MAIB
MARINE ACCIDENT INVESTIGATION BRANCH

ACCIDENT REPORT

VERY SERIOUS MARINE CASUALTY | REPORT NO 11/2013 | JUNE 2013

# *TIMBERLAND*

## Man overboard
## North *Sea*
## 25 November 2012

## SUMMARY

At 1459 (UTC[1]) on 25 November 2012, two crew members were washed overboard from the general cargo vessel *Timberland*. The accident occurred during heavy weather in the North Sea. Both men lost their lives; the body of one of them was recovered from the sea by helicopter following a search and rescue operation co-ordinated by The Netherlands Coastguard. The body of the other remains missing.

The two crew members had proceeded onto the aft mooring deck **(Figure 1)** to secure a coiled mooring rope that had loosened in its stowed position. They were struck by a large wave, which washed them overboard, causing their respective lifelines, which were secured to the vessel, to part.

The management company, Imperial Ship Management AB, has since taken action to ensure that all mooring ropes which are not secured on drums are stowed underdeck on board all vessels within its fleet. Additionally, it has introduced detailed instructions and guidance in its safety management system manual with regard to sending crew on deck in heavy weather. Consequently, the MAIB has made no recommendations.

[1] Universal Time Co-ordinated

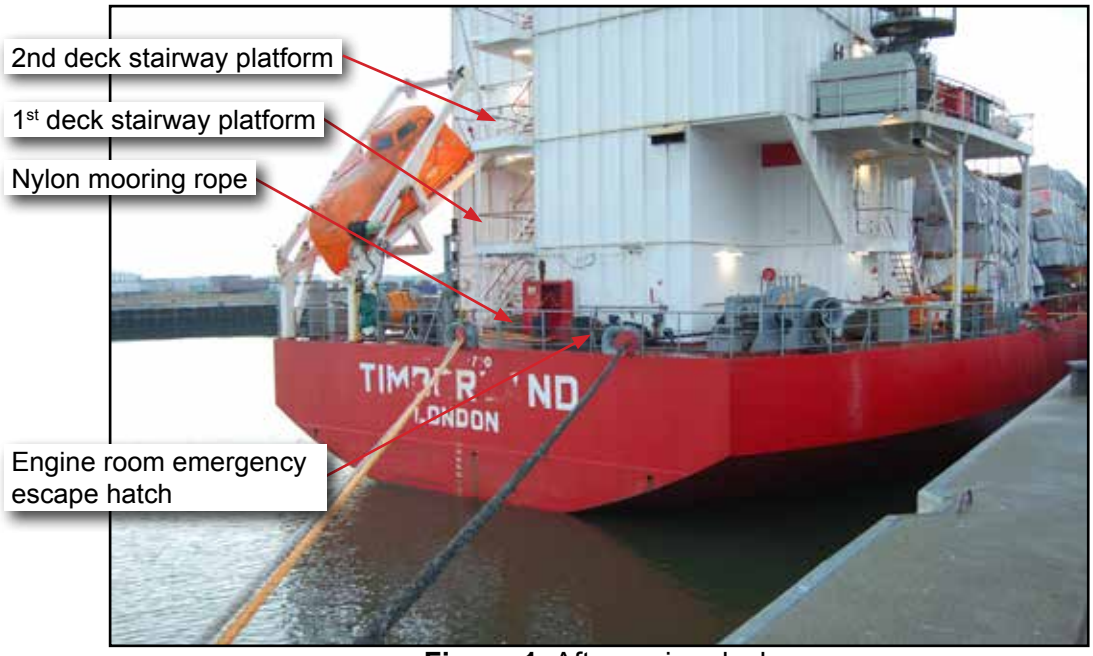


**Figure 1:** Aft mooring deck

**Extract from The United Kingdom Merchant Shipping (Accident Reporting and Investigation) Regulations 2012 – Regulation 5:**

"The sole objective of the investigation of an accident under the Merchant Shipping (Accident Reporting and Investigation) Regulations 2012 shall be the prevention of future accidents through the ascertainment of its causes and circumstances. It shall not be the purpose of such an investigation to determine liability nor, except so far as is necessary to achieve its objective, to apportion blame."

