The Swedish Club

Claims at a Glance

2019

The Swedish Club is a pioneer in providing comprehensive 'All-in-One' insurance solutions and in loss prevention. Our most important mission, in a world of increasing complexity in global trade, is to assist our members and clients in managing current and future risks.

We are a leading marine insurer providing cover to some of the largest ship owning companies in the world. Through the Club's comprehensive approach and diversified offering we have developed the highest levels of competence in risk management, claims handling, underwriting, technical services and loss prevention.

Our expertise is reflected not only in the way The Swedish Club handles and resolves existing claims, but also in how the Club monitors industry developments in order to prevent future claims and provide insurance solutions for new risk

www.swedishclub.com

Contents

1 Introduction

Claims at a Glance offers an insight into The Swedish Club's latest publications, highlighting some of the real cases that we have handled and featuring up to date claims statistics and the latest comment.

Accidents do happen and as an insurer we experience them every day. We believe by being transparent and sharing our statistics and experience from handling claims that we can raise awareness of issues and highlight best practices.

Our focus is never to apportion blame but to ask why accidents happen and what we can learn from them. Of course to make a real change, this approach must be taken within your own company, both ashore and on board the vessel.

We hope you find this publication interesting and that you find it of assistance in your company's loss prevention efforts. If you have any questions or suggestions we welcome your feedback.

2 Learning from mistakes

Hindsight is a wonderful thing, and it is always easy to point the finger of blame following an accident. Third party bystanders – the reader, claims handlers and investigators – are in possession of the facts about how events unfolded leading to an accident, and can follow the flow of decisions that were made. What we don't know is exactly WHY these decisions were taken. It made sense for the individual at the time, so we need to find out exactly why that was the case and learn from that insight.

What could and should have been done differently? Would these actions have prevented the accident?

There is often no guarantee that a different decision would have given a different result.

What we do know is that key learnings from this type of evaluation should help the reader to recognise when an operation is a high risk and then revaluate the situation as it progresses. We might catch ourselves doing something wrong, or be aware that someone else is making a mistake, and correct the error before disaster hits.

The most common causes of accidents are poor communication, failure to follow procedures or inadequate procedures in place on board to start with. In most accidents there are several people involved, yet we see that these individuals are trained to do the work they do, and there are ISM/SMS procedures written so the job can be completed successfully and safely. This leads to the conclusion that managers should focus upon ensuring that the crew on board and the shore department work as a team.

There is also a need to see that:

- The procedures reflect what is actually being done on board
- Resources are being given to the crew so they can carry out their jobs properly
- That the crew is trained properly and that this is verified by the shore staff during visits and audits
- Training within the company highlights accidents that have happened and demonstrates the importance of every person and their actions, and the value of the crew working together as one unit

It is important for a seafarer to understand dangerous situations and risks. It is imperative for a shipowner to train the crew to take early actions and always analyse what is happening around them and adapt.

We take this approach with the case studies in this issue of Claims at a Glance. We identify what went wrong, look at best practices, and suggest what early actions can be taken. No matter how unfortunate the consequences of an accident, if we can at least learn something then that is at least positive.

A serious accident is devastating for those on board, but will also lead to serious repercussions for the shipowner. It might cause pollution, loss of lives and loss of reputation. Accidents happen every day. The more we know and understand the risks the better prepared we will be.

3 General statistics

At The Swedish Club we closely monitor the frequency of different types of claim, identifying patterns and trends derived from our loss statistics for both P&I and H&M.

As in previous issues of Claims at a Glance the statistics are based on the last five years and cover the three most commonly insured vessel types for P&I and H&M; bulk carrier, container and tanker vessels. These represent more than 75% of the vessels insured by the Club.

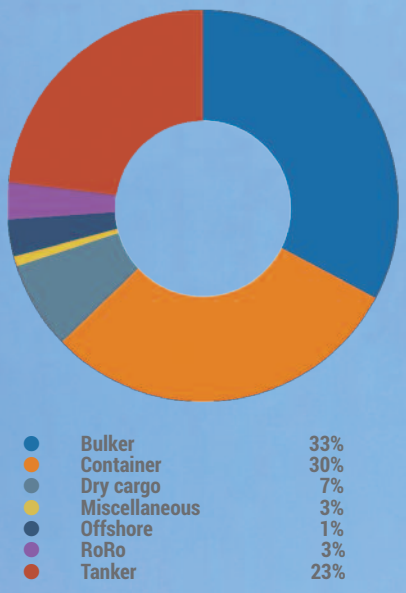
P&I claims include cargo claims, illness, and injury; and H&M claims include machinery claims and navigational claims (collision, contact and grounding). In this issue we have expanded these statistics and examine multiple cost brackets to obtain a deeper understanding of the claims picture.

We have not included claims for the current year (2018) as it is very difficult to analyse what the claim cost will be for ongoing claims which are still in progress. It must be noted that to a lesser extent this can be applied to 2017 as there can still be a significant change in the cost of the claim.

GRAPH 3.*1*

P&I - All insured vessel types

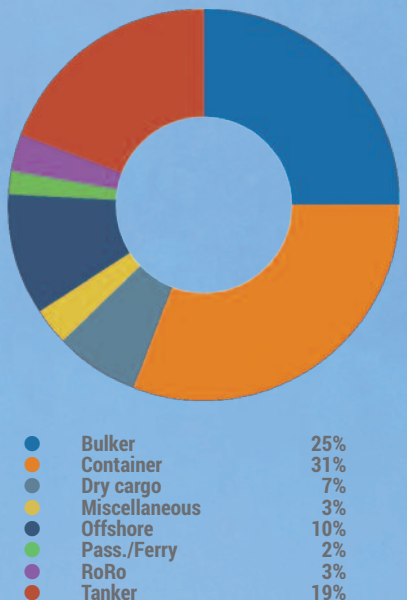
March 2018



GRAPH 3.*2*

H&M - All insured vessel types

March 2018



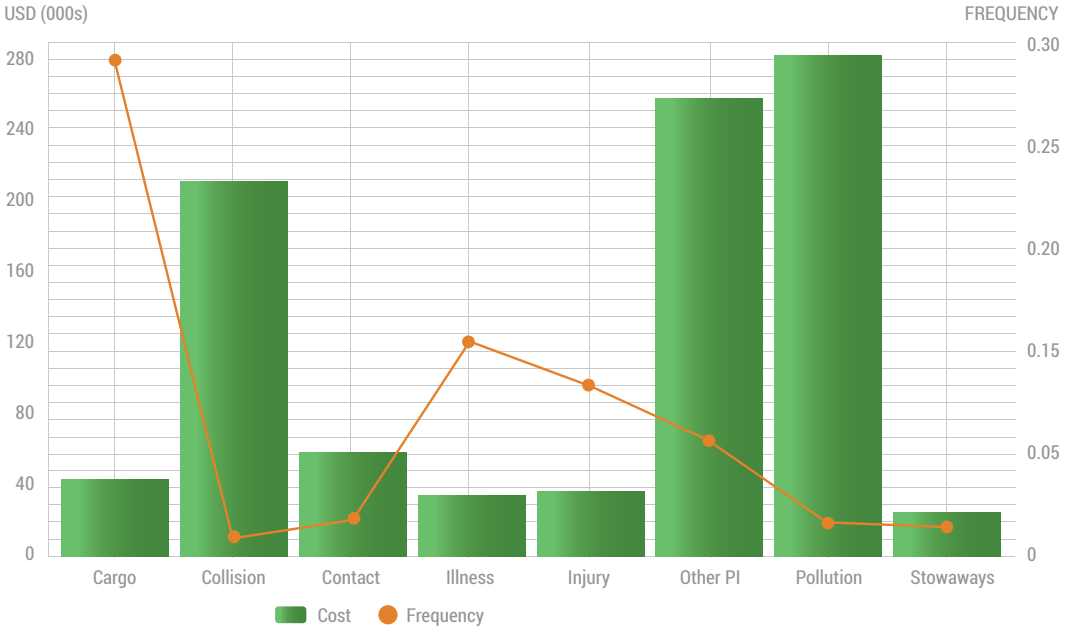
4 P&I

4.1 P&I statistics overview

GRAPH 4.1

Average claims costs & frequency per category of claim *(2013 – 2017)*

Claims cost: => 1 - uncapped (USD)
Type of vessel: Bulk carrier, container, tanker
Type of claims: All types of claims
As per 14/03/2018



Cargo, illness and injury claims have the highest frequency.

Collision, other P&I and pollution claims have the highest average cost, but fortunately have a low frequency. They are often caused by a catastrophic H&M claim.

The statistics are based on claims after the deductible. The average deductible for P&I is about USD 10,000.

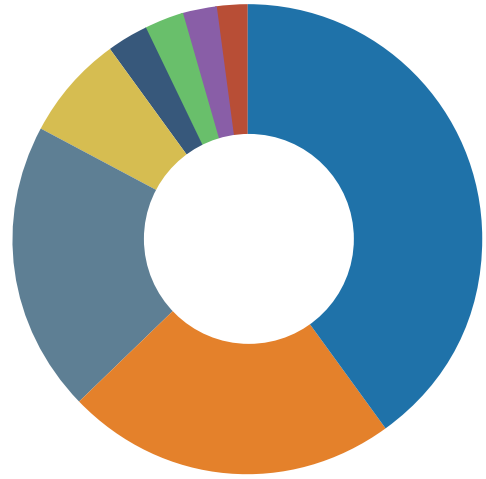
GRAPH 4.2

Most common claim types *(2013 – 2017)*

Claims cost: => 5,000 - uncapped (USD)

Type of vessel: Bulk carrier, container, tanker

As per 14/03/2018



Cargo	40%	Stowaways	3%
Illness	23%	Contact	3%
Injury	20%	Collision	2%
Other P&I	7%	Pollution	2%

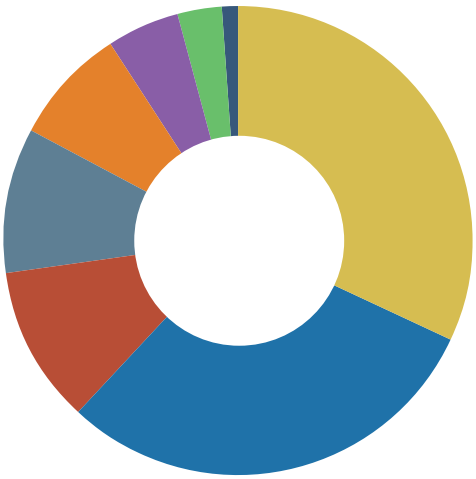
GRAPH 4.3

Most costly claim types *(2013 – 2017)*

Claims cost: => 5,000 - uncapped (USD)

Type of vessel: Bulk carrier, container, tanker

As per 14/03/2018



Other P&I	32%	Illness	8%
Cargo	30%	Collision	5%
Pollution	11%	Contact	3%
Injury	10%	Stowaways	1%

Interestingly the distribution of claim types is similar in this year's analysis compared with the last report we published in 2016.

In this publication we focus on the three most common claim types which are cargo, injury and illness, which represent 83% of all P&I claims seen by the Club.

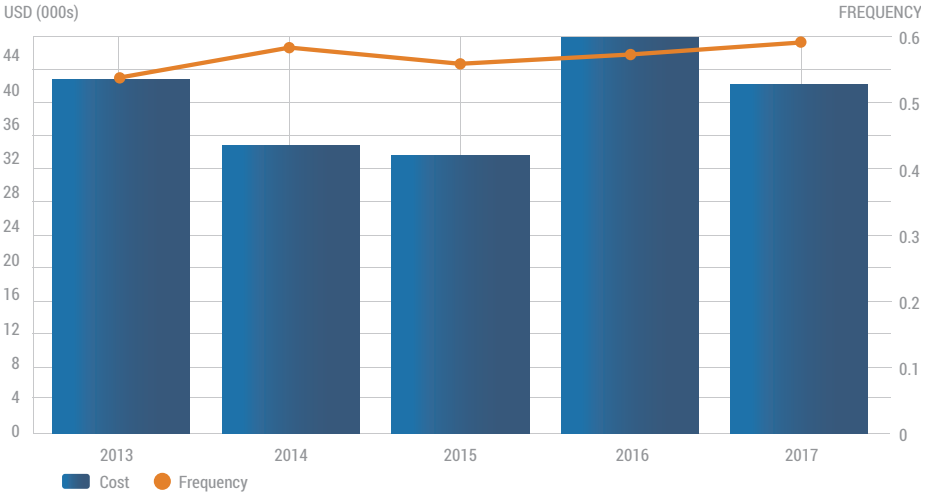
However, unlike distribution of claim types, the trend in distribution of cost has changed significantly since the last issue of Claims at a Glance in 2016. At that point, 66% of claims cost came under the category of 'Other P&I', which includes wreck removal, an expensive operation. The Club has seen an improvement in these statistics as we have not had as many expensive claims as previous period. Whilst the cost of 32% is significant, it is a great improvement on previous years.

4.2 P&I statistics – most common types of claim

GRAPH 4.4

Average claims costs & frequency for common claims *(2013 – 2017)*

Claims cost: => 1 - uncapped (USD)
Type of vessel: Bulk carrier, container, tanker
Type of claims: Cargo, illness and injury
As per 14/03/2018



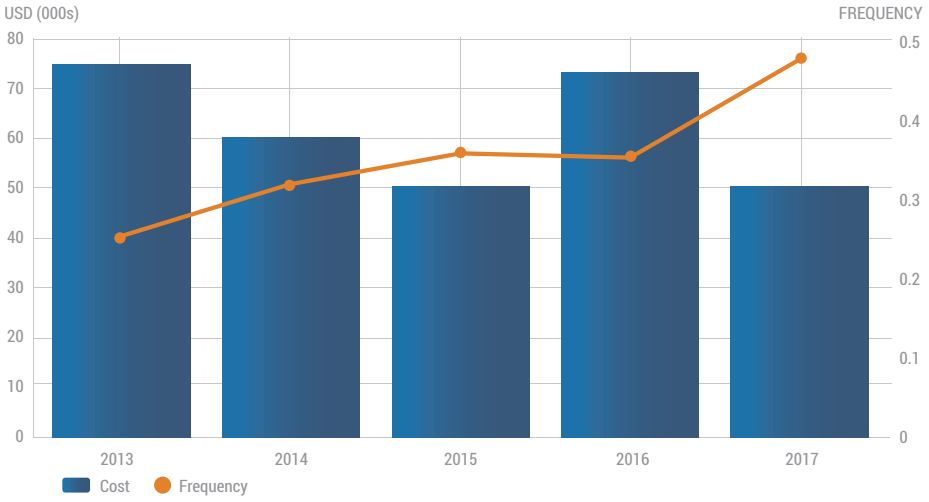
Both the frequency and the cost are stable, showing a slight increase trend. The lowest frequency was 0.53 in 2013 and the highest was 0.60 in 2017. This means that more than 50% of all vessels entered with the Club had either an injury, illness or cargo claim.

When analysing claim cost we have removed claims below USD 5,000, to remove lesser claims which might have only generated cost for services and surveyor reports. However, when looking at the number of claims we include these claims in order to get a better idea of the true volume of claims, all of which must be handled.

GRAPH 4.5

Average claims costs & frequency for common claims *(2013 – 2017)*

Claims cost: => 5,000 – uncapped (USD)
Type of vessel: Bulk carrier, container, tanker
Type of claims: Cargo, illness and injury
As per 14/03/2018

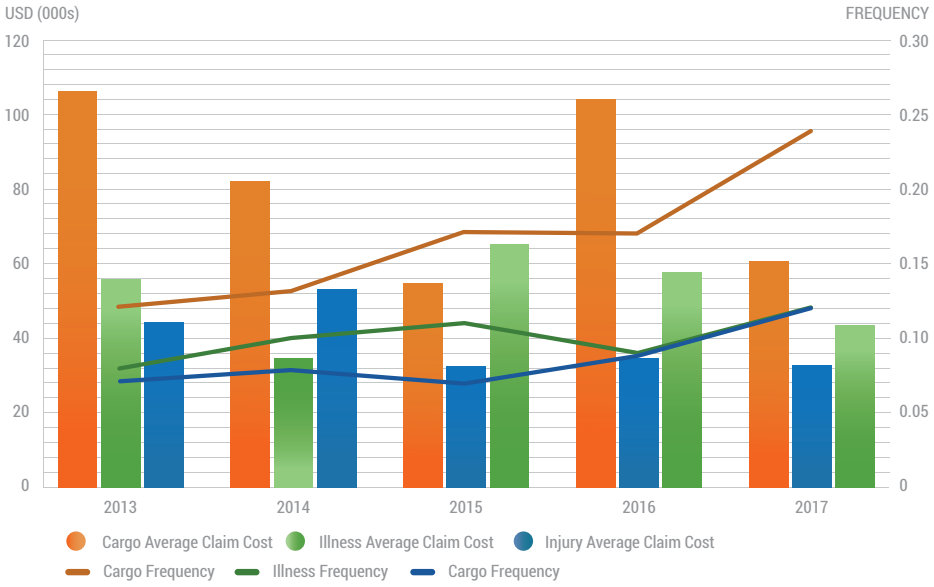


The frequency of claims is similar to the last study.There is an increasing trend in frequency for claims above USD 5,000. The trend for the cost is decreasing.

GRAPH 4.6

Average claims costs & frequency per category of common claim *(2013 – 2017)*

Claims cost: => 5,000 – uncapped (USD)
Type of vessel: Bulk carrier, container, tanker
Type of claims: Cargo, illness and injury
As per 14/03/2018

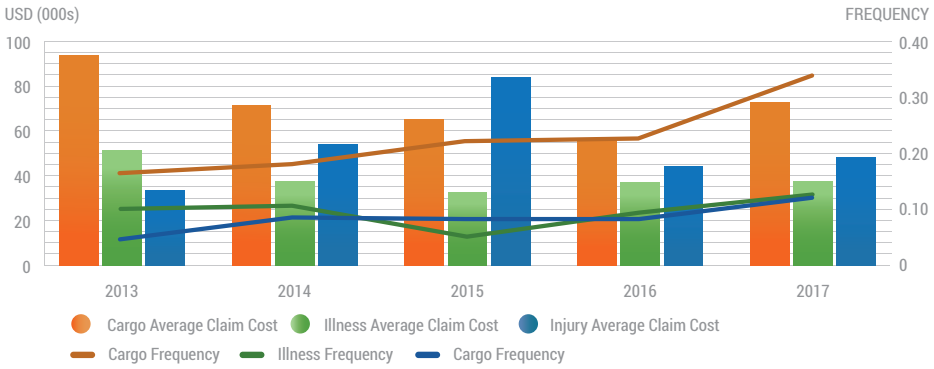


Cargo claims are the most common and costly claims. During 2017 the frequency was 0.24.

