GOBIERNO DE ESPAÑA
MINISTERIO DE TRANSPORTES Y MOVILIDAD SOSTENIBLE
SUBSECRETARÍA DE TRANSPORTE Y MOVILIDAD SOSTENIBLE
COMISIÓN PERMANENTE DE INVESTIGACIÓN DE ACCIDENTES E INCIDENTES MARÍTIMOS

CIAIM REPORT-10/2023

Fall and death of a crew member while using the combination ladder to board the BORDEIRA oil tanker from the PICASSO PRIMERO service vessel on 4 May 2021 in the Bay of Algeciras.

NOTICE

This report has been compiled by the Spanish Maritime Accident and Incident Investigation Standing Commission (CIAIM), which is regulated by Article 265 of the Consolidated Text of the Law on State Ports and the Merchant Navy, approved by Royal Legislative Decree 2/2011, of 5 September, and by Royal Decree 800/2011, of 10 June.

The aim of the CIAIM when investigating maritime accidents and incidents is to draw conclusions and extract lessons learned to reduce the risk of future maritime accidents, thereby contributing to maritime safety and the prevention of shipping pollution. To this end, the CIAIM conducts a technical investigation into each case in which it attempts to establish the causes and circumstances that, directly or indirectly, may have contributed to the accident or incident and, when necessary, to issue the appropriate safety recommendations.

The preparation of this technical report does not in any way prejudge any decision that may be handed down by the courts, nor does it seek to assess responsibilities or determine guilt.

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Figura 1. B/T BORDEIRA

Figura 2. E/S PICASSO PRIMERO

Figura 3. Location of the accident

1. SUMMARY

On 4 May 2021, the service vessel (E/S) PICASSO PRIMERO and the tanker (B/T) BORDEIRA, sailing under the Maltese flag, were conducting a crew changeover operation outside the boundaries of the Port of Algeciras. While climbing the pilot ladder to board the ship, one of the crew members fell from the ladder onto the service vessel and from there into the sea, sustaining injuries as a result of the impacts. When the PICASSO PRIMERO was unable to rescue the injured man from the water, its skipper requested assistance from the pilot boat GETARES. Not without difficulty, the crew of the latter was able to rescue the injured man, who showed signs of hypothermia. The injured crew member was taken to hospital, where he later died.

1.1. Investigation

The CIAIM was notified of the incident on 4 May 2021. The case was immediately provisionally classified as an "extremely serious accident", and the decision was made to open an investigation. A CIAIM committee meeting ratified the classification of the incident and the initiation of the safety investigation. This report was reviewed by a CIAIM plenary session on 17 May 2023 and, following its subsequent approval, was published in February 2024.

2. FACTUAL INFORMATION

PARTICULARS OF THE SHIP / VESSEL		
Name	BORDEIRA	PICASSO PRIMERO
Flag / Port of Registry	Malta	Spain
Identification	IMO no.: 9529499	Vessel Registration No. (NIB): 226791; MMSI No.: 224906140
Type	Bunker ship, crude oil tanker. International traffic.	Port Services (list 5, class T) - Port, roadstead or bay traffic
Main details	Length overall: 274.39 m Width: 48.04 m Depth: 23.20 m Gross tonnage (GT): 81380	Length overall: 16.91 m Width: 4.8 m Depth: 1.5 m Maximum draught: 0.842 m Gross tonnage (GT): 22.30
Ownership and management	ARABELLA OWNING CO LTD (registered shipowner) TMS TANKERS LTD (Company, according to SMA certificate – *Safety Management Certificate*)	ALGECIRAS SOUTH PORT SERVICE, S.L. https://algecirassouthportservices.com/
Classification society	Bureau Veritas	Not classified
Shipbuilding details	Year of construction: 2013	Year of construction: 1999
VOYAGE PARTICULARS		
Departure / Arrival ports	In transit. Stop in the vicinity of the Bay of Algeciras to receive services.	Providing service in the Bay of Algeciras, beyond the port boundaries.
Cargo information	In ballast	Transporting crew
Documents	The Inspection Services of the Harbour Master's Office conducted a thorough inspection of the vessel and found no deficiencies.	Vessel cleared by the Algeciras Harbour Master's Office on 25/02/2021 with validity until 31/08/2021 and the following annotation: "NAVIGATION IN MARITIME SERVICE WATERS AND OUTSIDE THE BOUNDARIES OF THE PORT OF ALGECIRAS. INTERNATIONAL NAVIGATION NOT AUTHORISED. AN INSPECTION OF THE LIFERAFTS WHOSE CERTIFICATE EXPIRES ON 09-03-2021 MUST BE CARRIED OUT DURING THE PERIOD OF VALIDITY OF THIS CLEARANCE, AND A COPY OF THE RENEWAL SENT TO THIS HARBOUR MASTER'S OFFICE FOR THE RECORD."
INFORMATION ON THE INCIDENT		
Type of incident	Operational	
Date and time	04/05/2021, at 01:07 h (time of notification to SASEMAR services)	
Location	36°04.4'N / 005°23.9'W; close to, but outside the boundaries of the Port of Algeciras.	
Vessel's operations	Stopped	In service
Location on board	Starboard side (Projection from)	Cabin
Ship damage	None	None
Fatalities / missing / injured on board	1, deceased	
Pollution	No	
Other third-party damage	No	
Other personal injuries	No	
MARINE AND METEOROLOGICAL CONDITIONS (Source: AEMET)		
Wind	Easterly, gusty, from 11 to 16 knots (Beaufort 4)	
Sea conditions	Swell (0.5 to 1.25 m) Combined eastbound swell with significant wave heights between 1 and 1.5 m, and intervals of 5 to 7 seconds.	
Visibility	Intervals of low cloudiness and fair visibility between 22:00 and 24:00 on the 3rd, improving thereafter.	
INTERVENTION OF LAND-BASED AUTHORITIES AND REACTION OF EMERGENCY SERVICES		
Organisations involved	Maritime pilots, Maritime Rescue, 061 Emergency Medical Services	
Means deployed	Pilot vessel GETARES, rescue vessel (E/S) SALVAMAR DENÉBOLA, ambulance.	
Speed of intervention	Immediate upon receiving notification of the accident.	
Measures adopted	Deployment of rescue vessel and ambulances.	
Results obtained	The crew member was rescued from the sea and taken to hospital. His death could not be prevented.	