**NOTE**

This report is not written with litigation in mind and, pursuant to Regulation 14(14) of the Merchant Shipping (Accident Reporting and Investigation) Regulations 2012, shall be inadmissible in any judicial proceedings whose purpose, or one of whose purposes is to attribute or apportion liability or blame.



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# FACTUAL INFORMATION

## Vessel and environment

The 13,066 GT[2] general cargo vessel *Timberland* was on passage from Haraholmen, Sweden, towards Alexandria, Egypt. She was carrying a cargo of timber both above and below deck.

While transiting the North Sea, she encountered a forecasted south-west force 9 wind with a 6m head sea. An offshore platform in the vicinity of the vessel recorded a maximum wave height of 10.2m around the time of the accident.

## Narrative

At 1140 on 25 November 2012, *Timberland*'s engine speed was reduced from 96 rpm[3] to 80 rpm to prevent the turbocharger from overspeeding due to the vessel's pitching motion. *Timberland* was steering approximately 230°(T) and making good a speed of about 3 knots through the water and 1 knot over the ground.

The chief engineer told the master that the engine room emergency escape hatch cover on the aft mooring deck was leaking water into the steering flat. The hatch cover was being secured from the inside using chain blocks. However, the chief engineer was concerned that the coiled mooring ropes that were secured on the aft mooring deck might have come loose.

The master proceeded to the 2nd deck external stairway platform to visually check both the nylon mooring rope, located under the external stairway leading from the 1st deck to the aft mooring deck **(Figure 2)**, and the polypropylene mooring rope located adjacent to the engine room emergency escape hatch. Both ropes were loose in their stowage. The master's main concern was that if the nylon rope was washed overboard it would sink, and potentially foul the vessel's propeller. He therefore decided that action needed to be taken to re-secure the rope.

At shortly after 1430, the bosun (Mercado Agbing) and AB Raymund Alcontin volunteered to go onto the aft mooring deck to secure the nylon rope. The master's plan was for each of them to wear a lifejacket and a safety harness, with one end of a fire-fighter's lifeline attached to the safety harness securing ring and the other secured to a handrail on the 2nd deck external stairway platform. It was intended that any slack in the lifelines would be manually taken up by the master and another AB positioned on the 1st deck stairway platform, and the chief officer and chief engineer positioned on the 2nd deck stairway platform.

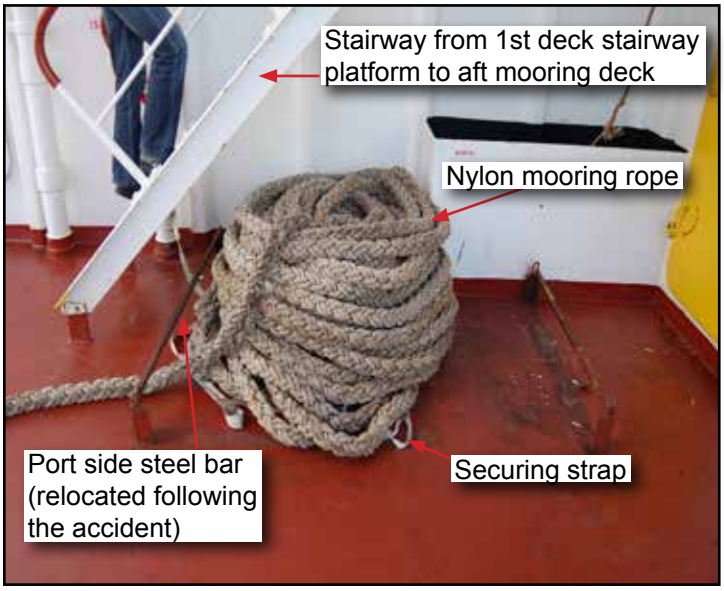


**Figure 2:** Nylon mooring rope stowage

With the lifelines secured as planned, the bosun and AB Alcontin descended the stairway from the 1st deck stairway platform to the aft mooring deck. The master, chief officer, chief engineer and other AB manually adjusted any slack in the lifelines. The other AB also took a turn of his lifeline around the handrail.

