



DUTCH
SAFETY BOARD

Man missing after falling overboard

Learning points from an accident
in the Baltic



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The Hague, November 2019

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Photo cover: Wijnne Barends

The Dutch Safety Board

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	Dutch Safety Board	
Chairman:	J.R.V.A. Dijsselbloem M.B.A. van Asselt S. Zouridis	
Secretary Director:	C.A.J.F. Verheij	
Visiting address:	Lange Voorhout 9 2514 EA The Hague The Netherlands	Postal address: PO Box 95404 2509 CK The Hague The Netherlands
Telephone:	+31 (0)70 333 7000	
Website:	safetyboard.nl	
E-mail:	info@safetyboard.nl	

N.B. The full report is published in the Dutch language. If there is a difference in interpretation between the Dutch report and English summary, the Dutch text will prevail.

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INTRODUCTION

On 1 February 2019, at around 15.30 local time¹, a deckhand of the Dutch registered cargo vessel Lady Ami fell overboard in unknown circumstances, shortly after departing the port of Liepaja in Latvia. The deckhand had been issued the task of sweeping out the cargo hold and subsequently fell overboard, for reasons as yet unclear.

During the search and rescue (SAR) operation that followed, the Lady Ami was assisted by the pilot boat from the port of Liepaja and a number of workboats operating in the area. The Liepaja vessel traffic service and Riga Rescue Radio were also informed. Despite this assistance, the deckhand was not recovered. As darkness fell, the SAR operation was halted and the Lady Ami returned to Liepaja. Given the fact that the water temperature was 3 to 4 degrees Celsius, it may be assumed that the deckhand drowned. The deckhand has been missing ever since.

The incident has been classified as a very serious marine casualty as defined in the Casualty Investigation Code of the International Maritime Organization (IMO) and Directive 2009/18/EC of the European Parliament and the Council. This means that the Netherlands as the flag state bears the obligation to ensure that an investigation is carried out. This obligation to carry out an investigation is also laid down in the Safety Board Decree.

For the purposes of this investigation, the following questions have been formulated:

1. How could the accident happen?
2. What barriers were in place to prevent such an accident, and how effective were they?
3. How can the risk of a crew member falling overboard and drowning be reduced in the future?

In the framework of the investigation, immediately following the accident, two investigators from the Dutch Safety Board travelled to Klaipeda, the next port at which the vessel had by that time arrived, to carry out the investigation on board the Lady Ami. For the analysis of this accident, the Dutch Safety Board held interviews with the crew members involved and with representatives of the shipping company. For the analysis, use was made of the TRIPOD analysis method, through which failing barriers and operational and organizational factors can be identified, in order to identify potential safety problems. On that basis, the Dutch Safety Board has described the analysis of the incident in this report.

¹ Local time is UTC+2

1 COURSE OF EVENTS AND BACKGROUND INFORMATION



Figure 1: The Lady Ami. (Source: Wijnne Barends)

On Wednesday 30 January 2019, the Lady Ami arrived at the port of Liepaja, Latvia, where bales of waste were to be unloaded that had been loaded in Boston, United Kingdom. Unloading was carried out continuously day and night, and by Friday afternoon of 1 February 2019, at 14.30 hours local time, the hold of the Lady Ami was empty. During the unloading of bales of waste, the deckhand, the subsequent victim, had swept out the hold together with the third officer and the AB motorman. The ship was set to subsequently sail to Klaipeda in Lithuania empty to take on board the next cargo.

After all the cargo had been unloaded, the ship was prepared for departure and around 15.05 hours, the pilot came on board. The Lady Ami subsequently departed from the port. At around 15.15 hours, the pilot disembarked and together with the subsequent victim, the third officer hauled in the pilot's ladder. The third engineer then went inside to change and the deckhand said to the motorman, who was on deck lubricating a winch, that he planned to enter the cargo hold in order to sweep out the final remaining waste, before taking an early rest. Near the entrance of the cargo hold, on portside, a pair of gloves and a plastic bag were later found. These were to be used during the cleaning in the cargo hold.