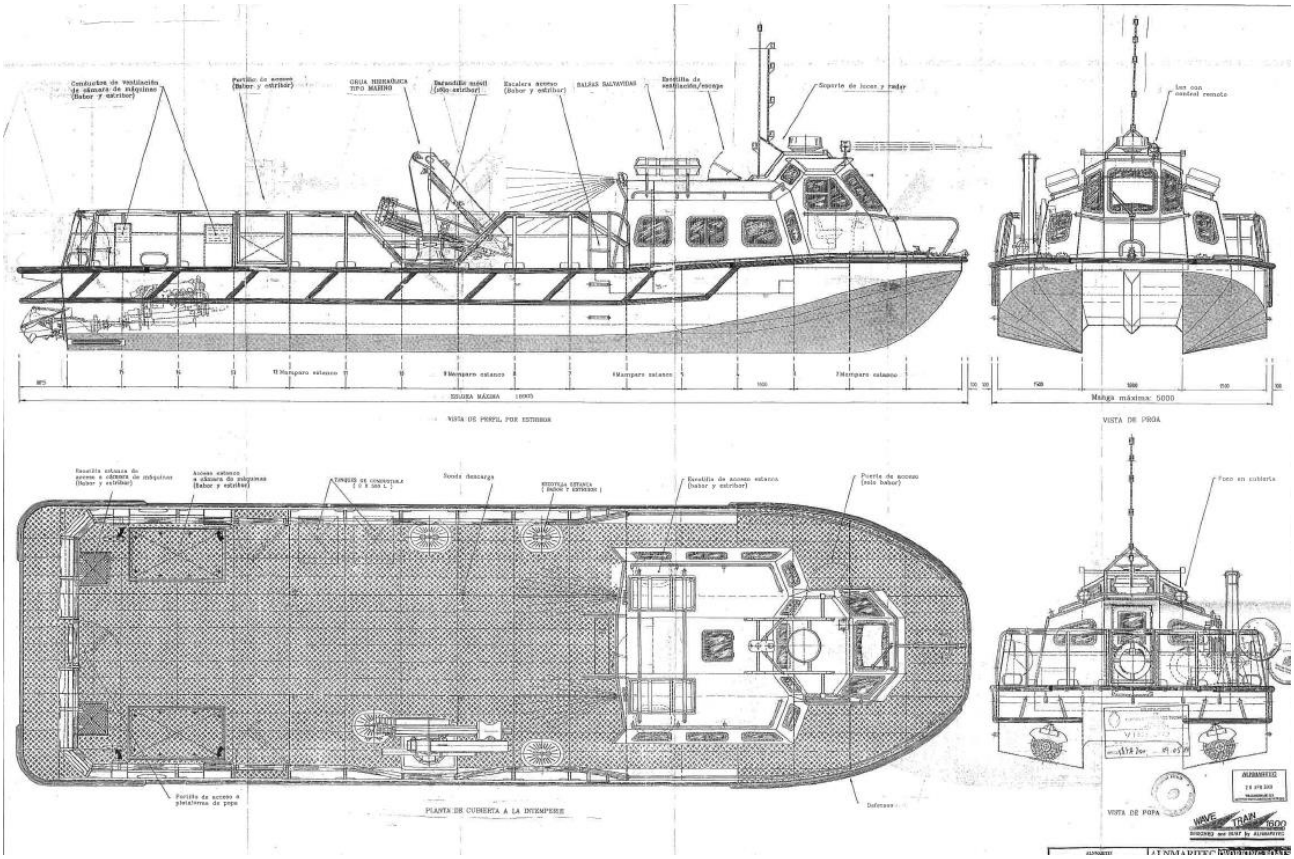


Figura 4. General layout of the PICASSO PRIMERO

2.1. Other information

In the preparation of this report, we have drawn from the following:

- The General Emergency Report issued by Maritime Rescue in regard to this accident.
- The judicial dossier on the case, including, among other things, the police report, the toxicology report and the final autopsy report.
- The Inspection Report prepared by the Inspection Services of the Algeciras Harbour Master's Office following their inspection of the B/T BORDEIRA as a result of the accident.
- The accident report issued by the company that owns the B/T BORDEIRA, which was carried out in compliance with Article 9 of the International Safety Management Code.
- The Statement of Facts, submitted by the Captain of the tanker in relation to the accident, which includes an extract from the ship's logbook.
- At the request of the Algeciras Harbour Master, the following statements were obtained:
    1. Statement from the skipper of the PICASSO PRIMERO vessel.
    2. Statement from the skipper of the pilot boat GETARES.
    3. Statement from the skipper of the SALVAMAR DENÉBOLA maritime rescue vessel.
- The CIAIM interviews with the PICASSO PRIMERO and GETARES crew members who were on board at the time of the accident.
- The registry of state port authority inspections[1].

[1] We have reviewed the most recent inspections of the crude oil tanker BORDEIRA recorded in Equasis, finding that since 2016 it has undergone 8 flag state inspections under various Memoranda of Understanding including the Paris MOU, the Tokyo MOU and the US Coast Guard MOU. These inspections did not result in any detentions, and only 3 deficiencies were found in that period, none of which were related to the ship's Safety Management System (which supports the idea that it was a well-maintained vessel) nor specifically to the pilot boarding facilities or the accommodation ladder.

3. DETAILED DESCRIPTION

This description of events is based on the reports and statements collected by the CIAIM. The times referenced are local time.

