Lloyd's List Intelligence

MARITIME SAFETY 2012-2021

A decade of progress

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CONTENTS

RICHARD CLAYTON
Chief Correspondent, Lloyd's List

CHRIS PÅLSSON
Author, Head of Consulting Lloyd's List Intelligence

ADRIAN SKIDMORE
Sales Lead, Lloyd's List Intelligence
adrian.skidmore@informa.com

LUCY SMITH
Program Manager, Lloyd's List Intelligence

NEIL WIESE
Commercial Editor, Lloyd's List Intelligence

Lloyd's List Intelligence

Published by Informa UK Ltd.

TRANSFORMATION WILL REQUIRE NEW WAYS OF THINKING ABOUT SAFETY

By Richard Clayton
Chief Correspondent, Lloyd's List

SAFETY is not the absence of danger, nor is it a checklist with ticks alongside. Safety is the foundation on which you build your life, and your life's work. Moreover, it's not a box separated from the other boxes that make up a business operation, it's the box within which your business is carried out.

It does not follow that shipping is safer because there have been fewer accidents and incidents. A reduction in casualties might indicate that something is going right – it should spur us on to understand what that might be.

Too often shipping accepts a level of risk and measures the outcomes against that level. The sea is, after all, an unforgiving medium. Wind and waves, when whipped into turbulence, make for a dangerous environment that challenges the ingenuity of engineers, designers, and navigators. That won't change when the balance between humans and technology shifts in favour of tech.

This DNV maritime safety report comes at a time of rapid change for shipping. The push for decarbonisation has become the dominant driver for all sectors of the industry, while the introduction of new technologies will bring new ways of working and demands a new mindset from everyone involved in shipping.

At a time of transformation, possible risks are more likely to come from new fuels, novel technologies, and ambitious expectations impacting one on another. This is when everyone anticipates possible unintended consequences and trains to expect the unexpected. Safety successes of the past will be no guarantee against the challenges of the future.

And it's precisely at a time of transition that the industry needs to focus on why an incident happened and not on who was to blame. In the maritime industry, we see the same incidents happening repeatedly. Lives are changed, businesses are broken, reputations are lost. The answer is not to reiterate the mantra about 'human error' but to dig deeply, to share widely, and to implement intelligently.

Speaking on a Lloyd's List podcast following the release of a new analysis, Closing the Safety Gap in an Era of Transformation, DNV Principal Consultant Fenna van der Merwe warned that safety is not an add-on.

"Our research showed that we need to continue to focus on the people on our way to a safer, cleaner future in maritime," she said. "Through breaking down silos we can generate a holistic picture of safety risk and collaborate towards identifying and implementing mitigating measures."

It's that holistic view that underpins safety at all levels. Pointing to human error might have been accurate but it has not always been helpful in getting to the bottom of why accidents and incidents happen. This report reveals that while data is good and analysis of the data is even better, it's the insight offered through a holistic understanding of the maritime venture that is the real basis for safer shipping.

In 2015, an American cargo ship sank with the loss of 33 lives. It was the deadliest American maritime disaster since World War II. At the end of her human-centric analysis of the tragedy, published as Into the Raging Sea [4th Estate, 2018], author Rachel Slade demanded to know, "with all our sophisticated technology, how could an accident of this magnitude happen?"

How indeed. The loss of the El Faro and her crew serves as a warning for the industry to be mindful that even when all precautions are taken, safety must remain the priority. This report, with its overarching conclusion that the number of shipping incidents is falling steadily despite a continued increase in fleet size, supports the industry's ongoing efforts.

PEOPLE ARE KEY TO FURTHERING SAFETY'S PROGRESS

By Knut Ørbeck-Nilssen
CEO Maritime, DNV

The welfare of our seafarers and the environment lies at the core of safe and sustainable ship operations.

The decline in the number of vessel casualties and losses over the past decade is testament to the shipping industry's efforts to improve safety standards towards the overarching goal of safeguarding life, property, and the environment.

Measures such as increased digitalisation and automation of ship systems, modern class rules, better vessels and tighter regulatory supervision have contributed to this welcome safety trend.

Nevertheless, the toll of fatalities from ship accidents over the same period should not be forgotten or overlooked. The ambition must always remain to avoid incidents at sea through a culture of continuous improvement, even as the tectonic shifts of digitalisation and decarbonisation pose new safety challenges for the industry.

At DNV we've identified a looming "safety gap" between shipping's existing safety-risk approach and ambitions for greater digitalisation and the adoption of alternative, more environmentally friendly fuels. The longer we wait to identify and address these, the more the gap will grow.

We need renewed risk controls and a new regulatory approach, based on individual fuel assessments, knowledge, and experience. Simply applying existing rules and standards is not an option. To develop these and close the safety gap requires a collaborative, continual effort.

Class has a role to play acting as trailblazers for regulators, gathering expertise, partnering with industry, and developing guidelines. Suppliers, owners, charterers, and yards can work together to ensure a holistic approach to safety onboard – where one decision impacts directly upon another. And all stakeholders should work together to build fuel-specific competence and enable a culture of continuous improvement.

Incoming alternative fuel technologies will require a renewed safety focus to understand and mitigate potential hazards that can put lives and vessels at risk.

A human-centric approach to design and operation is therefore essential when developing new technologies, automated processes, and systems to ensure they are focused on the end user so that their potential can be realised in a safe and sustainable manner for the transformation of shipping.

The pandemic underscored the value of our seafarers to global trade. Their efforts to keep the wheels of the global economy turning throughout this incredibly difficult period was nothing short of herculean. The role of seafarers will remain no less important as we progress into a future of greater system complexity.

If we want to ensure a safe, timely and impactful maritime transformation, we as an industry, must embrace the potential in our seafarers and onshore personnel. Continual competence development in these developing areas is critical to manage the transition safely. Silos must be broken down in a collaborative, connected approach to fertilise knowledge sharing, while safety data and information should be shared for the betterment of safety at sea.

Working on emerging safety risks will need to be balanced with issues that may seem quite basic but are still out there; things such as cargo liquefaction, fires, and risks during manoeuvring. Preventing these issues lays the groundwork for keeping crews and vessels safe in a time of unprecedented transformation.

The industry is embarking on a Maritime Renaissance. As we step forward into this inspiring new era, we must keep safety at the core of technological progress.

EXECUTIVE SUMMARY

Don’t let ‘safer’ be the enemy of ‘safest’

By Chris Pålsson
Head of Consulting, Lloyd’s List Intelligence

THIS comprehensive report into maritime safety is based upon data drawn from the decade spanning 2012-2021, up to the mid-point of 2021.

Using the unique databases of Lloyd’s List Intelligence, we have reviewed 866,000 inspections, 26,000 detentions, 22,000 casualty incidents, and 1,000 losses.

Through interrogation of that data, we have identified a gratifying, overall pattern of improvement in maritime safety, although there can be no room or time for complacency, and critical issues lie ahead for shipping.

However, it does no harm to look at what has been achieved as a result of targeted and consolidated effort, even as the industry seeks solutions for future issues to be confronted.

Enhancements to safety and environmental protection in the past decade have been remarkable.

In the early 1990s, the global shipping fleet was losing vessels at a rate of 200-300 each year. The current rate of attrition is between 50 and 100 vessels a year. This is even more remarkable given the fact that there are almost 130,000 ships in the global fleet (100 gross tons+) compared with just 80,000 ships some 30 years ago.

Much has happened in the past ten years to which this report refers.

MACHINERY DAMAGE THE PEAK CASUALTY CAUSE

In January 2015, the sulphur limits in the SECAs (sulphur emission control areas) were capped to 0.1%. Five years later, a global sulphur cap of 0.5% entered into force. Consequently, more fuel types have entered the market to make it possible for ship operators to comply with regulations.

The long-term impact of the new fuels on ships’ engines may not yet be fully known, but it is known that machinery damage is the most common cause of casualty. Engine designers and other stakeholders must, and will, follow this development closely.

The route to decarbonisation tops the agenda as much for shipping as it does for other sectors of the global economy. There is great uncertainty about how ships should be fuelled, propelled, and designed to meet both future environmental targets and business demands.

LNG has been the alternative fuel of choice over the past 10 years, with high numbers recorded for 2021, thus positioning LNG as a relevant fuel for many. Ships ordered with electro fuels, hybrid, or fully electric drives are on the increase, and further solutions are likely to emerge.

Every one of these solutions brings a requirement to evaluate all safety aspects.

PANDEMIC IMPACT ON SAFETY

Shipping has not been immune to the impact of Covid-19. Indeed, much to the delight of the often ‘unsung’ world of shipping, the global community has been made even more aware of the importance of seaborne trade logistics through pandemic-related supply chain problems.

Passenger shipping, in all its forms, was immediately and heavily impacted by the pandemic. Because passenger vessels are involved in a relatively high share of safety incidents, particularly machinery damage and contacts, those numbers dropped as activity stopped.

Tanker shipping activity followed a different track. Oil prices plunged in the northern spring of 2020 and trade intensified as oil market stakeholders seized the opportunity to stock up at low prices. Many tankers were chartered for storage.

Container carriers saw activity drop early in 2020 as China went into lockdown. As China gradually opened, Europe and the US shut down. Stocks continued to pile up, with serious disruptions to the supply chain worldwide.

Basic services were gradually reinstated, but challenges quickly mounted, with stockpiles, reduced capacities in ports, limited availability of trucking, labour shortages and a shortage of containers. Charter and freight rates surged. Idle ships were taken into service and new ship ordering regained momentum.

> Enhancements to safety and environmental protection in the past decade have been remarkable

It was challenging to change crew as travelling was heavily restricted. There were many examples of crew being stuck onboard ships for months longer than planned.

In 2020, unrelated to the pandemic, the 200,00 dwt bulk carrier *Wakashio* ran aground on a reef south-east of Mauritius in July. The ship later broke into two. At the time, the crew had been onboard the ship much longer than usual due to the pandemic. One year later, they were still in Mauritius, held in custody without charge. The ITF called on the Mauritius government to release the crew.

One of the most disastrous incidents in 2020 was the explosion on 4 August in Beirut port, Lebanon. The explosion destroyed port infrastructure, killed 200 and injured more than 6,500 people. Several ships in port were also damaged. The passenger vessel *Orient Queen* was severely damaged at berth. The ship later listed, capsized, and sank.