At around 15.30 hours, the motorman on the poop deck heard a scream. He quickly ran to the starboard side and saw the deckhand lying in the water. He also saw the ladder of the hatch cover crane hanging loose. The vessel was already travelling almost at full

speed, and the distance between the vessel and the man overboard grew rapidly. The motorman quickly ran to the bridge and alarmed the captain. The captain saw the deckhand in the water and turned the rudder immediately to port in order to turn the vessel around. The motorman was sent below to make rounds on the vessel with the cook, while looking out for the victim. By this stage, the third officer had also been notified and he too came to the bridge to look out for the man overboard.

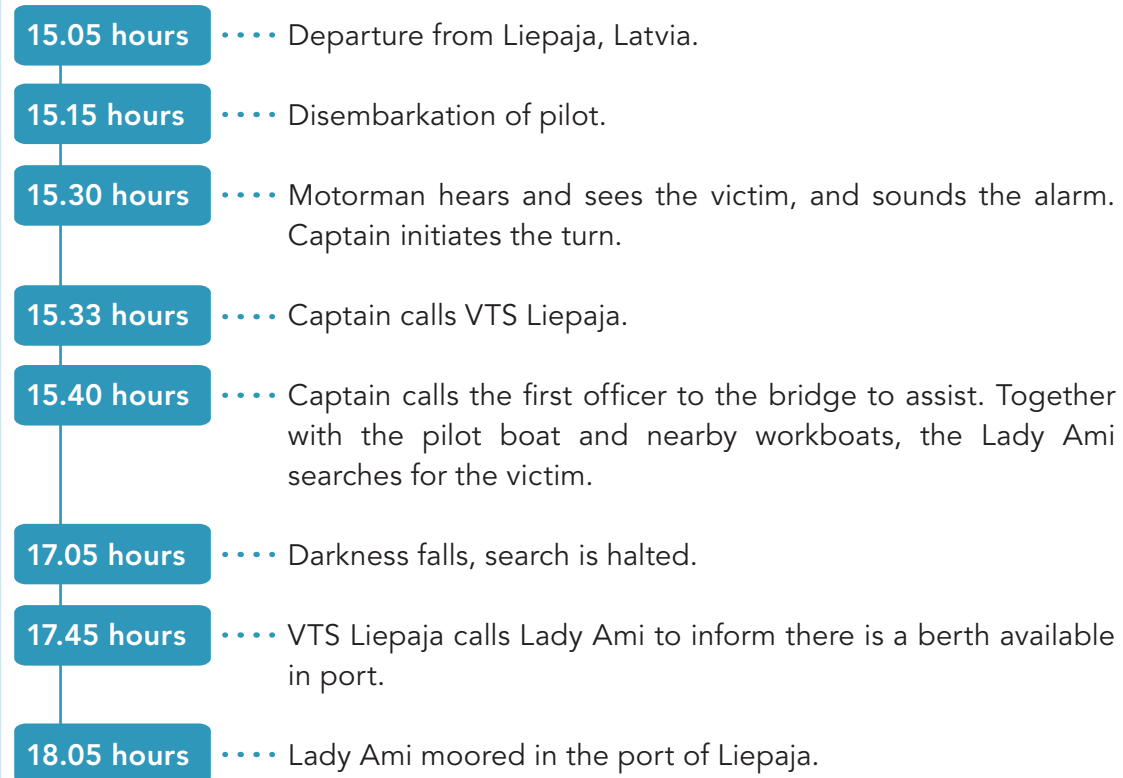
As the ship was turning, the captain informed the vessel traffic service in Liepaja (VTS Liepaja). The VTS instructed the pilot boat to assist in the search for the victim. Two workboats operating in the area also offered assistance. Because the Riga coastguard (MRCC Riga) called the Lady Ami and asked a number of questions, the first officer was called to the bridge to assist.

The search was unsuccessful: the victim had been lost from view and could not be located. The victim's shoes were found floating in the water, what indicates they searched close to the victim's last position. As time passed, the pilot boat was recalled to port. The Lady Ami and the workboats searched the area until darkness fell, but were forced to halt the search when it became too dark. By 18.05 hours, the Lady Ami was once again moored in Liepaja.