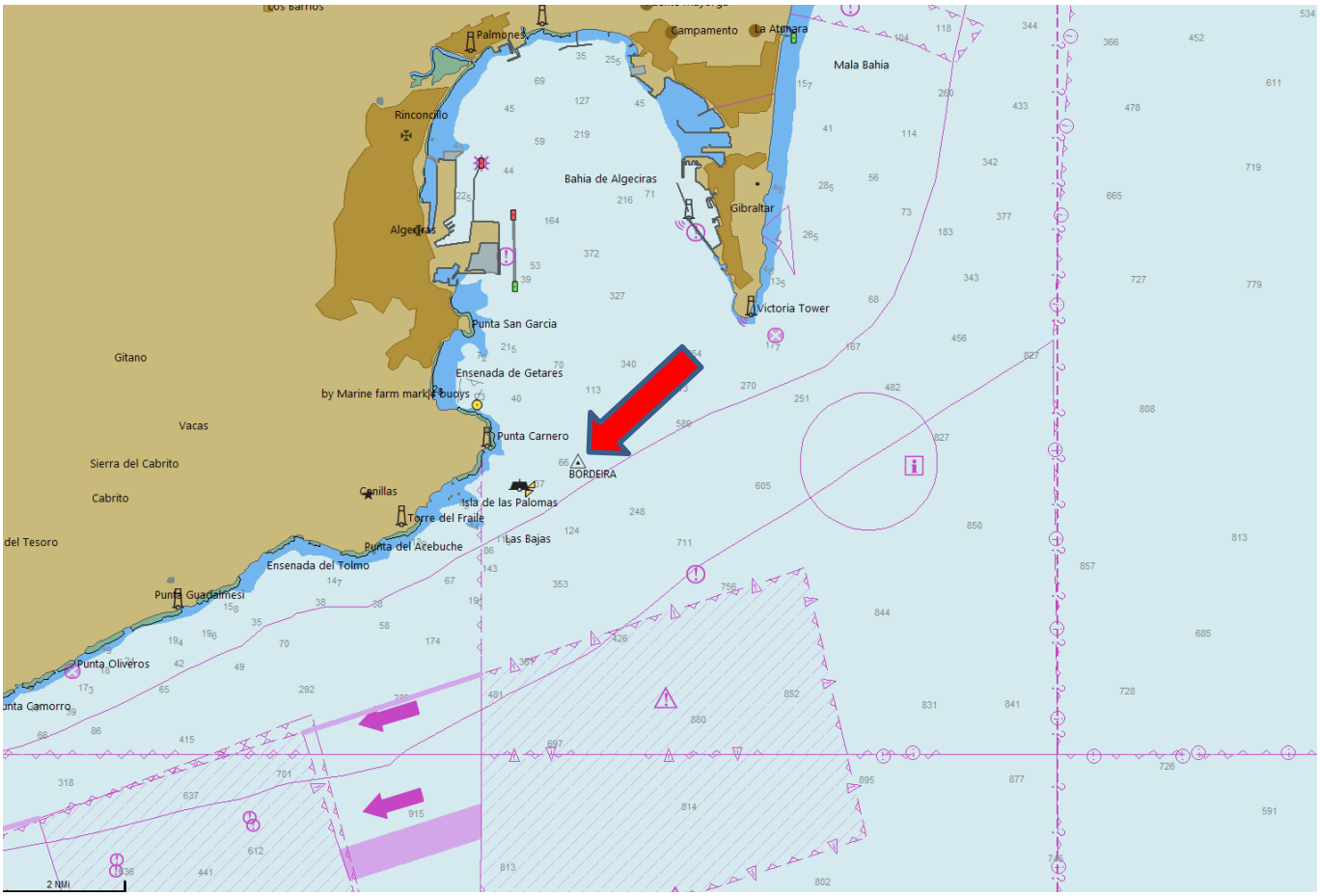


Figura 5. Area of the accident, outside the port boundary in the Bay of Algeciras.

The B/T BORDEIRA arrived in the Bay of Algeciras on 30 April 2021 at 01:18 h, bound for the CEPSA single buoy mooring which, being occupied, obliged the vessel to anchor at Anchorage B until the single buoy mooring was free, which happened on 3 May at approximately 00:07 h[2]. As a result, the vessel spent more than two and a half days at anchor while loaded.

The B/T BORDEIRA unloaded its crude oil tanks at the CEPSA single buoy mooring[3] in Algeciras and, on 3 May at 23:12 h, disconnected the hose and proceeded to a point outside the port boundaries to carry out a crew changeover. Said crew change could not be carried out while unloading because it was against the terminal's regulations.

Four crew members were to disembark, and three were to board. To this end, the shipping agent arranged for the PICASSO PRIMERO service vessel to carry out the transfer, meeting the B/T BORDEIRA in a position previously agreed with the shipping agent and the Algeciras Marine Traffic Department, just beyond the port boundaries in the waters of the Strait of Gibraltar.

[2] These times were obtained by checking the vessel's movements through its SIA signal and may not coincide with the times given in other official reports.
[3] Also known by its English acronym "SBM" or "Single Buoy Mooring".

At 01:18 h on 4 May, the E/S PICASSO PRIMERO contacted the tanker and requested that it deploy the combination ladder[4] on the starboard side. The ship manoeuvred as necessary to provide shelter[5] for the service vessel, maintaining the minimum steerageway of 1 to 1.5 knots.

At 01:30 h the ship arrived at the agreed point and shut down the engine. The vessel approached the starboard side of the B/T BORDEIRA and docked with its port side[6] close to the vessel's midship section. They immediately began to load the luggage of the crew members who were to board[7] onto the B/T BORDEIRA.

At 01:42 h, the crew changeover operations began under the supervision of the ship's 1st Officer. The 2nd Officer boarded first with no problems.

The 3rd Engineer Officer then began the ascent. When he was approximately 4-4.5 m above sea level and about 1-1.5 m below the lower platform of the accommodation ladder, he stopped climbing and gripped the pilot ladder tightly with both hands[8]. He was about 3 or 4 ladder rungs below the platform.

According to the company's report compiling the witness statements, the 3rd Engineer Officer began to tremble slightly, looked down, suddenly released his hands[9] and fell backwards onto the PICASSO PRIMERO and from there into the water. It was approximately 01:50 h.

According to the skipper of the PICASSO PRIMERO, he was starting to separate his vessel from the side of the ship when, before it separated, he heard a loud thud on his boat, which he later attributed to the fall of the casualty. When he emerged from the cabin, he saw the crew member in the water. The current was moving him towards the stern, in the direction of the vessel's propellers, so the skipper of the PICASSO PRIMERO manoeuvred to keep up and ensure the victim was kept away from that area.

A lifebuoy ring was thrown from the PICASSO PRIMERO but was swept away by the current before the casualty could grab it. On the BORDEIRA, the 1st Officer immediately gave the call "Man Overboard[10]" and launched a lifebuoy ring with a towline and light[11]. The casualty managed to grab and get inside this lifebuoy and remained afloat.