GRAPH 4.7

Average claims costs & frequency for bulk carriers *(2013 – 2017)*

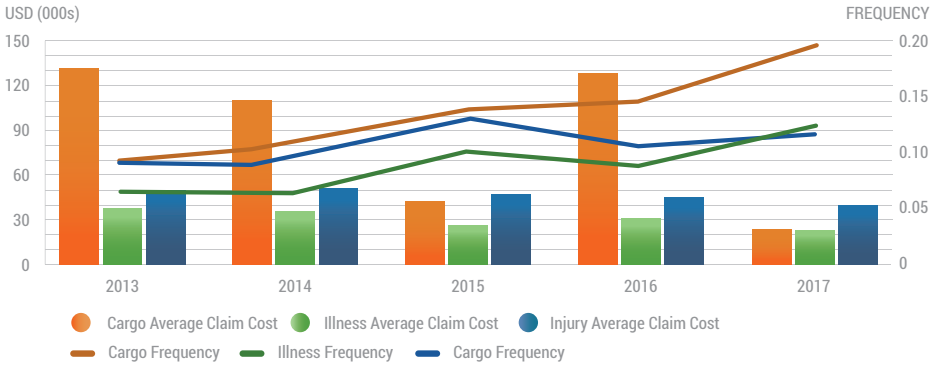
Claims cost: => 5,000 – uncapped (USD)
Type of claims: Cargo, illness and injury
As per 14/03/2018



GRAPH 4.8

Average claims costs & frequency for containers *(2013 – 2017)*

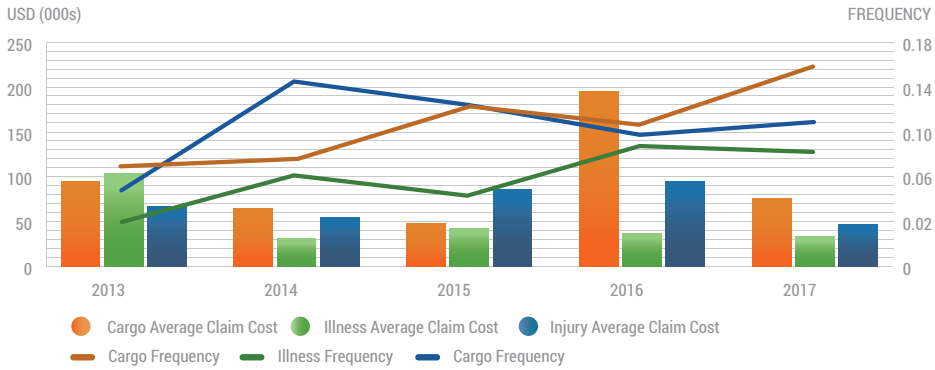
Claims cost: => 5,000 – uncapped (USD)
Type of claims: Cargo, illness and injury
As per 14/03/2018



GRAPH 4.9

Average claims costs & frequency for tankers *(2013 – 2017)*

Claims cost: => 5,000 – uncapped (USD)
Type of claims: Cargo, illness and injury
As per 14/03/2018



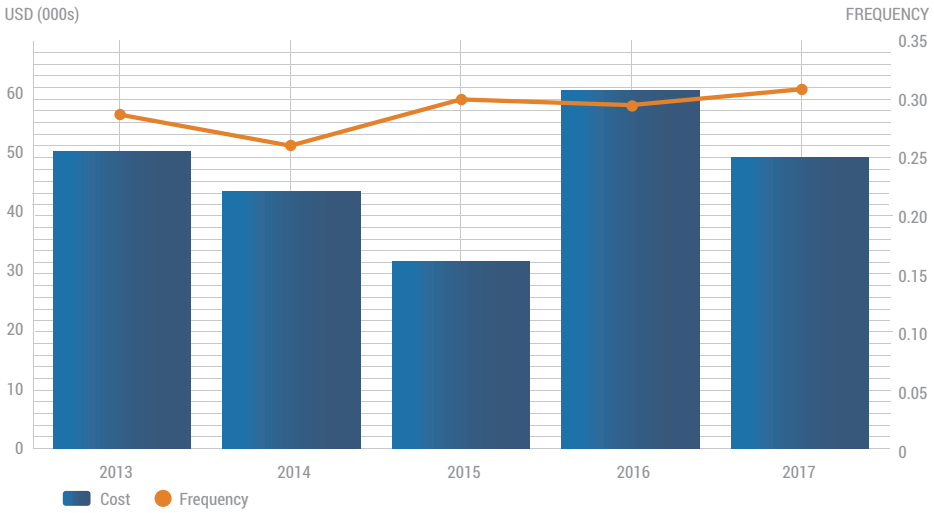
4.3 Cargo

4.3.1 Cargo claims statistics

GRAPH 4.10

Average claims costs & frequency for cargo claims *(2013 – 2017)*

Claims cost: => 1 – uncapped (USD)
Type of vessel: Bulk carrier, container, tanker
As per 14/03/2018

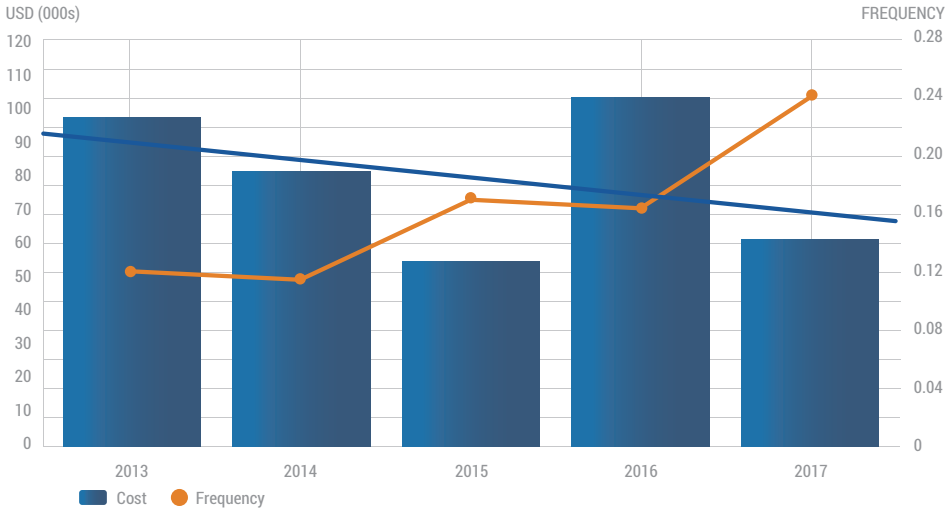


Cargo claims are the most common and costly category of P&I claim. This graph shows only those claims which are above the average deductible. This graph shows a somewhat steady frequency between 0.26-0.31, demonstrating that almost 30% of all insured bulker, container and tanker vessels will suffer a cargo claim every year.

GRAPH 4.11

Average claims costs & frequency for cargo claims *(2013 – 2017)*

Claims cost: => 5,000 – uncapped (USD)
Type of vessel: Bulk carrier, container, tanker
As per 14/03/2018



In this graph we look at cargo claims which have generated a cost of more than USD 5,000.
The frequency for 2013 was 0.13 and increased to 0.24 for 2017 which is an increase of almost 100%. There has been a steady increase in frequency since 2014. However the trend line for cost is decreasing as the total claim cost will increase because of the increase in frequency

GRAPH 4.12

Most common causes of cargo claims *(2013 – 2017)*

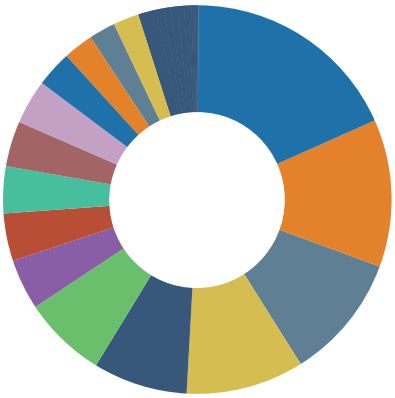
Claims cost: => 5,000 - uncapped (USD)
Type of vessel: Bulk carrier, container, tanker
As per 14/03/2018

Improper cargo handling, shore side	16%
Error in calculation	10%
Poor tally	9%
Inherent vice	8%
Damage prior to loading	7%
Improper cargo handling, ship side	7%
Heavy weather	5%
Flooding in hold	4%
Other	34%

GRAPH 4.13

Most costly causes of cargo claims *(2013 – 2017)*

Claims cost: => 5,000 - uncapped (USD)
Type of vessel: Bulk carrier, container, tanker
As per 14/03/2018

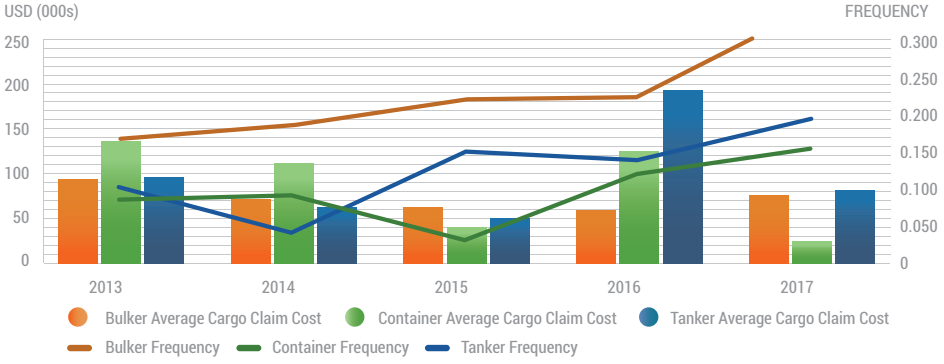


Grounding	18%
Inherent vice	12%
Improper cargo handling, ship side	10%
Collision	10%
Improper cargo handling, shore side	8%
Flooding in hold	7%
Poor tally	4%
Damage prior to loading	4%
Insufficient cleaning	4%
Leaking hatch covers	4%
Multiple	4%
Error in calculation	3%
Poor stowage	3%
Heavy weather	2%
Leaking vents	2%
Other	5%

GRAPH 4.14

P&I average claims cost & frequency per vessel type *(2013 – 2017)*

Claims cost: => 5,000 - uncapped (USD)
Type of vessel: Bulk carrier, container, tanker
As per 14/03/2018




3
3
3

4.3.2 Causes of cargo claims

Costly cargo claims are often due to catastrophic circumstances occurring as the result of navigational claims – categorised as collisions, contact or groundings – often including the total loss of a vessel.

Other expensive causes are inherent vice and improper cargo handling either on board, before loading or during discharge.

4.3.2.1 Cargo claims statistics

Inherent vice describes the state where a hidden defect or the very nature of the cargo itself is either the cause or a contributory factor in its deterioration or damage. In many cases the cargo can appear to be in proper condition when being loaded but circumstances during the voyage may cause damage to the cargo. For example it is not uncommon that, should discharge be delayed in port, especially sensitive cargo such as bananas and soybeans can be damaged because the cargo becomes ripe or heated up. This emphasises the importance of following proper testing procedures to ensure that cargo is within specification before loading.

Errors in calculation and poor tally are frequent causes of bulk cargo disputes between the shipowner and cargo receiver. Whilst they are fairly common, they are not usually particularly expensive.

4.3.2.2 Improper cargo handling on board the ship

Disputes between the cargo owner and shipowner are commonly caused by improper cargo handling on board the ship. This is caused by damage which most likely happened during the voyage. The most common causes are:

1. Wet damage caused by rain or leakage into the cargo hold (bulkers & container vessels)
2. Shortage of cargo (tankers & bulkers)
3. Damage to reefer cargo (container vessels)
4. Damage caused by crew operation during the voyage or poor maintenance (all vessels)
5. Contamination (tankers & bulkers)

4.3.2.3 Improper cargo handling on the shore side

Disputes between the cargo owner and shipowner can also be caused by improper cargo handling on the shore side. These are claims where the damage has occurred before the cargo is loaded on the vessel or during the discharge or loading operation. The most common claims are:

1. Cargo damaged in port or by stevedores while loading or discharging (all vessels)
2. Shortage of cargo (tankers & bulkers)
3. Cargo in poor condition which is often inherent vice (bulkers)
4. Contaminated at the loading port (tankers & bulkers)

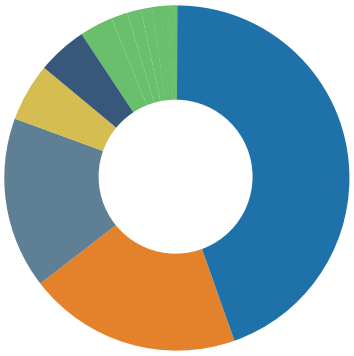
4.3.3 Cargo claims statistics on specific vessel types

GRAPH 4.15

Most common type of cargo claims for bulk carriers *(2013 – 2017)*

Claims cost: => 5,000 - uncapped (USD)

As per 14/03/2018



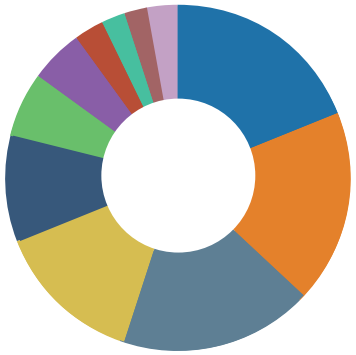
Shortage	45%
Wet damage	20%
Physical damage	16%
Multiple	5%
Contamination	5%
Other claim categories	9%

GRAPH 4.16

Most costly type of cargo claims for bulk carriers *(2013 – 2017)*

Claims cost: => 5,000 - uncapped (USD)

As per 14/03/2018



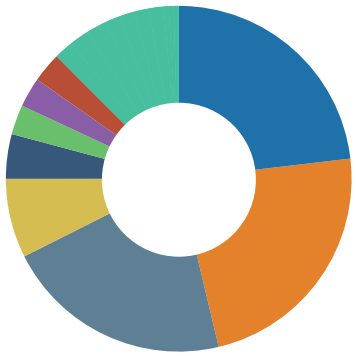
Wet damage	19%
Other	18%
Shortage	18%
Physical damage	14%
Multiple	10%
Deterioration	6%
Contamination	5%
Spontaneous heating	3%
Self ignition	2%
Temperature damage	2%
Other claim categories	3%

GRAPH 4.17

Most common type of cargo claims for container vessels *(2013 – 2017)*

Claims cost: => 5,000 - uncapped (USD)

As per 14/03/2018



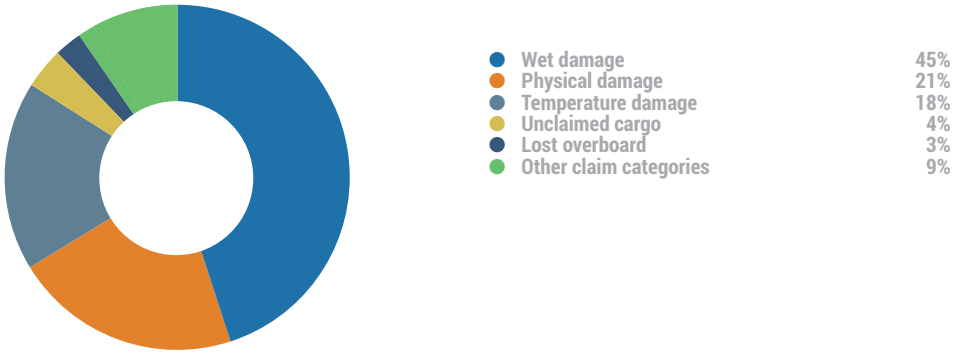
Temperature damage	23%
Wet damage	23%
Physical damage	21%
Unclaimed cargo	7%
Other	4%
Deterioration	3%
Theft	3%
Lost overboard	3%
Other claim categories	13%

GRAPH 4.18

Most costly type of cargo claims for container vessels *(2013 – 2017)*

Claims cost: => 5,000 - uncapped (USD)

As per 14/03/2018

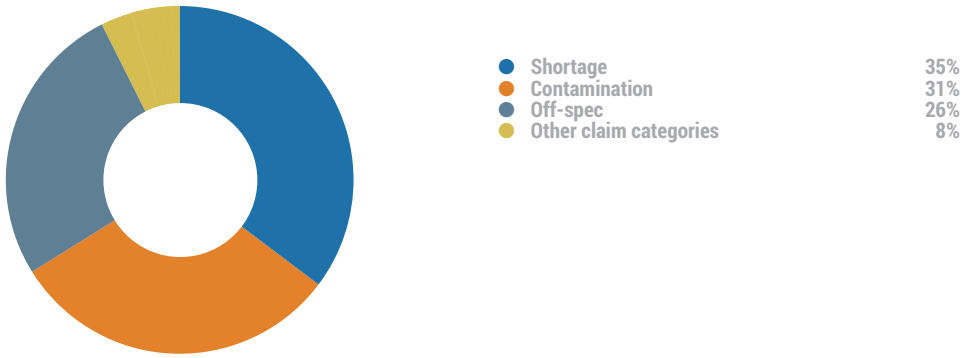


GRAPH 4.19

Most common type of cargo claims for tanker vessels *(2013 – 2017)*

Claims cost: => 5,000 - uncapped (USD)

As per 14/03/2018

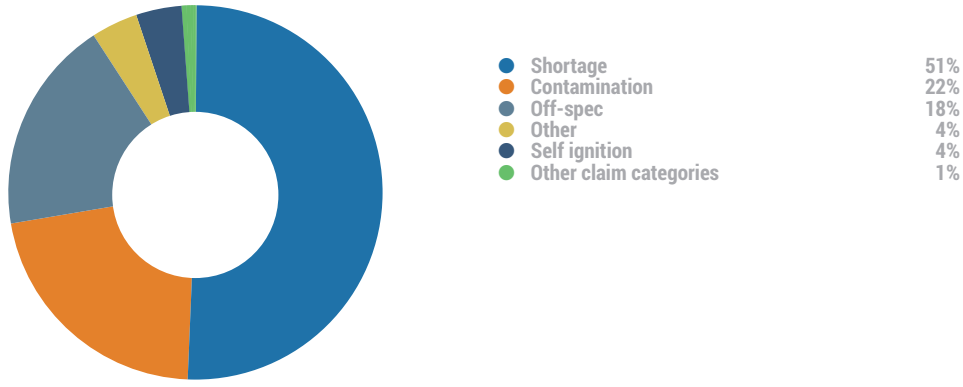


GRAPH 4.20

Most costly type of cargo claims for tanker vessels *(2013 – 2017)*

Claims cost: => 5,000 - uncapped (USD)

As per 14/03/2018



On bulk carriers the most common and expensive claims are wet damage, shortage and physical damage.

On container vessels the most common and expensive claims are wet damage, temperature damage and physical damage to the cargo.

On tanker vessels the most common and expensive claims are shortage, contamination and off-specification.

4.3.4 Case studies and loss prevention advice

In this section we highlight those claims which we believe will be of particular interest to our members, and provide readers with appropriate loss prevention advice.

4.3.4.1 Bulk carriers – wet damage

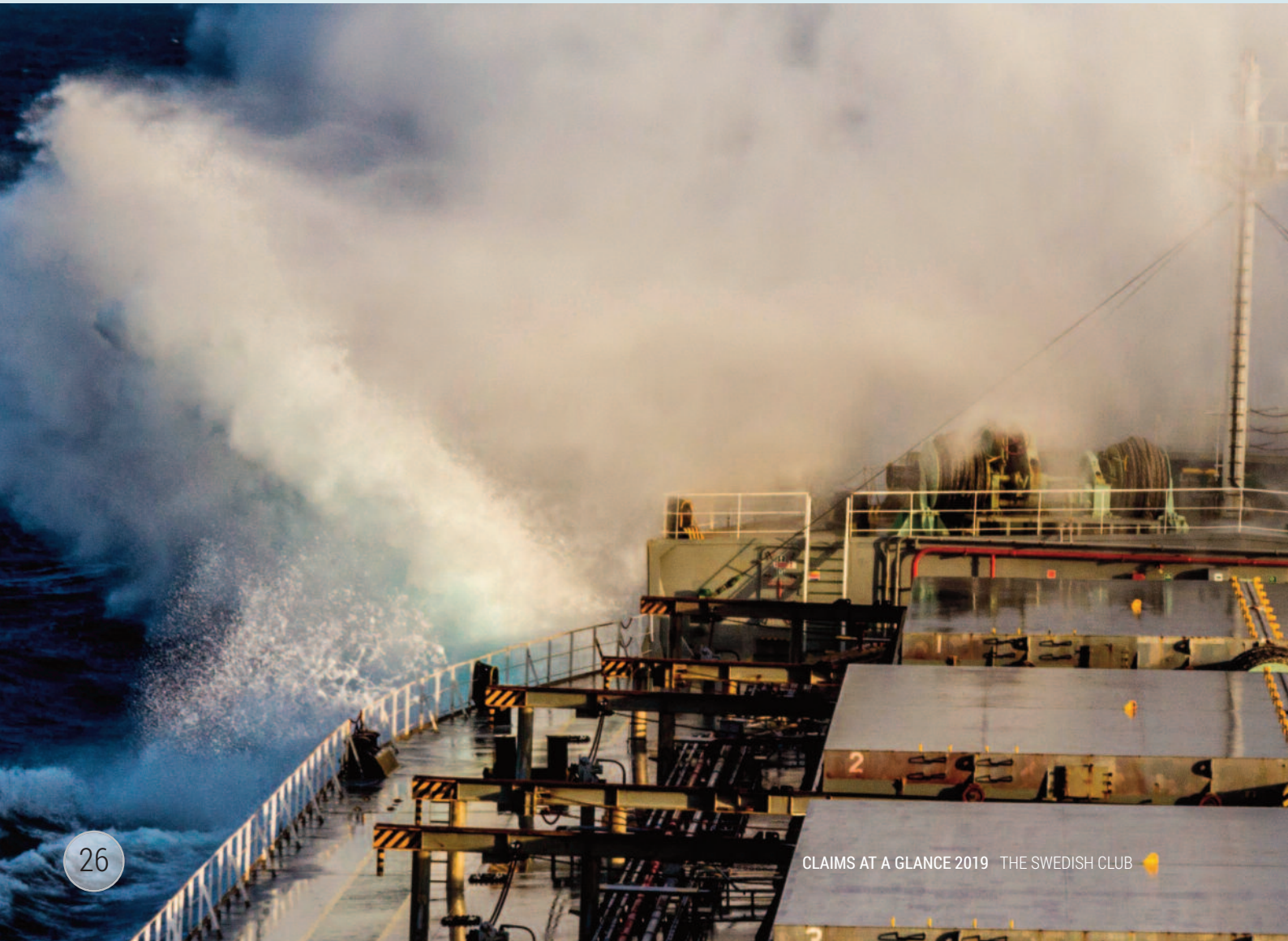
Wet damage on bulk carrier cargo is a recurring problem. The most common challenge is that seawater enters the cargo holds due to leakage in the sealing system between the cargo hatch covers and the coaming.

In our publication ***'Wet Damage on Bulk Carriers'***, the Club joins forces with the cargo hatch cover experts MacGregor and classification society DNV GL to investigate causes and deliver practical loss prevention advice. Please see ***Appendix (I)*** for highlights from the publication.

The Swedish Club's statistics show clearly that most wet damage claims are caused by lack of maintenance.

Before departure it is important to inspect the specific parts and equipment for the cargo hatch covers as directed. The use of tape and sealing foam should never be used as a replacement for proper maintenance.

The potential risk of any insurance complication deserves to be considered as well. To ensure that proper maintenance has been completed will save money, headaches and improve safety on board.



CASE 1

Leaking cargo hatch covers caused cargo damage

The bulk carrier had been fully loaded with grains. The vessel had side rolling cargo hatch covers. For six days, the vessel encountered heavy weather at Beaufort scale 9 which caused it to pitch and roll heavily.

During the voyage the cargo hatch covers were washed over by seawater.

All hatch covers were opened when the vessel was at anchor and waiting for an available berth. This was to ensure the vessel was gas free since fumigation had been carried out in all cargo holds at the loading port.

Whilst opening the cargo hatch covers it was found that cargo in a number of holds had been damaged by water. Most of the water-damaged cargo was below the middle cross joint of the hatch covers and below the aft hatch coaming's corners.

