

Technical report S-28/2011

Investigation of the sinking of fishing vessel VILLA DE AGUETE off the coast of Mauritania, on the 1st of July 2009

NOTICE

This report has been drafted by the Standing Commission for Maritime Accident and Incident Investigations, CIAIM, regulated by the 26th Additional Provision to Law 27/1992, dated 24 November, by National Ports' (Puertos del Estado) and the Merchant Navy (Marina Mercante), by Royal Decree 800/2011, dated 10 June and as applicable, by Royal Decree 862/2008, dated 23 May, 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 aforesaid premises and must not, therefore, prejudice 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.



THE ACCIDENT

The following report of the events has been drafted from the statements provided by the crew and other documents. The times referred to in this report are local times at the location of the accident.



Figure 1. Location of the accident

Background.

On the 24th of June 2009, fishing vessel VILLA DE AGUETE, which operated under Spanish flag departed from the port of Marín in Pontevedra headed for the fishing grounds off the coast of Mauritania. The vessel had a license for bottom trawl fishing for molluscs from the 1st of June 2009 to the 31st of August 2009.

The vessel had twelve crewmembers on board, of which only nine were enrolled.

On the 30th of June 2009 they arrived and anchored at the port of Nouadhibou in Mauritania. None of the crewmember disembarked. At Nouadhibou, they received the safety certificate required by Mauritanian authorities and ten Mauritanian crewmembers embarked, who were not enrolled; two of them were going to embark as crewmembers on fishing vessel VILLA DE MARIN, which is owned by the same shipowner.

At 22:00 hours on the 30th of June 2009, they departed from Nouadhibou and headed towards the fishing ground, which was located about two hours away.

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At approximately 01:30 hours they launched the gear and at about 05:30 hours they raised it back on board. Subsequently, they began a second setting and at about 10:30 hours they raised the gear back on board. Both settings were carried out as normal and the fish was processed and stowed in the cargo hold.

During those first two settings, the cod-end picked up a lot of garbage and although the crew estimated that during each setting the cod-end weighed between 8 and 10 t, there was only 3 t of fish stowed in the cargo hold after the processing and stowing was completed.

The accident.

The gear was launched for the third time and when the launch ended, at about 12:30 hours, the entire crew went to lunch.

After eating, the Skipper, First Engineer, Cook and Assistant Cook went to their berthing to rest. The Second Skipper and the Second Engineer remained on duty at the wheelhouse and engine room respectively.



At 14:15 hours, they called on the Skipper for him to go on deck and assist in hoisting the gear during the third setting, which took place at approximately 14:30 hours.

The gear was brought on board and placed on the deck without emptying and the crew calculated that the cod-end weighed between 25 and 30 t. Then, the crew noticed that the vessel was heeling towards her port side and that her stern was lower than her bow.

The Skipper went up to the wheelhouse and ordered the Second Skipper, who was already grabbing the briefcase with the vessel's documentation inside, to try to correct the heeling condition and to report their situation to shipping vessel CURBEIRO, which was operating nearby. He also ordered the Boatswain to lower the life rafts and tell the crew to don their life vests. The Second Skipper reported their situation to fishing vessel CURBEIRO and requested their assistance.

The bilge water level alarm sounded in the engine room. The Second Engineer engaged the engine room's emergency sump pump as well as all the fishing area sump pumps. He verified that the water level was below the engine room deck plates and went up to the wheelhouse to report what had occurred. Due to the heeling of the vessel to her port side, the First Engineer had to exit the engine room through the starboard boom, from which he accessed the upper deck and the wheelhouse. Afterwards, he returned to the engine room following the same route.

The noise made by the crew as they approached the meeting point alerted the First Engineer, the Cook and the Assistant Cook, who were in their berthing at the time. The First Engineer went from the upper deck down to the engine room via the starboard boom. The Cook and the Assistant Cook donned their life vests and went to the meeting point on the starboard side.