The service vessel was able to throw a line to the casualty, which allowed him to stay alongside. When the crew of the PICASSO PRIMERO found they were unable to haul the casualty on board, the skipper requested assistance from the Algeciras Marine Traffic Department.

At 01:54 h on 4 May 2021, a communication was received at the Rescue Coordination Centre (CCS) in Algeciras from the service vessel PICASSO PRIMERO reporting a "man overboard" situation at 36º04,4'N and 005º23,9'W. The communication also indicated that the crew member appeared to have been injured and could not be brought aboard.

In the minutes that followed, the Algeciras CCS mobilised the rescue vessel (E/S) SALVAMAR DENÉBOLA and the auxiliary boat of the (B/S) LUZ DE MAR rescue vessel. It also requested that the pilot boat GETARES, which was closest to the scene of the accident at the time, proceed to the area beyond the boundary to assist in the rescue.

At 02:20:00 h, the E/S SALVAMAR DENÉBOLA left the base.

[4] The ship was in ballast. This meant that the freeboard that had to be surmounted to access the ship's main deck from sea level was considerable, approximately 15 m depending on the draughts of both vessels, which is very physically demanding to do using a vertical ladder, also known as a "pilot ladder". The accommodation ladder is not designed to be fully deployed at that height either, and, moreover, it is unsafe to do so. For this reason, in these situations, both ladders are deployed: the first section is climbed externally using a vertical ladder to access the lower platform of the accommodation ladder 5 or 6 metres above, and from there, the accommodation ladder is used to reach the deck. The combined use of these two ladders is known as a "combination ladder" (see Figura 8) and is the appropriate means of access to a ship the size of the BORDEIRA when in ballast.

[5] The vessel is positioned so that the side where the crew changeover is to take place is sheltered from the sea and/or wind. In this case, the BORDEIRA ship was positioned to receive the wind and sea on its port side. Subsequently, as the emergency continued for a prolonged period of time, this configuration changed, leaving the PICASSO PRIMERO more exposed to the sea and wind, as all attention was focused on dealing with the emergency.

[6] The weather conditions recorded by the crew of the BORDEIRA were a force 4 wind with a wave height of approximately 1 metre. The air temperature was 16º and the water temperature was 15º.

[7] To do this, the luggage is placed on a net, which is lifted on board the ship using a **small hoist.**

[8] In another version, he hugged the ladder tightly.

[9] There are other versions, which are discussed in the analysis section.

[10] Man Overboard!

[11] SOLAS Chapter III, Regulation 7, requires that this device be located adjacent to the embarkation point at all times ready for immediate use in case of need, as transpired.

At 02:25 h, the Getares pilot vessel arrived at the scene of the accident. The auxiliary boat of the B/S LUZ DE MAR reported leaving the base.

On arrival, the crew of the GETARES found the PICASSO PRIMERO with a person on its starboard side, who was being held by one arm but could not be pulled on board due to the high freeboard and their size. The vessel was about 50-70 m away from the tanker and was losing the lee it provided. On board the PICASSO PRIMERO were its skipper and deckhand, as well as the third crew member of the BORDEIRA, a companion of the injured man who had been next to board the ship. This individual was apparently in a state of shock, preventing them from offering effective assistance.

The deckhand from the GETARES boarded the PICASSO PRIMERO, and between the skipper and the two deckhands, they tried again to get the casualty onto the vessel without success.

This attempt having failed, they decided to try and lift him out using the device on the GETARES. To do this, the two deckhands were transferred to the GETARES and its skipper manoeuvred to stay parallel to the PICASSO PRIMERO and shelter the casualty from the sea and the wind. Shortly before the vessels got into position, the casualty let go of the line he had been clinging to, becoming inert in the water and at risk of slipping out of the ring and losing it.

The skipper of the GETARES then jumped into the water to grab the casualty and pull him to the vessel's lifting device[12].

At 02:30 h, the E/S SALVAMAR DENÉBOLA arrived at the scene. They did not intervene so as not to hinder the efforts being made by the GETARES.

Once he was in the device, the two sailors on the GETARES couldn't pull him in, so the skipper, who was in the water, climbed back on board to try and pull him up between the three of them. The injured person was unable to cooperate with the rescue. With great difficulty, they managed to get him on board the starboard side of the GETARES. It was approximately 02:35 h[13].

They secured the casualty where he lay[14], covered him with a thermal blanket, and headed immediately to the Saladillo Marina, where they arrived in no more than 10 minutes.

At 02:40 h, the pilot station reported that the GETARES vessel was heading to Saladillo with the rescued crew member. They reported that the crew member was conscious, with a broken arm and signs of hypothermia. An ambulance was dispatched via the 112 emergency service.

The ambulance arrived at Saladillo 3 or 4 minutes after them. Once docked, they helped the medics remove his wet clothes and transfer him to a stretcher.

At the time, the casualty was exhibiting symptoms of hypothermia; his left arm was clearly fractured, and he had several bruises on his side and chest. He was just about conscious but unable to move.

At 03:17 h, the 061 ambulance service transferred the crew member to the Punta Europa Hospital in Algeciras, ending the emergency.

The crew member later died in hospital as a result of the injuries sustained in the fall.

[12] The lifting device is shown in the Analysis section.
[13] This is the time recorded in the SASEMAR general emergency report.
[14] Given the casualty's condition and the space constraints, moving him any more than necessary wasn't advisable.

4. ANALYSIS

4.1. Proximate cause of the crew member's death.

Figura 6. The starboard combination ladder on the BORDEIRA on the arrival of the judicial police.

4.1.1. Autopsy findings

The autopsy report states that the casualty died accidentally from "hypovolemic traumatic shock brought on by the fall". It also states that "the histopathological study of the heart does not reveal any evidence of an acute ischaemic crisis that might have caused the fall". No traces of drugs or alcohol were found.

4.1.2. Discussion of the eyewitness accounts of the fall

The eyewitness accounts differ as to the details of how the fall occurred. Some witnesses stated that the crew member started to shake, looked down and let himself fall; others stated that he hugged the ladder and fell backwards. Either of these accounts could indicate that he blacked out while climbing the ladder. Another witness said that he tripped.