Navigational safety drew global attention in 2021 through the plight of the *Ever Given*. The container ship ran aground in the Suez Canal on 23 March, blocking canal traffic for six days. The incident headlined the news agenda around the world as the importance of free-flowing maritime traffic suddenly became evident to everyone.

DOWNWARD TREND FOR DETENTIONS

The average number of vessels inspected each year between 2012 and 2019 was 94,800. Fewer inspections were carried out in 2020 because of the pandemic. The overall trend for the period from 2012 onwards reveals a decline in the number of inspections despite a steady growth of the global fleet.

While this is true for the entire fleet, the underlying details show a slightly different trend.

The number of inspections is increasing for the growing fleets of bulk carriers, container ships and gas carriers, and are on a sustained level for other tankers. However, fleets which are declining in number are seeing a diminishing number of inspections.

Gratifyingly, inspections that lead to detentions are following a clear downward trend. By 2019, detentions were 40% fewer than in 2012, a remarkable reduction. The number of detained ships was down for all vessel types, but most of all for general cargo carriers. Over the years, general cargo carriers have been the most detained vessels, but since 2019 detained general cargo carrier numbers are on about the same level as bulk carriers.

In that context, it should be mentioned that there are almost twice as many inspections of bulk carriers than of general cargo carriers, so the share of inspected ships that lead to detention is still higher for general cargo carriers.

The world fleet consists of 130,000 ships of 100 gt and above, aggregating 1.56 billion gt. By number of ships, slightly more than half (54%) of the fleet was built since the turn of the millennium. However, in terms of gt, fully 88% of the fleet has been built since 2012. So, in general terms, large ships are young and old ships are small. (see Figure 1 showing world fleet age profile by gt and year built)

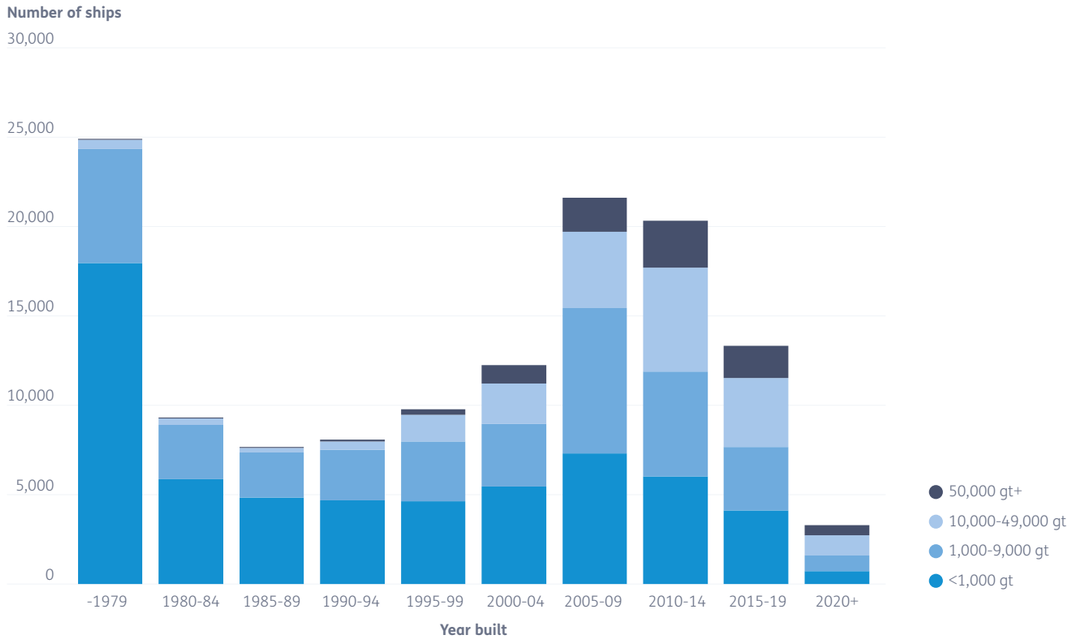


Figure 1: World fleet age profile by gt and year built

2014 OR 2017? A PEAK YEAR FOR CASUALTIES

Most detained vessels are small, below 10,000 gt, and close to half of the small vessels are 25 years or older. When ships reach the second half of their lifecycles, it is common for ownership and flag to change, so ships end up with smaller shipowners. That might mean ships receive better care and are properly maintained, but there are risks too; resources are limited in tougher times, with resulting implications for the frequency of service, maintenance, and repair.

A total of 21,746 casualties were recorded over the past decade. The year 2017 saw the greatest number of casualties, although when the number of casualties are calculated in relation to the size of the fleet in any given year, the peak year was 2014. Casualty numbers have declined since 2017, and the incident rate has declined since 2014.

While machinery damage continues to be the main cause of casualties, as mentioned above, there is not enough detailed data evidence yet to make a definitive determination as to why this is, but factors such as new fuels, change of speed and other measures to remain compliant with EEXI and CII could increase the risk of machinery failure and damage.

One of these factors, bunker fuel quality, is expected to emerge as an increasing source of scrutiny in incident reporting as more fuel types become available on the market. In recent years, low sulphur fuels and LNG have become widely offered. Bio-fuels and electro-fuels are still relatively rare but will be more readily available in the near term. The potential impact on the frequency of machinery damage is uncertain, but fuels and lubricants specialists have issued warnings.

Ship engines perform best when running at ratings defined by the engine designers. The engine should match the ship's size and targeted design speed. In the past decade, ship speeds have been reduced to save fuel and costs. If slow steaming is maintained for months or years, there will be an impact on engine reliability. The seriousness of this impact depends on how slow and for how long the ships are ordered to operate at those speeds.

Lloyd's List Intelligence records identify in excess of 8,000 different engine designations. Many of them are variations of the same engine family, but that reflects the many and unique engines available. It is too early and too diversified to accurately forecast how hard the impact of fuel switch will be on each engine type.

The highest number of casualty incidents involve general cargo carriers and passenger vessels. As mentioned above, these are large fleets with a significant share of old and small vessels. These are often low-margin business operations, which compromises fleet renewal.

A contributing factor is that parts of passenger vessel services for river crossings or connections with archipelagos are frequently operated by public entities. Public funding is generally constrained, and contracts commonly awarded to the lowest bidder. Those low bids, more often than not, are backed by older ships with lower capital costs.

> While fewer passenger ships are being lost, every lost vessel is one too many

NEWBUILDING PRICES ON THE RISE

The ultimate failure for maritime safety is when a ship is lost, and people onboard lose their lives. While fewer passenger ships are being lost, every lost vessel is one too many. Climate change is leading to more extreme weather and weather events, which must be understood and for which preparations will have to be made in order to protect lives and livelihoods.

Ship designs to match rougher weather conditions may run up against environmental targets. Stronger engines and more robust hull constructions lead to higher energy consumption. Upgraded ship designs and construction materials will be needed to meet both requirements, and newbuilding prices will therefore likely increase.

Small and old vessels are more likely to be lost than larger, newer ships. Passenger vessel losses result in more deaths than for any other vessel type, simply because there are more people onboard than just the crew. However, not many passenger vessels are lost, and the trend is for fewer losses year by year. When they are lost, the number of deaths is high.

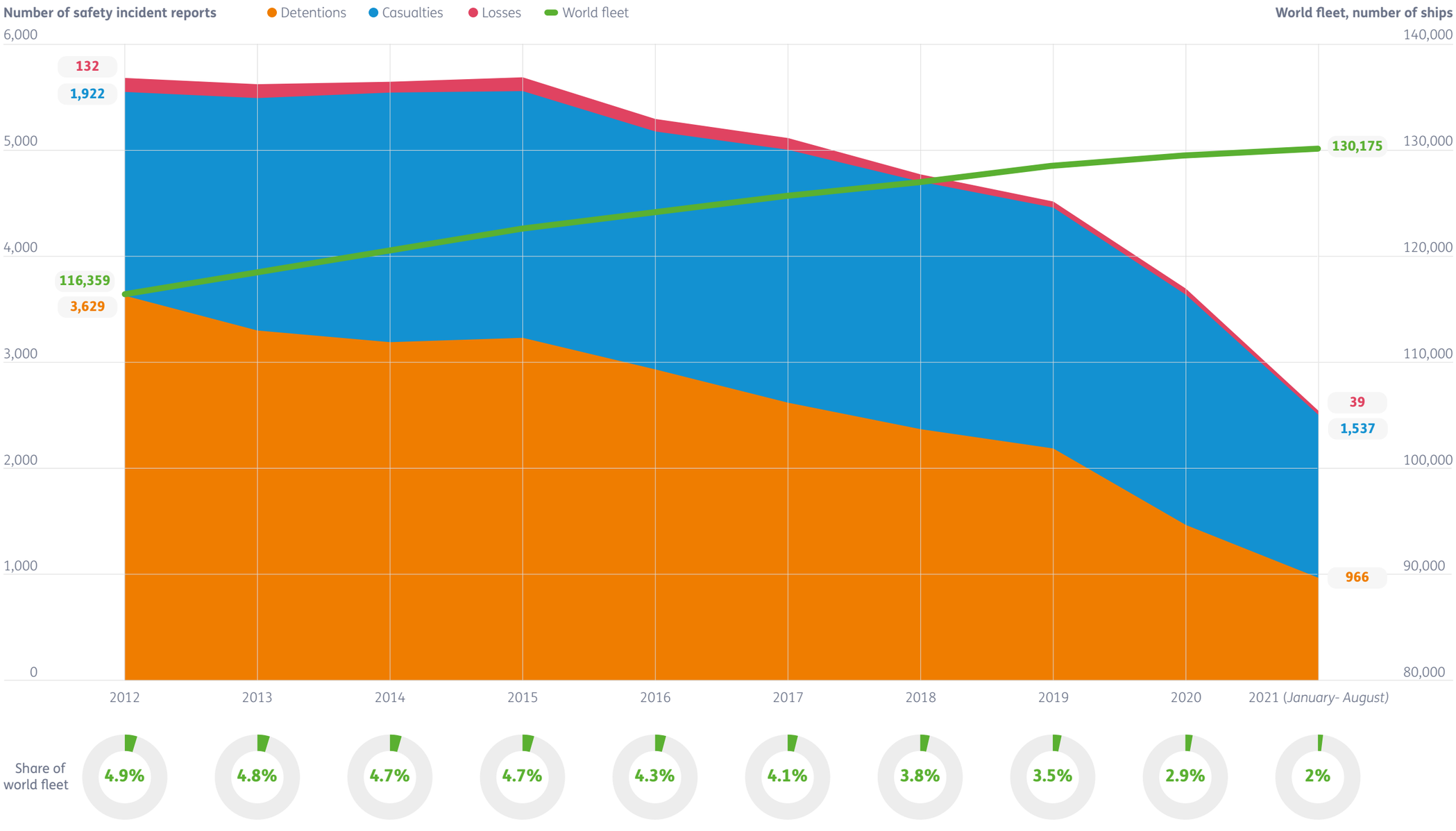
As this report outlines, the trend in maritime safety is positive: life at sea is becoming safer. However, I see many safety challenges ahead, so the successful safety work of the past must be intensified to keep the trend line pointing in the right direction.