The bosun and AB Alcontin arrived on the aft mooring deck and started to pass the free end of the nylon rope's securing strap through the turns of the rope and around the stairway structure.

At 1459, the aft mooring deck shipped a large wave, the force of which washed the bosun and AB Alcontin overboard and caused the master, AB, chief officer and chief engineer to release their grip on the lifelines. As the bosun and AB Alcontin were washed away, their lifelines parted.

The same wave crossed the 1st deck stairway platform, forcing the AB to the deck and causing the master's lifejacket to inflate.

The chief engineer then went to the engine room and the chief officer proceeded to the bridge via the internal stairway. On arrival on the bridge, the chief officer told the second officer that there were two men overboard. He then went to the port bridge wing with the second officer and the AB on watch and saw the bosun and AB Alcontin in the sea at a distance of about 100 metres off the vessel's port quarter. Their lifejackets had inflated and the lifejacket lights were flashing.

The chief officer returned to the wheelhouse and transmitted a Digital Selective Calling (DSC) Man Overboard (MOB) alert on VHF[4] radio. The second officer pressed the "man overboard position" save button on the Global Positioning System (GPS) monitor.

[2] Gross Tonnage

[3] revolutions per minute

[4] Very High Frequency

Meanwhile, on the instruction of the second officer, the AB on watch released the port bridge wing MOB lifebuoy. The attached smoke/light unit activated correctly but landed on the main deck before being washed overboard by the sea. The AB was then joined by the AB from the 1st deck stairway platform and one of them released the starboard bridge wing MOB lifebuoy, which fell into the sea; its attached smoke/light unit activated correctly.

After removing his lifejacket and arriving on the bridge, the master instructed the second officer to transmit a DSC alert on MF[5] radio. The chief officer then broadcast a "Mayday" message on VHF radio Channel 16. At that time, the master considered that it would be too dangerous to turn the vessel around in the prevailing weather conditions.

The "Mayday" message was received by an offshore platform, which notified The Netherlands Coastguard at 1510. By 1534, two lifeboats and two rescue helicopters had been tasked by The Netherlands Coastguard. A number of other vessels joined the search. At 1654, the two lifeboats aborted their task for safety reasons.

At 1819, the bosun and AB Alcontin were sighted by one of the two rescue helicopters. The helicopter dropped a marker but was unable to stay on scene because of insufficient fuel. The other helicopter recovered the bosun from the sea but was unable to recover AB Alcontin, located in position 54º27.635'N, 005º20.511'E, also owing to insufficient fuel.

The medic on board the helicopter reported the bosun as being deceased and that AB Alcontin had appeared to be deceased. Later further attempts to find AB Alcontin were unsuccessful.

The bosun was subsequently reported to have died as a result of drowning.

## Mooring rope securing arrangement

The nylon mooring rope was liable to sink more readily than the remaining two polypropylene mooring ropes that were also coiled and secured on the aft mooring deck.

In the absence of a dedicated enclosed means of stowage, the coiled ropes were each secured on pallets, positioned within two steel bars that had been welded to the main deck. A securing strap was passed twice over the coiled mooring rope and through a steel ring located at each end of the two steel bars, and then tightened by means of a ratchet mechanism.

Following the accident, it was found that the port side steel bar holding the nylon mooring rope in position had broken free from the deck, causing the rope to loosen.

## Fire-fighter's lifeline testing

The remaining lengths of the two fire-fighter's lifelines still attached to *Timberland* following the accident, together with the length of lifeline found still attached to the bosun's safety harness, were sent to TTI Testing Ltd for inspection and assessment.

Inspection of the two failed lifelines showed that there was pre-existing damage and corrosion to the 4mm diameter wire rope cores. The lifeline that had been attached to AB Alcontin had an area of particularly bad corrosion and wire breaks which would have significantly reduced its strength and energy absorption capacity. The lifelines were not designed to be used in a load-bearing application; their function was to aid navigation during the low visibility conditions of a fire and they were covered with a double-braided protective fibre layer to maintain their integrity in that situation.

