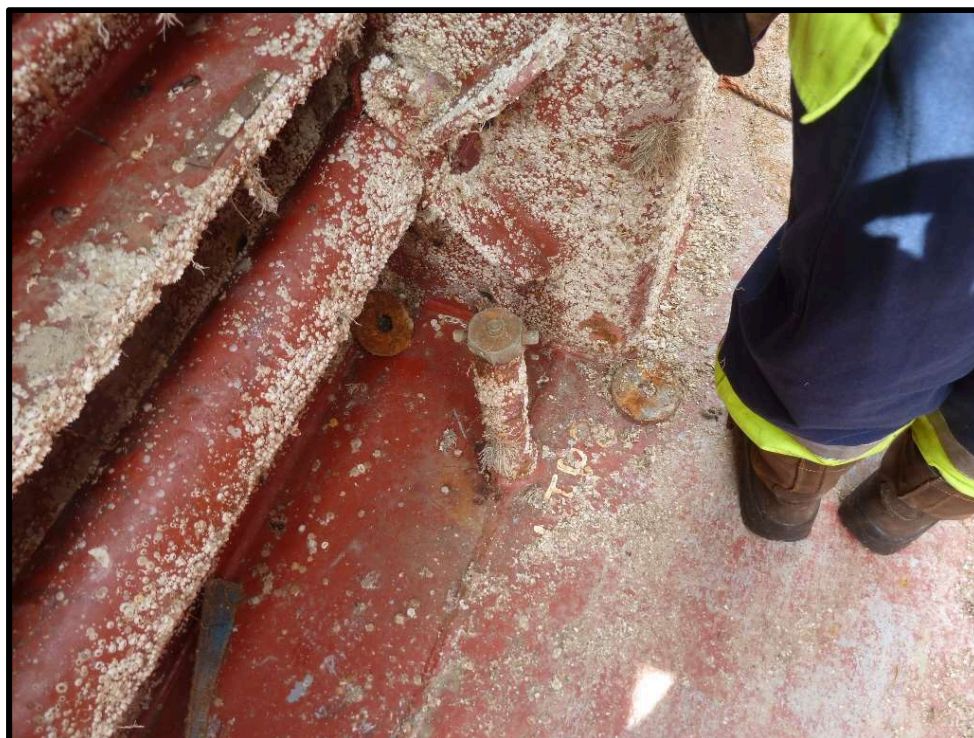


Fig 41 Sounding Cap

(Fluvius Tamar)

ANALYSIS AND DISCUSSION

4.1 General Comments

- 4.1.1 The loss of the *Fluvius Tamar* along with the opportunity to carry out a close examination of the structure effectively, prior to the commencement of the salvage operation prevents the establishment of the true cause(s) of the casualty.

4.2 Ownership

- 4.1.1 The owners Exe Shipping Ltd. (IMO No: 5693551) have been involved in small ship ownership for a number of years, the technical and crewing operation was conducted by Shipowners Support BV (IMO No: 5418110).
- 4.1.2 The owners took delivery of the *Fluvius Tamar* and the sister ship *Fluvius Tavy* in December 2016. Inspections were carried out by the Flag State prior to accepting the vessel onto the Barbados Ship Registry. The RO – Lloyds Register carried out full statutory surveys and issued the required Certificates.

4.3 Manning

- 4.3.1 The Safe Manning Document issued by the Barbados Maritime Ship Registry required a minimum of six persons, the Master, two deck officers and an Engineer, plus 2 Able Seaman. The manning and certification was found to be compliant with the Safe Manning Document, having a complement of seven crew members.

4.4 Construction

- 4.4.1 The ship was constructed in accordance with the Rules issued by Lloyds Register of Shipping, a full member of the International Association of Classification Societies (IACS), all evidence provided indicates that all survey activities were carried out to the expected standards and norms.
- 4.4.2 An intermediate survey was conducted by LR, when the vessel was in dry dock at Bolnes, this included inspection of all ballast tanks. An International Load Line Certificate was issued by Class on 3rd January 2017. By issuing this certificate it confirmed the watertight integrity of the vessel was satisfactory. Areas that would be inspected would have included the cargo hatches, access points, ventilators and air pipes.
- 4.4.3 There was no evidence of any structural issues during the life of the vessel.