According to the report submitted by the company, he had a valid medical certificate that qualified him for the position of 3rd Engineer Officer. He was not known to have any previous pathologies or to be taking medication of any kind. Due to the period in which the accident took place, the casualty and his colleagues underwent a PCR test for COVID, with negative results.

According to the skipper of the PICASSO PRIMERO, the casualty fell onto the vessel's cabin and then ended up in the water. He didn't see it, but he heard the impact while he was skippering the vessel inside the cabin. The injuries detailed in the autopsy report are consistent with this assessment. If this were the sequence of events, there would be two consequences:

1) The casualty fell backwards, not vertically. If he had fallen vertically, either he would have fallen straight into the water (if the vessel was sufficiently separated from the side of the tanker) or, if there were insufficient separation between the side of the vessel and the tanker, he would have hit the deck of the PICASSO PRIMERO's boarding area with his legs (resulting in different injuries to the ones he sustained).
2) When he fell, the vessel was separated from the side of the ship by a shorter distance than was necessary while people climbed the pilot ladder. This explains why when the crew member fell slightly backwards, he fell first onto the cabin and then into the water.

4.1.3. Rescue and medical care

The crew member was in the water for approximately 45 minutes before he was rescued[15]. He did not receive medical assistance until 1 hour and 5 minutes after the fall[16], and he was admitted to hospital 22 minutes later.

SASEMAR's report on the rescue refers to a broken arm and the onset of hypothermia when the casualty was evacuated to hospital. The rescuers could not know for certain at the time whether the casualty had internal injuries, although when this was discussed with them, they confirmed that they were aware of that possibility.

4.2. Factors that contributed to the accident

4.2.1. Boarding area and available resources

Figures 7 and 8 show the port side of the vessel and the boarding area from where the replacement crew members boarded the BORDEIRA and to where the BORDEIRA crew members who were going on leave disembarked. The crew member fell onto the cabin adjacent to the boarding area. Based on the appearance of the injuries, the crew member impacted the structure between its lateral and horizontal surfaces before falling into the water.

[15] Between 01:50 h and 02:35 h.
[16] Between approximately 01:50 h and 02:55 h, which is when they began to stabilise him in the ambulance.

Also shown in Figura 7 is the portable ladder, which was fitted to the vessel and deployed at the indicated location during the emergency to rescue the fallen crew member. From its point of attachment on deck to the first rung you have to step onto in the water, there is a distance of 1.85m. The freeboard in that area is 90 cm, so the ladder's first rung would be approximately 90 cm from the waterline, adequate for a reasonably fit person to place their feet on it and climb up the ladder.

This was not the case for the crew member, whose severe injuries prevented him from climbing the ladder himself.

The PICASSO PRIMERO did not have facilities to lift anyone out of the water if they were unable to aid in the rescue manoeuvre themselves.

4.2.2. The manoeuvre

The PICASSO PRIMERO vessel did not separate from the side of the tanker in time due to the existence, according to its skipper, of a perceived[17] strong current, which was cushioning the vessel against its side.

The vessel was powered by two D9 500 VOLVO PENTA engines[18], each rated at 368 kW at 2600 rpm, so there is no reason to believe that the it would have had any difficulty in moving away from the BORDEIRA if the skipper called on the propulsion system to provide the necessary power.

The vessel is propelled by water-jets, which provide better manoeuvrability than a traditional propeller and rudder assembly, so the manoeuvre to separate from the tanker shouldn't have presented any difficulties. However, the skipper didn't want to manoeuvre abruptly because of the risk of dragging the vertical ladder and destabilising the crew member who was using it at the time. This forced the skipper of the PICASSO PRIMERO to use his propulsion system cautiously, preventing him from using its full power to force the vessel to separate quickly.

The explanations indicated that the crew member climbed up the ladder at the same time as the vessel separated from the ship. The CIAIM has concluded that, in this case, it would have been safer to carry out these actions in three well-defined steps to ensure that the crew member gained height without the vessel underneath him:

1. First, the crew member steps onto the vertical ladder, climbs two/three metres up so that the vessel's movements won't affect them, and stops. They remain still, holding on to the vertical ladder and waiting for someone on the vessel to call out that it is safe to climb.
2. The vessel's skipper separates the boat from the side of the ship. Once separated, someone on the vessel calls up to the crew member to advise them it is safe to continue climbing.
3. On hearing the call, the crew member climbs up the ladder. The vessel remains clear of the vertical space around the pilot ladder until the crew member safely reaches the accommodation ladder.

Clearly, there is no protocol for this operation, which is implemented and undertaken by all parties depending on the specific conditions involved in the manoeuvre to be carried out.

[17] "Perceived" in the sense that it was most probably the other way around, that it was the ship cushioned to the vessel due to the effect of the leeway and/or drift. The tanker had a much larger sail and hull area than the vessel, so the impact of leeway and drift would have been more pronounced on the ship than the vessel. In addition, standard practice is for the ship to position itself so as to shelter the vessel, allowing operations to be carried out smoothly, which means that these phenomena have a much more significant effect on the ship.

[18] The engines were fitted in 2017, replacing the previous less powerful engines of the same make, for which the corresponding refurbishment work was authorised by the Harbour Master's Office.

Figura 7. View of the port side of the PICASSO PRIMERO.

4.2.3. The experience of the skipper of the PICASSO PRIMERO in this type of manoeuvre

The CIAIM has reviewed the background of the skipper of the PICASSO PRIMERO, finding that he had obtained his offshore skipper's certificate *(patrón de altura)* in September 2016.

His first "embarkation" or assignment for this company was in 2014 as a deckhand on the COBECHO PRIMERO and the PICASSO PRIMERO. In January 2017, he joined the COBECHO PRIMERO for the first time as an officer. In May 2018, he was enlisted as 1st officer on the COBECHO PRIMERO and in July 2018, as skipper.

In July 2015, the Algeciras Harbour Master's Office issued a "Multiple Enrolment Resolution" for the vessels PICASSO PRIMERO and COBECHO PRIMERO, authorising the multiple enlistment of the crew members indicated in the Annex to said Resolution, "*...without the need to give prior notification of embarkations and disembarkations on said vessels, when substitutions or changes occur between them*". In the Annex to the Resolution updated as of July 2020, the skipper was already listed as such.