Inspection of the construction of the three sections of lifeline identified that the total length of the line attached to the bosun was 19.5m, and the remaining length of the line that had been attached to AB Alcontin was 28.5m. In the absence of any documentation concerning the fire-fighter's lifelines, their breaking strength, when new, was estimated to be 9.35kN. Results of breaking strength tests carried out following the accident indicated a maximum breaking load of 10.61kN. The sample of lifeline with the worst damage, corrosion and wire breaks failed under a load of 3.73kN.

Analysis of the breaking strength tests undertaken on sections of the failed lifelines showed that for the lengths of line involved, wave velocities of typically 8m/s would have been sufficient to cause failure of the lifelines, even those in relatively good condition.

## Lifeline standards and use

Chapter 3 of The International Code for Fire Safety Systems (FSS Code) details the specifications for personnel protection as required by Chapter II-2 of the International Convention for the Safety of Life at Sea 1974, as amended (SOLAS). For each breathing apparatus forming part of a fire-fighter's outfit, the FSS Code requires a fireproof lifeline of at least 30m in length to be provided. The lifeline is required to successfully pass a static load test of 3.5kN for 5 minutes.

[5] Medium Frequency

Annex 1 of the Maritime and Coastguard Agency's (MCA) Merchant Shipping Notice (MSN) 1731 (M+F), published in August 1999, lists the personal protective equipment required for compliance with The Merchant Shipping and Fishing Vessels (Personal Protective Equipment) Regulations 1999.

For any work carried out from an overside position or in an exposed position where there is a reasonably foreseeable risk of falling or being washed overboard, MSN 1731 (M+F) requires a lifebuoy and lifejacket to be provided. For work aloft or in any other area where there is a reasonably foreseeable risk of falling a distance of more than 2 metres, a safety belt or harness and associated lanyard are to be provided.

Guidance on best practice for fall protection equipment is detailed in British Standard (BS) 8437:2005 (code of practice for selection, use and maintenance of personal fall protection systems and equipment for use in the workplace). Fall protection equipment is commonly classified as either fall restraint or fall arrest.

Key elements of the standards applicable to fall protection equipment include:

- The material used in the manufacture of a work positioning lanyard is required to have a minimum breaking force of 22kN and withstand a static load of 15kN for 3 minutes.
- All components used in a fall protection system require adequate static and dynamic strength to withstand any loads or forces that they might be subjected to, plus an adequate margin of safety.

## Crew particulars

*Timberland*'s crew numbered 16 and were of Filipino nationality. The master was 51 years old and held a Class II/2 Certificate of Competency (CoC)[6] issued on 6 September 2000 and last revalidated on 3 December 2009. The master had started his career at sea in 1982 and had taken his first command in 2003. This was his first contract with the management company, Imperial Ship Management AB. The chief officer was 34 years old and held a Class II/2 CoC issued on 25 March 2010. He started his career at sea in 2000 and this was his first contract on board *Timberland*. The chief engineer was 52 years old and held a Class III/2 CoC issued on 24 August 2009. He had 20 years experience at sea and this was his second contract on board *Timberland.*

The bosun was 46 years old and held a Class II/4 CoC issued on 30 March 2011. AB Alcontin was 35 years old and held a Class II/4 CoC issued on 8 December 2005 and revalidated on 17 September 2010.

The crew held appropriate Certificates of Equivalent Competency issued by the MCA.

## Safety management system instructions

In addition to navigational requirements, Imperial Ship Management AB's safety management system manual required the following additional measures to be taken during heavy weather:

- The watertight condition of the vessel was to be regularly checked.
- All loose components were to be lashed and regularly controlled.
- Cargo securing was to be regularly controlled.

The frequency and manner by which the watertight condition of the vessel was to be checked, or loose components and cargo securing controlled, were not specified. There was also no requirement for a checklist to be completed when heavy weather was forecast.