The Skipper went down to the engine room via the starboard boom, which he accessed through the upper deck. He met both engineers in the engine room and after verifying that the water level was below the engine room deck plates, he went back up to the wheelhouse. At that moment, the main pump was operating and the electrical power was being supplied by the shaft alternator.

Both Engineers started and engaged the starboard auxiliary generator motor and stopped the main engine. The electrical power supply to the sump pumps was not interrupted at any time. The engineers remained inside the engine room until due to the heeling of the vessel, the water level rose above the engine room deck plates on the port side. Always via the starboard side, they headed towards the meeting point, next to the wheelhouse, without their life vests.

None of the crewmembers checked to see if water had entered the middle deck or the fishing area.

Meanwhile, the Boatswain had cut the lashings to the life rafts in order to release them. When he was cutting the lashings of the last life raft, which was located on the port side of the platform, the Boatswain fell overboard. He swam around until he found a grating floating in the water, which he held on to.

The Refrigeration Boatswain cast off the inflatable boat. The heeling of the vessel caused the boat to drop into the ocean with the refrigeration Boatswain inside.

When the Engineers arrived at the meeting point, the Skipper told the First Engineer that the Second Skipper was trapped inside the wheelhouse and was not able to exit due to the heeling. They both headed towards the wheelhouse to assist the Second Skipper. The vessel had heeled almost 90° and the rest of the crew jumped overboard. Shortly thereafter, the vessel sank.

Some crewmembers were able to reach the life rafts, others were rescued by the inflatable boat, which was operated by the Refrigeration Boatswain and others held on to buoys and gratings. The



Second Skipper was able to exit the wheelhouse and jumped overboard along with the First Engineer and the Skipper.

A life raft flipped over and was damaged. The survivors did not know how to turn it over so they rode on the bottom part of the raft.

The First Engineer, who was holding on to a buoy because he was not wearing his life vest remained beside the Second Skipper until they were rescued approximately a half an hour later. The Second Skipper died from a heart attack during the rescue.

At 14:46 hours, Spanish Maritime Safety and Rescue Agency (SASEMAR) received the 406 MHz radio beacon signal from fishing vessel VILLA DE AGUETE. Two minutes later, a new signal was received, which provided the approximate position of the sinking at latitude 20° 26.1' N, longitude 017° 24.5' W.

At 14:51, a new signal was received from the radio beacon, which positioned the vessel at latitude 20° 26.2' N, longitude 017° 27.7' W.

Fishing vessel CURBEIRO had requested assistance from other fishing vessels that were operating in the area. At 15:05, fishing vessel MANUEL NORES, which was owned by the same shipowner that owned the mishap vessel was located 40 miles from the accident and issued a MAYDAY RELAY call via VHF channel 16 alerting about the accident involving fishing vessel VILLA DE AGUETE at latitude 20° 26.0' N, longitude 017° 24.5' W. Fishing vessels CURBEIRO, PORTOMAYOR, MANUEL NORES, ESTELA and SANTO MAR, all operating under Spanish flag, arrived at the location of the accident as well as an unidentified fishing vessel that was operating under Mauritanian flag, which also arrived at the location of the accident but did not assist; instead, this vessel collected fishing gears from the ocean and never returned them to the shipowner.

At 15:13, fishing vessel PORTOMAYOR notified SASEMAR that it was in the area rescuing survivors from fishing vessel VILLA DE AGUETE, assisted by fishing vessel CURBEIRO. The sinking of the mishap vessel was confirmed.

At 15:14, SASEMAR was able to contact Mauritanian maritime rescue services, who reported that they would not have a patrol vessel available to assist in the rescue until 19:00 hours.

At 15:30, SASEMAR dispatched a patrol vessel from the Spanish Navy along with its helicopter, which was located at Nouadhibou. SASEMAR also dispatched rescue aircraft SASEMAR 103, which was based at Las Palmas de Gran Canaria.