The propulsion systems of the two vessels were different; the COBECHO PRIMERO had a traditional system (shaft and propeller), while the PICASSO PRIMERO had a water-jet system. The skipper was perfectly qualified to manoeuvre both vessels, although we cannot rule out the possibility that the differences between the two propulsion systems may have caused the skipper to be cautious, wary or confused about which propulsion system he was using at the time.

4.2.4. The means of access to the ship's main deck

The crew member climbed a vertical ladder of the "pilot ladder" type, the construction of which must comply with a number of industry standards to ensure its safety. The Harbour Master's inspection services have not reported any defects, nor have the witnesses to the accident reported any problems with the ladder.

Notwithstanding the above, the fall may have been facilitated by the fact that the crew member was carrying a rucksack[19] with, apparently, his personal belongings, although we cannot be sure whether this contributed to the accident or not. The rucksack's weight, which could have required additional effort and/or hindered the crew member's movements as he climbed the vertical ladder, is unknown. But regardless, the fall should have been into the water and not onto the boat. The possibility that the rucksack's weight was sufficient to pull the crew member backwards if he fainted has not been ruled out.

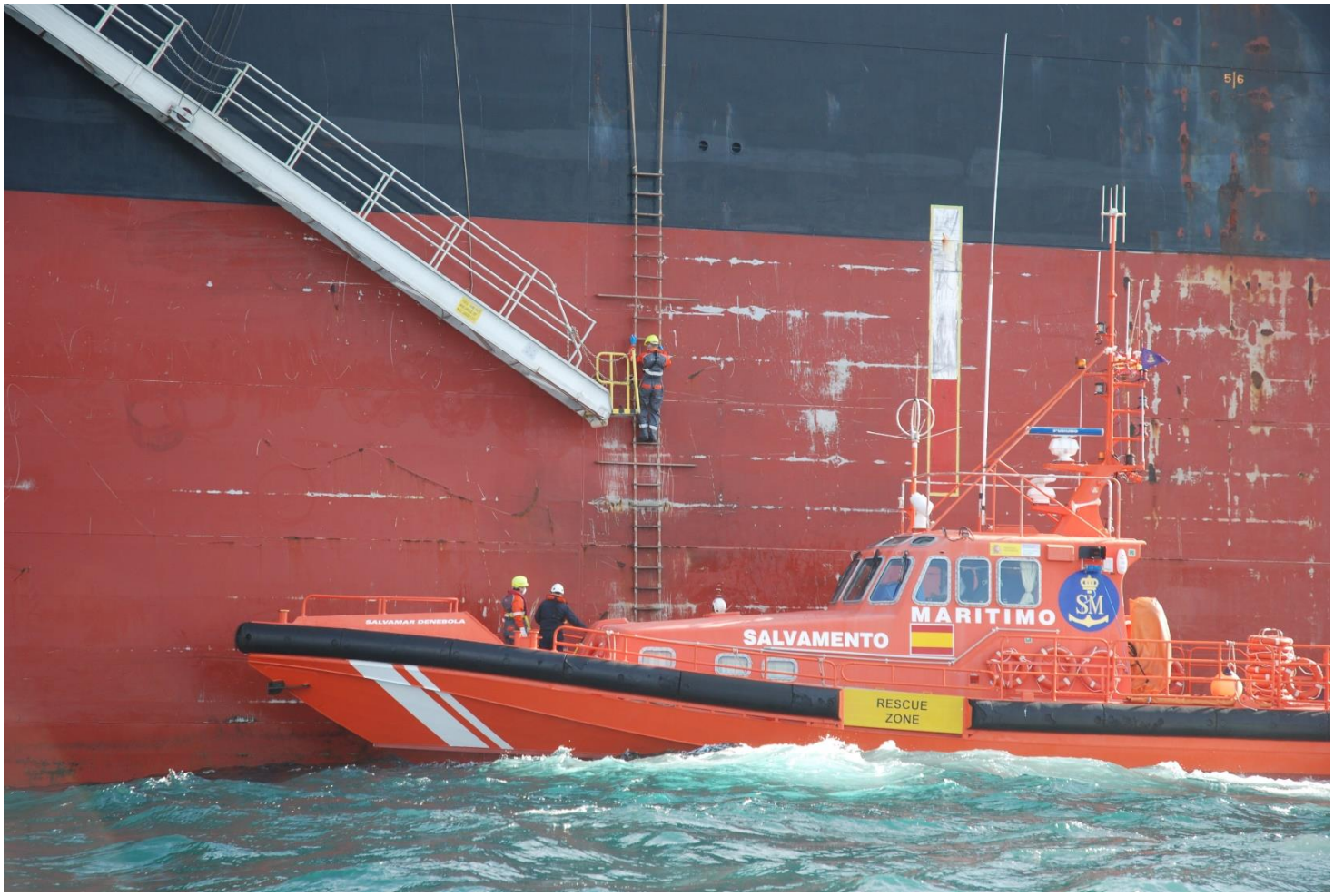


Figura 8. Reconstruction on the BORDEIRA's starboard combination ladder. Height from which the crew member fell. Source: Judicial Police

4.2.5. Safety procedures

The PICASSO PRIMERO did not have any procedures for transferring crews beyond the good practices to be followed in these situations.

The BORDEIRA had a risk analysis procedure in accordance with its Safety Management System. The inspection report prepared by the Harbour Master's Office after the accident concluded that this analysis lacked specificity.

[19] The rucksack was not sent with the luggage when it was hoisted onto the ship.

According to the analysis carried out by the company, none of the crew members who witnessed the operation perceived the risk inherent in the position of the PICASSO PRIMERO nor, therefore, warned or cautioned the skipper of the PICASSO PRIMERO to move away from the side of the ship.

Furthermore, although it didn't directly influence the accident, the crew member climbed the vertical ladder without wearing a lifejacket. Nor was he wearing an alternative means of safety, such as a safety harness. Neither the PICASSO PRIMERO nor the BORDEIRA provided them.