## Wave statistics

The significant wave height[7] at the time of the accident was 6 metres. The approximate frequency of maximum wave height as a multiple of the significant wave height can be derived from *Probabilistic Theory of Ship Dynamics*[8], and is shown in **Table 1**.

| Maximum wave height / Significant wave height | Occurrence |
|---|---|
| 1.21 | 1 in 10 |
| 1.61 | 1 in 100 |
| 1.94 | 1 in 1,000 |
| 2.21 | 1 in 10,000 |
| 2.46 | 1 in 100,000 |

**Table 1 –** Maximum wave height as a multiple of the significant wave height and the probability of occurrence

[6] All referenced Certificates of Competency were issued by the Republic of the Philippines in accordance with the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers 1978, as amended

[7] Significant wave height is defined as the mean of the highest third of the heights recorded in a wave time history.

[8] Price W G and Bishop R E D. *Probabilistic Theory of Ship Dynamics*. Chapman & Hall Ltd 1974

### Code of Safe Working Practices for Merchant Seamen

The Code of Safe Working Practices for Merchant Seamen (COSWP), published by the MCA, was carried on board *Timberland* in compliance with The Merchant Shipping (Code of Safe Working Practices for Merchant Seamen) Regulations 1998.

COSWP Section 13.9 states that '*no seafarer should be on deck during heavy weather unless it is absolutely necessary for the safety of the ship or crew'*. It further states that a risk assessment should be undertaken, and a permit to work and a company checklist for work on deck in heavy weather completed. The risk assessment should give consideration to a number of factors, including the following:

- Necessity of work. (i.e can it wait until daylight, next port, do the risks outweigh the benefits?)
- Permit to work and company checklist completed.
- Rigging lifelines.
- Lifejacket with safety harness.
- Be aware that even in a regular wave pattern, "rogue" waves can exist which can vary in direction and size from the regular wave pattern being experienced.
- ALWAYS plan for, and expect, the unexpected.

### Previous accidents

*Maersk Kithira*

On 23 September 2008, the chief officer and the chief engineer of the container vessel *Maersk Kithira* were seriously injured when they were struck by a wave as the vessel proceeded in heavy weather conditions in the South China Sea. The chief engineer subsequently died of his injuries.

The two officers went onto the forecastle to secure a leaking stores hatch and loose anchor securing chain following activation of a bilge alarm.

Although some measures were taken to reduce the risk to the men before they went onto the exposed forecastle deck, ship's staff did not fully appreciate the risk of large waves breaking over the decks in the prevailing conditions, and insufficient information was available on board the vessel to enable them to make a full risk assessment before embarking on the operation.

In response to a recommendation made by the MAIB following its investigation of the accident[9], the MCA included more comprehensive advice in its COSWP with regard to crew members working on deck in heavy weather. A further recommendation was made to the management company to amend its safety management system to include additional heavy weather checklist measures to ensure watertight integrity.

*Maersk Newport*

On 10 November 2008, while the container vessel *Maersk Newport* was on passage in a Force 8-9 wind and rough seas, the port anchor chain lashing was found to have released and the anchor had fallen, impacting against the hull and causing hull damage and consequent flooding.

The MAIB investigation[10] found that despite the forecasted poor weather conditions, no specific heavy weather checks had been carried out by the ship's staff.

*Annie PG*

On 3 January 2012, while the oil and chemical tanker *Annie PG* was on passage in heavy weather, a ventilator head on the forecastle became detached. A team of four crew members went on deck and successfully blanked the opening left by the ventilator head. The chief officer and second engineer then attempted to secure the loose ventilator head on the main deck. They were struck by a wave that washed across the deck. The chief officer died of his injuries.

The Isle of Man Ship Registry investigation[11] concluded that the master and chief officer were aware of the hazards on deck but their perception and approach to the situation did not include a thorough assessment of the risks. No lifejackets or lifelines were worn by the crew on deck except for the second engineer, who wore a fire-fighter's lifeline.

## ANALYSIS

### Overview

The following events were significant in the period leading up to and during the accident:

- The nylon mooring rope was coiled and secured on the aft mooring deck following *Timberland*'s departure from Haraholmen, Sweden.
- The port side steel bar holding the nylon mooring rope pallet in position broke free from the deck, causing the rope to loosen.
- Fire-fighter's lifelines were used to secure the bosun and AB Alcontin to the vessel.

[9] MAIB Report No 9/2009

[10] MAIB Report No 13/2009

[11] Casualty Investigation Report No CA 117

- The lifelines parted when a large sea washed across the aft mooring deck.
- After being washed overboard, the bosun and AB Alcontin were unable to survive in the prevailing heavy weather conditions.