Figure 2: Location of Liepaja and Klaipeda. (Source: Google Maps)

1.1 Accident timeline



1.2 Ship and crew

The Lady Ami was built in 2015 at the Dutch yard GS Yard B.V. in Groningen, the Netherlands, and is one of the twelve vessels built in the A-series. The Lady Ami is owned by Wijnne & Barends' Cargadoors- en Agentuurkantoren B.V. based in Delfzijl, part of the Spliethoff Group. The Lady Ami has a gross tonnage of 2544 tonnes. See Appendix A for further vessel details.

At the time of the accident, the crew of the Lady Ami consisted of six crew members. The minimum number of crew members required on board the Lady Ami is five. Figure 3 shows the composition of the crew.

Position	Number	Nationality
Captain	1	Dutch
First officer	1	Russian
Third officer	1	Filipino
Deckhand - motorman	1	Filipino
Deckhand - cook	1	Filipino
Deckhand	1	Filipino

Figure 3: Crew composition Lady Ami.

The working language on board was English, but between themselves the deckhands and third officer spoke Filipino. The victim had been employed as a seaman since 2013 and had been employed as a deckhand on board the Lady Ami since October 2018. Previously he had sailed on other vessels, including the Lady Alida, a sister vessel to the Lady Ami, and the Lady Nova, a smaller but comparable vessel. The Dutch captain of the vessel had been employed by Wijnne Barends for thirty years. In the past few years, after his retirement, he worked mainly as a relief captain for short periods, generally two to four weeks, and mostly on board vessels of the A-series.²

During unloading in Liepaja, the first and third officer alternated shifts every six hours to monitor the unloading work. The three deckhands were able to sleep at night and worked during the day. The records of rest hours and statements of the crew members reveal that during the days leading up to the accident, they were able to take sufficient rest, in accordance with the applicable regulations.

2 In total, Wijnne Barends operates twelve vessels of the A-series, suitable for various types of dry cargo. The vessels are mainly intended for European waters. Because of the height-adjustable steering house, these vessels are also suitable for sailing on Europe's larger rivers and inland waterways.

1.3 Sailing route

The Lady Ami mainly sails between ports in Western Europe and the Baltic. On 26 January 2019, the vessel had departed from Boston (United Kingdom) en route for Liepaja in Latvia, where she arrived on 30 January 2019. In Boston, the vessel had taken on board bales of waste, which were unloaded in Liepaja. On 1 February 2019, the vessel departed from the port heading for Klaipeda in Lithuania.

1.4 Weather conditions

At the time of the accident, air temperature and water temperature were around 3 to 4 degrees Celsius. The sea was calm with limited swell. There was a south-easterly wind, force 2/3, and visibility was good. Currents and tidal action in the Baltic are practically negligible.

2 ANALYSIS

This analysis focuses on the four elements that played a role in this accident: the ladder on the hatch cover crane, the use of a life jacket, the chances of survival in cold water and the man overboard procedure.

2.1 The ladder on the hatch cover crane

No one saw the victim fall, as a result of which it is not possible to determine with any certainty the precise cause of the fall overboard. The adjustable ladder on the hatch cover crane was discovered hanging loose by the motorman, after he had heard the victim's scream, but it is unknown whether the victim was on the ladder at the time of the fall. It is probable that the ladder hanging loose is related to the fall overboard. No other plausible explanation could be identified for the fall overboard, and the call for help also suggests a fall. Moreover, no other explanation was found for the loose-hanging part.