According to the Master there had not been any ventilation to the cargo holds during the voyage. A surveyor carried out an inspection and found the following hatch cover parts to be in poor condition:

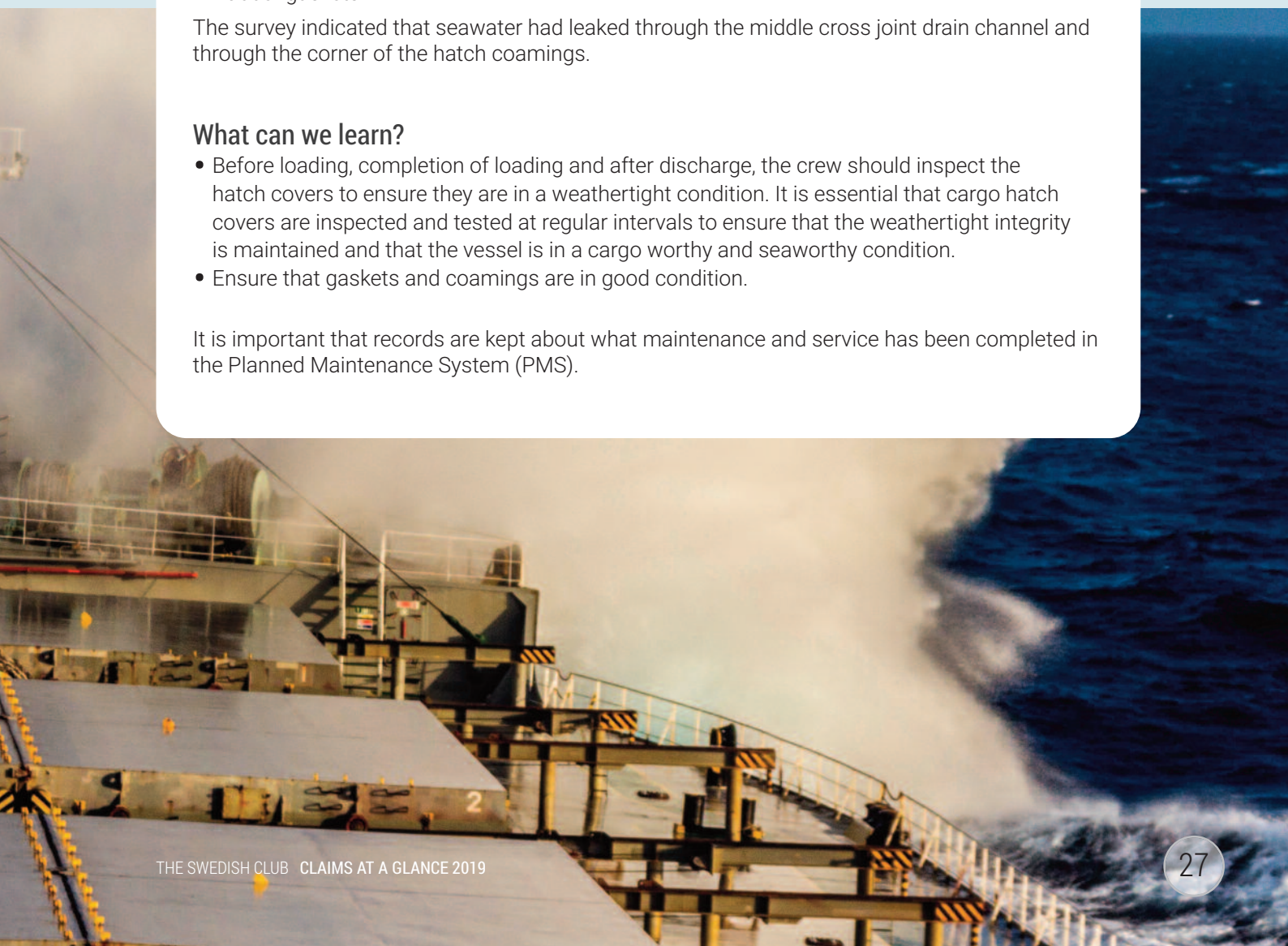
- Hatch cover panels
- Hatch coamings
- Water drain channels
- Non-return valves
- Quick cleats
- Rubber gaskets

The survey indicated that seawater had leaked through the middle cross joint drain channel and through the corner of the hatch coamings.

What can we learn?

- Before loading, completion of loading and after discharge, the crew should inspect the hatch covers to ensure they are in a weathertight condition. It is essential that cargo hatch covers are inspected and tested at regular intervals to ensure that the weathertight integrity is maintained and that the vessel is in a cargo worthy and seaworthy condition.
- Ensure that gaskets and coamings are in good condition.

It is important that records are kept about what maintenance and service has been completed in the Planned Maintenance System (PMS).



4.3.4.2 Bulk carriers – shortage

To prevent shortage claims it is advised that the Master adheres to the following advice:

- That draft surveys are carried out at both loading and discharging ports.
- The Master should secure and produce full and adequate figures from loading and discharging. The evidence needs to be convincing to overcome any allegation from the cargo receiver that the full cargo was not discharged. This is especially important on tankers and bulk carriers.
- If ship-to-ship operations are involved, accurate records should be kept of each transfer.
- Arrangements should be made to seal hatches upon completion of loading in the presence of a local magistrate/bailiff who should issue a certificate to that effect.
- Ensure that the seals are inspected before breaking by any official organisation such as the local branch of the Chamber of Commerce.
- Obtain a statement upon completion of discharge from an official organisation, such as the local Chamber of Commerce, that all cargo has been discharged and that the holds are completely empty.
- Before loading, all cargo tanks should be inspected either to confirm that they are empty or to establish the OBQ (On Board Quantity). The condition should be confirmed in writing by a surveyor (Tank Clean Certificate) in the presence of a representative of the shipper.

Masters are advised not to sign statements of shortages established without control or participation from the ship's side nor to authorise the ship agents to sign any such document on the ship's behalf. If such signing is made a condition of permission being granted for the ship to sail and the Master finds himself without any effective help from his agents or the Club correspondent, the statement should be endorsed with the words: 'All cargo discharged; neither the ship nor her representatives participated in the weighing of the cargo'.

Evidence of shortage should be carefully scrutinised even if issued by official authorities such as customs shortage certificates. The certificates do not carry more weight as evidence than the reality they reflect. If the tally or measurement system is poor, which it often is, or the certificate reflects observations made long after discharging, the certificate should be contested and the claim rejected as lacking sufficient evidence. It underlines the importance of information and observations from the ship and the local ship agent on local conditions in general and at the ship's call in particular.

4.3.4.3 Container vessels – damage to reefer cargo

Damage to reefer container cargo is both frequent and costly when it happens. If reefer cargo is not transported in the right environment with regard to temperature and ventilation, loss of the entire cargo stowed in the container generally results. Not only is reefer cargo by definition heavily dependent on ideal conditions being maintained throughout the voyage, but the cargo is also intended for human consumption and, therefore, subject to strict regulations from the market and from governmental health authorities. Even minor changes in the quality may cause authorities to order the complete destruction of the cargo.

Other evidence of importance from the time of loading is any carrying instructions received from shippers and/or charterers. Members should request such instructions to be in writing for future reference. The instructions should be followed unless they appear inadequate, based on the experience and expertise available. If in doubt, the officers should contact the owner or the Club for advice.

If the temperature of reefer cargo received for shipment is different from that in the carrying instructions or from what experience indicates it should be, the bill of lading should be clausedaccordingly. Otherwise the carrier will be responsible for damage inherent in the cargo or caused during a time when the cargo was not in his possession.

There is important evidence to be collected and maintained in respect of the carrying conditions during the voyage. The reefer log is a fundamental piece of evidence and should be stored carefully.

- Ships carrying reefer containers should have sufficient expertise, tools, spare parts and a supply of appropriate cooling medium to effect basic emergency repairs on board.
- All steps taken and observations made on the cargo condition should be recorded continuously in the reefer and deck logs.
- Contact The Swedish Club should problems arise.

4.3.4.4 Tankers – contamination

Whilst tanker vessels may have the lowest frequency of cargo claims, when they happen they are costly as the average contamination claim cost is about USD 100,000.

The crucial point is the requirement for a thorough and adequate cleaning of tanks, pumps and lines. The extent of cleaning has to be seen in relation to the cargo previously carried and that to be loaded.
The carrier is not absolved from liability if the tanks have been inspected and approved by the shipper's or the charterer's surveyor even if the charterparty contains a stipulation to that effect. On the other hand, the shipper's advice should be sought regarding the cleaning standard and procedure required as the shipper is the party best placed to know the requirements of his own cargo to be carried.

A Tank Clean Certificate should be obtained from a surveyor. First foot samples should be taken and analysed before the loading is allowed to continue. Further samples should be taken at the ship's manifold or where the shore installation piping system ends.

4.3.4.5 Tankers – off specification

Requests to co-mingle or blend oil cargoes usually come from charterers or shippers. This procedure is potentially complicated and can expose the shipowner to very large claims for off-spec cargo at the port of destination. It can also jeopardise the P&I cover. One has to keep in mind that the Master and his crew have no scientific knowledge of inherent characteristics of chemicals or other oil products. Should it prove necessary, it is of utmost importance that the shipowner and Master consult specialists in this field on loading, with the assistance of The Swedish Club. When accepting to co-mingle of blend cargo it is essential that the Master:

- Clauses the bill of lading accordingly.
- Takes samples.

There are also many interpretations as to what actually constitutes blending/co-mingling. In addition the Club recommends that Members request a Letter of Indemnity from shippers or charterers.

4.3.4.6 Cargo fires

The Club's recent publication on cargo fires, written in cooperation with Dr Neil Sanders at Burgoynes, highlights the risks of cargo fires and advises how to prevent them. Refer to ***Appendix (II)*** for further details.

CASE 1

Fire caused by moving cargo

The RoRo vessel was underway and expected to sail through heavy weather with up to Beaufort scale 10 winds and eight metre high waves.

The cargo on board consisted mainly of vehicles, containers, and jerry cans with fuel on flat racks. Before loading commenced the Chief Officer went ashore to inspect the cargo. He inspected the jerry cans that were secured with quick lashings through the handles of each row and secured to bars on the flat racks. He was concerned that the jerry cans were placed on flat racks and not in containers, as there were no walls around the racks to protect the jerry cans. The flat racks and containers were secured with a combination of web lashings and chains.

The vessel departed in the evening and maintained a speed of 18 knots to try to keep distance from the heavy weather. The following morning the Chief Officer and crew inspected the cargo. They found only minor issues with connecting a few slack lashings that needed to be tightened and they added additional lashings to some units that were a little loose, or did not have ideal angles. Later that morning the wind increased, the vessel started to roll and the Master slowed down. The vessel then sailed through heavy weather for the following 24 hours with up to Beaufort scale 10 winds and waves of at least eight metres high.

One of the containers came loose and hit one of the flat racks with jerry cans. The Master believed it unsafe for the crew to go onto the weather deck and relash the container because of the heavy rolling. The vessel was rolling and pitching so heavily that some of the cargo started to move. A number of jerry cans fell onto the deck and leaked fuel as waves and water washed over the weather deck. The Master assumed that any fuel spilled on deck would be washed away, but this was not the case. The Master altered course to face the waves and reduced speed even further. This stopped the rolling but not the pitching.

From the cameras on the bridge, sparks could be seen coming from the moving containers on the weather deck. To prevent a fire from starting, the electricity was turned off for the reefer units on the weather deck and the sprinkler system was started. The Master hoped that this would wash away all the fuel on deck but unfortunately this was not the case.

Huge flames could then be seen on the weather deck through the vessel's cameras. The Master activated the fire alarm and broadcast a mayday over the VHF. Everyone was assembled and accounted for. The burning cargo was in the forward part of the weather deck. The fire team, led by the Chief Officer, approached the fire from the side walkways and from the stern on the weather deck. The sprinklers were also working. There were now flames around 30 metres high. Several explosions occurred to the fuel containers and jerry cans. The crew fought the fire heroically for five hours until they had it under control.

What can we learn?

- If you find yourself questioning any situation then always get a second opinion. "If you think you should call the Master, call the Master" is an approach which can be applied to situations across the board. The Chief Officer was unsure about the jerry cans and the open trailer and he was also aware of the incoming heavy weather. If these issues had been discussed in more detail with the Master, technical manager or charterer, the decision may have been made that a closed container should be used. On board a vessel, consequences can be very severe. That is why critical operations like this need to be discussed in detail and a proper risk assessment completed which identifies the possible risks and consequences.
- The fire was most likely caused by sparks from the moving container, which ignited the fuel that had leaked onto the weather deck from some of the jerry cans that were damaged. It should be evaluated why the containers were not secured properly. Either the cargo securing manual has to be updated or there needs to be an investigation as to why the manual was not complied with.

CASE 2

Explosion caused by fumigation

A bulk carrier had loaded yellow corn in all cargo holds up to the hatch coamings. After the loading was complete, fumigation technicians came on board and fumigated the cargo with fumitoxin pellets.

As per the cargo documentation, the fumigation pellets were required to be applied subsurface. In this instance the technicians poured the pellets from flasks while walking on the hatch coamings or hatch covers. This work took a little more than an hour and afterwards all the cargo hatches were closed and the vessel sailed.

A couple of hours later an explosion occurred in one of the holds. The crew noted that the hatch covers had moved slightly and blue gray smoke was seen coming from under the edges. About an hour later another explosion occurred in a second hold, and a couple of minutes later an explosion occurred a third. There were explosions in the remaining holds shortly afterwards.

What can we learn?

- Fumitoxin pellets and similar fumigants are made up of around 55% aluminium phosphide which reacts with water to produce phosphine, an extremely toxic and effective fumigant. Phosphine gas will form an explosive mixture when mixed with air at a concentration exceeding around 1.8% to 2% by volume (the lower flammable limit). The concentration of phosphine in the air in each of the holds exceeded this lower flammable limit.
- The fumigant pellets in each hold had not been distributed across the entire cargo surface, or applied to the subsurface, but had been applied by simply pouring the pellets on top of the cargo. This method of application had permitted the accumulation of the pellets in limited areas and promoted a relatively rapid reaction of the pellets with moisture, generating concentrations of phosphine gas above the lower flammable limit, which lead to the explosions.
- The manager should ensure that the crew is aware of the requirements and procedures for the fumigation operation and the crew need to ensure that the fumigation pellets are distributed as per the cargo documents.

4.4 Injury

The profile of the injury claims seen by the Club is similar to that of cargo claims, in that the quantity of claims is remaining fairly stable but the cost of claims is increasing. The most common and costly injuries are slips and falls on board.

We have seen that injuries generally occur because the injured person did not follow guidelines and procedures. However, the question we should ask ourselves is why those procedures weren't followed? Our view is that it comes back to how that person perceived the risk, and a failure to consider the consequences of their choices. The unfortunate truth about a serious accident is that the individual might have climbed that ladder without a safety harness securing them for 999 times, but one slip, and they fall to their death – it takes only one mistake.

That is why there must be a focus on training people on best practices, explaining why they are implemented and showing the terrible consequences if they are not complied with. It might take a couple of extra seconds to secure a safety harness but it could make all the difference.

The COSWP (Code of Safe Working Practices for Merchant Seafarers) is a good source of advice on how to minimise the risks involved in high risk operations on board. It is recommended that the manager follows the suggestions from COSWP when preparing International Safety Management (ISM) procedures. Following that it comes down to training – once the correct procedures are in place the crew needs to understand why it is important to comply with them.

The injury cases we have included show the consequences when risks are not assessed correctly.

4.4.1 Injury statistics

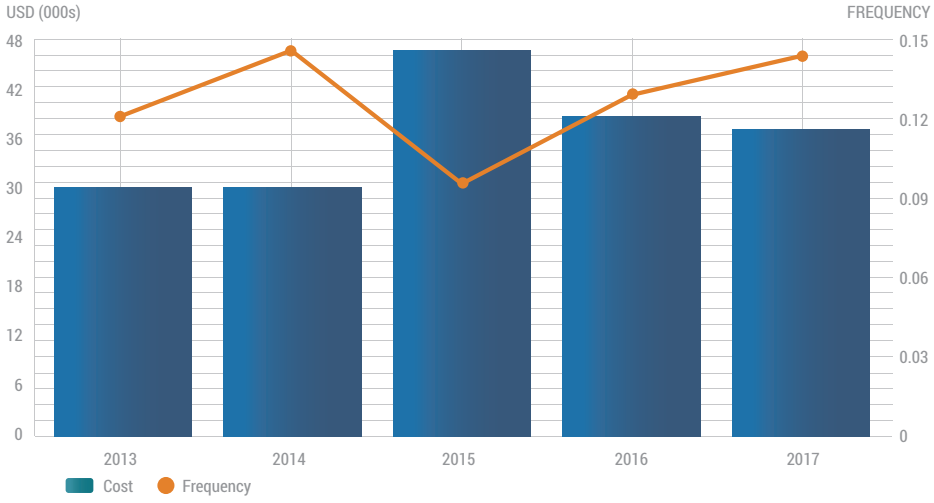
GRAPH 4.21

Average claims costs & frequency for injury claims *(2013 – 2017)*

Claims cost: => 1 – uncapped (USD)

Type of vessel: Bulk carrier, container, tanker

As per 09/04/2018

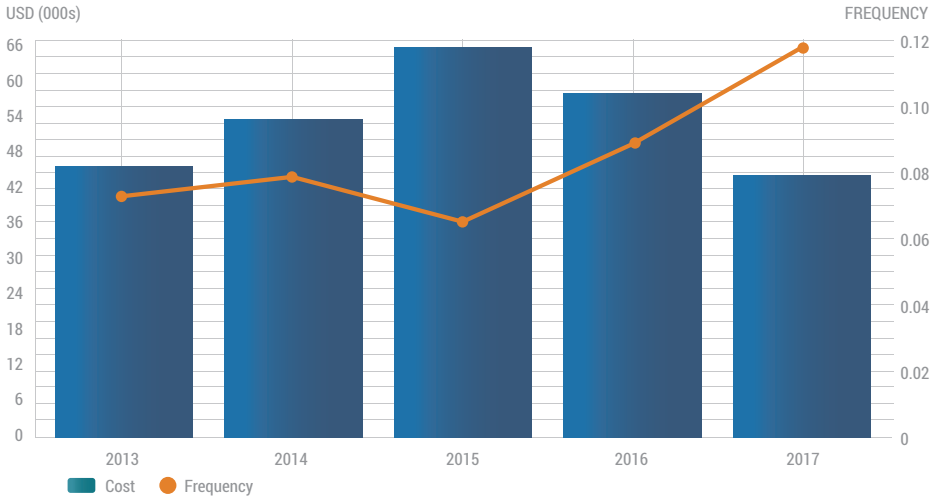


There was a dip in the frequency for 2015 but otherwise the frequency is somewhat stable between 0.12 and 0.14. This demonstrates the volatility of the claims profile in this category. The picture is also somewhat distorted by the number of small claims below USD 5,000 in this graph. The overall picture is clearer in the >= USD 5000 bracket, but in this instance we have used =>1 bracket in order to bear comparison with the published statistics of other clubs.

GRAPH 4.22

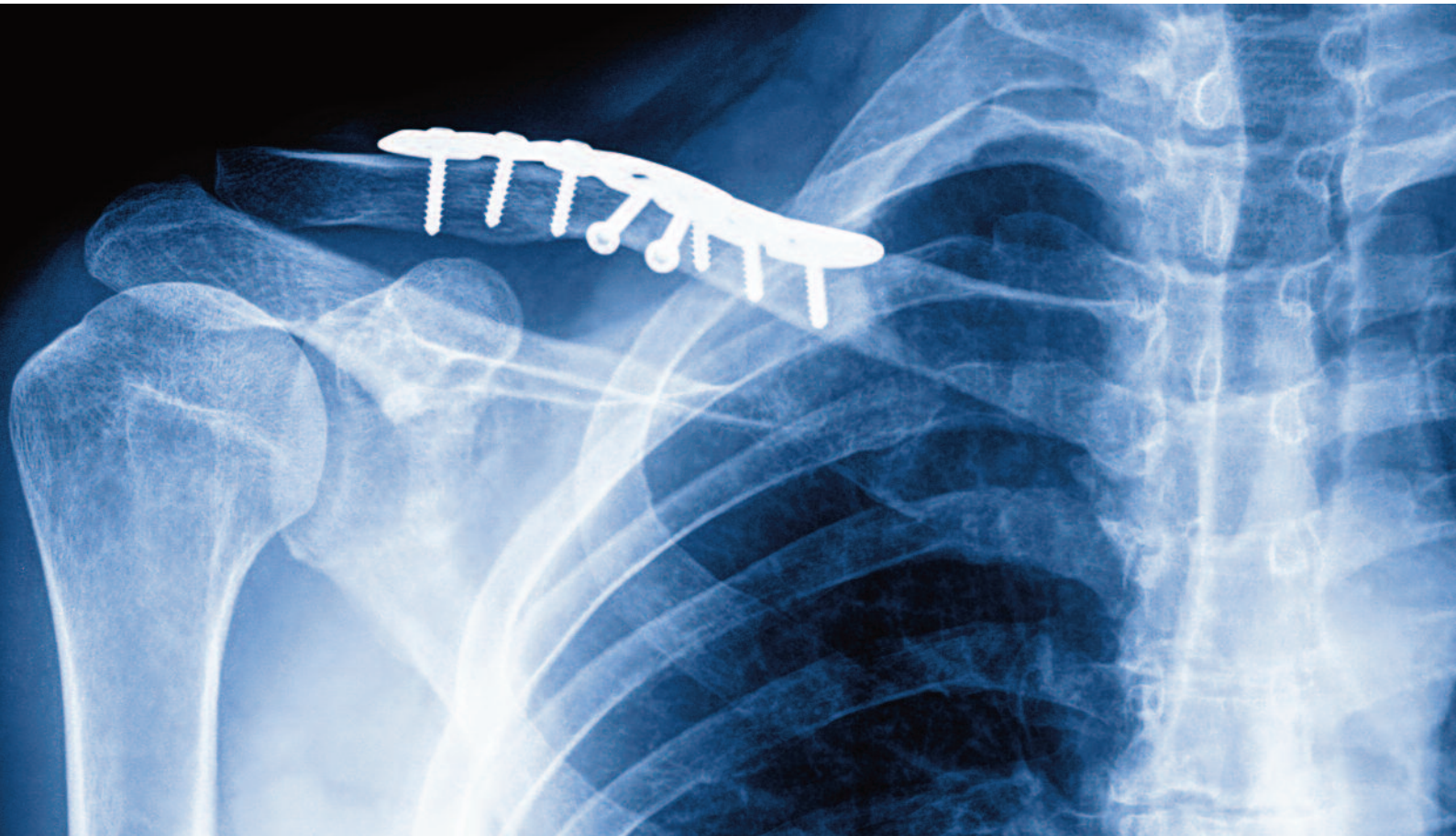
Average claims costs & frequency for injury claims *(2013 – 2017)*

Claims cost: => 5,000– uncapped (USD)
Type of vessel: Bulk carrier, container, tanker
As per 09/04/2018



Graph 4.22 shows a steady increase in the frequency of claims over USD 5,000 (after the deductible). If we compare this is Graph 4.21 we can see that the overall amount of injury claims is not increasing, but the cost for those claims is.