All stakeholders collectively own this challenge. It is a matter of design, functionality, technology, knowledge, training, attitude, and many other factors. Let us make our best even better.

Lloyd's List Intelligence is the trusted expert partner providing professionals connected to maritime trade with transparent data, validated analysis, and actionable insight for 300 years. Our maritime records form the backbone of any analysis and understanding of the industry's development

THINGS ARE GETTING BETTER ALL THE TIME

In the period 2012-2021, the number of ship losses has fallen from 132 to 58 in 2020, while casualties have declined from 1,900 to 1,500. This is in spite of a steady rise in the number of ships. The result is an encouraging fall in casualties as a share of the world fleet.



61%
of losses were due to foundering

37%
of casualties were 25+ years old

33%
of detentions were 25+ years old

CASUALTIES

2.3Bn dwt

The total size of the world fleet, as of September 2021

AS OF September 2021, the total world fleet counted 2.3Bn deadweight tonnes (dwt) spread on 130,175 ships. The fleet of bulk carriers was the largest with 923M dwt, followed by tankers (incl. gas carriers) with 765M dwt and container carriers with 289M dwt.

Measured in numbers of ships, the fleet of general cargo carriers was the most numerous cargo-carrying vessel sector with 17,680, outnumbering tankers by a small margin, while bulk carriers comprised 12,601 ships and container carriers 5,362. Other fleets with large numbers of vessels were offshore, tugs, fishing, passenger vessels, and barges.

The general cargo fleet consisted of many relatively small and old ships. The average vessel was 4,700 dwt and 29.8 years old. Other fleets which had a large share of old and small vessels were ferries (part of passenger/ferry in the accompanying graph), tugs, and offshore PSV (both part of 'other' in the accompanying graph).

Over the past ten years, the world fleet has grown by 46% in dwt and 16% in numbers. That equals 3.8% per year CAGR (compound annual growth rate) for the dwt growth. Bulk carriers have grown more than tankers – 65% vs 44%, but if the LNG and LPG tankers are looked at specifically, these fleets have grown by 78% and 81% respectively. The container carrier fleet growth has also been substantial, at 52%. The latter is based on dwt, if measured in teu (twenty-foot equivalent unit); the fleet grew by 65% which better reflects the ever-larger ships added to the fleet.

The number of casualties recorded between 1st January 2012 and mid-August 2021 totalled 21,746. The number was relatively low in 2012, at 1,922. In 2013 the number of reported casualties rose by 271 to reach 2,193, and the year after they increased further to 2,355. This was followed by a two-year decline until the period's peak was reached in 2017, at 2,386. Since then, casualty numbers have declined each year. 2021 is not a full calendar year, hence the lower number.

The increase in 2013 was attributable mostly to passenger vessels and the 'other' group of vessel types previously mentioned in this article. General cargo and bulk carriers were behind most of the 2014 growth in numbers. In the peak year 2017, most of the increase was evenly spread between general cargo, container carriers and 'other' vessels.

As mentioned above, the world fleet has grown substantially over the period. When the total number of casualties is divided by the total fleet number each year to arrive at an incident rate, you get a slightly different perspective of the development. The incident rate rose from 1.7% in 2012 to 2.0% in 2014. In the peak casualty year 2017, the incident rate was lower than in 2014, at 1.9%. After that, the rate declined to 1.7% in 2020.

If the number of incidents is put in relation to the fleet dwt, we still see a peak in 2014 at 1.26% per 10,000 dwt, but the decline was steeper than if measured per number of ships and landed at 0.97% in 2020.

Hull and machinery damages were the most common causes of casualty. They accounted for close to half (48%) of all casualties recorded over the near 10-year period. Hull damages only represented 5%, so machinery damage was the much bigger problem.

The incidence of hull and machinery damage peaked in 2017, when the numbers increased by 153 from the previous year. That was the largest year-on-year increase for the period. The damage reports increased notably in the years 2013, 2014 and 2017. In all three years, it was casualties classified as 'non-serious' that accounted for much of the increase. The number of serious machinery damages increased between 2014 and 2019.

Ships that were wrecked, stranded, or involved in collisions were relatively few in 2012-13. The peak number was reached in 2014. The numbers remained more or less steady 2015-2018. In 2019, wrecked and stranded vessels decreased noticeably, while the number of collisions showed a marked decline in 2020.

Reports about 'contact' hovered around an average of 220 per year throughout the near 10-year period. Fires and explosions averaged 192, with a peak at 232 in 2019. 'Foundered' reports usually stayed below 100 per year. In 2018 they were as low as 60. Foundering refers to vessels that submerge, capsize, and/or sink.

Data for 2021 only covers the period until mid-August, but indications show numbers are about 12% higher than for the same period in 2020 and slightly higher than in 2019. They are higher for hull and machinery, and on par or lower for the rest. However, this should be treated as a statistical indication, not definitive.

General cargo. General cargo carrier casualties averaged 550 per year, which is the highest among vessel type sectors. The casualty numbers were lower in 2019 due to fewer collisions and machinery damage. Hull and machinery damage

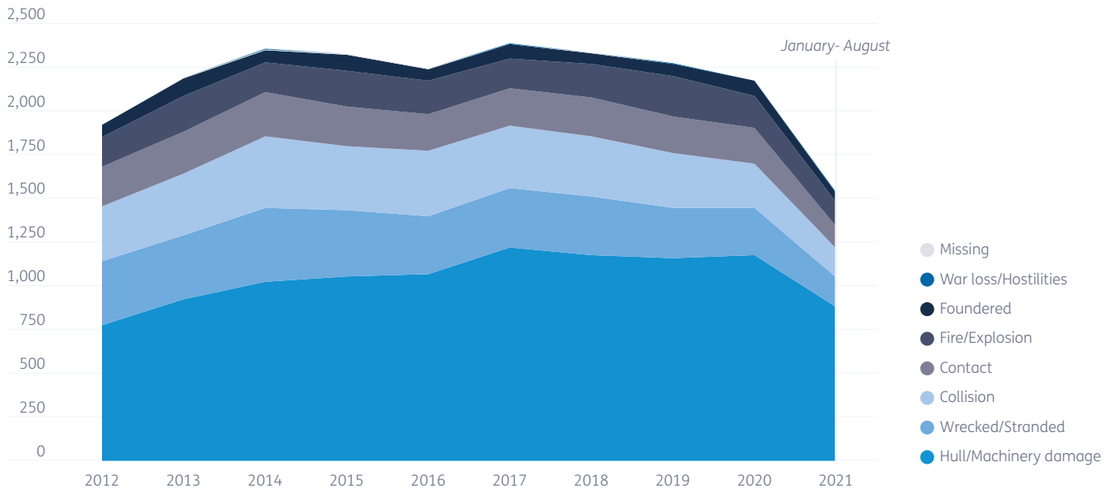


Figure 1: Incidents by casualty type 2012-2021

Casualties

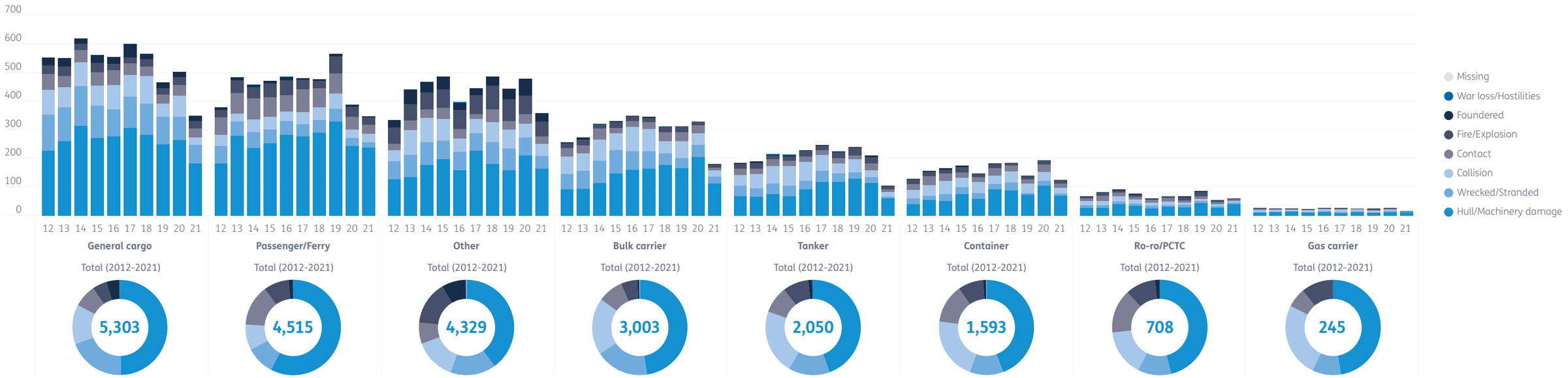


Figure 2: Casualty incidents by type and sector 2012-2021

accounted for about half of them, followed by wrecked and stranded (20%). There were 714 reported collisions which equals 13% of the total number of casualties over the period. Eight percent of the casualties were 'contacts'.

The incident rate for general cargo carriers was above the fleet average. The peak was in 2014 at 3.6%; 2017 was also a year in which the rate was above average, at 3.5%. Since then, the rate has declined and last year it was 2.8%, slightly above the rate in 2019.