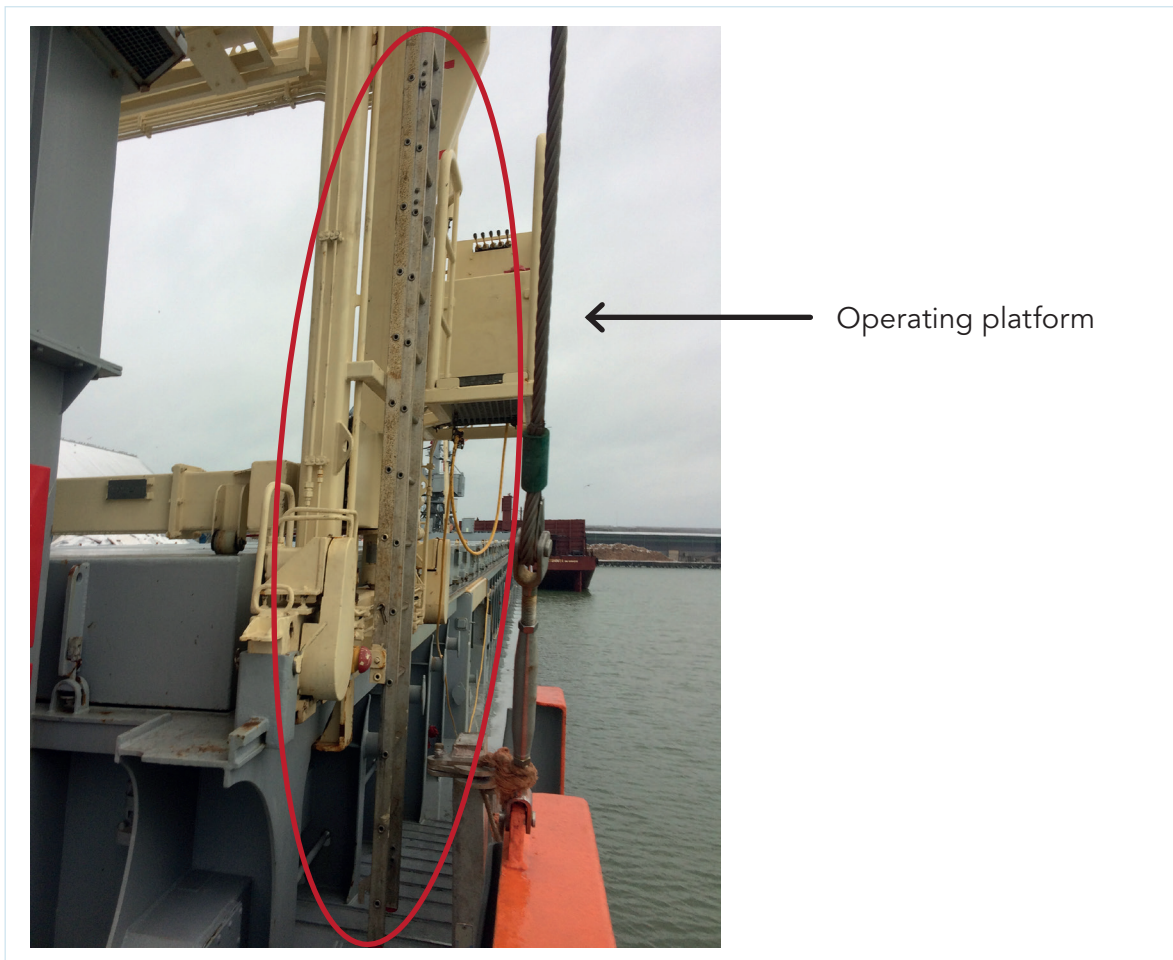


Figure 4: The ladder on the hatch cover crane with the adjustable section (circled). (Source: Dutch Safety Board)

The risk inventory for the hatch cover crane specifies that when operating the crane, a safety harness must be worn. This applies to any crew member on the operating platform. To reach the operating platform via the ladder, the only hazards referred to are missing a step and slipping. These risks are managed by wearing suitable footwear and by taking sufficient care.

Ladder can be adjusted to reach the deck

The hatch cover crane and the ladder are built and certified by the company Coops & Nieborg. The ladder consists of two sections: a fixed section and an adjustable section. The adjustable section is necessary in order to adjust the height of the step-up. The reason for this is that as the hatch cover crane is moved, the height from the deck in respect of the ladder varies. The adjustable ladder section is hooked onto the fixed ladder section at the top and at the bottom, by means of a hook with a locking pin secured to the fixed section (see Figure 5). Because of the removable section of the ladder, there was no fall protection fitted in the form of a handrail or cage.