At 15:48, SASEMAR reported that the dispatched rescue assets were no longer required since the survivors of fishing vessel VILLA DE AGUETE were on board fishing vessels PORTOMAYOR and CURBEIRO. The departures of the patrol vessel, helicopter and rescue aircraft were cancelled because there were no more survivors needing to be rescued and the crew was being cared for.

At 16:35, confirmation was received that the crewmembers and the body of the Second Skipper from fishing vessel VILLA DE AGUETE were on board fishing vessel ESTELA, which was owned by the same shipowner. They had been transferred onto fishing vessel ESTELA from fishing vessels PORTOMAYOR AND CURBEIRO. Fishing vessel ESTELA was scheduled to go to the port of Nouadhibou.

At 17:05, fishing vessel ESTELA reported that it was waiting for the shipowner to instruct them to head towards the port of Nouadhibou or to Las Palmas de Gran Canaria.



At 18:45, fishing vessel ESTELA reported that they were heading towards the port of Las Palmas de Gran Canaria. The 13 Mauritanian sailors were transferred to fishing vessel PUERTO DE CADIZ, which was owned by the same shipowner, and which took them to the port of Nouadhibou.

At 09:40 on the 4th of July 2009, fishing vessel ESTELA docked at the port of Las Palmas de Gran Canaria.

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**FACTUAL INFORMATION****The vessel**

Fishing vessel VILLA DE AGUETE, whose main characteristics are listed in table 1 was a fishing vessel under Spanish flag, owned by Spanish fishing company Pesquerías Nores Marín S. L., and used for trawling.

It was built by Astilleros de Murueta S. A., in Murueta, Biscay in 1987 and she entered service in September 1988.

Originally, the vessel was named GARRIDOPESCA DOS and her owner was Spanish fishing company Pesquera Garrido S. A.; in 1996, the vessel changed owners and her name change was authorized in 1997.

**Figure 2.** Vessel VILLA DE AGUETE**Table I.** Main characteristics of the vessel

Vessel Name	VILLA DE AGUETE
Type	Trawler
Builder	Astilleros de Murueta S. A
Location where she was built	Murueta, Biscay
Country where she was built	Spain
Year built	1987
Build Number	161
Flag country	Spain
Owner	Pesquerías Nores Marín S. L.
Marking	EHXV
Port of Registry	Cadiz
Base port	Marín, Pontevedra
Hull material	Steel
Length overall	38,30 m
Length between perpendiculars	31,00 m
Moulded Breadth	9,12 m
Maximum draught	4,66 m
Depth to the upper deck	6,50 m
Gross Tonnage (GT)	477
Net tonnage (NT)	143
Propulsion	Diesel engine with shrouded propeller
Maximum power	809 kW

At the time of the accident, all of the vessel's certificates were current and the dispatching of the vessel was valid from the 23rd of June 2009 to the 23rd of September 2009.



She had a license for bottom trawl fishing for molluscs in Mauritania from the 1st of July 2009 to the 31st of August 2009.

The shipowner

The vessel has had three owners. From the time it entered service in 1988 until 1994, she was owned by Spanish fishing company Pesquera Garrido S. A., who then sold her to Mr. Manuel Nores Gonzalez. In January 2009, the ownership of the vessel was transferred to Spanish fishing company Pesquerías Nores Marín S. L., which was operating the vessel at the time of the accident.

When the accident occurred, company pesquerías Nores Marín S. L. owned a fleet of about ten fishing vessels.

The Crew

The vessel's crew at the time of the accident was comprised of the following twenty two personnel:

- 1 Skipper of Spanish nationality.
- 1 Second Skipper of Spanish nationality.
- 1 First Engineer of Spanish nationality.
- 1 Second Engineer of Spanish nationality.
- 1 Boatswain of Spanish nationality.
- 1 Refrigeration Boatswain of Spanish nationality.
- 1 Oiler of Russian nationality.
- 1 Cook of Spanish nationality.
- 1 Assistant Cook of Peruvian nationality.
- 11 Sailors of Mauritanian nationality, which were not enrolled.
- 2 Sailors of Mauritanian nationality who were going to embark on a different vessel from the same owner and they were not enrolled.