Bulk carriers. The bulk carrier casualties hovered around 314 per year. The highest number was in 2016 when 347 casualties were recorded. They were lower in 2018, mainly due to fewer wrecked and stranded vessels. The numbers increased in 2020, primarily due to more hull and machinery damage.

Hull/machinery damage and wrecked/stranded accounted for 66% of all casualties over the near 10-year period. The number of collisions represented 9% of total bulk carrier casualties.

The incident rate for bulk carriers was lower than that for general cargo carriers but higher than the total fleet average. The incident rates reached 3.0% in 2014, 2015 and 2017, but the peak year was in 2016 at 3.1%. In 2018 to 2020, the annual rate was 2.6%. A reduction in the number of collisions, wrecked and stranded vessels contributed the most to the lower figures.

Passenger/ferry. There were 4,515 casualties recorded for the period, giving an average of 463 per year. The peak was reached in 2019, largely due to an exceptionally high number of hull and machinery damage compared to the other years. The following year, the number dropped significantly, which is not surprising since passenger vessel activity dropped markedly due to the pandemic.

Hull and machinery damage accounted for 58% of all passenger vessel casualties, which is the highest share of all vessel type sectors in this report. 'Contact' was also a common casualty cause for passenger vessels, at 14%. This is a high share, second only to the roro sector. The other causes all came in at a share of 10% or lower of the total number.

The passenger and ferry sector showed the highest incident rate of all sectors in this report. The average per year was 4.6%. The highest rate was recorded in 2019 and the lowest in the low (pandemic) activity year 2020.

Other. Casualty reports for the diverse fleet of vessels included in the sector named 'other' numbered 4,329. The highest number of reports in this sector were for fishing vessels (1,572), tugs (849), barges & pontoons (220), offshore PSVs (228) and reefers (194).

The average number of casualties per year was 441. Casualties were lower in 2016 partly due to fewer hull and machinery damage incidents, while they were relatively high in 2018 and 2020. In 2018, all casualty types increased. In 2020, hull and machinery damage and 'foundered' increased.

Hull and machinery damage was the most common casualty cause, as with all other sectors, but the share was 40% which is the lowest of all sectors in this report. The share of fire and explosion was the highest of the vessel sectors, accounting for 15% of the reports. 'Contact', on the other hand, was at the other end of the scale at 7%.

This is a large fleet of ships which at end of August 2021 counted in excess of 64,000 vessels. From this, it follows that the incident rates were by far the lowest of all sectors, at an average of just 0.7%. This is probably not due to a supreme performance compared with other ship sectors, but rather due to a combination of lower activity for many ships and the fact that a high number of barges and pontoons are non-propelled and therefore will not sustain machinery damage. There could also be an element of under reporting, but this is difficult to establish.

Tanker. The number of tanker casualties averaged 216 per year. The peak was in 2017, mainly due to higher hull and machinery damage. The hull and machinery damage was even higher in 2019, but the overall number of casualties were slightly lower. The share of collisions was somewhat high at 22%. Only gas carriers had a larger share.

Tankers' incident rate was below the total fleet average. The peak year of 2017 also resulted in the highest incident rate; 1.7%. From that level, the incident rate dropped to 1.6% in 2019 and 1.4% in 2020.

Container. The container carrier casualty reports counted 163 per year on average. The highest was in 2020 when hull & machinery damage and

'contact' increased. Years with lower number of reports were 2016 and 2019.

The incident rate is not showing any indications of a declining path when seen in relation to the number of ships. However, If the rate is instead related to the fleet teu, then the rate has come down.

Roro/PCTC. There were on average 72 roro casualties per year. That included the specialised pure car and truck carriers. The peak year was 2014, and high numbers were also registered in 2019. The number of hull and machinery damage varied significantly between years, but for the near 10-year period they accounted for 46% of casualties for this sector. Collisions and 'contact' were the causes of almost one third of casualties. As with ferries, roro vessels have a high port call frequency which may contribute to a relatively higher share of these two casualty causes.

The incident rate was above the world fleet average, at 3.6% measured in numbers. Years with higher rates were 2014 and 2019.

Gas carriers. Gas carrier casualty reports were few, with an average of 25 per year, but the fleet is also relatively small. At end of August 2021, the fleet comprised 2,229 ships. The most common casualty causes were hull and machinery damage, collisions, and fire/explosion. Together, these causes accounted for 84% of casualties. The incident rate was below world fleet average and remained unchanged 2018-2020 at 1.2%.

More than half of casualty reports come in from locations in Europe. This may not reflect the entire picture, assuming a degree of under reporting from some areas outside of Europe. Since this is difficult to establish, we can only present the data available.

Seven percent of reports were from locations in South China, Indo China, Indonesia and the Philippines. Another 5% were from Japan, Korea and North China. Casualty locations in the Americas represented 22% and the Middle East 2%.

For casualties in NW Europe, general cargo and passenger vessels were the most common type sector. Roro's share was relatively high there. General cargo and passenger vessel casualties were also most common in East Mediterranean and the Black Sea. Iceland and northern Norway had relatively high shares of passenger/ferry incidents. In Germany's Kiel Canal, most casualty reports involved general cargo and container carriers.

In the South Atlantic and east coast of South America, there was a high share of bulk carrier casualties. In the Arabian Gulf, casualties were mostly for tankers and gas carriers.

IS THERE AN AGE PROBLEM?

It might be tempting to jump to the conclusion that casualties increase towards the end of a ship's lifecycle. Looking at the number of casualties over the past decade, that is true to a degree. A little more than 8,000 of the 21,746 casualties recorded happened to vessels that were 25 years or older. One third of ships in that age group were 40 years or older.

But it is also interesting to see that the group of the oldest vessels' share of total casualties decreased over the period, from 40% in 2012 to 32% in 2020. The largest contribution to the lower number came from fewer wrecked and stranded vessels, and to some extent also from the number of collisions. The number for hull and machinery damage, on the other hand, increased slightly.

The age group that has increased is the 10–14-year-old. The growth is almost entirely due to more hull and machinery damage.

A MATTER OF SIZE

The size perspective is important for the overall understanding of the situation since about two-thirds of all the casualties included in this report were with vessels smaller than 10,000 gt. Only 7% involved the largest vessels, here defined as 50,000 gt and above.

Close to half of the casualties among the smaller vessels were hull and machinery damage. Wrecked and stranded account for 16%, and collisions for 13%.

If we then add the age structure, we see that more than half of the casualties among ships smaller than 10,000 gt involved vessels that were 20 years of older at the time of the incident. To summarise, the most common casualty was hull and machinery damage to an old and small ship.

Bulk carriers differ slightly from the general picture above. Even if the most frequent casualty was seen in a small and old vessel, half of the incidents were with ships 10,000-49,000 gt that were younger than 15 years. A high share of the total bulk carrier fleet fell within these ranges, so the numbers were not out of proportion.

There are relatively few ships in the container carrier fleet that are older than 20 years, so the casualty numbers were mostly for younger vessels.

The tanker casualties were almost evenly distributed over the age groups, but there was a high degree of small vessels among them.

The situation was different for passenger vessels; there was a clear dominance of old and small vessels among the casualties. That reflects the profile of the passenger vessel fleet, within which there are a significant number of vessels that are both small and old.

This is even clearer in the general cargo fleet, in which 43% of all casualties involved vessels below 10,000 gt and 25 years or older.

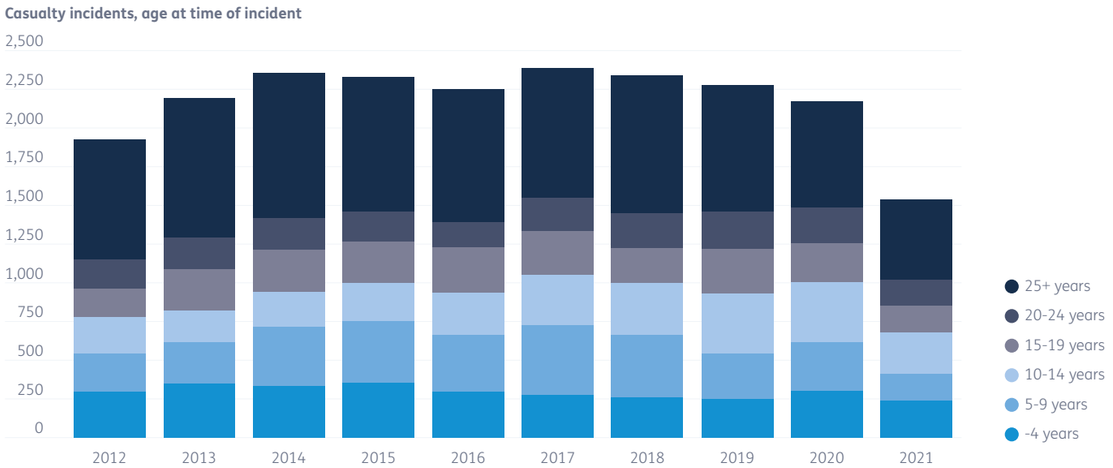


Figure 3: Casualty incidents, age at time of incident

	<1,000 gt	1,000-9,000 gt	10,000-24,000 gt	25,000-49,000 gt	50,000-99,000 gt	100,000 gt+	Total
-4 years	3%	4%	2%	2%	1%	1%	14%
5-9 years	2%	6%	3%	3%	1%	1%	15%
10-14 years	2%	5%	2%	2%	1%	0%	13%
15-19 years	2%	5%	2%	2%	1%	0%	12%
20-24 years	2%	5%	1%	1%	0%	0%	9%
25+ years	13%	18%	4%	1%	0%	0%	37%
Grand Total	**24%**	**44%**	**14%**	**12%**	**5%**	**2%**	**100%**

Table 1: Casualties split on vessel age at the time of incident, and vessel gt size group, 2012 to August 2021

TECHNOLOGICAL SHIFT CHALLENGING THE SHIPPING SAFETY PARADIGM

The number of maritime incidents has fallen but an emerging 'safety gap' from adoption of digitalisation and decarbonisation technologies requires change in traditional thinking on risk management and system integration

By Øystein Goksøyr
Head of Department Safety Advisory, DNV

A SHIFT to real-time risk management together with a renewed focus on human and organisational factors are required to tackle emerging safety hazards from digitalisation and decarbonisation in the shipping industry, despite a dramatic reduction in accidents over the past decade.