Figure 5: Hooks and securing mechanism for the adjustable ladder. (Source: Dutch Safety Board)

Adjustable section rarely used

To remove the adjustable section of the ladder, the bottom pin must be removed and the ladder section lifted from the hooks. If the ladder is correctly fixed in place, it cannot hang loose of its own accord. According to the crew members, this section of the ladder is rarely removed and is only used to climb onto the hatch cover crane. The victim had not received instructions which made climbing onto the hatch cover crane necessary. The standard route from the deck to the hold was not via this ladder.

2.2 The use of a life jacket

Life jacket is compulsory in bad weather

In the vessel's Safe Working Manual, it is stated that in poor weather conditions crew members are forbidden from going on deck, unless absolutely necessary for the safety of the vessel or crew. If they do go on deck, the work must be carried out in pairs, and permission must be obtained from the bridge and from the captain. Moreover, in those conditions, every person entering the deck area must wear a life jacket, wear waterproof clothing and carry a walkie-talkie. For activities on deck in those conditions only three

suitable life jackets were available, apart from the life jackets which are mandatory according to SOLAS regulations.

The investigation has revealed that the victim was not wearing a life jacket when he fell overboard. A life jacket could have prevented the deckhand from drowning. However, the victim was not wearing a life jacket because the weather conditions were good. There was little wind and the sea was calm. In addition, the victim planned to enter the hold to sweep it clean. In principle, there was little risk of a fall overboard. However, this accident shows that even in calm weather conditions account must be taken of this potential scenario. When moving around the deck, the use of a life jacket is therefore desirable, even in calm weather. Nonetheless, the use of a life jacket could not have prevented hypothermia, as described in the next paragraph.

2.3 The chances of survival in cold water

Cold water results in hyperventilation and gasping for air

The temperature of the seawater in the Baltic at the time of the accident was between 3 and 4 degrees Celsius. In such conditions, the chances of survival of a man overboard decline rapidly. The first physical reaction that occurs following a fall into cold water is cold shock, leading to hyperventilation, an accelerated heart rate and a rapid rise in blood pressure. The hyperventilation causes breathing difficulty which in turn causes stress and further exacerbates the hyperventilation. A reflex response is gasping for air, even if the victim is underwater at the time. The risk of inhaling water is therefore high, certainly if the victim is not wearing a life jacket which could ensure that the victim's head remains above water.³

The body cools further, loss of control of limbs and loss of consciousness

After a few minutes, a victim is able to bring his breathing under control, but the cooling of the body continues. The man overboard quickly loses the ability to move his fingers and in very cold water after approximately ten minutes also loses control over his arms and legs, thereby reducing the ability to swim. At that moment, drowning is a high risk. Within 15 to 30 minutes the victim loses consciousness (see Figure 6), depending among other things on physical fitness and mental vitality.

³ The Chilling truth about cold water, www.shipwrite.bc.ca/Chilling_truth.htm. Consulted on 18 July 2019.

How hypothermia effects most adults:

Water Temperature in Degrees F (Degrees C)	Exhaustion or Unconsciousness	Expected Time of Survival
32.5 (0.3)	Under 15 min	Under 15 to 45 min
32.5 to 40 (0.3 to 4.5)	15 to 30 min	30 to 90 min
40 to 50 (4.5 to 10)	30 to 60 min	1 to 3 hrs
50 to 60 (10 to 15.5)	1 to 2 hrs	1 to 6 hrs
60 to 70 (15.5 to 21)	2 to 7 hrs	2 to 40 hrs
70 to 80 (21 to 26.5)	2 to 12 hrs	3 hrs to indefinite
Over 80 (Over 26.5)	Indefinite	Indefinite

Figure 6: Water temperature and chances of survival. Source: *The Chilling truth about cold water*, www.shipwrite.bc.ca/Chilling_truth.htm. Consulted on 18 July 2019.