The following irregularities were found regarding the crew:

- The vessel was dispatched with ten crewmembers enrolled from the 23rd of June 2009 to the 23rd of September 2009 but one of them, an Oiler of Peruvian nationality, did not embark.
- The vessel departed from the port of Marín with twelve crewmembers on board; nine of them were enrolled and three Mauritanian sailors were not enrolled.
- An additional ten crewmembers embarked at the port of Nouadhibou, which were not enrolled. Two of them were going to embark on another vessel from the same owner.

The vessel departed from the port of Marín in compliance with the minimum crew safety requirements, which require a Skipper at command, a Second Skipper, a First Engineer, an Oiler and three Sailors.

Enrolled crewmembers were in possession of the current diplomas and certificates, which qualified them to carry out their duties on board. No information is available relative to the diplomas and certificates of non-enrolled personnel.



Weather information

The weather conditions at the time and location of the accident were the following:

- Wind from the NNE of force 5 on the Beaufort scale, with average speeds between 17 and 21 knots.
- The sea conditions included wind and sea components, with prevailing winds from the NNE, which transitioned from rough seas to strong swell, reaching significant wave heights of up to 2.5 m. Due to the bottom conditions present in the area where the sinking occurred, a wave diffraction of deep waters occurred, which contributed to increasing the significant wave heights, reaching values of approximately 3.0 m at the location of the sinking.
- Visibility was good.

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ANALYSIS AND CONCLUSIONS

A cod end weighing between 25 and 30 t was loaded on board, which resulted in a decrease in stability; however, this was not enough to cause the accident in accordance with the vessel's documentation.

Analysis of the flooding of the vessel's spaces

The following can be concluded from crew statements:

- No spaces were flooded above the vessel's upper deck.
- The crew berthing spaces located at the bow of the main deck were not flooded.
- Inside the engine room, the water level was below the deck plates.

After analysing the possible flooding of the spaces that are located below the main deck and below sea level, which can be seen in the drawing of figure 3, the following has been concluded:

- The flooding of the fuel tanks and the fresh water tanks, since all of these are practically full, would have not been sufficient to cause the vessel to heel like it did.
- If the cargo hold had flooded and the cod end had shifted to the port side, the vessel would have heeled like she did. The loss of stability caused by the generated free surface would have contributed to the heeling, which would have been compensated in some measure as the centre of gravity got lower due to the effect of the water on board. However, in this case the sinking of the stern would have decreased and that of the bow would have increased, which is the opposite of what actually occurred. Therefore, the flooding of the cargo hold is not considered to be the cause of the accident.
- As stated by the crew, the flooding that occurred in the engine room was not above the deck plates. The area at the bottom part of the engine room narrowed and the water volume in that space was not sufficient for the decrease in stability caused by the effects of the free surface, compensated in a certain measure by the increase in stability created as the centre of gravity got lower, to cause the accident.