Vessel losses have dropped by 70% since January 2012 and overall casualties are on a similar downward trend at the same time as the global fleet has grown significantly to 130,175 ships with a total tonnage of 2.3 billion dwt as of September 2021 – an increase of 16% in number and 46% in deadweight tonnes, according to the latest incident data from Lloyd's List Intelligence.

The number of casualties resulting in losses fell from 132 in 2012 to 39 up to mid-August of 2021, while the annual tally of casualties has shown an increasingly steep decline over the past four years after reaching a peak for the period of 2386 in 2017, with around 1600 casualties so far this year.

Despite the positive safety trend, there is no room for complacency as the risk picture for shipping is changing with adoption of increasingly complex digitalised systems and alternative fuel technologies to meet emissions reduction goals.

THE RISK OF A GROWING SAFETY GAP

DNV has identified an emerging 'safety gap' as the industry takes onboard digital control systems running on algorithms with software and sensors that become more complex as the myriad systems become interconnected.

These systems are designed to enhance operating efficiency, such as by cutting fuel consumption to reduce costs and emissions, but they also make ships more vulnerable to systemic and cybersecurity risks that need to be assessed and understood so they can be resolved.

Similarly, alternative fuels such as hydrogen and ammonia are necessary to achieve decarbonisation of the fleet, but these have specific safety challenges like increased explosion or toxic risk that must be addressed and mitigated.

Integration between ship systems presents a big security risk if not managed properly as it requires an open 'plug-and-play' data interface for all equipment suppliers, compared with the traditional model of having multiple company-based black box standards.

However, such technical issues are being addressed with DNV's new Data Infrastructure class notation to standardise data interfaces – including data from sensors – as well as the Cyber secure class notation to verify the security of IT and OT systems in line with IMO requirements and above.

SYSTEM INTEGRATION

Increasingly complex and integrated systems call for a dedicated system integration role. This is a relatively new role in shipping and, together with standardised rules, it needs to be implemented and strengthened to close the safety gap with uptake of new technology in the industry, as any system failures could halt adoption at scale of vital technologies that can also benefit safety in the long run.

There is set to be a shift away from rigid risk management practices towards remote, real-time continuous risk monitoring of the various ship control systems with ongoing barrier management, similar to the offshore and aviation industries, in line with the trend towards more autonomous operations.

A fully autonomous vessel essentially is self-learning as it is run by software solutions without a human interface, and its behaviour is constantly changing with new upgrades and patches, so the risk management regime cannot remain locked in as has been standard practice.

Consequently, the risk management model has to be more responsive as autonomous technology is introduced onto the bridge and in the engine room, so that corrective action can be taken remotely if the vessel behaves abnormally, allowing safety barriers to be added.

As traditional risk management methods become insufficient, it will be necessary to focus on system performance in addition to component reliability to manage increasingly complex ship systems.

DATA TRANSPARENCY

Digital twins that give an accurate virtual model of the asset can be used for real-time product and process verification to ensure safe and reliable systems. With DNV as a partner, the Open Simulation Platform joint industry project has proven the efficacy of this technology.

DNV sees holistic risk management, including a systemic perspective on safety, as key to managing safety risks on the pathway to a more digitalised, carbon-neutral industry.

Increasing automation of ship systems will necessitate greater data transparency so that incident data gathered from ship operations can be shared industry-wide for learning purposes to optimise best practice.

Changes in the human and organisational aspects are also needed, alongside the technical shift, to ensure maritime systems are robust and resilient with a process in place for continuous safety improvements.

The transition to automated systems will entail different roles and responsibilities for seafarers who will be educated with more advanced training to provide vital safety support for complex systems in a digital world. We call this 'humans in the loop'.

HUMAN-CENTRED DESIGN

DNV sees the need for human-centred design of systems with technologies that support human performance, as well as 'function allocation' so personnel and technology have defined roles to ensure complex integrated systems run smoothly even with increased centralisation and remote operation from shore.

From an organisational perspective, companies must have a digital transformation strategy in place to manage emerging risks across the entire organisation as it becomes a patchwork of multiple stakeholders and suppliers.

There are four main areas for such transformation covering a strategic roadmap, smart fleet transformation, management implementation and smarter ship operations that are supported by remote and data-driven services from DNV, for example remote technology for ship inspections.

Digital connectivity has undoubtedly played an important role in reducing casualty figures through such systems as online weather and navigational updates, and also has great potential to improve safety in future, provided systems and rules are in place to manage the risk.

← Digital twins that give an accurate virtual model of the asset can be used for real-time product and process verification to ensure safe and reliable systems

COUNTING THE LIVES SAVED

The International Cospas-Sarsat Programme uses satellites to detect and locate people who activate emergency beacons when life is threatened. About half of the calls received are from mariners

By Steven Lett
Head of secretariat, International Cospas-Sarsat Programme

FORTY years ago, at the height of the Cold War, allies and adversaries collaborated to build a satellite system to find people in distress. The objective was to pinpoint aviators who activate emergency locator transmitters (ELTs) and mariners who activate emergency position-indicating radio beacons (EPIRBs). Canada, France, the former Soviet Union, and the United States conceived and initiated this humanitarian project from technology otherwise being developed for national scientific or security purposes. The Russian Federation later assumed the role of the former Soviet Union.

Today, the International Cospas-Sarsat Programme, an intergovernmental, treaty-based organisation, has 45 associated countries and agencies that co-operate in delivering those distress-alert messages free of charge to more than 200 countries and territories that can take action for rescue.

Cospas-Sarsat's dedication to mariners and others is enshrined in its constituting treaty instrument, where it is noted that the "purpose of this agreement is to support, by providing distress alert and location data [on a non-discriminatory basis], the objectives of the International Maritime Organization (IMO) and the International Civil Aviation Organization (ICAO), concerning search and rescue".

SUMMARY OF SAR EVENTS AND PEOPLE RESCUED (SINCE SEPTEMBER 1982)

The IMO and ICAO are specialised agencies of the United Nations that, among other things, set global safety standards. As of the end of 2020, Cospas-Sarsat has helped to save more than 53,000 people involved in over 16,000 search-and-rescue (SAR) events. This is an undercount, because Cospas-Sarsat statistics only include cases when a reliable after-action report has been prepared and submitted through reporting channels to its Secretariat, the administrative arm of the programme located in Montréal, Québec, Canada.

The SAR-receiver payloads that listen for distress signals and the satellites upon which they ride are provided by the four founding governments, as well as by the European Commission, the European Organisation for the Exploitation of Meteorological Satellites (EUMETSAT), India and, soon, China. The distress alerts received from beacons are relayed by these satellites to government agencies that can take action for rescue, as well as the home country of the beacon owner.

Compatible beacons, ones that operate at 406 MHz, are made by dozens of different manufacturers, and can be purchased from retail stores, online, or as original equipment on a vessel or aircraft. Cospas-Sarsat does not make or sell beacons, but it reviews independent laboratory testing of all models to ensure that they meet rigorous specifications. Beacons small enough to be easily carried in a pocket or on a lifejacket (personal locator beacons: PLBs) also are now widely available.

A HELPING HAND

The overwhelming beneficiaries of Cospas-Sarsat are mariners, whether commercial or recreational. Typically, about half of all distress alerts received and managed are from maritime incidents. Since the first Cospas-Sarsat-assisted rescue in 1982, through to 2020, Cospas-Sarsat has provided the only alert to SAR authorities of maritime distress in 2,447 SAR events, the first alert in 2,942 incidents, and supporting data in 3,361 cases. That is assistance in nearly 9,000 life-threatening maritime emergencies. Those emergencies involved 39,705 people. These statistics too are significant undercounts. Cospas-Sarsat contributes to the rescue of many people in incidents that

government authorities do not report back to the Cospas-Sarsat Secretariat.

The continued value of Cospas-Sarsat is seen in 2020 statistics. In all environments, Cospas-Sarsat assisted in the rescue of 2,278 people from 951 distress incidents. Forty percent of the people rescued were in a maritime environment.

Cospas-Sarsat beacons are built to be easily activated, even by untrained persons, and are portable (or "float-free") so that they do not "go down with the ship". They have batteries that can last in standby for years and perform well even in frigid temperatures. Many beacons have a built-in navigation receiver (e.g., for GPS, Galileo and/or Glonass satellites) or can be connected to receive position data from a vessel's bridge instruments. Such beacons report their position in a distress message. But even without this information, Cospas-Sarsat can locate an activated beacon through satellite trilateration. Cospas-Sarsat is unique in allowing for dual, redundant means of finding persons in distress.

Furthermore, there are no subscriptions or other fees imposed by Cospas-Sarsat (although a few countries have license or registration fees). There are estimated to be as many as 2.5 million beacons deployed today, with over a million of those being maritime EPIRBs. There may be as many as 400,000 ELTs and one million PLBs, the latter often being used in aviation and maritime environments, such as on lifejackets.

An important reminder: Remember to register your EPIRBs or other beacons. This could mean the difference between life and death. Registration provides SAR authorities with important information about your vessel, people to contact in an emergency, and other information that can help rescuers better execute a rescue plan, while avoiding needless searches in cases of false alerts. Means of registration vary by country. Determine where to register your beacon at bit.ly/2TMGABT.

DETENTIONS

SHIP inspections form a fundamental part of maritime safety enforcement. According to records from Lloyd's List Intelligence, 866,000 inspections were carried out from 1st January 2012 until mid-August 2021. The number of annual inspections averaged 94,800 for the years 2012-2019. The numbers dropped in 2020 as the pandemic reduced the ability to carry out inspections, and vessel activity declined for whole or parts of 2020, depending on vessel type and location. The data for 2021 does not cover the entire year, hence lower numbers of inspections and detentions.

The number of unique vessels inspected each year (2012-2019) was 35,600 on average, meaning that each vessel was inspected an average of 2.7 times per year. The share of the total world fleet that was inspected each year amounted to 29%. For most cargo or passenger vessels, the share was significantly above 29%. The vessel sector named 'other' pulled the overall share down, since there were a significant number of vessels not inspected in that sector. The share of reported inspections of passenger vessels and ferries was also somewhat low.