Chances of survival of the victim in the cold water were minimal

Due to the conditions at the time of the accident, the chances of survival of the victim were minimal. The water was just a few degrees above the freezing point and the deckhand was not wearing a life jacket. Without a floatation aid such as a life jacket or life buoy, it is difficult even for a physically fit individual to remain above water.

2.4 The man overboard procedure

Man overboard procedure is focused on relocating and rescuing a man overboard

As soon as a man overboard (MOB) situation occurs, the attention of the crew must be aimed primarily on relocating and rescuing the man overboard. In many cases, the ship is required to carry out a manoeuvre to return to the MOB position. There are a number of different MOB manoeuvres. The most commonly employed manoeuvres are the Williamson turn and the single MOB turn (also known as the Anderson turn). The choice of manoeuvre depends on the situation, whereby above all weather conditions and visibility are important.⁴

⁴ Two men overboard in the Baltic, 5 December 2013, Dutch Safety Board, <https://www.onderzoeksraad.nl/en/page/3161/two-crewmembers-overboard-in-the-baltic-5-december-2013>

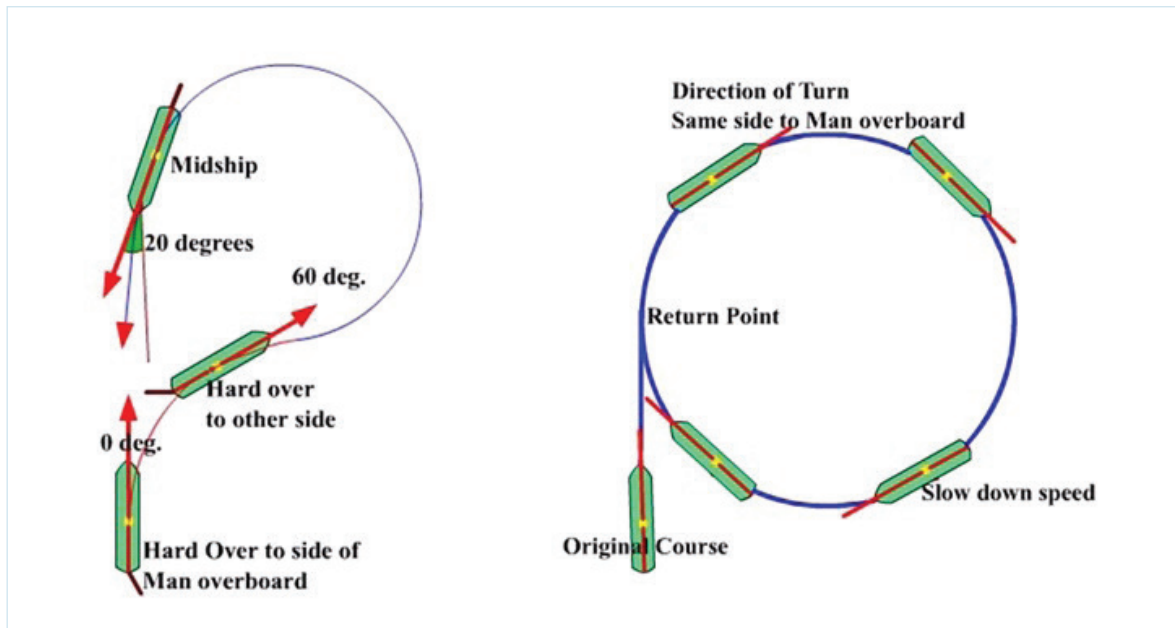


Figure 7: The Williamson turn (L) and the Anderson turn (R), Source: officerofthewatch.co.uk/2016/02/man-overboard-actions, consulted on 31 July 2019.

As well as initiating a turn, the MOB procedure includes a number of other actions. To prevent the man overboard being lost from view, it is essential that the position of the man overboard be pointed out, for example from the bridge wing. In addition, the throwing of a life buoy, preferably with a smoke marker⁵ to improve visibility, is important, because this buoy can be used both as a marker and as a floatation aid. In addition, the position of the MOB should be plotted in the GPS (or ECDIS) by pressing the MOB button, so that it is easily possible to sail back to the position where the MOB took place. One of the other primary actions is to notify surrounding vessels and shore stations.