The following sections analyse each of the above events with the aim of identifying relevant contributing factors and safety issues as a basis for action to prevent similar accidents occurring in the future.

## Securing for sea

On departure from Haraholmen, Sweden, the nylon mooring rope was secured on the aft mooring deck in accordance with the vessel's normal routine. Although heavy weather was forecast, no formal checks were made subsequently on the rope's security. No heavy weather checklist was available and none was required to be completed as part of the vessel's safety management system.

It being their first contract on *Timberland*, neither the master nor the chief officer had experienced the aft mooring ropes coming loose previously. Although the chief engineer had seen it happen before, he had not conveyed this information to either the master or chief officer prior to his informing the master on the day of the accident that the engine room emergency escape hatch cover was leaking water into the steering flat.

Previous occurrences of the aft mooring ropes coming loose had not been formally recorded, possibly because there had been no adverse consequences. The master accepted the risk of the polypropylene ropes coming loose and trailing over the vessel's stern. However, he recognised the additional risk of the nylon rope fouling the vessel's propeller, owing to its inherent tendency to sink, which he reasoned unacceptably endangered the vessel and her crew.

Although the vessel's general arrangement plan featured a "rope store", the space was, in fact, used as a general deck store. There was no designated enclosed means for stowing the coiled aft mooring ropes; a need for one had not been recognised.

## Rope stowage bar failure

The port side steel bar holding the nylon mooring rope pallet in position broke free from the deck due to weld failure. The structure as manufactured had lacked strength, and its exposed position and apparent lack of maintenance rendered it liable to corrosion from the effects of weather and shipped seawater.

## Risk assessment and control measures

Imperial Ship Management AB's safety management system did not contain a heavy weather checklist or instructions about the precautions to be taken before sending crew on deck in heavy weather. Despite this lack of guidance, *Timberland*'s master did not instigate a formal assessment of the risks involved in sending personnel on deck in such conditions to secure the mooring ropes, nor did he consult COSWP.

COSWP warns of the possibility of encountering "*rogue*" waves and the need to "*plan for, and expect, the unexpected*". Around the time of the accident the significant wave height was 6m and using this figure, *Probabilistic Theory of Wave Dynamics* indicates that a wave height of 9.66m could be expected once in every 100 waves, and an 11.64m wave every 1000 waves. It is possible that *Timberland*'s master did not spend enough time reviewing the prevailing sea conditions. Had he made a more studied assessment of the wave heights actually being encountered, he might have made a more realistic estimation of the potential maximum wave heights likely to be encountered, and the risks of a wave washing over the aft mooring deck during the evolution.

*Timberland* was not equipped with safety lines specifically for use when sending crew on deck in heavy weather, and this investigation has not identified an appropriate standard for such lines. There was a risk of the bosun and AB Alcontin being washed overboard and, as required by MSN 1731 (M+F), both men were wearing lifejackets. Had they been washed overboard, but remained tethered to *Timberland*, they would in effect have fallen from height. To prevent this occurring, safety harnesses and tethers manufactured to a fall-restraint standard (BS 8437:2005) would have been appropriate. The increased strength of such equipment - 22kN, compared to the fire-fighter's lifeline strength of up to 10.61kN – had it been appropriately anchored instead of tended by hand, might have been sufficient to prevent the men from being washed overboard. After the accident the master assessed that the conditions were too rough for him to turn *Timberland* around. Had this been identified as part of a formal risk assessment, he would have known that his absolute priority was to ensure the bosun and AB Alcontin remained on deck, no matter what *unexpected* event might occur. The strength and standard of lifelines used and their anchoring arrangement should, therefore, have been the subject of more consideration.

### Fire-fighter's lifelines

When examined and tested, the fire-fighter's lifelines used as lifelines during this accident were found to be in poor condition. Although when tested, the weakest section of lifeline wire failed at a load of 3.73kN, sufficient to pass a static load test of 3.5kN, the wires were badly corroded, had broken strands, and one was significantly shorter than the statutory minimum length stipulated in the FSS Code. Although the fire-fighter's lifelines used in this accident were inappropriate, it is questionable whether they would have been fit for their intended purpose.