4.5 Abandonment and Rescue

- 4.5.1 All the crew donned their Immersion Suits and Lifejackets prior to abandoning the vessel.
- 4.5.2 The port liferaft was launched satisfactorily and five of the crew managed to scramble into the raft speedily. The starboard liferaft deployed automatically following the activation of the hydrostatic release unit.
- 4.5.3 Two of the crew in the water for over an hour were subsequently rescued by the *Norstream*, using a pilot ladder via the Pilot Door. The survival of the two crew in the such conditions can only be attributed to the wearing of the Immersion Suits and Lifejacket.

4.6 Salvage

- 4.6.1 The vessel lies in a major shipping lane within the North Hinder TSS. The vessel sits upright on the sea bed in approximately 36 metres of water, with a clearance depth of about 17 metres. The vessel therefore is a potential hazard to navigation for deep drafted vessel if left in situ, even though the wreck is marked by buoys fitted with Racon.
- 4.6.2 It is estimated that about 77.7 tonnes of fuel remain on board, 76 tonnes of gas oil and 1.7 tonne of lubrication oil. Prior to salvaging the vessel all gas oil and lube oil was removed from the *Fluvius Tamar*.

4.7 Watertight Integrity

- 4.7.1 The underwater survey revealed the Forward Cargo Hold Entrance Door was open at the time of the foundering, although the ship's crew in their statements indicated all doors were closed on departure from Eemshaven.
- 4.7.2 There was no indication the cargo hold door had been damaged prior to departure, which might have prevented the door from being fully dogged down.
- 4.7.2 The distortion to No. 3 hatch cover was likely to have been caused as the vessel foundered.

CONCLUSIONS

- 5.1 The underwater survey identified the cargo hold door was open, although the Master and Officers said in their statements that all doors were closed and the officers on watch frequently checked the fore deck while on watch using the bridge searchlights during the heavy weather.

RECOMMENDATIONS

6.1 Recommendations to the Operator.

- 6.1.1 The operator should ensure that all crew are trained to ensure watertight integrity of the vessel and that all doors and openings are fully secured for sea.
- 6.1.2 Regular deck inspection to confirmed watertight integrity is maintained throughout the passage and where possible an appropriate statement of this inspection should be entered into the Bridge Log Book.

MAGNESIA (DEADBURNED)**DESCRIPTION**

Manufactured in briquette form and is usually white, brown or grey. It is very similar in size, appearance and handling to gravel and is dry and dusty. Deadburned magnesia is natural magnesite calcined at very high temperatures, which results in a non-reactive magnesium oxide, which does not hydrate or produce spontaneous heat.

CHARACTERISTICS

ANGLE OF REPOSE	BULK DENSITY (kg/m ³)	STOWAGE FACTOR (m ³ /t)
Not applicable	2000	0.5
SIZE	CLASS	GROUP
Fines to approx 30 mm	Not applicable	C

HAZARD

No special hazards.

This cargo is non-combustible or has a low fire-risk.

STOWAGE & SEGREGATION

No special requirements.

HOLD CLEANLINESS

No special requirements.

WEATHER PRECAUTIONS

No special requirements.

LOADING

Trim in accordance with the relevant provisions required under sections 4 and 5 of the Code.

PRECAUTIONS

Prior to loading, the shipper or the manufacturer shall provide the master with a declaration stating that the cargo has been sufficiently heat-treated and is ready for loading.

VENTILATION

No special requirements.

CARRIAGE

No special requirements.

DISCHARGE

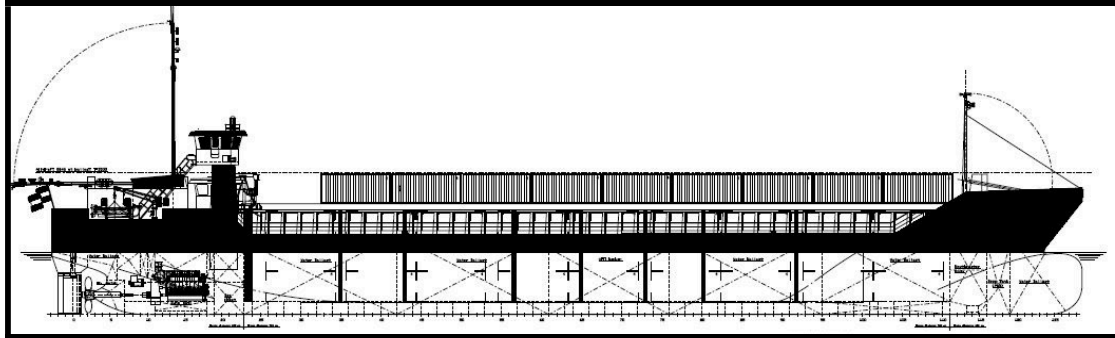
No special requirements.