This could be explained by a greater awareness of the right to make a claim and secondly the attraction of significant potential financial compensation. There are, however, many other factors in operation. These include greater demands on individuals on board vessels, an increase in stress-related conditions and the erosion of social interaction in the lifestyle at sea.



GRAPH 4.23

Average claims costs & frequency for injury claims per vessels type *(2013 – 2017)*

Claims cost: => 5,000– uncapped (USD)
Type of vessel: Bulk carrier, container, tanker
As per 09/04/2018

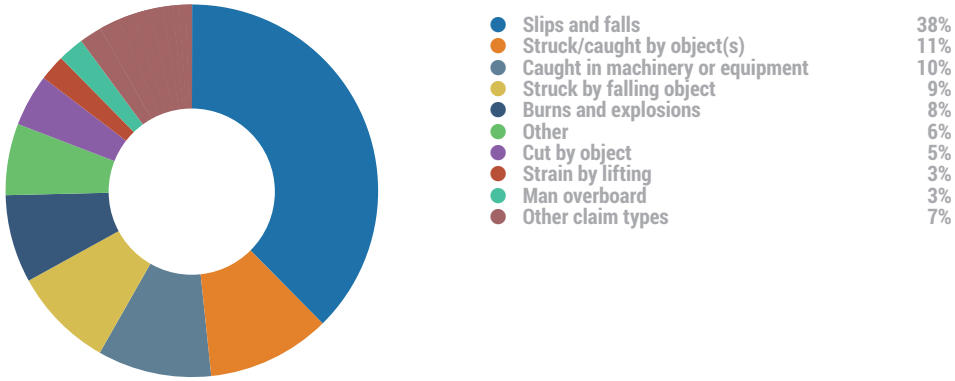
The graph shows that the frequency for every vessel type is very volatile.

Tankers are showing high costs as there were a number of expensive claims during 2015 and 2016. Tanker claims are not common but when they happen they are very serious and costly. The average cost for injury claims on tankers during 2016 is over USD 110,000. This is similar for 2015 but the average cost is USD 85,000. For the three vessel types during this period the average cost is USD 60,000.

GRAPH 4.24

Most common causes of injury claims *(2013 – 2017)*

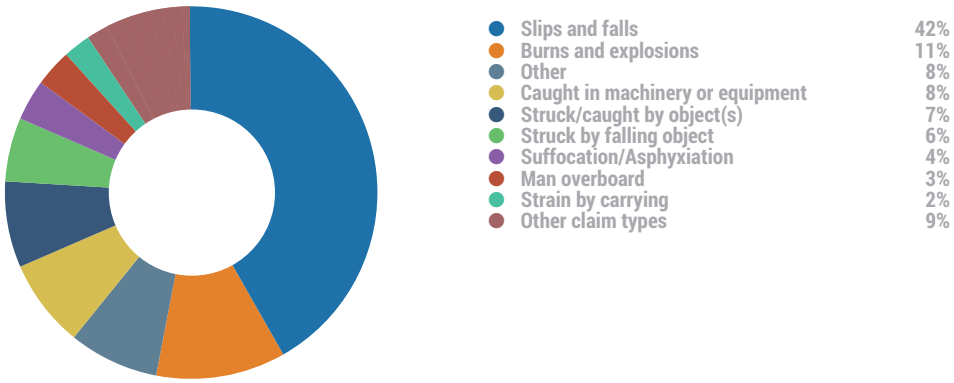
Claims cost: => 5,000 - uncapped (USD)
Type of vessel: Bulk carrier, container, tanker
As per 09/04/2018



GRAPH 4.25

Most costly causes of injury claims *(2013 – 2017)*

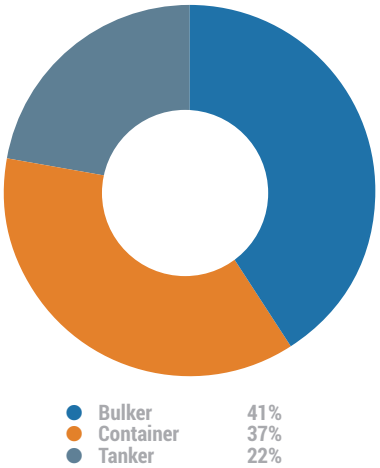
Claims cost: => 5,000 - uncapped (USD)
Type of vessel: Bulk carrier, container, tanker
As per 09/04/2018



GRAPH 4.26

Most common slips and falls *(2013 – 2017)*

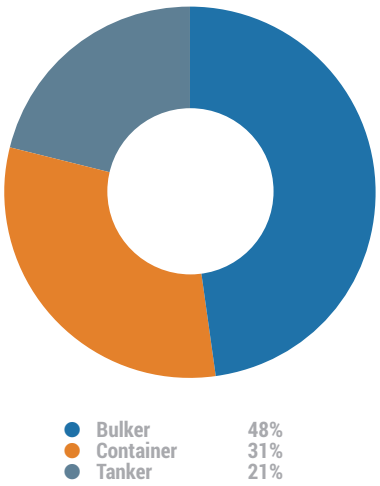
Claims cost: => 5,000 - uncapped (USD)
Type of vessel: Bulk carrier, container, tanker



GRAPH 4.27

Cost of slips and falls *(2013 – 2017)*

Claims cost: => 5,000 - uncapped (USD)
Type of vessel: Bulk carrier, container, tanker



Slips and falls are most common on bulk carriers and container vessels. This is of no surprise as most of these accidents happen while the vessel is loading or unloading with stevedores on board and equipment lying on deck to secure containers or cargo hatch covers. During the cargo operation there is also a greater risk for crew members and stevedores to fall into the cargo hold.

4.4.2 Case studies and loss prevention advice

CASE 1

Fatal fall from ladder

Two stevedores were in the cargo hold finishing their job. It was in the morning and they had started their shift the previous evening. They had worked for more than 12 hours. When they were leaving they had to first climb up a vertical ladder, then ascend a spiral staircase and for the last 2.5 metres climb up another vertical ladder to get out of the cargo hold.

The stevedores had brought a thermos and tea cup each. The cup did not fit in the first stevedore's boiler suit pocket so he held it in his hand instead. This wasn't a problem when he ascended the spiral staircase. However, when he reached the last platform there was still the vertical ladder to climb up.

Climbing up the last ladder he only used one hand as he had the tea cup in the other. He was not wearing a safety harness. When he was almost at the top he slipped and fell down. Unfortunately, he did not hit the platform below but fell more than 20 metres and landed at the bottom of the cargo hold.

The other stevedore shouted for help which the bosun heard. He could see the stevedore lying at the bottom of the cargo hold and instantly called the Chief Officer on the radio and told him about the accident. The Chief Officer assembled a rescue team with a stretcher and gave the stevedore first aid. An ambulance arrived shortly afterwards and he was lifted out of the cargo hold by a crane. Unfortunately, he was declared dead at the hospital.

It was later found that a steel bar was missing from one of the lower railings at the beginning of the spiral ladder. The railing was most likely damaged during the loading by one of the crane grabs, or an excavator as it was covered by the cargo when it arrived at the discharge port.

What can we learn?

- The definition of 'working at height' should be addressed in the risk assessment, in addition to details of the safety measures that need to be taken.
- In the risk assessment it should state whether the specific job requires a work permit.
- It is up to every company to define if they consider it an acceptable risk to enter the cargo hold on a vertical ladder without a safety harness attached.
- In this specific case the person climbing the ladder only used one hand and had no safety harness. The problem here is how the stevedore perceived the risk at the time.
- Most of us would agree that it is safer to use both hands when climbing a ladder. However, when climbing ladders is a daily occurrence it is easy to forget that the consequences of slipping can be fatal. Advise from COSWP states that climbing a ladder three points (foot or hands) should always be in contact with the ladder. When the consequences of falling from that ladder are so severe, a harness should really be used.
- It would be beneficial to have a tool box meeting with the stevedores' supervisors to explain what is required of the stevedores when working on board.
- It is understood that many ports require that stevedores wear a safety harness when climbing the cargo ladder. It is important that the Chief Officer emphasises the importance of complying with this requirement.
- After both loading and discharging, the Chief Officer should inspect the ladders to ensure they have not been damaged during the cargo operation.
- This accident highlights the minimal effort it takes to do a job safely, and the consequences of not making that effort.

CASE 2

Lost balance while washing down

A bulk carrier was in port and one of the ABs was washing the hatch coaming gutter. He had connected a fire hose to a fire hydrant and was spraying water. The cargo hatch covers were open and the AB was wearing a safety harness. The harness became tangled with the fire hose and so the AB briefly unhooked it so he could untangle the safety cord. At the same time the pressure in the hose changed causing the AB to lose his balance and fall 16 metres down into the cargo hold.

First aid was given to the AB by the crew and the Master called for an ambulance. Unfortunately he did not recover and died at the hospital.

What can we learn?

- Working aloft is a high risk operation and all vessels have procedures on how to do safely. It is a requirement to fill out both a risk assessment and a work permit for any job in this category. The risk assessment and COSWP requires that all risks should be evaluated and that the harness should be connected at all times.
- The AB in this case was wearing a safety harness, but at the time of the accident had it unhooked at the same time as he lost his balance. This highlights once again that it only takes one second to make a fatal mistake.
- If two persons had been assigned for this job it would have meant that the AB could work on his assigned task by washing down and the other AB could assist with the hose.
- Working at sea is by default a dangerous job and the crew is often involved in high risk operations e.g. working aloft, mooring, securing cargo and other operations. A case like this highlights that a decision to unhook the safety harness when at the same time holding a pressurised fire hose can lead to a fatal fall.
- Everybody looks on risk differently – that is why it is so important that the safety department ensures the crew is trained in evaluating and understanding risks, and the potentially fatal consequences of forgetting this.

CASE 3

Lost his leg during mooring operation

It was early morning and the vessel was approaching the port. There was no wind or currents. On the stern an AB was preparing the mooring ropes. The stern lines were put partly around a bollard with a bight at a right angle to the normal pull direction. After the AB had prepared the mooring lines, the Third Officer joined him. They talked for a while before the berthing operation began. First the spring lines were sent ashore and made fast. The Master was on the bridge and he put the engine pitch to zero, allowing the vessel a slight forward moment. The rudder was hard to starboard as the vessel was berthing port side alongside. After the spring lines were secured the heaving line was connected to both stern lines.

The Chief Officer, who had been by the manifold, came to the stern to assist and took charge of the mooring winch. The Third Officer walked to the stern railing by the fairlead.

The linesmen shouted that they were ready to receive the stern lines, so the AB began to lower the stern lines into the water. He was facing the mooring winch and had his back to the Third Officer by the railing. He let the mooring lines run out at a very high speed. Suddenly the Third Officer started to scream. The AB turned around and could see the Third Officer was caught between the mooring line and the fairlead. The mooring line's speed was now so fast that it cut through the Officer's clothes and he was bleeding badly. The mooring line was actually cutting through the Third Officer's leg which was cut off just below the knee.

The Chief Officer realized that the mooring rope was stuck in the propeller and screamed over the VHF to the Master to stop the engine. The Master pushed the emergency stop and the propeller stopped.

The Third Officer was still standing but in severe shock and he finally collapsed.

The Chief Officer ran over to give first aid and the gangway was rigged. A first aid team from shore side came on board and helped. It took about 30 minutes for an ambulance to arrive and take the Officer to hospital. The Third Officer survived, but is now disabled and can never work at sea again.

What can we learn?

- The vessel had a risk assessment for the mooring operation, but it did not include the risk of the mooring line getting stuck in the propeller, as the mooring line should be floating in normal circumstances. This time the mooring line was lowered too quickly and ended up under the surface. The propeller blades are only 2 metres below the surface so the lines were sucked into the propeller.
- Another risk was that the mooring line was partly around the bollard, with a bight and a right angle to the normal pull direction. This arrangement caused the snapback zone to cover the entire area between the bollard and railing. When the rope ran out rapidly and got caught in the propeller it snapped back to where the Third Officer was standing. The Officer was actually outside the normal snapback zone, showing the importance of evaluating each situation independently. Although a normal operation, mooring is also a high risk operation and the risks need to be evaluated every time.
- It is important to always be aware of your surroundings and not stand too close to fairleads and ropes. Inexperienced crew members should be trained about these risks.
- When lines are prepared on deck the line-up should be in direct line with the expected movement of the rope.
- When passing lines to shore, they should be controlled and slowly passed to prevent the lines running below the water. This is also applicable for floating mooring lines.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4.5 Illness

Illness must be treated somewhat differently compared with injury and cargo claims, as most preventive measures need to be implemented before the crew member boards the vessel.

The Club's statistics show cardiovascular disease as the most common and costly illness.

To improve the health of the crew the manager can promote healthier diets, ensure there are exercise facilities on board, discourage smoking and drinking, and support crew members who wish to change their lifestyle. It is also sensible to offer a Pre Engagement Medical Examination (PEME) to crew members before being employed.

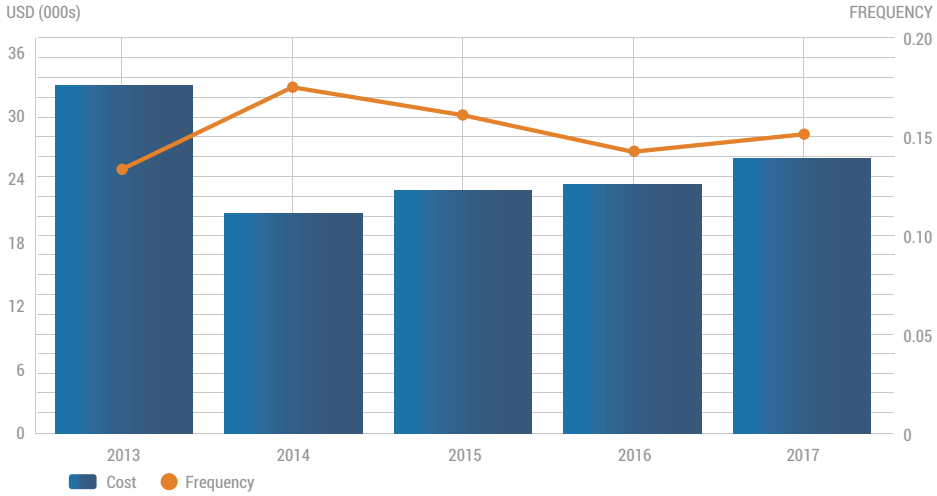
There is also the ever-increasing problem in the industry of finding experienced, properly trained seafarers. Retention of quality personnel is a priority and it is important that these quality personnel are given the tools and the encouragement to make healthy choices. For managers, it is essential that they are sure that their crew members are fit and healthy before they are employed. A serious illness can cause so many other concerns besides the person's own illness. The vessel can be delayed in arriving at the next port, delayed in port, there can be problems finding replacement crew and the stress this will cause on board and ashore is difficult to measure in monetary terms.

4.5.1 Illness statistics

GRAPH 4.28

Average claims costs & frequency for illness claims *(2013 – 2017)*

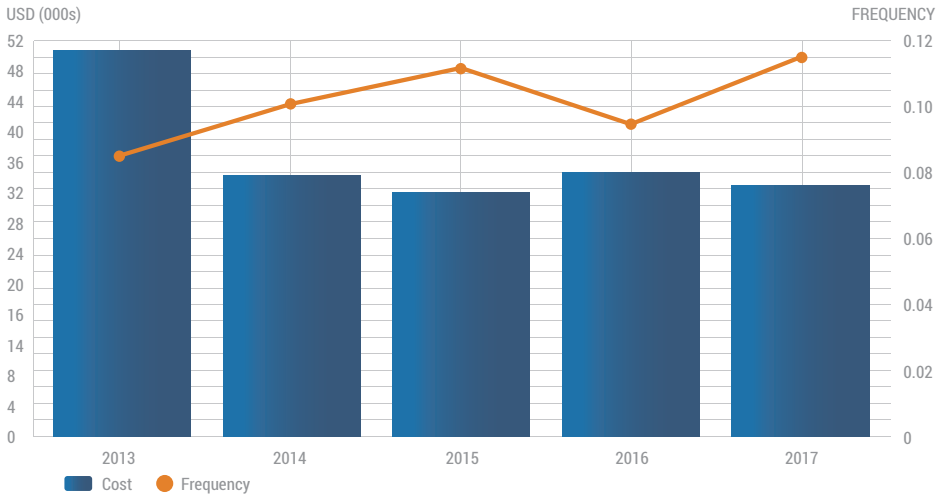
Claims cost: => 1 – uncapped (USD)
Tyoe of vessel: Bulk carrier, container, tanker
As per 09/04/2018



GRAPH 4.29

Average claims costs & frequency for illness claims *(2013 – 2017)*

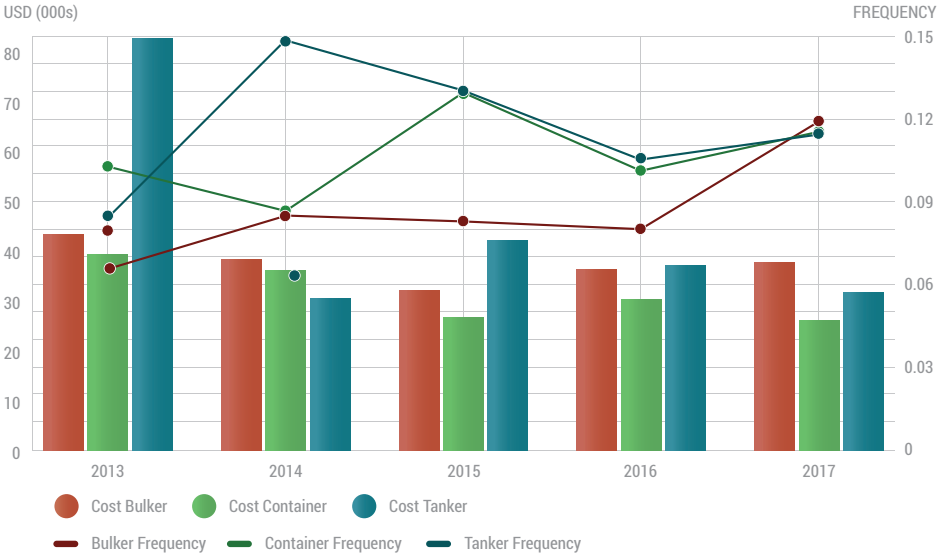
Claims cost: *=> 5,000– uncapped (USD)*
Type of vessel: *Bulk carrier, container, tanker*
As per 09/04/2018



GRAPH 4.30

Average claims costs & frequency for illness claims per vessel type *(2013 – 2017)*

Claims cost: *=> 5,000– uncapped (USD)*
Type of vessel: *Bulk carrier, container, tanker*
As per 09/04/2018



GRAPH 4.31

Most common causes of illness claims *(2013 – 2017)*

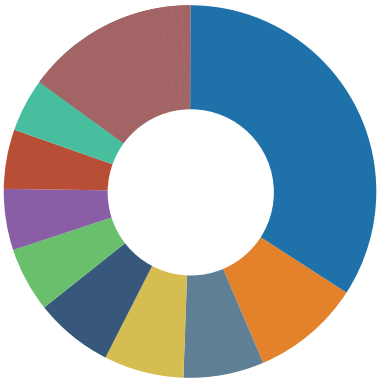
Claims cost: *=> 5,000 - uncapped (USD)*
Type of vessel: *Bulk carrier, container, tanker*
As per 09/04/2018

Conditions of the cardiovascular system	21%
Conditions of the musculoskeletal system	10%
Conditions of the genito-urinary system	10%
Infectious and parasitic diseases	9%
Other	8%
Appendicitis	8%
Conditions of the digestive system	7%
Conditions of the respiratory system	5%
Other claim types	22%

GRAPH 4.32

Most costly causes of illness claims *(2013 – 2017)*

Claims cost: *=> 5,000 - uncapped (USD)*
Type of vessel: *Bulk carrier, container, tanker*
As per 09/04/2018



Conditions of the cardiovascular system	34%
Conditions of the nervous system	9%
Infectious and parasitic diseases	7%
Conditions of the genito-urinary system	7%
Other	7%
Conditions of the musculoskeletal system	6%
Appendicitis	5%
Conditions of the respiratory system	5%
Conditions of the digestive system	5%
Other claim types	15%

The Club's statistics show cardiovascular disease as far the most common and the most costly illness. Unlike many illnesses, remedial action can be taken on board however. To improve the health of the crew the manager can promote healthier diets, ensure there are exercise facilities on board, discourage smoking and drinking, and support crew members who wish to change their lifestyle.