MOB procedure partially followed: crew immediately sounded alarm and initiated the turn
 The investigation revealed that during the accident on the Lady Ami, a number of actions from the MOB procedure were carried out correctly. The alarm was immediately sounded and a single turn was initiated. In the conditions at the time, the single turn was a logical choice given the good weather and the daylight situation.⁶ The VTS in Liepaja was also notified, so that surrounding vessels could assist. These actions were carried out immediately following discovery of the MOB, which increased the possibility of success of the SAR operation.

Victim was not pointed out and the MOB button was not pressed

A number of other crucial steps from the MOB procedure were not carried out correctly. The victim was not continuously pointed out and as a result was lost from view. In addition, the MOB button was not pressed. As a result, the precise point at which the deckhand fell overboard was not recorded, which hindered the rescue operation. Finally, no life buoy was thrown, despite the fact that the vessel is equipped with life buoys with smoke markers, which can be released via a quick-release mechanism. The vessel was

⁵ The smoke markers release brightly coloured smoke which clearly identifies the position.

⁶ The Williamson turn is often employed in bad weather conditions or in the hours of darkness because it brings the vessel precisely back onto the victim on the opposite course. The Williamson turn does take more time.

travelling at high speed away from the victim, as a result of which the distance between the vessel and the victim grew rapidly.

Experienced crew was conversant with the MOB procedure

The investigation revealed that the crew members of the Lady Ami were conversant with the correct MOB procedure and complied with all training requirements.⁷ The captain and other crew members had long seagoing experience, but no one had ever experienced an MOB. The MOB drill was not carried out with the vessel in motion and, as required by international regulations, the only drill carried out was the lowering of rescue boats into the water, while the vessel was stationary in port.⁸ Also tabletop exercises were held, meetings to discuss a simulated emergency situation in a non-threatening environment without the physical activity. However, these exercises are not full MOB drills. The carrying out of the MOB drill while in motion is not compulsory and according to the shipping operator was not carried out in order to not place the crew at risk during an exercise. Ensuring a clear personal understanding of the procedures to be undertaken was considered sufficient.

Crew was unable to rely on routine response during sudden and massive stress

Sudden and massive stress and workload arose for the crew members as a consequence of the accident. The small crew had a close bond causing more stress and emotions after the accident. Under this high pressure a number of decisions had to be made, requiring a rapid response. Moreover, the MOB was completely unexpected, because given the weather conditions and the work to be carried out, there was a limited risk of a fall overboard. To take account of such a scenario, it is essential that the crew members are able to rely on pre-learned procedures and responses. The regular practising of such drills and procedures, not just discussing the drill during a tabletop exercise, can ensure that in an emergency situation a more effective response is provided. It is also essential that every crew member is aware of the risks present (situational awareness) so as not to be surprised by a casualty.⁹

⁷ MSC.1/Circ.1447 of the IMO: Guidelines for the development of plans and procedures for recovery of persons from the water.

⁸ SOLAS III, Regulation 19, Emergency training and drills

⁹ Leadership and work involvement kit, Understanding human failure, Health and Safety Executive, <http://www.hse.gov.uk/construction/lwit/assets/downloads/human-failure.pdf>. Consulted on 25 July 2019.

3 CONCLUSIONS

On board the Lady Ami, the risk of a fall overboard and its consequences were managed in several ways. Firstly, during bad weather conditions, crew members were forbidden from going on deck, except in extreme emergency conditions, and then always in pairs. This measure reduced the risk of falling overboard. The use of a life jacket was compulsory in such situations, so that in the event of a fall overboard, the chance of survival was increased. Secondly, there were procedures in place for an MOB situation, and the crew was aware of those procedures. The purpose of these fixed procedures was to ensure that a rescue operation could be carried out rapidly and successfully.