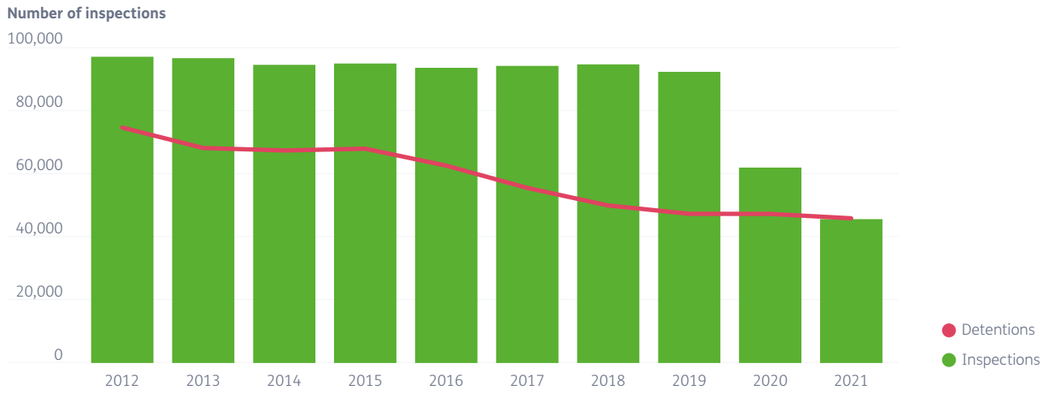


Figure 1: The number of inspections and the share of inspected vessels that were detained

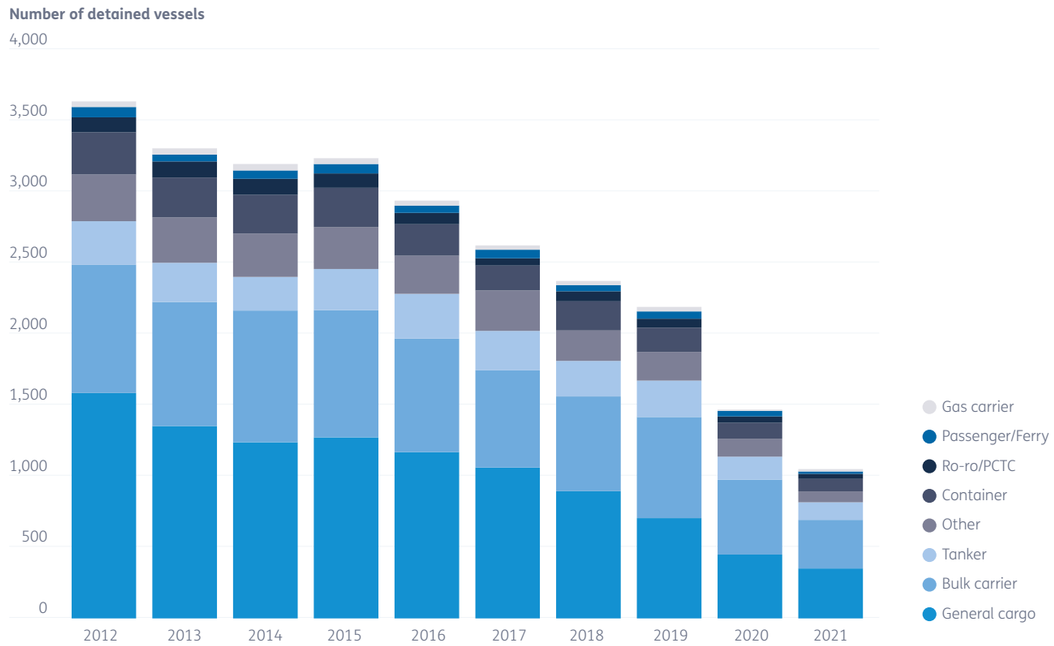


Figure 2: The number of detained vessels by vessel type sector

The number of detentions for the same period totalled 25,972. That means that 3% of vessel inspections led to detentions. In 2012, more than 3,600 vessels were detained. In 2019, that figure had dropped to 2,187 which took the percentage of detained vessels down from 3.7% to 2.4%. That share remained the same in 2020, and in the first 7.5 months of 2021 it had dropped even further.

It is positive for the industry that both the actual number of detentions and the share have followed a declining path. It should be noted that the number of inspections also dropped; from slightly above 97,000 in 2012 down to 92,400 in 2019. In that same seven year window, the world fleet increased by almost 12,000 vessels, so the share of inspected vessels fell too. The reduction was almost entirely attributable to fewer inspections of general cargo vessels.

The number of detentions decreased by 40% between 2012 and the end of 2019, and by 60% by the end of 2020, a significant reduction by any measure.

The general cargo sector detentions declined the most – both in absolute numbers and in relative terms, down 55%. The drop in container carrier detentions was 43%. Detained vessel numbers fell for all vessel type sectors during that seven year period, and that trend continued in 2020.

If the data for 2021 is scaled up to a full year, based on the first 7.5 months, it appears that the number of detentions will be lower than in 2019, but higher than in 2020. It should be underlined though that this appearance is the result of a statistical exercise and not fact.

The detained vessels' flag registration is identified for most reports. As many as 150 different flag states were identified in the approximately 26,000 detentions between January 2012 and August 2021. The top five flags appearing in detained vessels were Panama, Liberia, Marshall Islands, Malta, and Cambodia. They represented 11,120 or 43% of the total number of detentions.

It is only fair though, that this incidence information is seen in relation to the total number of vessels registered under each flag. That is potentially contentious, given that many ships change flag several times during their lifecycles.

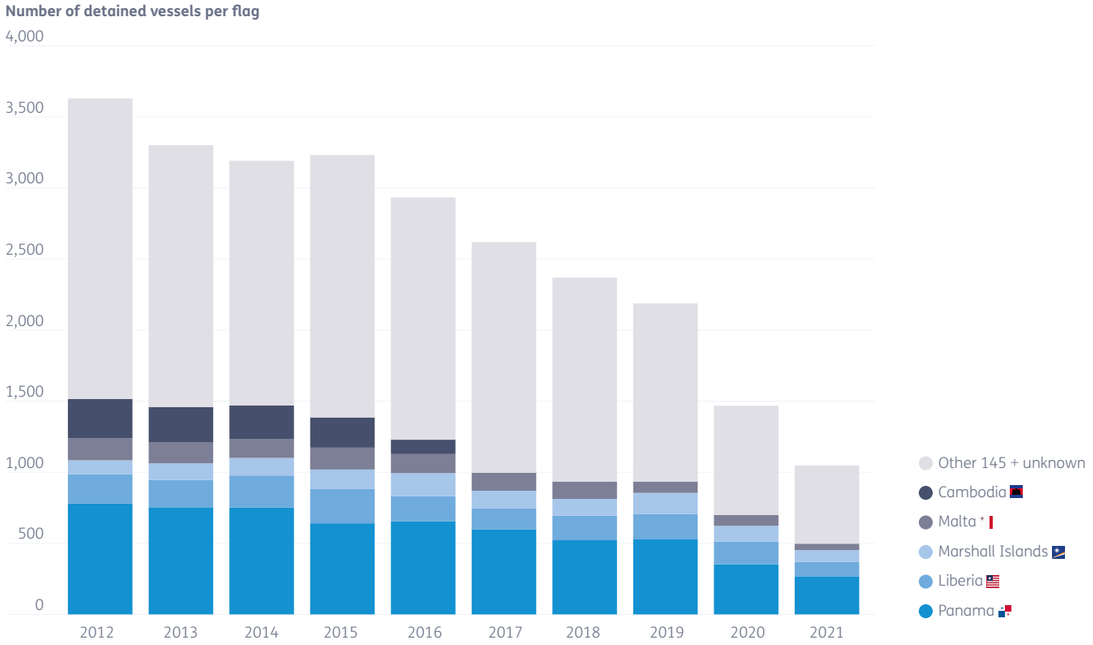


Figure 3: The number of detained vessels by flag

As at the end of August 2021, the top five mentioned above flagged 16% of the total fleet in numbers. Panama currently has 9,507 vessels registered according to Lloyd's List Intelligence data, which equals 7% of the total world fleet numbers if all vessel types are included. The Liberia flagged fleet counts 4,878 and equal to 4%, Marshall Islands has 4,452 (3%), and Malta 2,490 (2%). The Cambodia flagged fleet only has six vessels that match the criteria for inclusion in the register. The Cambodian fleet has changed over the period as have the number of detention reports, which have been zero since 2017.

The number of detained Panama flagged vessels declined over the period, as they did for vessels flying the flags of Liberia, Togo, and Malta. For Marshall Islands, the number increased slightly, but it should be noted that the number peaked in 2016, after which detention numbers dropped.

Panama flagged vessels have topped the list of detained vessels in each of the years 2012-2021, but Panamanian vessels are also inspected more than any other flag, so the share of inspections that leads to detention is lower than that of some other flags.

In 2012-2016, for example, an average of 15% of Cambodian flagged vessel inspections led to detentions, and in eight of the past ten years, Sierra Leone has shown up with a similar average, to mention just a few seen in the attached graph (Number of detentions).

The vessel type sectors with the highest average age at the time of detention in 2012-2021 were passenger and ferry with 26.3 years, followed by roro/PCTC (25.7), 'other' (25.5), and general cargo (23.1). Bulk carriers and container vessels were on average younger when detained. Tankers were on average 15.4 years, and gas carriers 18.7.

The location where ships are detained is topped by China, Australia, and Russia. China is a leading origin or destination for seaborne traffic, so based on that, the number detentions should statistically be high.

Australia is a leading exporter of iron ore, coal, and in recent years, LNG, which explains the high number of bulk carrier detentions there. Detentions in Russia are high for general cargo carriers and roro/PCTC which are very frequent visitors at Russian ports in the Baltic and Black Seas.