It is also sensible to offer a Pre Engagement Medical Examination (PEME) to crew members before being employed.

4.5.2 Pre Engagement Medical Examination (PEME)

The Club believes that the standard medical examination often proves an inadequate tool to prevent illness and ensure that a crew is fit and healthy. It can take years of unhealthy living for a serious illness to develop, and indeed the early symptoms of many illnesses are not initially obvious. If the warning signs can be identified and preventive measures taken at an early stage, it is likely that steps could be taken to prevent suffering and even premature death.

To this end, the Club has developed its own PEME, which is much more comprehensive than the medical examination normally required. Currently two clinics in the Philippines have been approved to carry out this examination on behalf of the Club. If the PEME is followed correctly a serious illness is more likely to be discovered.

A PEME examination will result in the following benefits:
- The possibility of a more precise evaluation of health status and cardiovascular risks.
- Reduction of the possibility of allowing unfit crew to go to sea.
- Overall healthier crew.
- Fewer deaths at sea, as a result of cardiovascular disease, for example.
- Fewer helicopter evacuations, which are always a high risk.

It can prevent the following issues:
- Sudden disembarkation of crew on health grounds.
- Hospitalisation abroad.
- Difficult and risky repatriation.
- Death at sea.
- Loss of a qualified worker.
- Deviations, delays and general disruptions etc.

Illness can strike at any time but by trying to identify problem areas and risks before they occur is good loss prevention practice and minimises the exposure in this respect.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5 H&M

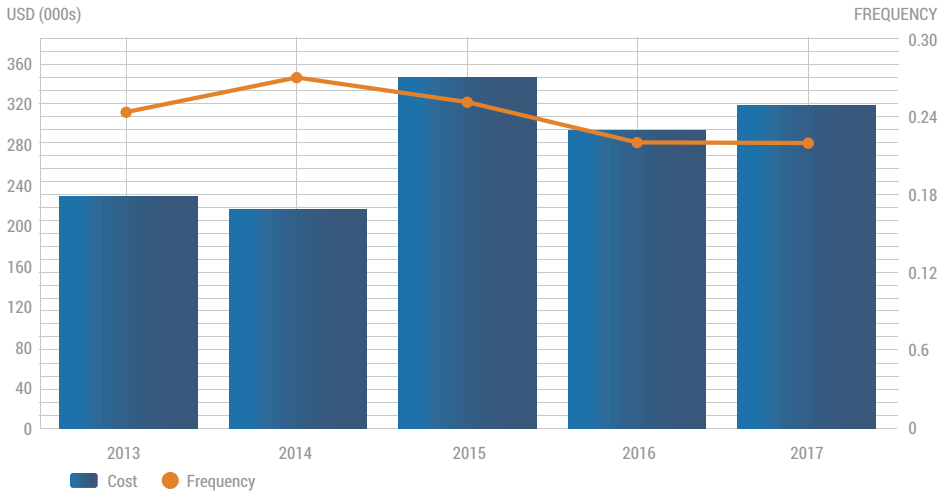
5.1 H&M claims statistics

When we analyse statistics we usually focus on the most common claim categories instead of the most expensive. If a vessel runs aground on a sandy bottom in an area with proper shipyard facilities and good access to salvors, it will be more cost efficient to deal with the grounding compared to a grounding on a remote island with rough seas and where salvors are weeks away. It is still one grounding but the cost will be significantly different.

GRAPH 5.1

Average claims costs & frequency *(2013 – 2017)*

Claims cost: => 1– uncapped (USD)
Type of vessel: Bulk carrier, container, tanker
As per 23/04/2018

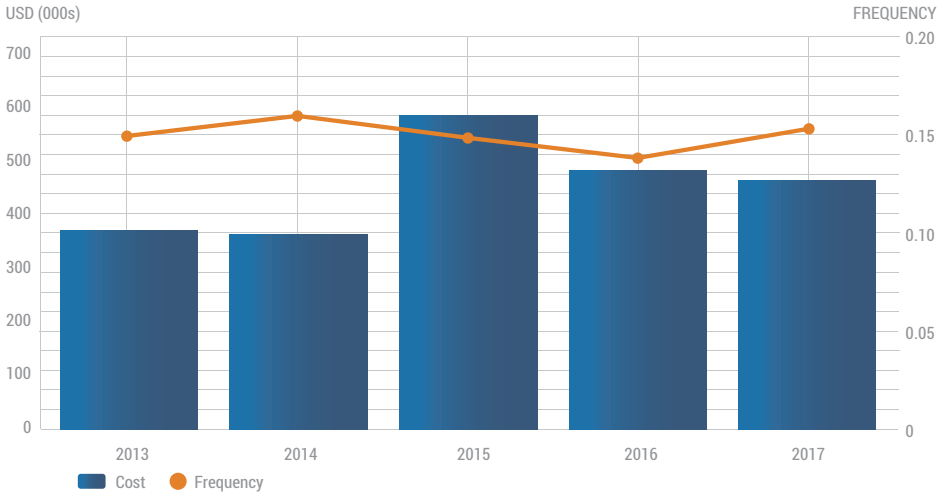


The statistics are based upon claims after the deductible – the average deductible for H&M is about USD 100,000. Since 2014 the frequency of H&M claims has decreased from 0.27 to 0.22 in 2017. However the average claim cost can be seen to be increasing.

GRAPH 5.2

Average claims costs & frequency *(2013 – 2017)*

Claims cost: => 10,000 – uncapped (USD)
Type of vessel: Bulk carrier, container, tanker
As per 23/04/2018

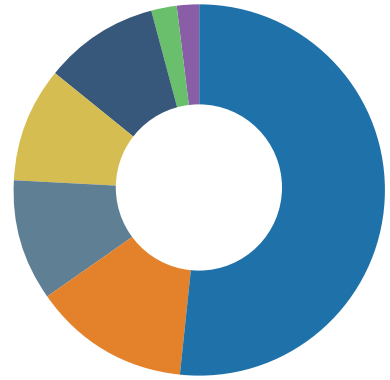


The standard cost bracket the Club uses for Hull and Machinery is for claims cost => 10.000 – uncapped. The chart shows no decrease in the frequency of this type of claim, being relatively stable between 0.14 and 0.16, however the average claim cost is also increasing in this bracket. This shows a similar trend as for P&I, where the average claim cost is increasing.

GRAPH 5.3

Most common claim types *(2013 – 2017)*

Claims cost: => 10,000 - uncapped (USD)
Type of vessel: Bulk carrier, container, tanker

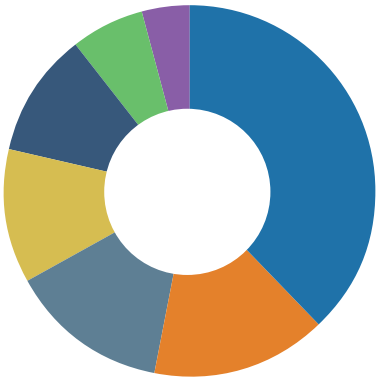


Machinery or equipment	52%
Contact	14%
Other HM	11%
Collision	10%
Grounding	10%
Fire or explosion	3%
Heavy weather	2%

GRAPH 5.4

Most costly claim types *(2013 – 2017)*

Claims cost: => 10,000 - uncapped (USD)
Type of vessel: Bulk carrier, container, tanker



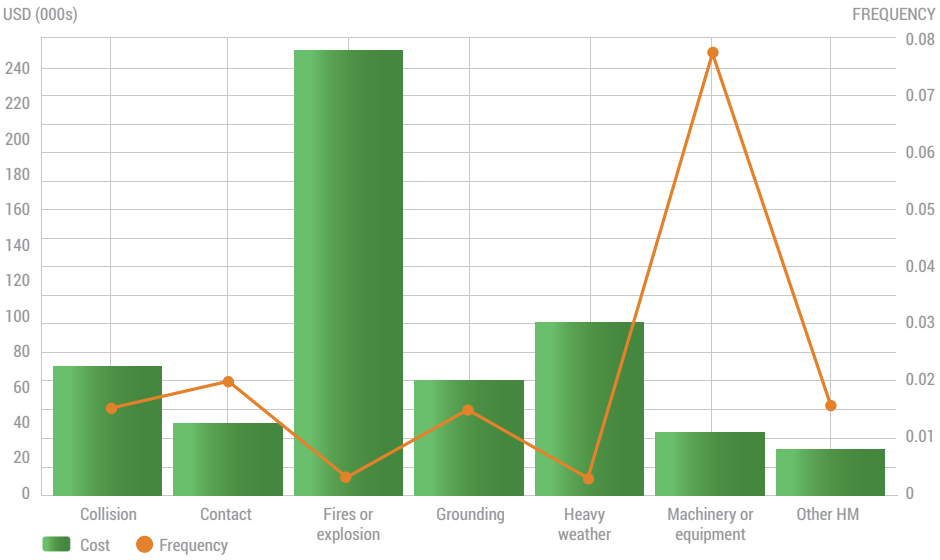
Machinery or equipment	38%
Collision	15%
Contact	14%
Fire or explosion	12%
Contact	11%
Other HM	6%
Heavy weather	4%

Machinery claims are the most common category of claim with more than half of all claims falling into this category. These claims make up almost 40% of the claims cost during the period. Navigational claims make up about 35% of the claims with a total cost of about 40%.

GRAPH 5.5

Average claims costs & frequency per category of claim *(2013 – 2017)*

Claims cost: => 10,000 – uncapped (USD)
Type of vessel: Bulk carrier, container, tanker



5.2 Navigational claims

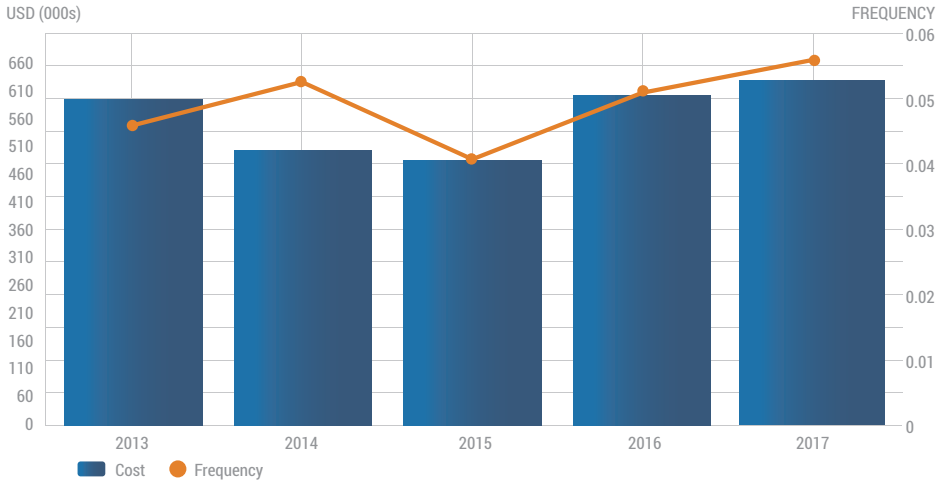
Navigational claims consist of collisions, contacts and groundings. These claims are mostly caused by poor communication, failing to follow company procedures or not taking action at an early stage. The consequences of this can be disastrous.

The issues mentioned here are addressed in our publication ***'Bridge Instructions'*** which highlights best practices for the Officer of the Watch (OOW). Particular note should be made of ***'Section 7 – Collision Avoidance'*** and ***'Section 8 – Avoid Close Quarter Situations'*** which demonstrate how important it is to be proactive and evaluate the present risks.

5.2.1 Navigational claims statistics (collision, contact & grounding)

GRAPH 5.6

Average claims costs & frequency of navigational claims *(2013 – 2017)*
Claims cost: => 10,000 – uncapped (USD)
Type of vessel: Bulk carrier, container, tanker



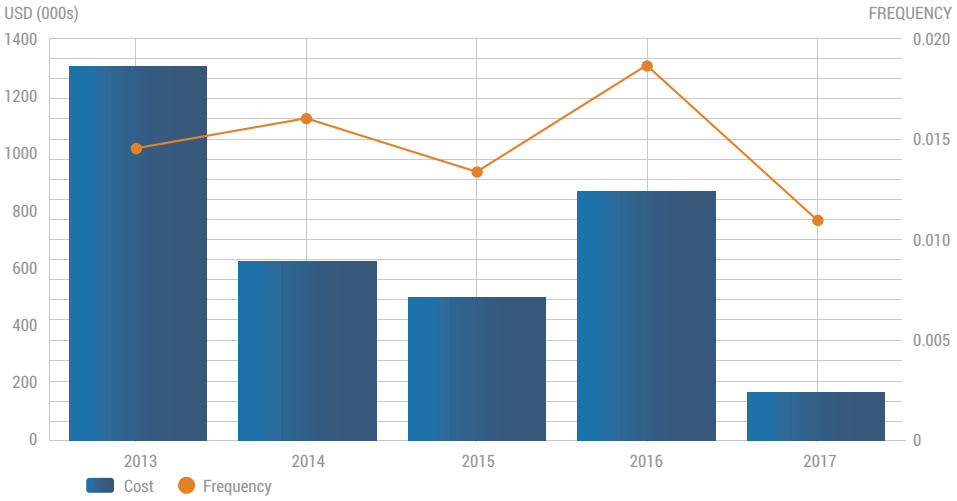
5.3 H&M statistics – most common types of claim

5.3.1 Collision claims

GRAPH 5.7

Average claims costs & frequency of collision claims *(2013 – 2017)*

Claims cost: => 10,000 – uncapped (USD)
Type of vessel: Bulk carrier, container, tanker
As per 23/04/2018

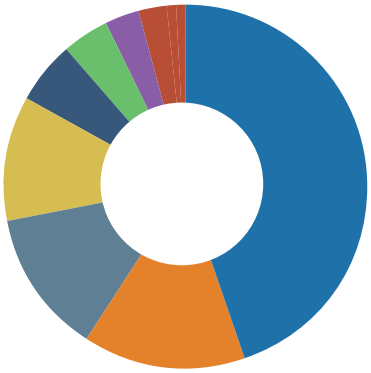


The overall trend is positive with a decrease in frequency and cost from 0.019 (1.9%) average claim cost at USD 900,000 for 2016 to 0.01 frequency and average cost of about USD 160,000 in 2017.

GRAPH 5.*8*

Most common causes of collision claims

(2013 – 2017)
Claims cost: => 10,000 - uncapped (USD)
Type of vessel: Bulk carrier, container, tanker
As per 23/04/2018

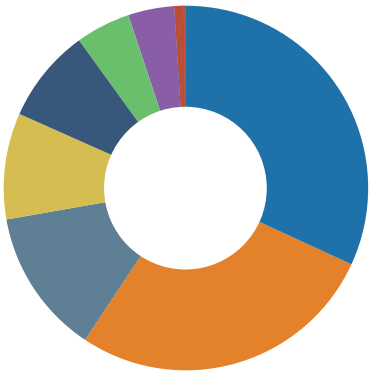


Lack of situational awareness	45%
Not applicable	14%
Underestimating natural forces (interaction)	13%
Insufficient watch-keeping	11%
The ship losing her manoeuvrability	6%
Failure to set priorities - Lack of action	4%
Collision regulations disregarded	3%
Other	4%

GRAPH 5.*9*

Most costly causes of collision claims

(2013 – 2017)
Claims cost: => 10,000 - uncapped (USD)
Type of vessel: Bulk carrier, container, tanker
As per 23/04/2018



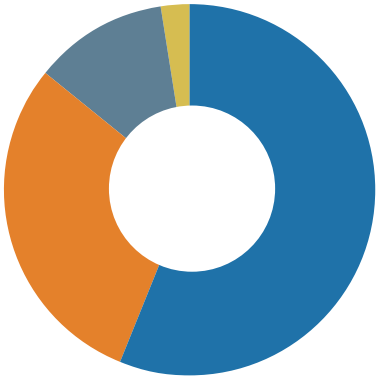
Collision regulations disregarded	32%
Lack of situational awareness	27%
Failure to communicate intentions	13%
Underestimating natural forces (interaction)	9%
Insufficient watch-keeping	8%
The ship losing her manoeuverability	5%
Not applicable	4%
Other	2%

It can be seen that the most common cause for collision is lack of situational awareness. This is also the second most costly cause. The value of complying with The International Regulations for Preventing Collisions at Sea (COLREGS) can be seen here, where the most costly cause of collision claims is due to disregarding collision regulations.

GRAPH 5.*10*

Collision – pilot on bridge *(2013 – 2017)*

Claims cost: => 10,000 - uncapped (USD)
Type of vessel: Bulk carrier, container, tanker
As per 23/04/2018

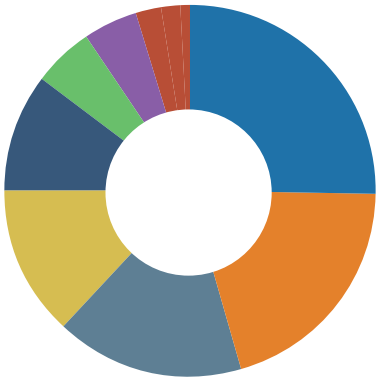


No	56%
Yes	30%
Unknown	12%
Not applicable	2%

GRAPH 5.*11*

Collision – vessel location *(2013 – 2017)*

Claims cost: => 10,000 - uncapped (USD)
Type of vessel: Bulk carrier, container, tanker
As per 23/04/2018



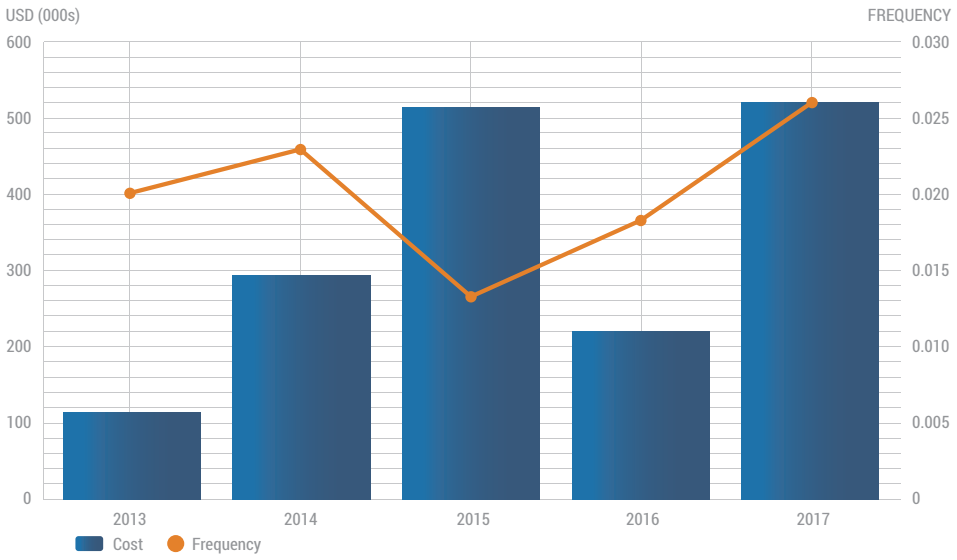
Port	26%
Anchorage area	20%
Open sea, inside EEZ, 12-200nm	17%
Port approach	13%
Coastal water, within 12nm	10%
River	5%
Canal	5%
Other	4%

5.3.2 Contact claims

GRAPH 5.12

Average claims costs & frequency of contact claims *(2013 – 2017)*

Claims cost: => 10,000 – uncapped (USD)
Type of vessel: *Bulk carrier, container, tanker*
As per 23/04/2018

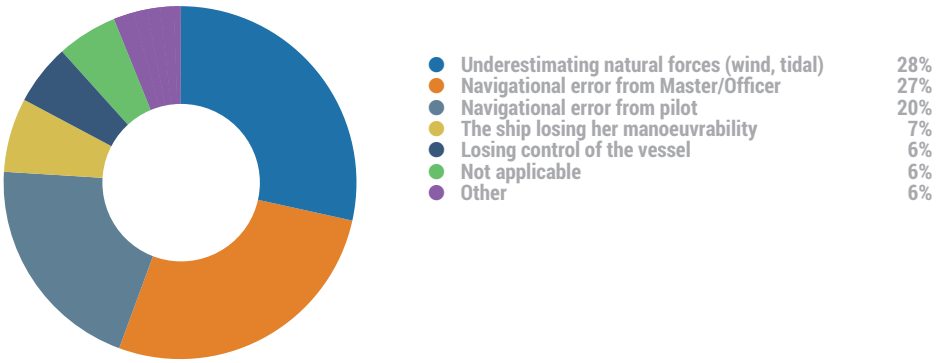


Since 2015 there has been a steady increase in both frequency and cost. The frequency 2015 was 0.014 and average cost was USD 530,000 and for 2017 the frequency was 0.026 and cost at USD 540,000.