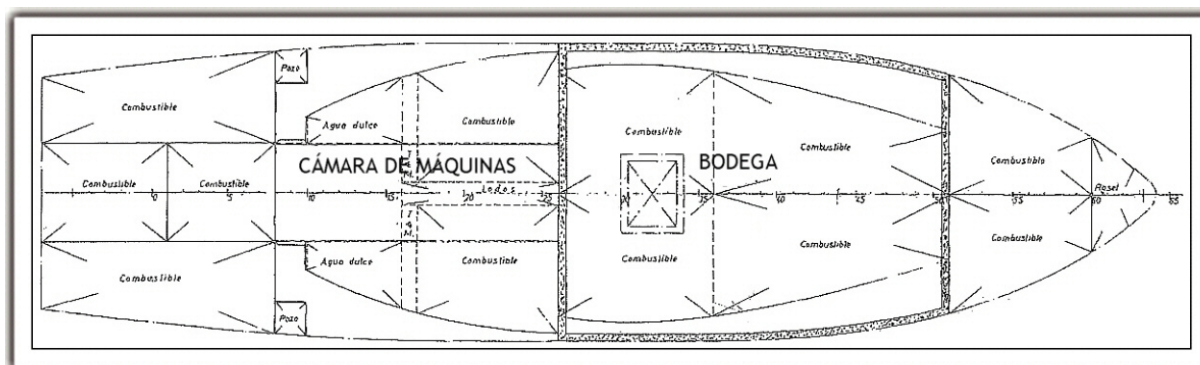


Figure 3. Spaces below the main deck

Therefore, the flooding of some of the spaces located below the main deck was not the cause of the heeling and the sinking of the vessel.



After analysing the possible flooding of the spaces located between the main deck and the upper deck, which can be seen in the drawing of figure 4, the following has been concluded:

- The flooding of the fuel tanks and the fresh water tanks, since all of these were practically full, would have not been sufficient to cause the vessel to heel like it did.
- As stated by the crew, the accommodation area did not flood.
- The flooding of the steering gear machinery room would not have caused the heeling.
- If the middle deck had flooded and the cod end had shifted to the port side, the vessel would have heeled like she did. The loss in stability caused by the generated free surface would have contributed to the heeling. However, in this case the sinking of the stern would have decreased and that of the bow would have increased, which is the opposite of what actually occurred. Therefore, the flooding of the middle deck is not considered to be the cause of the accident.
- The flooding of the port side refrigeration tunnels would have caused the vessel to heel. However, for the heeling to reach the aforesaid values would have required both tunnels to flood simultaneously, which is not probable.
- The most probable cause of the heeling was the flooding of the fishing area through the waste hopper, which is located on the port side and labelled as dump in the drawing of figure 4.

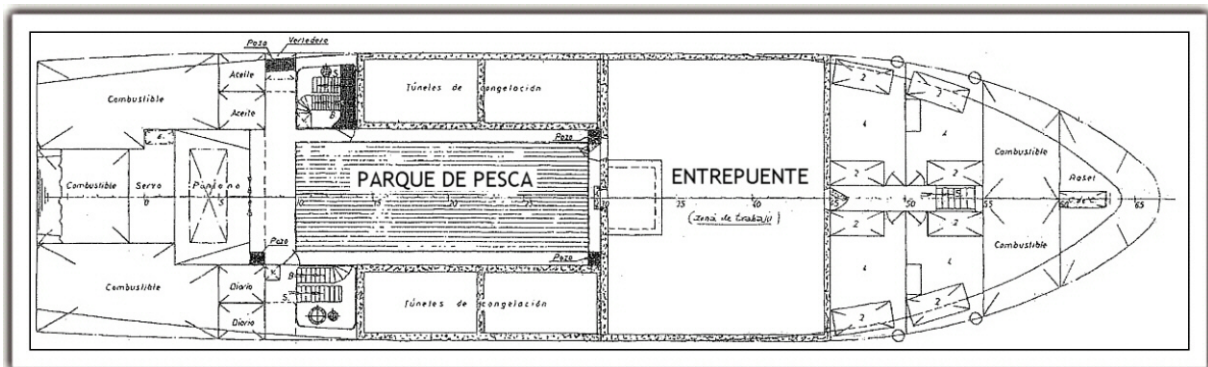


Figure 4. Spaces between the main deck and the upper deck

The waste hopper on this vessel was similar to the one shown in figure 5. This type of waste hopper has an outer door on the side of the ship, which is hydraulically closed and a watertight inner lock cover located at the top.