When assessing the risk of falling in this type of crew transfer, two main risks should be considered:

- That the crew member falls into the water, for which a self-inflating lifejacket with a light[20] should be worn, which
    1. Would keep them afloat while they overcame the shock and waited for help.
    2. At night, as in this accident, it would ensure the casualty could be located at all times, even if the current swept them away.
- That the crew member falls onto the vessel, which is what happened on this occasion, and for which the only mitigating measure to prevent the damage inherent in the fall would be for the vessel to separate from the side of the ship immediately after the crew member had secured themselves on the ladder.

This point indicates a failure to adequately assess the risks. Therefore, adequate protective measures were not taken for the crew members embarking/disembarking. Such measures would consist of both material (lifejackets) and procedural measures (adequate shelter from the vessel receiving the transfer service, checking the condition and layout of the ladder, appropriate footwear, handling all the luggage to allow unobstructed climbing up or down, instructing the crew member on how to climb up or down, not rushing, checking the clearance of the vessel from the side of the ship, etc.).

4.2.6. Other alternatives

The ship was at anchorage for more than two and a half days in conditions more suitable for this type of transfer: a loaded ship with a reduced freeboard height, better weather and sea conditions, greater availability and speed of assistance, etc.

It was also berthed at the single buoy mooring. According to our conversation with the terminal, for security reasons, crew changes in this situation are not permitted when the shipping agents in charge of the crew change differ from those in charge of the ship's stay[21].

It wasn’t considered necessary to carry out the operation with the ship at anchor or inside the bay.

4.3. Factors that affected the assistance provided to the crew member involved in the accident

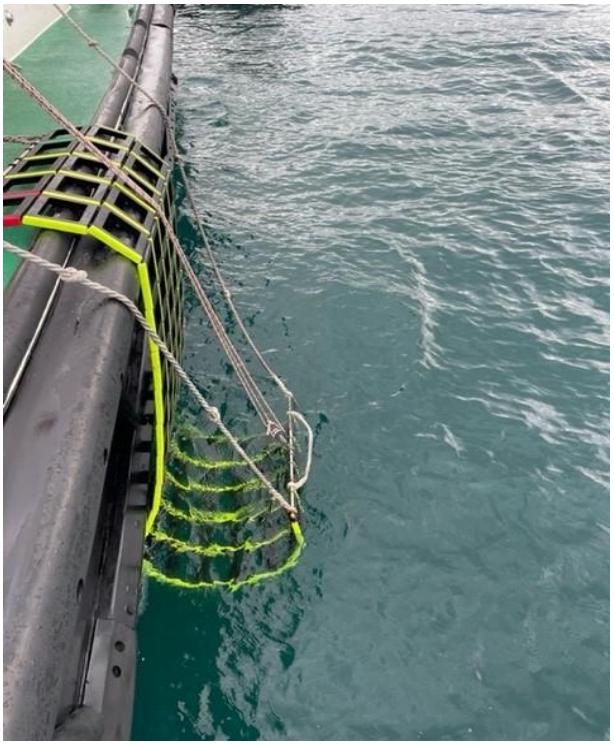
The assistance was affected by the following factors:

a) The injured crew member was heavyset, at 1.85 m and 130 kg in weight, as corroborated by the testimonies of those who assisted in the rescue.
b) The crew member was so seriously injured in the fall that he was unable to participate in any way in his own rescue. The crew member's condition progressively deteriorated until he lost his grip on the line connecting him to the vessel, forcing the GETARES' skipper to jump into the water so as not to lose him.
c) The service vessel PICASSO PRIMERO had a relatively high freeboard of around 90 cm, which made it very difficult to access the deck from the water.
d) The PICASSO PRIMERO service vessel was not prepared for this type of contingency. It had no mechanical or manual lifting equipment suitable for rescuing incapacitated people. It had a portable ladder for access from the water, but it would be impossible to use for an injured, incapacitated or unconscious person, as was the case.
e) The sea and wind conditions in the area, while not rough for a merchant ship, were significant for smaller vessels, which made the rescue work even more difficult.

[20] Alternatively a safety harness, but this would be more cumbersome and offer fewer advantages than the previous option.
[21] Argument put forward by the company. According to our discussions with the CEPSA terminal, for security reasons, crew changes are not usually authorised when the shipping agent in charge of the cargo is different from that of the crew change. Furthermore, without going into specifics, on those dates, there were restrictions on the entry and transit of people through the terminal due to COVID.

The GETARES had a device for rescuing people from the water called a JASON'S CRADLE MOB SYSTEM[22], a form of articulated and flexible mesh or stretcher which, in the end, was what made it possible to lift the casualty out of the water, although not without difficulties due to the circumstances mentioned above.

[22] More information at https://www.jasonscradle.co.uk/



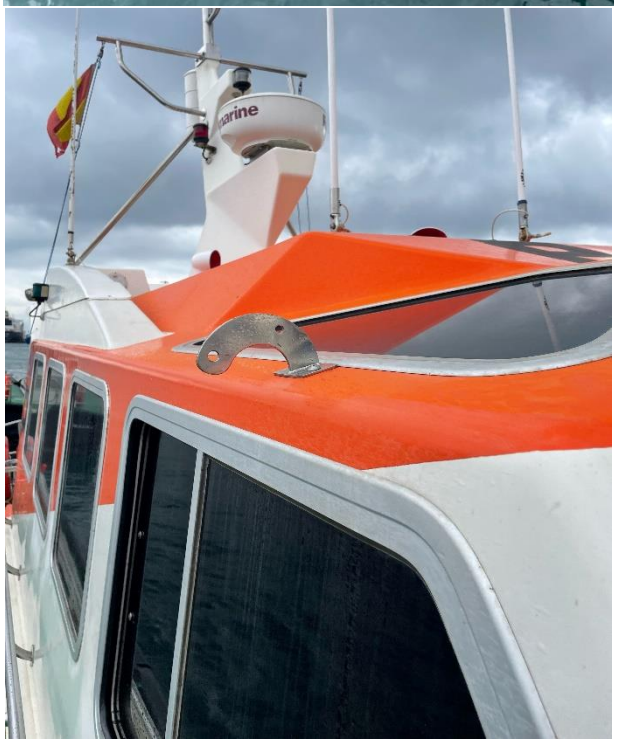


Figura 9. Images of the device used by the GETARES to rescue the injured crew member.