GRAPH 5.13

Most common causes of contact claims *(2013 – 2017)*

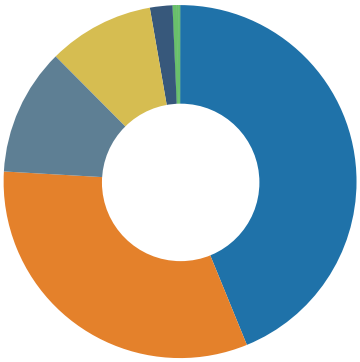
Claims cost: => 10,000 - uncapped (USD)
Type of vessel: Bulk carrier, container, tanker
As per 23/04/2018



GRAPH 5.*14*

Most costly causes of contact claims *(2013 – 2017)*

Claims cost: => 10,000 - uncapped (USD)
Type of vessel: Bulk carrier, container, tanker
As per 23/04/2018



Navigational error from pilot	44%
The ship losing her manoeuvrability	32%
Underestimating natural forces (wind, tidal)	11%
Navigational error from Master/Officer	10%
Losing control of the vessel	2%
Other	1%

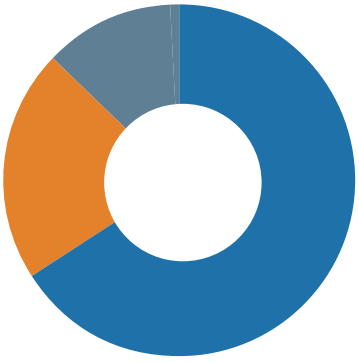
Whilst the top category shows that the most costly causes of navigational error are attributed to the pilot, it must be remembered that this highlights a lack of team work.

That the pilot is allowed to commit an error is often caused because the pilot and bridge team did not communicate properly with each other.

GRAPH 5.*15*

Contact claims – pilot on bridge *(2013 – 2017)*

Claims cost: => 10,000 - uncapped (USD)
Type of vessel: Bulk carrier, container, tanker
As per 23/04/2018

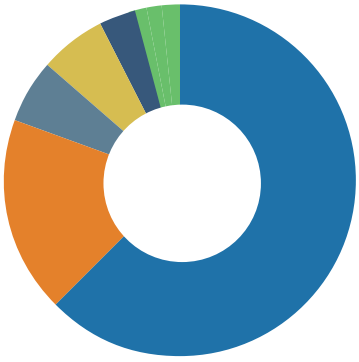


Yes	66%
No	21%
Unknown	13%

GRAPH 5.*16*

Contact claims – vessel location *(2013 – 2017)*

Claims cost: => 10,000 - uncapped (USD)
Type of vessel: Bulk carrier, container, tanker
As per 23/04/2018



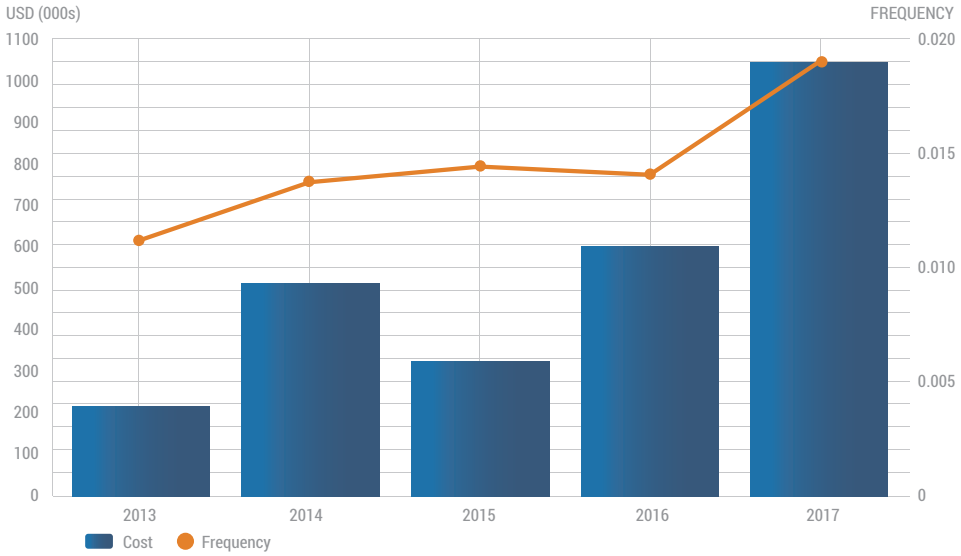
Port	63%
Lock	18%
Port approach	6%
Coastal water, within 12nm	6%
Anchorage area	3%
Other	4%

5.3.3 Grounding claims

GRAPH 5.17

Average claims costs & frequency of grounding claims *(2013 – 2017)*

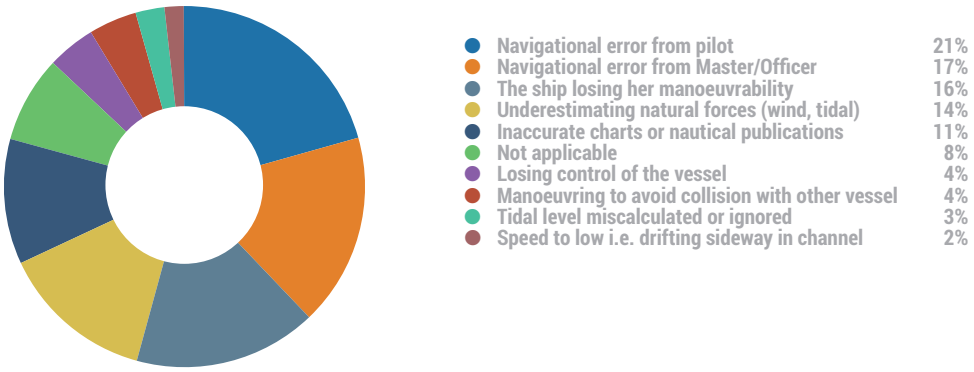
Claims cost: => 10,000 – uncapped (USD)
Type of vessel: Bulk carrier, container, tanker
As per 23/04/2018



GRAPH 5.18

Most common causes of grounding claims *(2013 – 2017)*

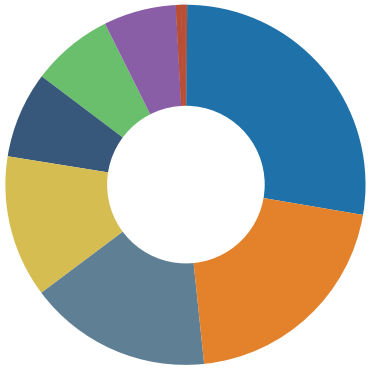
Claims cost: => 10,000 - uncapped (USD)
Type of vessel: Bulk carrier, container, tanker
As per 23/04/2018



GRAPH 5.19

Most costly causes of grounding claims *(2013 – 2017)*

Claims cost: => 10,000 - uncapped (USD)
Type of vessel: Bulk carrier, container, tanker
As per 23/04/2018

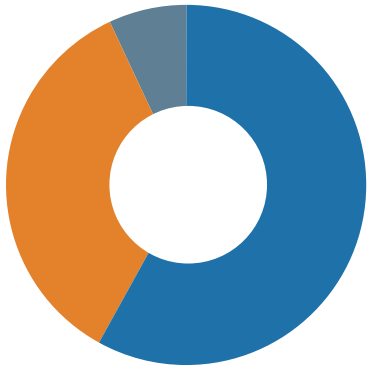


Underestimating natural forces (wind, tidal)	32%
Navigational error from Master/Officer	28%
Navigational error from pilot	13%
The ship losing her manoeuvrability	9%
Not applicable	8%
Inaccurate charts or nautical publications	5%
Manoeuvring to avoid collision with other vessel	4%
Other	1%

GRAPH 5.20

Grounding – pilot on bridge *(2013 – 2017)*

Claims cost: => 10,000 - uncapped (USD)
Type of vessel: Bulk carrier, container, tanker
As per 23/04/2018

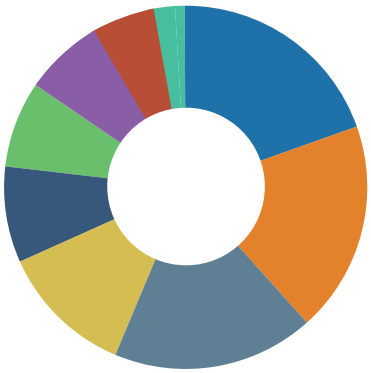


No	58%
Yes	35%
Unknown	7%

GRAPH 5.21

Grounding – vessel location *(2013 – 2017)*

Claims cost: => 10,000 - uncapped (USD)
Type of vessel: Bulk carrier, container, tanker
As per 23/04/2018



River	20%
Port	19%
Port approach	18%
Canal	12%
Coastal water, within 12nm	9%
Anchorage area	8%
Inland water	7%
Open sea, inside EEZ, 12-200nm	5%
Unknown	2%

5.4 Common causes of navigational error

5.4.1 Pilotage

A vessel is at its highest risk when it sails in enclosed waters - we define these as port, anchorage, port approach, river, and canal. Everything else will be considered open waters.

There is no surprise that 84% of all groundings and 94% of all contacts happen in enclosed waters. Collisions can happen anywhere, but the risks are greatest in enclosed waters where vessels depart and arrive at ports. This is confirmed in our statistics with 70% of collisions taking place in enclosed waters.

To enter and leave a port safely a pilot is most often required to be on board. Indeed, the Club's statistics show that during a navigational accident it is very likely that a pilot is on board - a pilot is on board ship during 30% of all collisions, 66% of all contacts and 58% of all groundings.

So how can we explain these statistics? The integration of the pilot into the bridge team has to be a priority. For a successful pilotage the Master needs to ensure that the pilot is fully briefed about the vessel and its limitations. In turn the pilot needs to update the Master about the intended route, and if this is agreed with the Master this route should be implemented into the voyage plan so that the OOW can monitor the progress of the vessel and voice any concerns to the pilot. There also needs to be proper communication between the pilot and the bridge team - closed loop communication is always preferred.

5.4.2 Situational awareness

One of the most common causes for a navigational claim is loss of situational awareness i.e. the officer has not been able to evaluate all the present risks and has missed vital information. We should, however, be careful not to apportion blame, but try to understand why the officer missed essential information or did not recognise the risks.

Our statistics highlight that in many of these accidents the officer did not use all available means on the bridge. It is essential, therefore, that the company trains their officers so they understand and know the capabilities and limitations of the equipment on the bridge.

Another key contributing factor is the fact that officers did not communicate efficiently with each other. Either there was no two-person confirmation or closed loop communication, or all information was not shared within the bridge team. It is essential that the Master ensures that the bridge team is comfortable and has the confidence to be assertive and voice any concerns they may have. The Swedish Club's MRM (Maritime Resource Management) shows, this approach is proven to reduce accidents. We strongly encourage our members to ensure that all officers on board the vessel receive MRM training, and that the manager makes sure that this is then practiced on board.

5.4.3 Bridge instructions

The issues highlighted in the below cases are addressed in our booklet ***'Bridge Instructions'***, which provides guidance on setting up an efficient bridge team, working with a pilot and when preparing your own navigation policy.

Technically, a collision should not occur if COLREGs are complied with. In real life however these do leave room for interpretation. We often see individual officers interpreting these requirements differently, which highlights the importance of training and understanding the risks and consequences of our actions.

A detailed navigation policy will make processes and procedures clear and support the bridge team in its decision making. It is also important to ensure that all officers are trained in simulators and have a thorough understanding of the bridge equipment and its limitations.

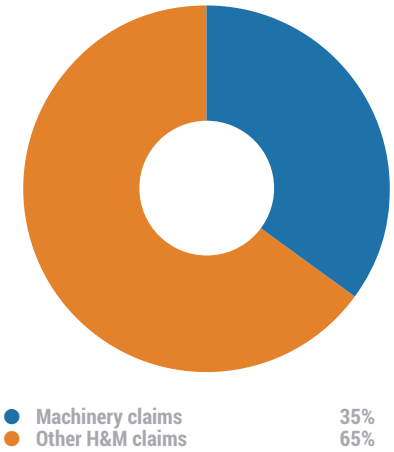
5.5 Machinery

Machinery claims are the most common claim type under H&M representing over 50% of all claims and 40% of costs. (See graphs 5.3 and 5.4.) Below are some of the major causes, recurring issues and findings. For more in depth analysis, please refer to The Swedish Club's ***'Main Engine Damage'*** and ***'Auxiliary Engine Damage'*** report.

5.5.1 Machinery claims statistics

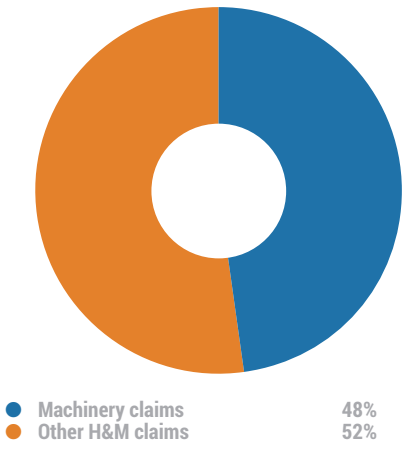
GRAPH 5.*22*

H&M claims by cost *(2010 – 2014)*



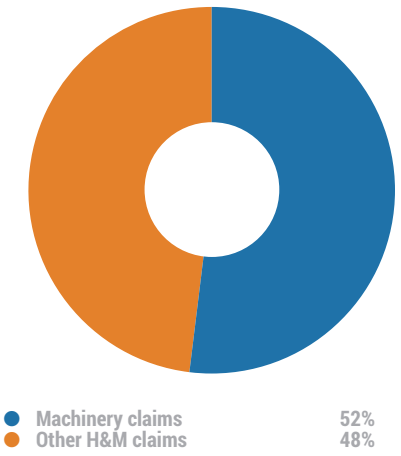
GRAPH 5.*23*

H&M claims by cost *(2015 – 2017)*



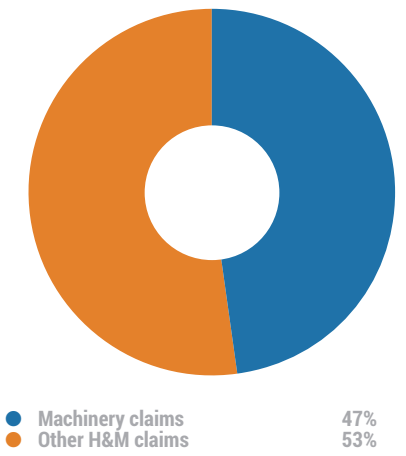
GRAPH 5.*24*

H&M claims by number *(2010 – 2014)*



GRAPH 5.*25*

H&M claims by number *(2015 – 2017)*



5.5.2 Case studies and loss prevention advice

CASE 1

Machinery failure

The vessel was in ballast and at anchor, awaiting further instructions. After seven days the weather deteriorated and the vessel´s anchor dragged. The anchor was heaved up and the vessel started to slow steam in the area. After about 24 hours the differential pressure alarm of the main engine duplex lubrication oil filter sounded in the engine control room. The crew found aluminium and other metal inside the lubrication filter, and in the crankcase of the main engine, metal particles were found.

The subsequent investigation alongside revealed that the metal parts found in the lubrication oil filters emanated from piston rings and piston skirts. Three pistons had almost seized. The main engine, a six cylinder medium speed type, had severe damage and the following parts had to be renewed; all cylinder liners, three complete pistons, piston rings on all cylinders, all main and connecting rod bearings.

In addition the turbo charger had to be overhauled as the nozzle ring was broken. The complete lubrication system had to be carefully cleaned and flushed.

The vessel was off hire for almost two weeks.

The pistons in cylinder units no.1 and 3 were melted down in certain areas and the skirt in no.4 was torn. Liners were scuffed as a result of the above. The cylinder lubrication channels were found clogged and so cylinder lubrication had been inactive. The lubrication oil pump was found deteriorated due to the hard impurities in the lube oil system.

It was obvious that the engine had been operated on a high thermal load for a long time and that the turbocharger efficiency had been affected by fouling. The lubrication oil had actually been contaminated for some time.

There had been indications that something had gone wrong, for example it was written in the log book that the auto filter had been shooting up to 609 times a day, but the engineers had not been concerned.

What can we learn?

- Fuel oil samples before and after purifiers were taken and analysed. The result indicated that the purifiers were working satisfactory. All fuel oil analyses from bunkering were within specification.
- Several samples of the damaged piston rings were sent to a laboratory. The conclusion was that the excessive wear of liners and pistons was not caused by catalytic fines.
- The cylinder liner lubrication system was tested and was found to work properly.
- At the time of the casualty the main engine, including turbo charger, had been running 7,300 hours since its previous major overhaul. This overhaul had been carried out 18 months previously.
- Investigation of the maintenance records showed that maintenance had been carried out in accordance with manufacturer's instructions.

• When reviewing the monthly main engine reports it became obvious that the main engine exhaust temperatures of all cylinder units had increased 30°C – 40°C for the previous six months.
• The turbo charger revolutions had dropped from about 14,500 rpm to 12,000 rpm at 85% load as had the charge air pressure from 1.7 bar to 1.2 bar. These changes also began to appear in the past six months.
• Due to high exhaust gas temperatures, the engine was under a high thermal load, which finally caused it to breakdown.

The company states that:

• The follow up of all engine logs has now been improved, especially the understanding of the exhaust gas temperatures and their alarm levels.
• The scope of performance reporting between vessel and office will also be intensified in the future.
• The trend logging of reported performance parameters in the shore manager's engine performance monitoring system has been implemented.
• Engineers will be sent on four stroke engine training courses.

CASE 2

CPP failure caused heavy contact with lock gate

The vessel was berthed alongside a quay, waiting to proceed through a lock to another berth. The pilot called on the radio and asked the Master if it would be possible to depart in half an hour. Pre-departure checks were completed by the OOW, the radar was tuned and the ECDIS set up for departure. The OOW did not check the controllable pitch propeller (CPP) as the vessel had only been alongside for twelve hours and the OOW assumed everything should be OK. He also felt stressed about preparing everything for departure in such a short time. According to the company's SMS, the CPP should always be tested before departure.

The Master came on the bridge accompanied by the pilot. The OOW did a quick handover and then proceeded to the forward mooring station. The Master and pilot had a short pilot briefing and afterwards the Master gave the order to let go all lines.

The vessel proceeded towards the lock and was in the final approach when the Master realised that the CPP was not responding correctly and the vessel was rapidly approaching the lock. The Master attempted to recover control of the CPP system, but the pitch was stuck at approximately 40% ahead, causing the vessel to accelerate. The Master panicked and was unsure what to do, so he shouted on the radio to the mooring parties to get the lines ashore and stop the vessel. The forward mooring party managed to get the forward spring secured to a bollard but no other lines were attached. The pilot ordered the tug that was standing by beside the vessel, to push the vessel towards the quay. This caused the vessel to make heavy contact with the quay, but unfortunately did not slow it down enough. The vessel continued towards the lock at a speed of about three knots, the forward spring broke with a loud bang, and finally the vessel made heavy contact with the outer lock gate.

Forty seconds after the impact the Master pushed the emergency stop button for propulsion.

Afterwards the engine control room took control of the propulsion.

Shortly after the incident the Chief Engineer and First Engineer inspected the CPP system to determine if something was wrong. Before any third party was able to investigate the CPP, the Chief Engineer cleared the system. This destroyed any evidence of what might have caused the failure.

The vessel was boarded by port state and class inspectors. The vessel sustained damage to its bulbous bow, the tug sustained minor damage and the lock gates sank. Fortunately there were no injuries or pollution. However there were costly repairs to both the lock and vessel.

It was also discovered that the company had had four similar CPP near misses reported on sister vessels. The company had not made any changes to the PMS (Planned Maintenance System) or sent any special instructions to the vessels in the fleet.

What can we learn?

- Ensure that the OOW understands why it is important to test all equipment as per the checklist, both for departure and arrival. This highlights the importance of carrying out the checks required by the SMS.
- The Master did not save the vessel's Voyage Data Recorder (VDR) – this was done by a port state inspector two hours after the incident. Always save the VDR, as soon as possible after an accident. It is important to have procedures that ensure that any evidence of what may have caused an accident is not removed or cleared in order to understand and learn why the accident happened.
- Always try to establish why an accident happened so it can be shared with the fleet. The near misses that had been reported to the company were never acted upon – there is no point in having a near miss reporting system if nothing is then done about the reports. Near misses and best practices should be shared within the fleet.

MEDIA ALERT!

Media risk points: The highly visible nature of the damage to the lock and vessel make it likely that this situation will attract media attention. The pattern of similar CPP near misses will create an easy target for any journalist who is able to identify the pattern. The pilot and local pilots' union may issue a statement (depending on culture). Any information from inside the company (e.g. former or current employees talking anonymously) could present a serious risk.

Recommended actions: A statement should be prepared and posted on the company's website, however no dark site (replacing the normal site) should be used as there have been no injuries or serious pollution. The statement should focus on the professionalism of the pilot and crew (look for positives rather than mistakes made) and on the absence of any environmental damage. A promise of a full investigation will be important. No speculation about blame should be included or directly responded to.

CASE 3

Routine job caused grounding

The vessel was in ballast and sailing about seven miles from land on its way to the loading port in the NW Atlantic. It was early spring with heavy winds blowing and large waves. There was also some ice in the water so the crew had to clear the lower starboard sea-chest which was blocked with ice. The crew changed to the upper intake and then removed the large cover from the lower sea suction filter, finding it choked with ice slush. While removing the ice the main sea water valve, located on the side shell plate, began to leak.