As shown in figure 5, the conveyor belt must be removed in order to close the waste hopper's top cover. It is common practice for crewmembers to not close the cover after processing the fish because it is inconvenient and impractical to remove and install the conveyor belt. If the top cover was left open or wasn't closed properly at the time of the accident, the flooding could only have occurred through the waste hopper if the following two events had occurred:



Figure 5. Waste hopper similar to the one on vessel VILLA DE AGUETE

- That the sea level in the waste hopper area was above the waste hopper's top cover.
- That the waste hopper's outer door was left open or not closed properly.

It is probable that the outer door was left open or was not closed properly because the vessel did not incorporate a system to indicate whether or not this door was closed or open and it is common for these types of doors to not close properly when they are shut on any object.

Below we analyze the possibility that the vessel may have had a draught to stern that was greater than the allowed, which would have caused the waste hopper to be positioned below sea level.

Analysis of the vessel's freeboard

The vessel had a "National freeboard certificate (1930)" issued on the 23rd of August 2007, with an expiration date of 21 August 2010. It had passed the annual freeboard certificate inspections and the last inspection had been conducted with the vessel afloat on the 8th of June 2009, four weeks prior to the accident.

The certificate specified a summer freeboard of 57 mm, corresponding to a mean draft of 4,25 m, equal to the draft of the maximum load condition included in the stability book.

None of the photographs that are available of the vessel show the required freeboard markings. The photograph of figure 6, which is part of the vessel's navigation license and was taken in 1988 when her name was still GARRIDOPESCA DOS, we can see that the vessel did not have the required freeboard markings, which should be visible just like the draught markings.

Also, the freeboard marking are not seen in more recent photographs such as the one of figure 2, which was taken in 2007.

In the photographs of figures 7 and 8, we can see that the vessel exceeded the maximum allowed draughts as we will analyze below.



Figure 6. Vessel GARRIDOPESCA DOS, later named VILLA DE AGUETE



Figure 7. Vessel VILLA DE AGUETE on the 12th of January 2007



Figure 8. Vessel VILLA DE AGUETE on the 16th of April 2009

The photograph of figure 7 was taken on the 12th of January 2007 at 11:31 hours. That same day, the vessel was scheduled to depart for the fishing grounds at 16:00 in accordance with the information provided by the Port Authority. The condition of the vessel at that moment corresponded approximately to a port departure condition with 100% consumption on board. Figure 9 shows a drawing of the vessel with the actual flotation of the vessel when the picture of figure 7 was taken; in this picture, we can see that the vessel's flotation was above the main deck and that the waste hopper's outer door was below the water line.