4.4. Corrective actions taken by the Maritime Authority

Due to their relevance, the instructions issued by the Harbour Master of Algeciras to the companies that offer crew transfer services in the Bay of Algeciras following the accident are included below:

> *With a view to bringing them to the attention of companies owning vessels engaged in the transfer of persons to or from vessels at anchor or in beyond-port-boundary operations, the following safety conditions are attached:*
>
> *a) Embarkation shall be carried out one at a time, and the transportation vessel shall separate from the hull of the ship or vessel to be boarded as soon as the individual embarking has a firm stance and grip on the ladder, keeping clear of the side as they climb up it.*
>
> *b) Disembarkation shall be carried out one at a time, and while the individual disembarking is climbing down the ladder, the transportation vessel shall be kept clear of the side. It shall only approach when the crew member is ready to jump onto the vessel.*
>
> *c) All persons embarking/disembarking must wear a lifejacket and cannot carry any luggage, including rucksacks, suitcases, bags, documents, etc...*
>
> *d) In nocturnal operations, the ship must provide adequate lighting in the embarkation area, and the transportation vessel must be equipped with a searchlight.*
>
> *e) Crew members shall assist in the operation on board both the ship and the transportation vessel.*
>
> *f) Any incident must be notified immediately to the Algeciras Marine Traffic Department.*

The CIAIM considers these measures to be both appropriate and relevant.

4.5. Corrective actions taken by the company TMS TANKERS

Following the accident, TMS TANKERS has adopted the following measures to address the safety issues identified during the investigation into the accident:

- Alert the fleet by drawing the attention of seafarers to the need to use their "stop work authority" to properly plan and supervise embarkation/disembarkation.
- Elaboration of a specific checklist for embarkation and disembarkation by boat.
- Implementation of a risk assessment for embarkation/disembarkation by boat.
- Distribution of a boarding safety rules poster to all employees.
- In addition to the requirements of international conventions and safe shipping industry practices, provide self-retracting lifelines for use during boarding by boat, together with life jackets and safety harnesses.
- Procedures for embarkation/disembarkation by boat - Including but not limited to: Responsibilities, means of embarkation, maintenance, communication, minimum PPE / equipment, selection criteria for the service vessel.
- Improve the Stop Work Authority procedures through a campaign.
- Modify the PPE matrix to include service boat embarkation/disembarkation activity.
- Develop training material to share lessons learned from this incident (Learning Engagement Tool - LET).
- Produce a "Welcome on Board" leaflet with safety guidelines, including safe (de)embarkation, and distribute it to the fleet and crewing agencies.

5. CONCLUSIONS

1) The crew member fell from the pilot ladder he was climbing to access the ship BORDEIRA for reasons that cannot be established with certainty, although the indications are that he fainted.
2) His fall ended when he hit the cabin of the PICASSO PRIMERO, sustaining internal injuries that later ended his life.
3) The subsequent rescue and evacuation of the crew member to a medical centre proved extremely difficult due to the circumstances explained in this report, and the extent to which more rapid attention could have prevented his death could not be determined from the medical information available.

The CIAIM has identified the following as contributing factors to the accident and its consequences:

a. The PICASSO PRIMERO vessel had not moved away from the ladder. According to the skipper of the PICASSO PRIMERO, it was difficult for him to move away from the side of the ship. He did not want to force the propulsion because of the risk of dragging the vertical ladder, thus destabilising the climbing crew member. If this was the case, it suggests that an unacceptable point of risk was reached, and

the operation should have followed a safer procedure: once the crew member was positioned on the ladder, well clear of the vessel, the skipper should have ordered the crew member to stop and then separated his vessel from the ship before the crew member continued the ascent.

b. The preceding points, together with other circumstances, such as not using a lifejacket or safety harness, the fact that the crew member was carrying a rucksack, which may well have affected the way (backwards) he fell after fainting, or the apparent inaction of the ship's crew in responding to the vessel's failure to pull away, suggest that the parties were not following a known and agreed procedure.
c. The PICASSO PRIMERO was not equipped with any means, mechanical or otherwise, to hoist on board an individual who was incapacitated, unconscious or whose faculties were impaired.

Although unrelated to the accident, the ship had two previous opportunities over several days to conduct the crew changeover in considerably more favourable conditions: at the anchorage and at the single buoy mooring.

6. SAFETY RECOMMENDATIONS

To ALGECIRAS SOUTH PORT SERVICE, S.L.:

1. It is recommended that ALGECIRAS SOUTH PORT SERVICE, S.L. follow the instructions issued by the Algeciras Harbour Master's Office. With regard to the lifejacket, it is recommended that they are approved inflatable lifejackets fitted with a light.
2. It is recommended that ALGECIRAS SOUTH PORT SERVICE, S.L. draw up a protocol for beyond-port-boundary crew transfer operations, in accordance with Chapter 6 (beyond-port-boundary operations) of Royal Decree 186/2023, of 21 March, approving the Regulations on Maritime Navigation, and that it take into account the recommendations made by the Algeciras Harbour Master's Office. Said protocol should be based on recognised standards, e.g. UK-MCA MGN 432 (*Safety during transfers of Persons to and from Ships*).
3. It is recommended that ALGECIRAS SOUTH PORT SERVICE, S.L.train its skippers on how best to separate from a ship without destabilising the vertical ladder when in use, taking into account all the circumstances that may arise, particularly the type of propulsion and the prevailing weather and sea conditions.

To TMS TANKERS LTD:

4. It is recommended that TMS TANKERS LTD provide for the possibility of crew changes while moored at the single buoy mooring in accordance with the requirements imposed by the terminal.

To the General Directorate of the Merchant Navy

5. It is recommended that the General Directorate of the Merchant Navy instruct the Harbour Masters to require companies engaged in the transfer of persons at sea to prepare a protocol for carrying out crew transfer operations, based on the guidelines of the International Maritime Organisation as set out in MSC-MEPC.7/Circ.10, on safety during the transfer of persons at sea and/or recognised standards, e.g. UK-MCA MGN 432 (*Safety during transfers of persons to and from ships*). The protocol shall include procedures to ensure operations are conducted as safely as possible and provide for vessels to carry equipment (similar to that shown in this report) for the rapid and safe recovery of persons who fall overboard.