Whilst the crew were replacing the filter cover, one of the engineers applied a large valve wheel key to the actuator valve, in an attempt to stop the leakage. Too much force was applied damaging the gear mechanism that operates the valve spindle and water began leaking into the engine room at high pressure.

The crew made attempts to stop the leakage but the pressure and volume of water were too great. Attempts to pump out the water entering the engine room were also unsuccessful as electric motors and control gear were splashed with sea water causing short circuits which disabled the bilge pumps.

The vessel blacked out and began drifting in the severe weather conditions approximately 6-7 M off the coast. The Coastguard arrived at the scene and tried to attach a tow line, however the attempts failed. The vessel then dropped both anchors but this did not stop the vessel from drifting.

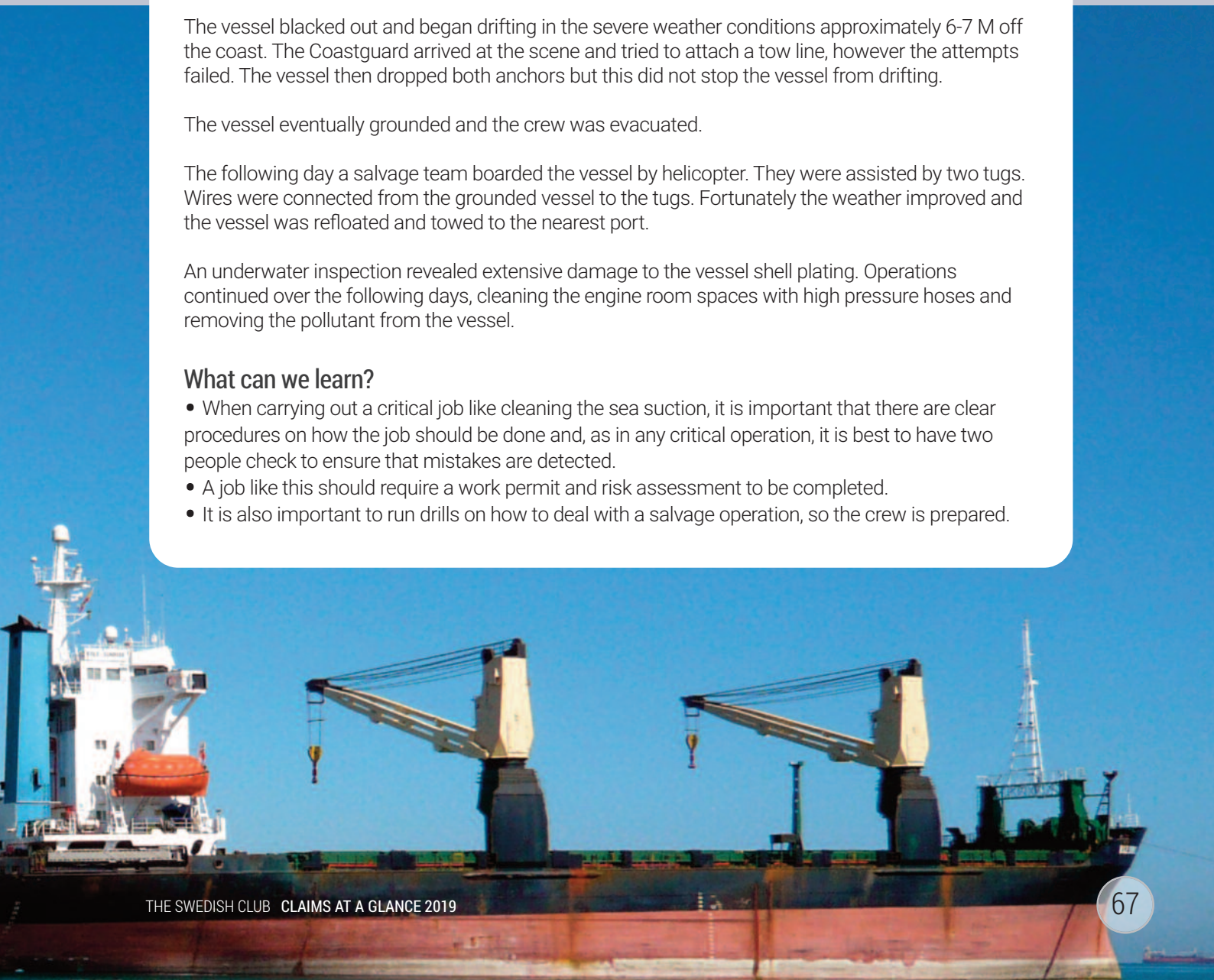
The vessel eventually grounded and the crew was evacuated.

The following day a salvage team boarded the vessel by helicopter. They were assisted by two tugs. Wires were connected from the grounded vessel to the tugs. Fortunately the weather improved and the vessel was refloated and towed to the nearest port.

An underwater inspection revealed extensive damage to the vessel shell plating. Operations continued over the following days, cleaning the engine room spaces with high pressure hoses and removing the pollutant from the vessel.

What can we learn?

- When carrying out a critical job like cleaning the sea suction, it is important that there are clear procedures on how the job should be done and, as in any critical operation, it is best to have two people check to ensure that mistakes are detected.
- A job like this should require a work permit and risk assessment to be completed.
- It is also important to run drills on how to deal with a salvage operation, so the crew is prepared.



5.5.3 Machinery focus

5.5.3.1 Auxilliary Engine Damage

For more detailed information please read our complete publication, ***'Auxiliary engine damage'***.
Auxiliary engines run at high revolutions and have a common lubrication system for both cylinder and crank case lubrication. Auxiliary engines are not covered by the same strict regime from the classification society as main engines and maintenance is often carried out by the vessel crew.

Major causes of damage

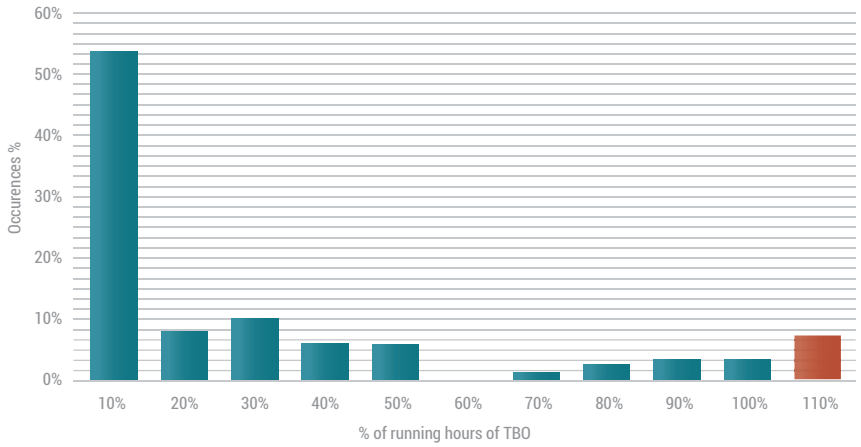
- Incorrect maintenance and repairs
- Failure to adhere to repair procedures and use of incorrect tools
- Crew lacking formal engine specific training
- Inexperienced crew and no expert in attendance
- Failure to detect contamination due to poor lubrication oil management
- Not following up on results from lubrication oil sampling

Time between overhaul (TBO)

The Club found that a majority of the casualties, 55%, occur within only 10% of the TBO, corresponding to the first 1,000 hours or so of operation after overhaul. In most cases, the damage occurs only a few hours after start up. The TBO of an auxiliary engine is normally between 12,000-16,000 hours.

GRAPH 5.*26*

Casualties % in relation to TBO recommended by manufacturers



Reviewing our records we note that the common factor for these occurrences in most cases is the incorrect assembly of vital engine parts in connection with regular overhaul. In particular, the assembly of connecting rods, bearings and pistons causes severe and costly accidents.

How to avoid auxiliary engine damage

- Ensure you have the necessary knowledge and experience before commencing any overhaul work.
- If you have not received training on the specific engine model, engage an expert from the manufacturer.
- Always strictly follow manufacturer's instructions.
- During overhaul, check and double check that stud bolts for connection rods and bearing keeps are tightened 100% in accordance with manufacturer's instructions.
- Ensure that required tools are available and calibrated as necessary.
- Monitor the quality of your lubrication oil and take prompt action when irregularities are detected.

5.5.3.2 Main engine damage

Introduction

The Swedish Club's ***'Main engine damage'*** report examines main engine damage claims in detail - specifically frequency, vessel type, engine manufacturers, engine speed, damaged parts and cause of damage. Please read the complete report for more information.

Major findings

- The Club experienced 734 machinery claims in the 2015-2017 period, totalling USD 384 million. Main engine damage is the most expensive category with a total cost of USD 131 million, contributing to 16% of the cost of all H&M claims and 34% of all machinery claims.
- The average cost of main engine claims has increased by 21% since the period 2010-2014, amounting to almost USD 650,000 per claim. It should be noted that this increase in costs has, however, been seen across the board in all machinery claims.
- Costly rudder and bearing damage have affected the result for steering claims, which have seen an increase in cost of 53%.
- The increase in the average deck equipment claims cost is because the number of offshore vessels that the Club insures has increased during the period 2015-2017. These carry expensive deck equipment. As the proportion of offshore vessels in the Club's portfolio increases, so does the average cost of deck equipment claims overall.
- On a positive note, the average claims cost for damaged turbochargers is reducing, a trend that has been apparent since the last publication. There has been a suggestion that a major contributing factor to this trend is the move seen in recent years from ball bearings to sliding bearings in the turbine rotor shafts.
- Medium/high speed engines are 2.5 times more frequently damaged than slow speed engines. They also have a disproportionate claims cost (43%) in relation to insured vessels (28%), whereas slow speed engines carry 72% of the insured vessels and 57% of the claims costs.
- Almost 60% of all insured vessels during the period of 2015-2017 were running on a slow speed S2 engine. They account for merely 30% of the claims and have a frequency of 0.012 claims per vessel. It is the best performing type of engine in the insured fleet.
- Generally speaking slow engines are more robust and have a lower damage frequency than medium/high speed engines.
- The medium/high speed engines are a minority in The Swedish Club's insured fleet. The top three engine manufacturers account for 31% of all the costs in the fleet and 19% of all the insured vessels.

How to avoid main engine damage

Prevention of damage is naturally preferable to cure. A first step to avoiding damage is to have a well-implemented and proper management system. This implementation can only be assured with proper training and education for the crew and providing them with the essential knowledge and experience required for ordinary daily work and maintenance according to company procedures.

- Implement robust onboard fuel and lubrication oil management systems.
- Carry out drip sampling when bunkering. Avoid consuming the fuel until analysis results are available.
- In addition to onboard testing of lubrication oil, submit samples for laboratory analysis at regular intervals, at least every third month.
- At regular intervals, carry out system checks of purifiers and filters for both fuel and lubrication oil systems.
- Ensure that maintenance manuals are at hand and that proper tools are available and calibrated. Crew members must have the necessary training and experience to carry out maintenance.
- It is highly recommended that engine maintenance is carried out as part of a computer based PMS (Planned Maintenance System), linked with the onshore organisation.
- During major overhauls it is recommended that an expert from the manufacturer is in attendance – consider a formal service agreement.
- Always take engine alarms seriously, for example oil mist detection, and investigate thoroughly. A fully functional alarm system is essential for the safe operation of the main engine.

5.6 Loss of anchor

5.6.1 Introduction

The Swedish Club recently worked with DNV GL and Gard in a Loss of Anchor project designed to highlight why anchor losses happen and provide learning materials to aid loss prevention initiatives and officer training. The main issue observed was that often the crew is not fully aware of the limitations of the anchor equipment.

With the correct training and understanding many of these anchor losses can be prevented.

5.6.2 The main causes of anchor loss

Anchor loss commonly occurs during normal anchoring operation in the designated anchorage. The most common causes are the following;

- When the vessel's speed is too high during anchoring.
- When dropped without control by the brake.
- When dropping anchor in too deep water.
- When dragging. (Sometimes this may also cause damage to cables and pipelines and cause collisions.)
- When the clutch disengages accidentally during anchoring operations.
- When anchor is stuck or fouled.
- When the hydraulic motor is engaged and the chain is pulled out by the vessel's movements.
- Breakdown of windlass motor and the anchor and chain needs to be cut.
- Technical failure:

Anchor loss due to failure of:

- D-Shackle
- Swivels
- Chain
- Kenter shackles

Anchor and chain lost due to technical failure of:

- Windlass motor
- Windlass brakes
- Chain stoppers

5.6.3 Acceptable design parameters for anchors

This is an issue that we believe that the crew is not fully aware of:

The Class Rules based on IACS UR A1 – anchoring equipment state the following:

- Designed for temporary mooring in a harbour or sheltered area
- Current velocity: max 2.5 m/s
- Wind velocity: max 25 m/s
- No waves

Equivalent condition including wave loads:

- Current velocity: max 1.5 m/sec
- Wind velocity: max 11 m/sec
- Significant wave height max 2 m

Length of paid out chain

- Scope of cable: 6-10 shackles
- Good holding ground

Anchor winch motor performance:

- Minimum lifting capacity of 3 lengths of chain, i.e. 82.5 metres plus the anchor

5.6.4 Loss prevention advice when anchoring

Prior to anchoring the Master and Chief Engineer need to discuss whether any overhaul of machinery or essential equipment for ship navigation is planned, to ensure that during anchoring no maintenance is done on the engines.

(i) How to anchor properly

Ensure the anchoring location is suitable and consider the following;

- Traffic and congestion in the area and your backup option.
- The water depth.
- That the windlass may not be able to recover more than three lengths of anchor chain (82.5 metres).
- Safe distance to underwater cables and pipelines.
- What is the nature of the sea bed & holding power?
- Clay is the best holding ground but has a 'sucking effect' to be considered for prolonged anchorage.
- Shingle and sand may be good holding ground.
- Pebbles and cobbles have low holding power.
- Rocky bottoms and slopes are poor anchoring grounds where the anchor may be stuck.

Take into account available port specific information as;

- Pilot books.
- 'Guide to Port Entry'.
- Large scale charts.
- ECDIS.
- Updated weather forecast for the anchoring period.
- Carry out a pre-anchoring brief with all involved parties, where all possible risks are evaluated.
- Make sure you always have a plan B.

There are three ways of lowering the anchor:

Let go of anchor.

- Anchor being let go from the hawse pipe or from sea level.
- Suitable for shallow waters (up to 20-25m) with soft sea beds.

Lowering by the windlass and let go controlled by brake.

- The anchor is lowered by the windlass until 10-15 metres from bottom and then let go controlled by the brakes.
- Suitable for depth range 25 to 50 metres and for hard and rocky bottom where impact may damage the anchor.

Lowering down by the windlass to bottom.

- Anchor chain is lowered by the windlass motor to the bottom.
- Suitable for depths more than 50 metres and when the sea bed is rocky.

(ii) When at anchor

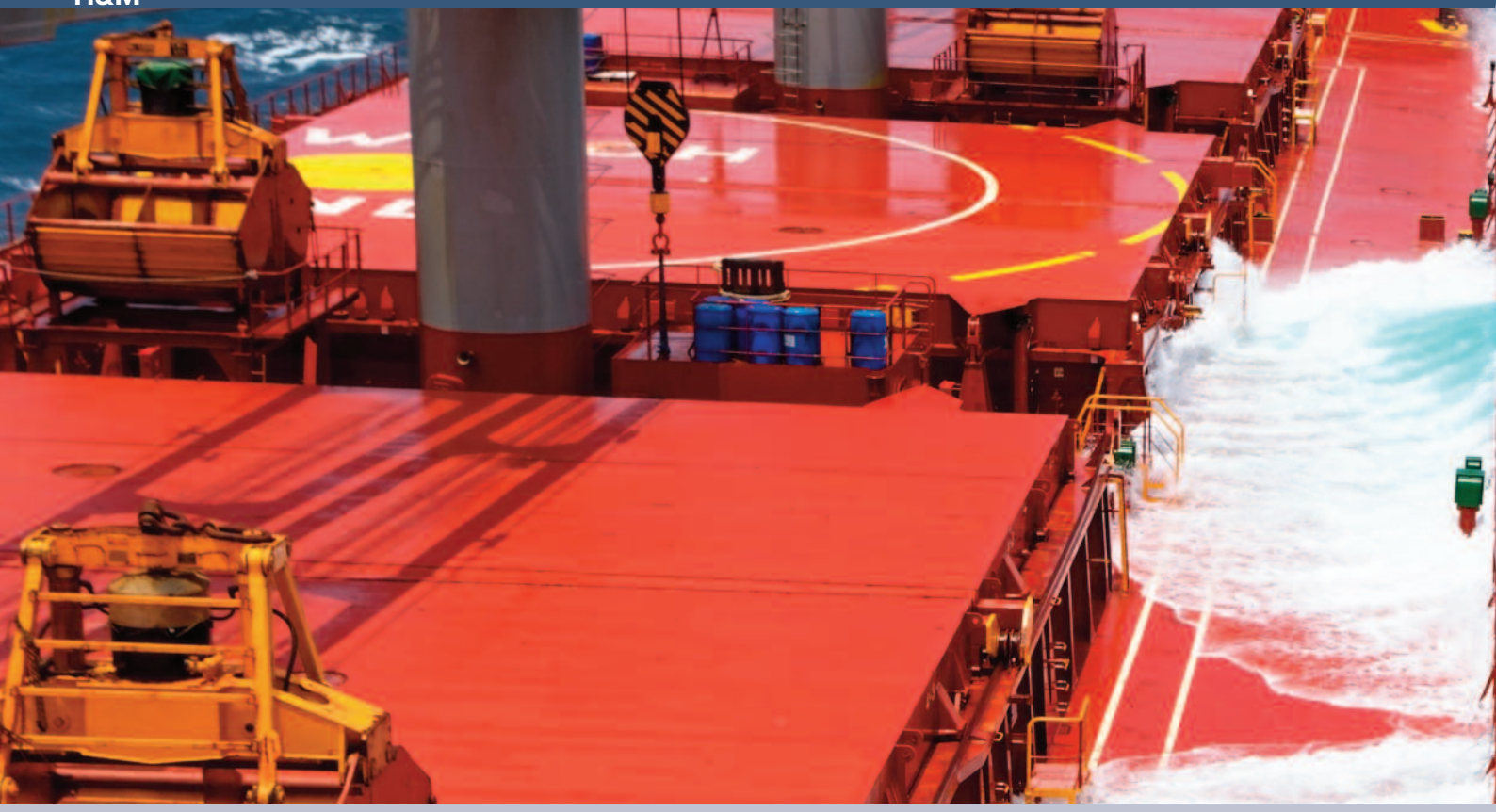
- Define the limiting wave / wind exposure based on the current at the location.
- In case of heavy weather approaching, leave the anchorage in time.
- When the anchor has been laid out, the chain stopper should be engaged and gear disconnected from the motor.
- Use all navigational equipment to ensure that the vessel is not dragging.
- If vessel stays at anchor for a long time and current and wind swing the vessel, heave the anchor to avoid knotting the chain and fouling the anchor with own chain.

(iii) Heaving the anchor

- Do not heave up the anchor in strong wind and high seas
- Minimise the tension in the chain to keep the chain as vertical as possible
- In windy weather conditions or strong current the rudder and engine must be fine-tuned to prevent too high tension in the chain and overload of the windlass motor
- Close communication between bridge and the anchor watch

(iv) Departure

- Ensure the anchor is safely secured before sailing
- The anchor to be securely stowed in the hawse pipe
- Excessive slack may cause 'hammering' of the anchor to the ship hull and loss of the D-shackle securing pin
- Winch brakes have to be applied
- Chain stoppers to be engaged
- Further secured with lashings with turnbuckles or other similar fasteners
- Windlass clutch has to be disconnected from the gear at sea to avoid risk of damage



5.6.5 Case studies and loss prevention advice

We can see from our findings that anchor equipment is not designed to withstand heavy weather and stronger currents. In many of the cases that we have experienced the vessel has been at anchor during heavy weather. This can lead to the loss of the anchor when the vessel starts to drag, or a situation occurring when the anchor chain cannot be retrieved as the hydraulic motor breaks down due to external forces from the heavy weather. A vessel should never be anchored when heavy weather is anticipated.

CASE 1

Loss of anchor in heavy weather

The vessel was waiting for its berth to become available so the decision was made to anchor. A pre-anchor briefing was held on the bridge where the number of shackles to be used was discussed and what different tasks the crew had during the anchoring operation.

One week earlier the bosun had inspected the windlass including the brake linings and had reported that all was in good condition.

The weather forecast warned of rough weather the following day. The Master informed the bridge team that he would decide what to do later regarding the anticipated heavy weather.

The anchoring party consisted of the Chief Officer, Bosun and two ABs. The bosun was controlling the brake, the Chief Officer was reporting what was happening to the bridge, and giving orders to the Bosun and ABs. This was the first time the crew had anchored at this anchorage.

The vessel approached the dedicated anchor position that the VTS had given them. When the vessel was fully stationary the Chief Officer ordered the bosun to walk the anchor out using the windlass motor. When the anchor was about half a shackle above the seabed the anchor was let go. All went well and the crew resumed their normal duties when the vessel was safely moored.

During the night the weather deteriorated. The OOW noticed that the vessel had begun to move and realised that the vessel was dragging. He called the Master who came up on the bridge. The weather was now rapidly deteriorating and the Master woke up the Chief Officer and told him to assemble the anchor party and heave up the anchor.