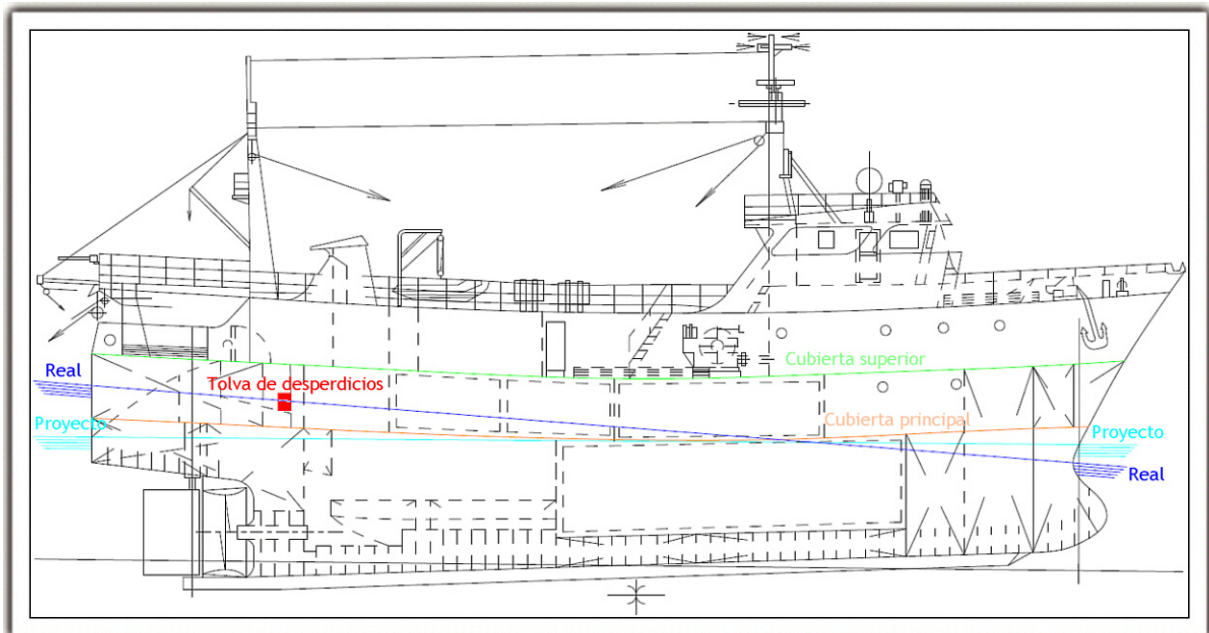


Figure 9. Position of the draughts of vessel VILLA DE AGUETE on the 12th of January 2007

The photograph of figure 8 was taken on the 16th of April 2009. The vessel had arrived at the port of Marin on the 14th of April. In this condition, the vessel did not carry any cargo and had very little fuel on board. The drawing of figure 10 shows the actual flotation of the vessel in this condition.

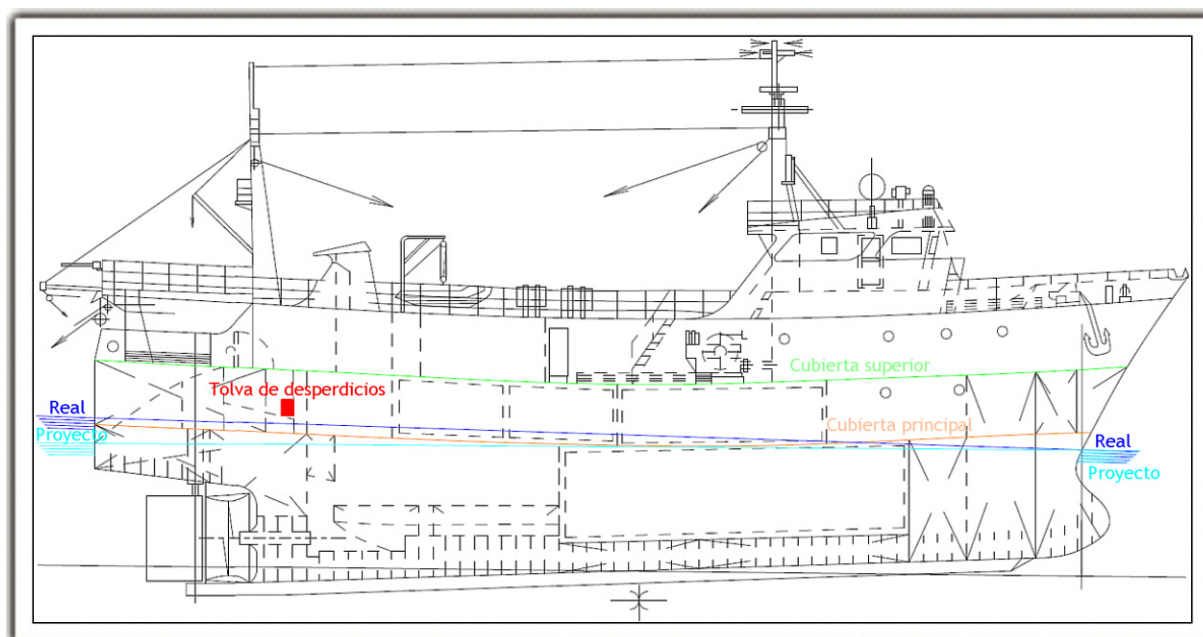


Figure 10. Position of the draughts of vessel VILLA DE AGUETE on the 16th of April 2009

Under the condition of figure 10, the distance from the lower edge of the waste hopper's outer door to the water is much greater than that of the project.