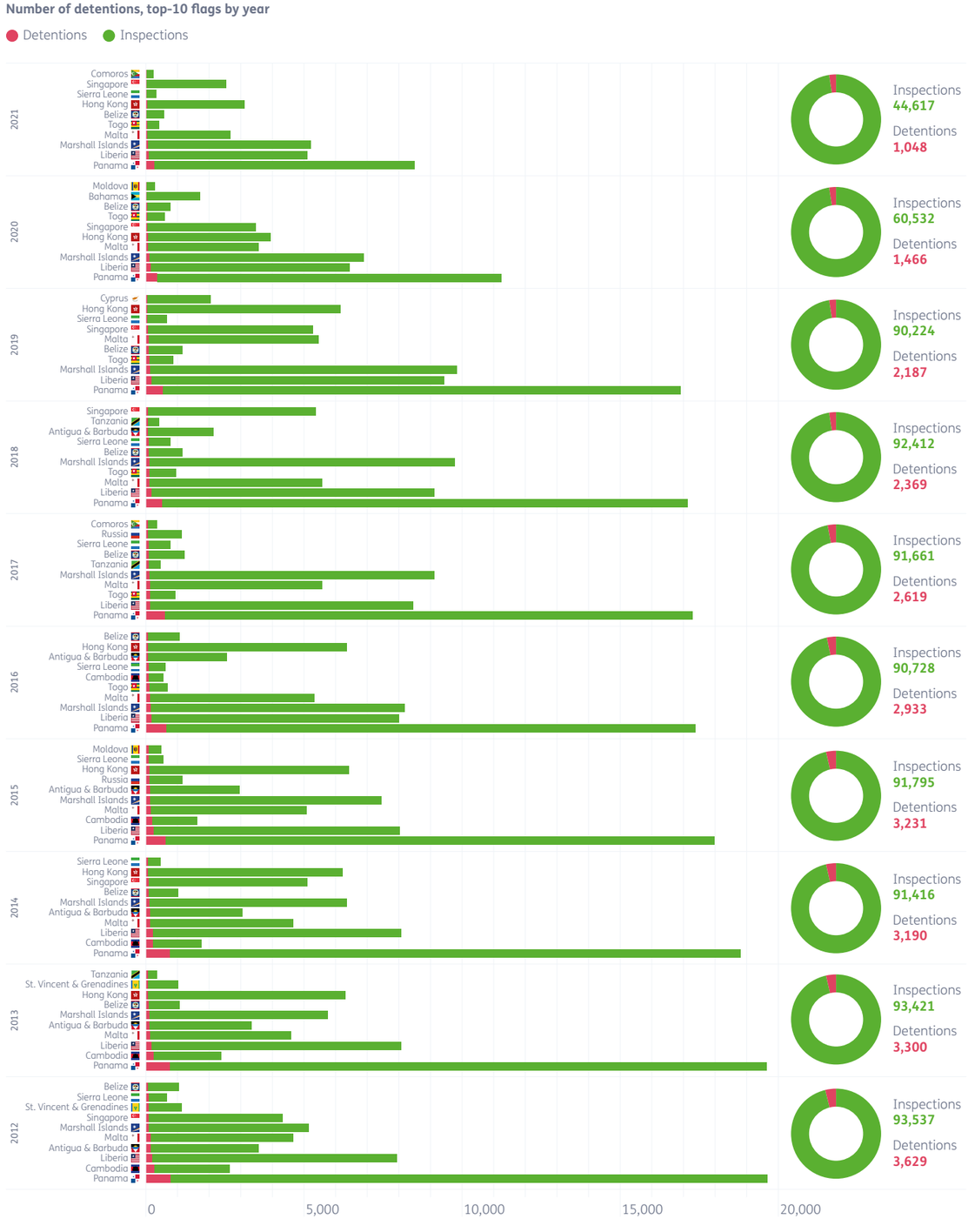


Figure 4: Number of detentions and inspections, flags with highest number of detained vessels each year

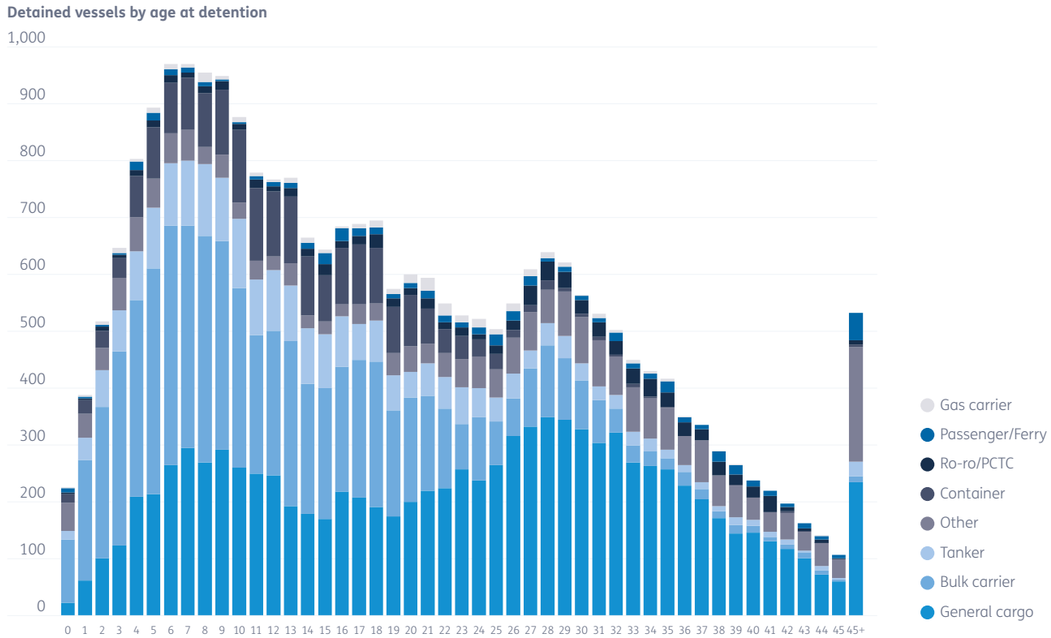


Figure 5: Number of vessels detained by age and sector 2012-2021

	China	Australia	Russia	USA	Japan	Turkey	Italy	S Korea	Singapore	Greece	Other	Total
General cargo	1,508	345	1,082	301	1,048	967	493	410	114	290	3,502	10,060
Bulk carrier	1,487	1,908	508	508	153	130	160	124	149	69	2,115	7,311
Tanker	343	158	121	201	17	31	54	75	174	56	1,258	2,488
Other	245	237	147	141	99	28	47	67	86	28	1,290	2,415
Container	556	363	74	169	25	38	83	40	63	19	664	2,094
Ro-ro/PCTC	35	102	142	99	42	31	48	27	6	11	236	779
Passenger/Ferry	29	16	15	48	2	31	84	10	3	66	203	507
Gas carrier	85	19	11	53	3	10	2	20	6	6	103	318
Grand Total	**4,288**	**3,148**	**2,100**	**1,520**	**1,389**	**1,266**	**971**	**773**	**601**	**545**	**9,371**	**25,972**

Table 1: Top 10 countries detaining the highest number of vessels 2012-2021

Japan's presence on the list is mainly due to the high number of general cargo carrier detentions. For Turkey, it is much the same. Singapore has a high share of tanker detentions.

A PERSPECTIVE ON SIZE AND AGE

Slightly more than a third of all inspected vessels were smaller than 10,000 gt, 48% were ships in the size range 10,000 to 49,999 gt, and 16% were ships that were 50,000 gt or above.

Close to two-thirds of inspected vessels were younger than 15 years at the time of inspection. 17% of all inspections were of ships that were younger than 10 years, and 25,000-49,000 gt.

Many of these were bulk carriers.

Eleven percent of inspections were of ships that were smaller than 10,000 gt and 25 years or older. In this group, general cargo carriers were the most common vessel type.

Inspections were carried out on vessels of all ages, with a slight emphasis on mid-to-large sized, young bulk carriers, and smaller, old general cargo carriers.

As mentioned above, almost 26,000 of the inspections resulted in detentions. When that figure is broken down, the most detained size-age combination was vessels that were small and old. A majority within that group were general cargo carriers.

INSPECTIONS	<1,000 gt	1,000-9,000 gt	10,000-24,000 gt	25,000-49,000 gt	50,000-99,000 gt	100,000 gt+	Total
-4 years	0%	4%	5%	8%	3%	1%	22%
5-9 years	1%	6%	5%	9%	4%	1%	26%
10-14 years	1%	5%	3%	6%	3%	0%	18%
15-19 years	0%	4%	3%	3%	2%	0%	12%
20-24 years	0%	4%	2%	1%	1%	0%	8%
25+ years	3%	8%	2%	1%	0%	0%	14%
Grand Total	**5%**	**30%**	**20%**	**28%**	**13%**	**3%**	**100%**

DETENTIONS	<1,000 gt	1,000-9,000 gt	10,000-24,000 gt	25,000-49,000 gt	50,000-99,000 gt	100,000 gt+	Total
-4 years	0%	3%	2%	3%	1%	0%	10%
5-9 years	0%	7%	3%	5%	2%	0%	18%
10-14 years	0%	6%	2%	4%	2%	0%	15%
15-19 years	0%	5%	3%	3%	1%	0%	13%
20-24 years	0%	6%	2%	2%	1%	0%	11%
25+ years	5%	24%	4%	1%	0%	0%	33%
Grand Total	**6%**	**51%**	**16%**	**18%**	**7%**	**1%**	**100%**