The weather had now increased to Beaufort 8 and the bow was slamming because of the large waves. At that point, while the anchor was being heaved up the windlass motor stopped. The Chief Officer could see smoke coming from it and it was obvious that the motor could not be fixed straight away. At the same time the weather was deteriorating even further so it was decided that the anchor chain should be let go. The bitter end was removed and the anchor chain was released. The vessel then left the anchorage and drifted in a safer position. The anchor and chain were lost and the vessel was not allowed to continue its journey until the anchor and chain had been replaced. The vessel had a spare anchor but the operation to replace the main anchor and chain took several days.

What can we learn?

- It is imperative that the crew understands the limitations of anchor equipment. Many of the issues mentioned above did happen in this case.
- This case study highlights the fact that the crew were not aware of the Class rules or maybe did not fully understand them.
- Anchor equipment is not designed to endure heavy weather. If heavy weather is anticipated the anchor should be raised.

6 Other advice

6.1 Piracy risks

Piracy in the Gulf of Aden has reduced in the last couple of years but may well be on the rise once again. Piracy in South East Asia is increasing and there has also been an increase in piracy attacks in the Gulf of Guinea (GoG). In this region it is more common that the crew is kidnapped, robbed or the cargo is stolen instead of hijacking the vessel.

BIMCO, ICS, INTERCARGO and INTERTANKO, have developed advice when trading in the GoG. ***'Guidelines for Owners, Operators and Masters for Protection against Piracy in the Gulf of Guinea Region'*** can be downloaded from https://www.maritimeglobalsecurity.org/ and should be used in conjunction with ***'Best Management Practices to Deter Piracy 5 (BMP 5)'***. This new industry resource provides information regarding all the regions of the world plagued with piracy.

We highly recommend all members download relevant information for the areas in which they trade. There are publications covering not only piracy but also cyber security, migration, stowaways, smuggling and armed conflict and war.

The highest risk waters are the coastal waters of Ghana, Nigeria, Togo, Cameroon and Benin, and vessels are most vulnerable when the vessel is drifting or at anchor.

It seems that cargo theft is more common for oil tankers and robbery and kidnapping is more common for bulk carriers.

6.1.1 Case studies and loss prevention advice

CASE 1

Awaiting berth

The laden product tanker was drifting 20 miles outside a West African port where they would discharge their cargo. There had been pirate attacks in the area so the Master had ordered preventive measures to be implemented as per the Ship Security Plan.

Two ABs were assigned to the poop deck and forecastle but they were also to monitor the main deck. The crew prepared the deck and attached a single coil of barbed wire on the poop deck, forecastle and on the railing around the vessel; locked all doors and turned on all the outside lights. The Chief Officer noticed that a couple of lights were broken amidships and told the Bosun to repair them the next day.

The agent had called the Master and informed him that the berth would be occupied for another two days and would be in contact when the berth was ready.

After midnight the Second Officer was on watch and was monitoring a dedicated VHF channel that the local navy was broadcasting on. The main engine was kept running so the vessel could manoeuvre instantly, and two ABs carried out regular patrols on deck.

Shortly after midnight a small boat slowly approached the vessel. It stopped amidships by the broken lights where the freeboard was only 2 metres. They put a ladder on the railing which had a carpet attached to protect them from the barbed wire and climbed on board.


MED

None of the ABs saw the small boat approaching. The boat did not give a stable echo reading on the radar as it was made of wood and the choppy sea interfered.

The five men who climbed on board were pirates and armed with machine guns. They made their way to the poop deck and surprised the AB on watch. The pirates demanded that the AB should take them to the bridge or they would kill him. The AB unlocked the door into the accommodation and led the pirates to the bridge. When the pirates had secured the bridge they asked for the Chief Engineer to be brought to the bridge. He was beaten when he arrived and told that he would be killed if he tried to sabotage the engine and that any engineer would be killed if they tampered with the engines.

The Second Officer was told to show two of the pirates to the Master's cabin and the other three remained on the bridge with an AB and the Chief Engineer. The Master was forcefully woken up, beaten and forced to open the safe and give all the money to the pirates. When the Master was taken to the bridge, ten more pirates had arrived. A larger vessel was drifting alongside which looked like a fishing boat.

One of the pirates identified himself as the leader and explained to the Master that all the crew should be summoned to the mess room. If anyone resisted or tried to sabotage anything on the vessel he would be killed.

All the crew, except the Master, were placed in the mess room and their hands were tied. The Master remained on the bridge.

One of the Ship Security Alert System (SSAS) buttons was under a radar console but the Master was not close to it and was too scared to push it.

The pirates took control of the vessel and sailed it for ten hours when they stopped beside another smaller tanker. They started a ship-to-ship operation and when the other tanker had been loaded it sailed off. The other two pirate boats had followed and were drifting alongside the vessel.

The pirates took the Master to the mess room and tied him to a chair. He finally freed himself and when he got to the bridge he realised that the pirates had left, because both pirate boats were gone.

He called the office and informed them what had happened.

What can we learn?

- Best management practices should be followed and need to be adapted to every different area the vessel is visiting. It is essential that a piracy risk assessment for the trading area has been completed as described in ***'Best Management Practices to Deter Piracy 5 (BMP5)'*** and ***'Guidelines for Owners, Operators and Masters for Protection Against Piracy in the Gulf of Guinea'***.
- It is not common for pirates in the Gulf of Guinea to use ladders, but in this attack ladders were used to board the vessel, so preventive measures should be analysed and implemented. Physical barriers which increase the height will make it more difficult for the pirates to attach the ladders. A proper risk assessment need to be completed.
- It is imperative that all required equipment is working condition. In this case a number of floodlights were broken.

Ships operating in the Gulf of Guinea area are strongly urged to plan according to the following:

- Arrive at the Pilot Station, Port, Anchorage or STS Area 'just in time'. Plan transit times with consideration to safe speed and maintaining distance offshore or use an offshore waiting area.

Consider higher transit speeds where the risk/threat assessment is high.

- Rendezvous – where possible, avoid waiting and slow steaming. Consider offering several alternative rendezvous points and advise rendezvous points at the last minute. If waiting, keep well off the coast (up to 200M). Do not give away waiting positions. Do not drift and keep engines ready for immediate manoeuvres.
- Vessels should proceed within the 200M range at full speed.
- Anchoring - where practicable, a prolonged stay at anchorage is to be avoided.
- Minimize use of VHF and use e-mail or secure satellite telephone instead. Where possible, answer only known or legitimate callers on the VHF, bearing in mind that imposters are likely and may even appear in uniform.
- The greatest risks of piracy are at night and these need to be factored into all planning. Where possible, operations should start and end during daylight hours.
- The use of privately contracted armed guards on board is banned in Nigerian waters.
- If using an armed escort, due diligence on the company providing this service must be conducted to ensure strict adherence to the MOU issued by the Nigerian Navy and Nigerian Maritime Administration & Safety Agency (NIMASA).
- Shipowners and managers must have a means of verification that hardening measures are available and in place on vessels prior to entering the GoG area.
- Spot checks for verification at ports within the GoG area are an additional option to consider.
- Nigerian naval armed guards can protect merchant ships utilising patrol boats to escort ships in the region.
- Maintain all-round visual lookouts & good radar watch.
- Report to MDAT-GoG (the Maritime Domain Awareness for Trade – Gulf of Guinea, operated jointly by French and UK Navies); watchkeepers@mdat-gog.org and Emergency Tel: +33(0) 298 22 88 88.
- The MDAT-GoG will liaise directly with the navies in the region in the event of an attack. If a ship does not report to the centre then there is likely to be a delay in the response from the regional navy. Alerts and warnings will be issued by MDAT-GoG and they will also contact vessels in the immediate vicinity of an incident.

MEDIA ALERT!

If news reaches journalists, media interest in this incident will be high and indeed should be expected. It is likely to have been sourced from any of the following: Nigerian Navy, local agents, other vessels, the pirate gang themselves, or loose chatter from the crew – not least on social media. The incident adds to the pattern of tanker product theft in the region – and if it brings the total number of attacks to a numerical milestone (10, 50, 100 etc.), this will add to the interest from editors.

Recommended actions:

- Carry out immediate monitoring for social media chatter.
- Draft a holding statement.
- Establish close communications with the families of those on board and provide reassurance as to the steps that are being taken – they must trust the company and not try to raise awareness of the incident by speaking to the media or politicians.
- Identify and prepare a company spokesperson.
- Consider internal communication to back office staff.
- When possible, the Master of the vessel should be briefed to deal with any media interest. The Nigerian Navy has sometimes forcibly brought journalists on board merchant vessels to talk to the Captain as a publicity stunt.


OPEN
SLOT
SELECT

6.2 Media risks: Knowing when to worry

Dustin Eno
COO & Crisis Response Manager
Navigate Response

Some serious shipping casualties barely make a ripple in the media landscape while other situations which may not even prompt a company to activate their emergency response plans can attract aggressive international attention.

The likelihood of media interest and the risks if media interest is attracted, should be evaluated as a standard part of all initial incident responses.

Start by asking, is the situation newsworthy? That is, if you had no connection to the incident would you be interested in reading about it?

Five warning signs:

1. Significant impacts beyond the vessel (e.g. pollution, damage to infrastructure or serious injuries).
2. Connection with a larger issue (e.g. environmental concerns in the Arctic or previous incidents involving the company).
3. Participants whose social media activity you can't control (e.g. passengers, activists or contractors).
4. Incident visible to television cameras or social media savvy audiences (e.g. oil slick / listing vessel).
5. Incident that is graphic, ridiculous or amusing (e.g. OOW was on Facebook during collision).

The more of these signs which apply to the incident, the more likely the situation is to be newsworthy and receive attention.

If any one of these signs is raised, the company's media response plan should be activated.The second step is to evaluate the potential risks associated with the anticipated coverage.

Reputation

Any newsworthy incident creates the risk of media scrutiny and pressure, but of more concern are the potential reputational and financial risks. These risks can be identified by looking at two factors:

1. The potential to be blamed
2. Vulnerability to allegations of inaction

People accept that accidents (even serious ones) happen, but questions of cause, which can easily lead to blame are almost inevitable. How vulnerable is your company to being blamed, not just legally, but by the media? Even if you think it is clear that the event is not your fault (attacked by terrorists, hit while moored alongside, or impacted by an earthquake), identify ways in which public opinion might find fault with your preparedness, training, hiring practices, maintenance, safety culture etc.

Whether or not blame is a possibility (and it usually is), will people see that you are responding actively and effectively?

Public anger, activist pressure and eventual government intervention (which is almost always very costly) usually begins when a company is not seen to be taking sufficient action. Some actions are highly visible, but many actions a shipowner takes during an incident are not immediately obvious. Identifying where the strength of your response might not be obvious to the public and therefore needs to be explained/highlighted should be part of the ongoing response to any incident.

For every situation, evaluate the newsworthiness, the potential for blame and the risks of being seen as nonresponsive. Base the media response strategy on this assessment rather than on a technical assessment of the incident's severity.

7 Conclusion

The cases we have included in this year's Claims at a Glance highlight what happens if risks are not properly assessed. Working at sea is by default a dangerous job and provides a unique and self sufficient working environment. When at sea all problems and emergencies need to be handled by the crew. That is why it is so important to understand the consequences of your actions or inactions. If not this can lead to the end of your career and in the worst case injury or even death.

Many accidents are caused by poor decisions and so we believe it is important to try to understand why accidents happen, train the crew, and ensure they have the correct knowledge and understanding of risks.

It only takes one mistake during an entire career to change everything. It might be difficult to motivate a crew to follow the company's procedures and best management practices, but the importance of complying with procedures becomes apparent when the consequences are demonstrated.

It is probably even more important to focus upon best management practices. Most vessels sail between ports safely and without major incidents, and so it needs to be acknowledged when a good and efficient safety culture is working on board.

Internal audits on board a vessel, carried out properly, can really enhance the safety culture on board. The most efficient approach is to ensure that the auditor is not just following the checklist but is talking to the crew and understanding the problems they experience. If specific problems are identified then training should be carried out - not just to highlight observations and non-conformities but to understand why these procedures have not been complied with.

We do acknowledge that the crew and office are being audited and inspected by many external organisations which is why it is ever more important to ensure that the internal audits carried out by the company focus on the proper areas and provide training when needed.

We are very pleased to see the industry trend is that the overall amount of insurance claims are not increasing, however the average cost for these claims is increasing. The best defence is to have a well implemented safety culture and efficient loss prevention.

We at The Swedish Club hope that you have found this publication interesting and that you can take the practical advice it contains back to your own organisation.

8 Appendix I

An insight into wet damage on bulk carriers

This appendix contains selected extracts from The Swedish Club's publication ***'Wet Damage on Bulk Carriers'***.

Wet damage on bulk carrier cargo is a recurring problem. The most common challenge is that seawater enters the cargo holds due to leakage in the sealing system between the cargo hatch covers and the coaming.

In our publication the Club joined forces with the cargo hatch cover experts MacGregor and classification society DNV GL to investigate causes and deliver practical loss prevention advice. We include below highlights from the publication.

Wet damage accounts for about 15% of all cargo claims experienced by The Swedish Club and the cost is about 10% of the total cargo claims cost.

The most common wet cargo issues are related to the following;

- Leaking cross-joints
- Compression bars in poor condition
- Rubber gaskets in poor condition
- Hatch coamings in poor condition
- Leaking transverse packings
- Drain channels in poor condition
- Non-return valves in poor condition
- Cleats in poor condition

To ensure that the hatch covers are weathertight the sealing system needs to be in a good condition. The function of the sealing system is to protect the cargo from water ingress, and to contribute to the safety of the vessel by:

- Keeping water out by weathertight sealing between the hatch covers and the coaming, and in the hatch cover panel joints.
- Allowing for hull and coaming deformations at sea while still maintaining an effective sealing function.
- Keeping cargo dry and protected and/or inert gases inside the hold.

In many of the cases that we have experienced, the crew taped and attached sealing foam to the cargo hatch covers to prevent water from entering the cargo hold. This can give a false sense of protection. To be able to prevent water from entering the cargo hold the crew and shipowner has to ensure that the cargo hatch system is maintained and in proper condition. The use of tape and sealing foam should not be used as a replacement for proper maintenance.

It is imperative to ensure that the cargo hatch cover system's components are in proper condition, as this will reduce the risk of seawater entering the cargo holds.

Cargo hatch covers – maintenance

What the crew should do:

- Ensure that the paint is intact, which will give good protection against corrosion.
- Ensure that gaskets and coamings are in good condition.
- Inspect and test hatch covers at regular intervals to ensure that the weathertight integrity is maintained and that the vessel is in a cargo-worthy and seaworthy condition.
- Ensure records are kept about what maintenance and service has been completed in the Planned Maintenance System (PMS).

What the manager should ensure:

- A prudent shipowner will have vessel-specific procedures for operating the hatch covers e.g. opening, cleaning before closing, closing, cleating etc. and reporting routines when problems are detected.
- All maintenance of the cargo hatch system should be included in the vessel's PMS.
- It is important that the PMS clearly states how the maintenance should be done.
- It is essential that records are kept about what maintenance and service has been completed in the PMS.
- Inspections and tests of all cargo hatch components should also be included in the PMS and documented.
- It is essential that cargo hatch covers are inspected and tested at regular intervals to ensure that the watertight integrity is maintained and that the vessel is in a cargo-worthy and seaworthy condition.
- If complicated repairs are required, professional specialists should be employed.
- It is strongly recommended that a service engineer from the manufacturer inspects the cargo hatch system regularly, or at least ahead of an up-coming dry docking, in order to determine the condition of the hatch cover system and identify any necessary repairs.

Testing of weathertightness

- Carry out a tightness test at least annually and always after repairing or replacing components in the cargo hatch system. Water hose testing is frequently used but ultrasonic testing is preferred.
- When carrying water-sensitive cargo such as grain, soybeans, paper, etc. it is recommended that weathertightness is tested before each loaded voyage.

Cargo hatch covers – maintenance

It follows from the P&I rules that the member is covered in respect of liabilities, costs or expenses incurred by him in his capacity as owner, operator or charterer of the entered ship and rising out of an event during the period of insurance as a direct consequence of the operation of that ship.

There could be a condition in the insurance contract that the deductible is doubled for cargo liabilities caused by leaking hatches and/or hull (leaking hull includes tanks and pipes). It should also be noted that there is a risk that P&I cover could be jeopardised in case of the member's intentional or grossly negligent acts or omissions, or for such acts or omissions which the member knew, or ought to have known, would cause liabilities, costs or expenses.

9 Appendix II

An insight into cargo fires

This appendix contains extracts from The Swedish Club's publication ***'Fire'*** produced in partnership with experts Burgoynes.

Self heating

Coal

Coal starting temperature. It is important to check coal temperatures vs. the 55°C limit before and during loading. The International Maritime Solid Bulk Cargoes (IMSBC) Code also limits heating of fuel tanks adjacent to cargo holds to an average of 55°C.

Coal carbon monoxide production

When evaluating how to deal with high carbon monoxide concentrations in coal it is important to consider all of the relevant gas readings over the period since the coal was loaded.

Coal Lower Explosible Limit (LEL) readings

A high reading, above approx. 20% LEL, needs careful consideration because a risk of explosion may be developing.

Coal fires

If coal self-heating becomes a fire, then fire-fighting is usually with water. The International Maritime solid Bulk Cargoes (IMSBC) Code advises against the use of water but there may be little alternative. Fresh water should be used if possible because seawater often causes problems with the end use of the coal.

Coal with methane

Some coal contains methane gas that is released once the coal is mined. Methane is flammable and so it can present an explosion risk in ships' holds. Note: methane-emitting coal therefore needs ventilation, which is the opposite of self-heating coal. Following the IMSBC Code requirements with respect to taking gas readings should avoid this situation.

Direct Reduced Iron (DRI)

DRI is affected by water ingress, and so in heavy weather can start problematic self-heating. Seawater tends to be more reactive than fresh water. DRI should be properly cooled and aged before loading in order to reduce its reactivity.

Charcoal

Charcoal may be subject to the International Maritime Dangerous Goods (IMDG) Code requirements. If the IMDG Code applies, adequate heat treatment and then cooling of the charcoal is required before packing. This is to reduce the reactivity of the charcoal by allowing it to oxidise under controlled conditions.

Reactive solids

Reactive solids include calcium hypochlorite and other oxidising solids. These materials do not oxidise but they can be relatively unstable chemicals that decompose slowly over time, evolving oxygen. This self-decomposition can evolve heat which can lead to thermal runaway and an explosion. The IMDG Code, the International Group of P&I Clubs and some shipping lines give requirements for shipping some cargoes of this type, which are intended to reduce the risk of incidents.

Cargoes affected by other causes of heating

Cargo lights

Cargo lights in holds need to be properly isolated before cargo is loaded. This is best done by removing fuses or other physical links in the electrical circuits so that the lights cannot be switched on by mistake.

Smoking and hot work

Smoking and hot work need to be properly controlled. Control of smoking can be difficult where stevedores are working on board. Hot work permits need to be properly considered, not just a 'tick box' exercise.

Cars and other vehicles

Cars and other vehicles carried on board ships present some risk of fire. Risks include, cargo shifting in heavy weather, used vehicles in poor condition and electrical faults.

Fumigants

Fumigants can cause fire or explosion, particularly if there is an excessive amount of fumigant in one place; or if the fumigant is contacted by liquid water e.g. from sweating or condensation. In these situations the fumigant can react too quickly, evolving excessive heat or explosive gas/vapour. Fumigants must be correctly applied by qualified personnel. *See case 2 on page 31.*

P&I

Bulk carriers and container vessels

Issue Wet damage is the most costly category of P&I, and one of the most common.
Solution Most wet damage is caused by lack of maintenance. It is essential that cargo hatch covers are inspected and tested at regular intervals to ensure that the weathertight integrity is maintained.

Tanker vessels

Issue After shortage, contamination is the costliest cargo claim for tanker vessels, and one of the most common.
Solution Many claims will be prevented if a first foot sample of the cargo is taken and analysed before loading is allowed to continue.

Injury

Issue The most common and costly injuries are slips and falls which are often caused by equipment lying on deck and during cargo operation.
Solution Ensure risk assessments are carried out and followed. Implement suitable procedures from COSWP (Code of Safe Working Practices). Focus should be on training and best practices.

Illness

Issue Cardiovascular disease is seen to be the most common and the costliest illness.
Solution Remedial action can be taken on board to improve the health of the crew, including promoting healthier diets, ensuring there are exercise facilities on board, discouraging smoking and drinking, and supporting crew members who wish to change their lifestyle.

H&M

Navigational claims

Issue These are manifested as collisions, contacts and groundings, generally caused by poor communication, failing to follow company procedures and not taking action at an early stage.
Solution Proper communication between the bridge team (and the pilot, if on board), a detailed navigation policy and proper training to ensure that all officers have a thorough understanding of the bridge equipment and its limitations.

Machinery claims

Issue Machinery claims are the most expensive claim type under H&M representing over 50% of all claims and 40% of costs.
Solution A well implemented management system accompanied by proper training and education, providing the crew with the knowledge and experience required is essential.

Training

Issue Many incidents across all categories of claims arise due to a lack of proper training.
Solution Managers should ensure that the crew on board and the shore department work as a team; procedures should reflect actual onboard procedures; the effectiveness of training should be verified by shore staff during visits and audits and any accidents and near misses experienced by the company should be incorporated in the training.

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