From the analysis of the previous figures we can conclude that the vessel was usually overloaded, with more weight at the stern than authorized; and under the port departure condition with 100% of fuel on board as well as under the vessel without cargo condition and very little fuel on board, the maximum allowed draughts were exceeded as well as those listed in the stability book for these conditions.

All national and international regulations relative to the stability of fishing vessels indicate the need to comply with the proper freeboard in any load condition and in no case shall it exceed the assigned minimum.

Comments regarding the stability book

The last stability test was conducted in the year 2000 in compliance with royal Decree 1032/1999, dated 18 June, which determines the safety standards that are to be complied with by fishing vessels of a length equal or greater than 24 metres.

The vessel's stability book considers that the first progressive flooding point is located at 9.9 m above the keel. It does not consider that the waste hopper is located at 5.75 m above the keel and that it would be the first progressive flooding point in the case that the waste hopper was left open as occurs during the processing of fish or when for any reason, its outer door and inner cover are not closed properly.

The stability book states the following: "All access doors and other openings through which water may enter the hull, stacks, castles, etc., will be closed as required during foul weather; and to accomplish this, all required devices will be available on board in good condition and ready to be used" and "under all load conditions, it will be ensured that the vessel maintains a proper freeboard for its safety, and in no case will the freeboard be lower than the assigned minimum". However, there is no specific instruction relative to the waste hopper or relative to the need for keep-



ing the waste hopper's outer door and inner cover closed to comply with the stability criteria because during the stability calculation, it is considered that the vessel is watertight up to a point that is located 9.9 metres above the keel.

Conclusions

From everything that has been presented, this Commission has concluded the following:

1. The vessel normally operated in an overload condition and not in compliance with minimum freeboard criteria.
2. Due to this overload condition, the waste hopper's outer door was located nearly above or below sea level.
3. The location of the waste hopper's outer door was even lower during foul weather.
4. It was not common practice to close the waste hopper's lower cover because it was not practical to remove the conveyor belt structure.
5. The most probable cause of the sinking of the vessel was the flooding of the fishing area through the waste hopper because it was not closed properly and was under water after having loaded between 25 and 30 t on the stern.
6. The maritime Administration authorized correctly the vessel's stability book according to the stability regulation in force, that allows to consider the first flood point to be located at a point above the waste hopper.
7. The Maritime Administration renewed the vessel's freeboard certificate even though the vessel did not have the required freeboard markings.
8. The vessel was very sensitive to an operational error when operating the waste hopper since simply by not checking that the outer door was closed properly may have resulted in the flooding of the fishing area.
9. The vessel departed from the port of Marín with twelve crewmembers on board; nine of them were enrolled and three Mauritanian sailors were not enrolled.
10. An additional ten crewmembers embarked at the port of Nouadhibou, which were not enrolled. Two of them were going to embark on another vessel from the same owner.
11. The only distress signal emitted by the vessel was a radio call to a vessel that was operating in the area.
12. The crew's training was not adequate as demonstrated by them not knowing how to properly turn over a life raft that was flipped upside down in the water.

* * *



RECOMMENDATIONS

This Commission, in view of the conclusions reached, provides the following recommendations for the intent of preventing similar accidents from occurring in the future:

To the General Directorate for the Merchant Navy:

1. To analyze the advantage of prohibiting fishing vessels from using waste hoppers or other types of openings that are located below the first flooding point as per the stability book calculations and the freeboard calculation.
2. To not renew the freeboard certificate of vessels that do not have the freeboard markings in accordance with current regulations.

To fishing guilds:

3. To disseminate this report among its members as much as possible in order to prevent hazards involving the use of waste hopper doors and non-compliance with freeboard regulations.

To fishing vessel owners:

4. To ensure crews are in possession of the required professional qualifications and ensure they are trained in the performance of emergency safety procedures.

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