Nonetheless, on 1 February 2019, these management measures proved insufficient. The victim was not wearing a life jacket when he fell overboard, because the weather conditions were good and as a result the use of a life jacket was not compulsory. Without a life jacket, the chances of survival in cold water declined rapidly. Following the fall overboard, the MOB procedures were not followed completely, probably as a result of the sudden stress which occurred and because this scenario had not been trained and a sailing MOB drill was not routine. After the victim fell into the sea, the MOB button was not pressed and his location was not pointed out, as a result of which the position of the deckhand was not recorded, which hindered the SAR operation of the Lady Ami, the pilot boat and the workboats. Following the correct MOB procedures could have resulted in a less fatal outcome.

The cause of the deckhand falling overboard from the Lady Ami and his subsequent missing cannot be determined with any certainty. The victim possibly fell from the ladder on the hatch cover crane, when the ladder broke free. Because the ladder on the hatch cover crane was not equipped with fall protection such as a guiderail or a cage, there was no barrier to prevent a fall overboard of the deckhand. Despite the peculiar position in which the ladder was found, it has not been proven the victim has stood on the ladder.

On the basis of the incident, the Dutch Safety Board has elaborated a number of general learning points:

A man overboard situation can occur at any time, even at unexpected moments. For example in good weather conditions, the risk is still present. Crew members must always be aware of this risk.

A man overboard leads to huge stress and places huge demands on the crew. Good procedures and awareness that the risk is present are insufficient to prevent such an accident. The procedures must also be practised, so that during the sudden stress which occurs in the event of a man overboard, the crew can rely on previously learned actions and routines. This increases the probability of a successful SAR operation.

It is essential that crew members inform one another of their planned actions and their position on board. This certainly applies when a crew member goes on deck alone, at locations where there is a risk of falling overboard or falling into the hold. In this way, other crew members are kept informed whenever a high-risk situation arises.

In the event of a fall overboard, the wearing of a life jacket can simplify and accelerate the relocation of the victim and may prevent death by drowning. The wearing of a comfortable life jacket for all movements on deck is recommended, at least in water temperatures around the freezing point, but even in good weather. For this purpose sufficient and suitable life jackets must be available on board.


4 MEASURES BY THE SHIPPING OPERATOR

One week following the accident, the shipping company summoned a Safety Committee on board all its vessels, which focused on the MOB drill. The rescue turn, the recovery plans and procedures for recovery of persons from the water, and the contingency checklist man overboard were discussed. The shipping operator hopes that these actions have increased awareness among crew members. Nonetheless, the physical practise remains important.

The deliberations of the Safety Committee also revealed that the crew members on board the vessels of the shipping company were keen to increase the numbers of life jackets available on board which are suitable to wear during activities on deck. Prior to the accident, three of such life jackets were available on each ship. This number has now been increased, so that one life jacket is available for each crew member. The life jackets have now been made part of the personal protective equipment and, just like a helmet, safety shoes and gloves, must be worn when on deck. Following an extensive investigation by the shipping company, a choice was made in favour of a comfortable jacket, which does not hinder the wearer while working. Although this does not reduce the risk of falling overboard, it does increase the chance of survival.

Together with the supplier of the hatch cover crane, the shipping company has looked into a better solution for the ladder, but has not yet identified a proper solution.

APPENDIX A

Vessel data	Lady Ami
Photograph:	 <p data-bbox="660 896 1401 947">Figure 8: The Lady Ami. (Source: Wijnne Barends)</p>
Call sign:	PCZT
IMO number:	9624861
Flag state:	The Netherlands
Home port:	Delfzijl
Type of ship:	General cargo
Classification society:	Lloyds Register
Year of construction:	2015
Shipyard:	GS Yard B.V. Groningen
Length overall (LOA):	88 m
Length between perpendiculars (LPP):	84.98 m
Breadth:	13.35 m
Actual draft:	4.9 m
Gross Tonnage:	2544
Engines:	1 Caterpillar 3508C
Propulsion:	1 propeller – 1 thruster
Maximum propulsion capacity:	2020 kW
Maximum velocity:	10 knots
Vessel's certificates	All valid



Visiting address

Lange Voorhout 9
2514 EA The Hague
T 070 333 70 00
F 070 333 70 77

Postal address

PO Box 95404
2509 CK The Hague

www.safetyboard.nl