### Emergency response

Although two lifeboats and two rescue helicopters had been tasked by The Netherlands Coastguard within 35 minutes of the accident, the two lifeboats were forced to abort their task 1 hour and 20 minutes later for safety reasons.

It was not until 3 hours and 20 minutes after the accident that the bosun and AB Alcontin were sighted by one of the two rescue helicopters. Although both had been wearing lifejackets that had inflated, neither of them was able to survive their exposure to the heavy weather conditions.

## CONCLUSIONS

1. No heavy weather checklist was available and none was required to be completed as part of the vessel's safety management system.
2. Previous occurrences of the aft mooring ropes coming loose had not been formally recorded, possibly because there had been no adverse consequences.
3. The loose nylon mooring rope presented a significant risk of it fouling the vessel's propeller owing to its inherent tendency to sink.
4. The need for a designated enclosed means for stowing the coiled aft mooring ropes had not been recognised.
5. The manufactured port side steel bar holding the nylon mooring rope pallet in position had lacked strength and appeared not to have been maintained.
6. The vessel's safety management system contained no detailed requirements with regard to sending crew on deck in heavy weather.
7. The master possibly underestimated the potential wave height that could have been expected in the prevailing weather conditions.
8. No designated lifelines were provided on board for use in sending crew on deck in heavy weather.
9. The master overestimated the strength of the fire-fighter's lifelines and his ability to manually control their loading in the prevailing conditions.
10. The strength of the fire-fighter's lifelines was insufficient to withstand the loading exerted on them by the large wave that washed the crew members overboard.
11. Although both men had been wearing lifejackets that had inflated, neither the bosun nor AB Alcontin was able to survive their exposure to the heavy weather conditions.

## ACTION TAKEN

**Imperial Ship Management AB** has:

- Issued a company circular letter, identifying the stowage of coiled mooring ropes on the aft mooring deck and the use of fire-fighter's lifelines as root causes of the accident.
- Following the accident, verified that mooring ropes that are not secured on drums are stowed underdeck on board all vessels within its fleet.
- Subsequently enhanced its safety management system manual instructions for preparing for heavy weather, particularly to the effect that all loose deck equipment is to be secured and all additional mooring ropes not secured on drums are to be stowed in an assigned container or underdeck.
- Introduced a requirement for a risk assessment to be conducted and a permit to work issued before crew are sent on deck in heavy weather, and issued guidance on the factors to be considered and the appropriate equipment to be used.
- Provided two fall protection lifeline kits to each vessel within its fleet.

## RECOMMENDATION

In view of the actions taken by Imperial Ship Management AB following this accident, the MAIB has made no recommendations.

**SHIP PARTICULARS**

| | |
|---|---|
| Vessel's name | *Timberland* |
| Flag | United Kingdom |
| Classification society | Germanischer Lloyd |
| IMO number/fishing numbers | 9204790 |
| Type | General cargo vessel |
| Registered owner | Midlife Shipping Ltd |
| Manager(s) | Imperial Ship Management AB |
| Construction | Steel |
| Length overall | 153.22m |
| Registered length | 146.99m |
| Gross tonnage | 13,066 |
| Minimum safe manning | 13 |
| Authorised cargo | Not applicable |

**VOYAGE PARTICULARS**

| | |
|---|---|
| Port of departure | Haraholmen, Sweden |
| Port of arrival | Alexandria, Egypt |
| Type of voyage | International |
| Cargo information | Timber |
| Manning | 16 |

**MARINE CASUALTY INFORMATION**

| | |
|---|---|
| Date and time | 25 November 2012 at 1459 |
| Type of marine casualty or incident | Very Serious Marine Casualty |
| Location of incident | 54 26.8N, 005 08.8E |
| Place on board | Aft mooring deck |
| Injuries/fatalities | Two fatalities |
| Damage/environmental impact | None |
| Ship operation | On passage |
| Voyage segment | Mid-water |
| External & internal environment | South-west force 9 wind, 6m sea |
| Persons on board | 16 |