CLEAN-UP

No special requirements.

Appendix: ii

Fluvius Tamar profile



Appendix: iii

List of Ships Certificates

SHIP CERTIFICATES (as applicable to ship type, age & size)					
	Validity	Last survey / Audit		Validity	Last survey
Construction <i>Over 500 GT</i>	11-02-2019	3-01-2017	MARPOL <i>Tanker > 150GT</i> Annex I <i>Other > 400GT</i>		3-01-2017
Equipment <i>Over 500 gt</i>	11-02-2019	3-01-2017	Annex II & P&A Manual Cargo Record book <i>chemical tankers</i>		
Radio / GMDSS <i>Over 300 GT</i>	11-02-2019	3-01-2017	NLS Certificate <i>Carriage of noxious liquid in bulk</i>		
ISM DOC copy	11-05-2019	14-10-2015	CoF Offshore supply vessels <i>limited amount noxious substances</i>		
ISM SMC <i>Over 500 GT</i>	Audit 5-01-17	See notes	Annex IV <i>Sewage vessels</i> <i>vessels btl. prior 08/05 by 08/2010</i>		3-01-2017
ISPS <i>Over 500 GT</i>	Audit 5-01-17	See notes	Annex VI <i>by first periodic docking following 05/2005</i>		3-01-2017
CoF Chemicals in bulk <i>Ships built after 1.7.86</i>	11-02-2019	3-01-2017	Load Line <i>Vessels length > 24m</i>		3-01-2017
CoF Liquified gases in bulk <i>built after 1.7.86</i>			Passenger Ship Safety <i>Over 12 passengers</i>		
CoF Carriage INF cargo			Tonnage Certificate <i>Vessels length > 24m</i>	NA	22-12-2016
DOC Dangerous Goods <i>All ships > 500GT</i>	11-02-2019	3-01-2017	Grain Certificate	18-02-2020	
HSC Safety Certificate & Permit to Operate			HSC Training & Operation & Maintenance Manuals		
ILO Maritime Labour Certificate	18-01-2017	3-01-2017	SPS special purpose ship safety certificate		
ILO Declarations Part 1 from Flag State		22-12-2016	Part 2 from Ship Operator		03-01-2017
Radio Station Licence	issued date	16 December 2016	Safe Manning Certificate	issued date	22 December 2016

Appendix iv

Safe Manning Document

CREW CERTIFICATION AND MANNING ACCORDING TO THE SAFE MANNING CERTIFICATE																
SHIP'S COMPLEMENT (STCW 95 certificates: rating navigation watch, II/4. Rating engine watch, III/4)																
Officers	Manning Cert Requirements	Actual	Officers Specialised Ship Specific Training Certificates **					Ratings	Manning Cert Requirements	Actual	Crew Basic Training Certificates					
MASTER	1	1									All okay					
DECK	1	2						DECK	2	2						
ENGINE	1	1						ENGINE								
GMDSS	2 minimum	2														
DOCTOR																
								CATERING								
TOTAL	3	4	<i>** Where applicable to ship type</i>						2	2						
Officers Name	BARBADOS ENDORSEMENT								FOREIGN CERTIFICATE OF COMPETENCE							
MASTER & DECK OFFICER	Joining Date	Master	1M	Nav watch	Nav Watch	STCW Grade	Endorsement Number	Date of Issue	M	1M	Nav Watch	Nav Watch	STCW Grade	Issuing Country	Date Issued	CoC Number
	2-01-2017	v					All applied									See enclose docs
	2-01-2017		v				For Endorsement									
	2-01-2017			v												
ENG OFFICER		C/E	2/E	Eng Watch	Eng Watch				C/E	2/E	Eng Watch	Eng Watch				
		v														