Table 2: Inspections & detentions, by gt-size and age at time of inspection

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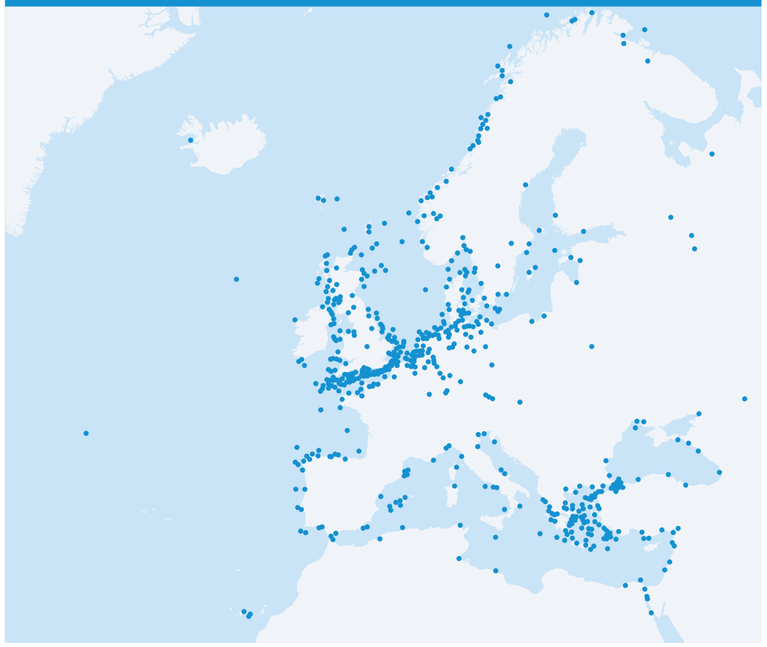
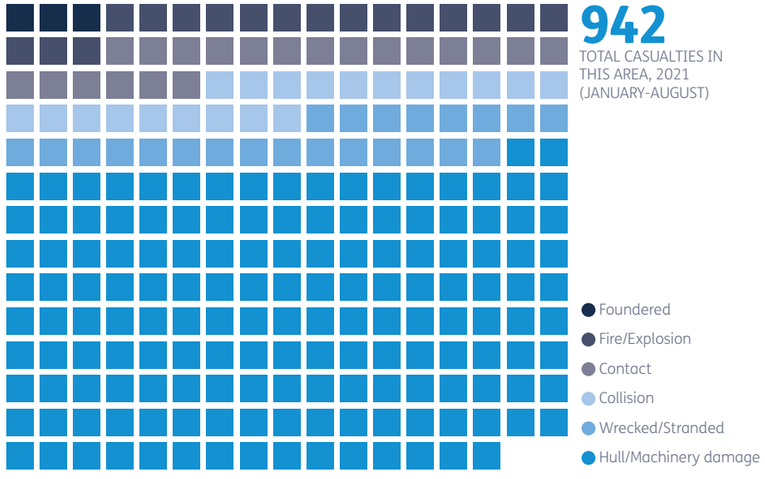
SAFETY FOCUS: EUROPE AND NORTH AFRICA

Analysis of the Lloyd's List Intelligence casualty records show a predominance of incidents in the Europe-North Africa region. The region also accounted for almost half the losses and detentions. It is likely that some incidents from other regions have been missed. Transparency on casualty data globally will raise levels of safety in all regions.

CASUALTIES

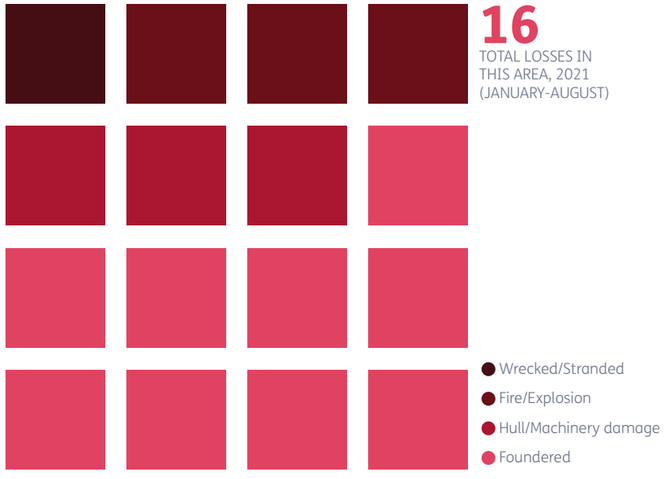


CAUSE OF CASUALTY

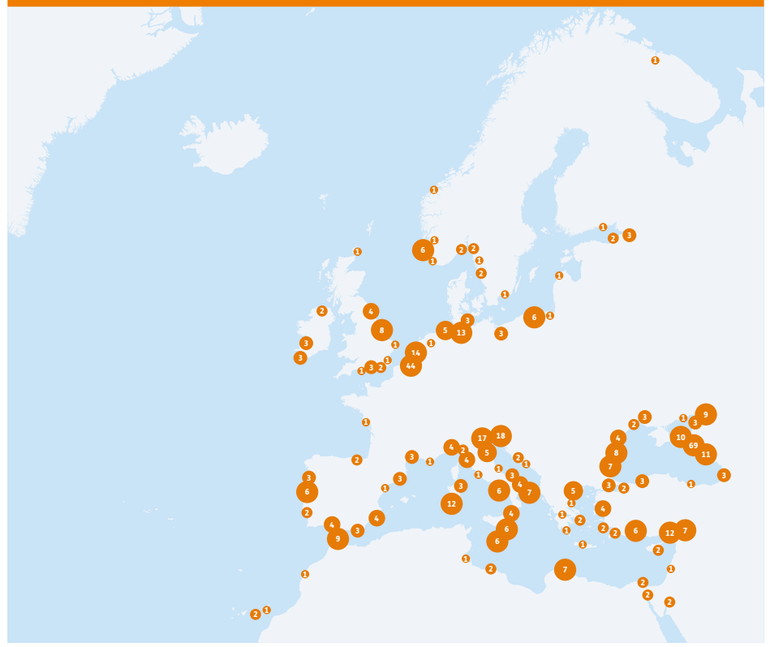


LOSSES

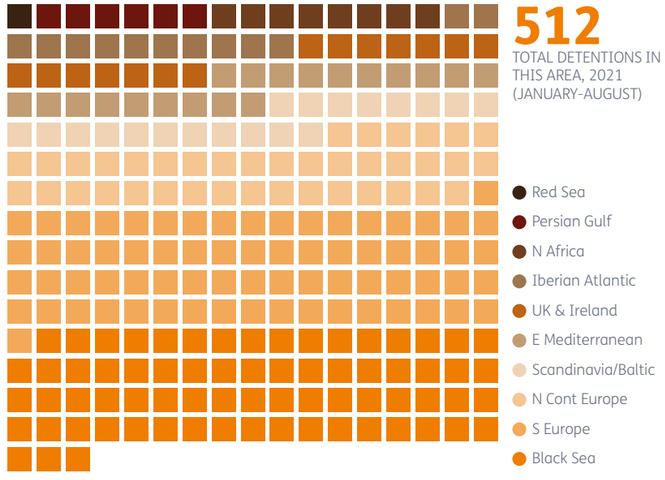
CAUSE OF LOSS



DETENTIONS



DETENTIONS BY LOCATION



HULL AND MACHINERY ISSUES A FOCUS AREA FOR SAFETY AMID GREEN FUEL TRANSITION

The use of digital tools and tighter port state supervision to improve maintenance are needed to mitigate hull and machinery (H&M) issues that were the main cause of ship casualties over the past decade, but alternative fuel technologies are posing new safety challenges we need to curb

By Marianne Strand Valderhaug
DNV Maritime
Class director for technical support

THE latest incident data from Lloyd's List Intelligence shows that nearly half, or 48%, of all 21,746 casualties between January 2012 and August 2021 were due to H&M damage, with machinery issues the main cause as hull damage accounted for only 5%.

While the overall number of casualties has gone down dramatically, this was identified as the most common cause of casualties across all vessel segments, at the same time as the overall number of collisions declined.

The older general cargo fleet had the highest average annual number of casualties at 550 due to H&M damage. While this accounted for 58% of all passenger vessel casualties – the largest share of any vessel type to H&M damage. This accounted for 58% of all passenger vessel casualties – the largest share of any vessel type.

IMPROVED CLASS RULES

First to the good news: a major reason for the overall improvement in safety over the past decade is improved class rules that have resulted in construction of better vessels and new requirements such as those for marine coatings that have greatly reduced corrosion and structural breakdown.

In addition, new digital technology such as navigation and collision avoidance systems has resulted in fewer accidents.

Similarly, DNV is applying digital tools to enhance hull survey work with historic data collation for more accurate condition analysis, and is developing picture recognition technology using artificial intelligence to assess the coating condition of tanks and identify corrosion and cracks. That technology, combining with drones, will be available in the near future.

To tackle the high number of machinery failures and reduce the risk of a total blackout, DNV has also launched a new additional class notation that specifically targets the operational reliability and availability of propulsion, steering, electrical power and manoeuvrability. Operational Reliability (OR) class notation applies to passenger ships built to the SRtP. The overall intention is to minimise the risk of functional loss and – if a functional loss should occur – ensure a simple and quick restoration.

A guidance paper about how to best manage the risks of a blackout has also been published, supporting the industry to reduce the number of machinery related casualties.

Improved condition monitoring for preventive maintenance, also using digital features such as remote sensors, are also necessary means to reduce the rate of machinery failures.

Stricter port state follow-up has improved safety, but this needs to be extended with wider inspections of older vessels still operating under less stringent port state regimes, such as general cargo carriers that accounted for the highest number of casualties among all vessel types.

The general cargo carrier fleet of 17,680 vessels – the largest of all segments – comprises smaller and older units with an average age of 29.8 years that transport cargoes such as rock, sand and cement with a lower value and pollution risk, resulting in a lower charter rate.

Such shipping companies therefore have less financial capacity to carry out inspections and maintenance, and they also have low-paid crews with less training. This makes these vessels more vulnerable on safety issues.

GREEN FUEL RISKS

A major cause for future concern is the potential safety risk – such as fire and explosion hazards – from alternative fuel technologies required for decarbonisation to meet IMO requirements to halve emissions from the global fleet by 2050.

For example, ammonia is highly toxic and flammable if exposed to high temperatures, while hydrogen is easily ignitable and difficult to contain as it has the smallest gas molecules. Battery fires are also difficult to contain due to the extreme heat generated.

There is a further risk from derating of engines for slow steaming, as well as newbuilds with less engine capacity, as this could lead to a lack of power for manoeuvrability in safety-critical situations.

This is an evolving area in which we need to assimilate operating experience with new fuels like hydrogen and battery technology, in order to determine the risk picture and develop appropriate rules. The regulatory framework needs to be upgraded in line with new technology.

DNV has already developed classification rules for the use of LNG, fuel cells, methanol, ethanol and LPG to safeguard against fire and the release of toxic gases through segregation, double barriers, leakage detection and automatic isolation of leakages, with new rules also being developed for ammonia and hydrogen.

Earlier this year, DNV updated its class notations with the release of Fuel Ready, which covers future conversion with more than one fuel in mind, and the 'Gas-fuelled ammonia' notation for owners pursuing a zero-carbon fuel option for their next newbuilding.

DNV is also collaborating across its business areas, as well as with other class societies, to expand competence in alternative fuels, and has taken the lead in joint development projects such as MarHySafe to develop a roadmap for hydrogen safety in shipping, along with the Hydrogen Safety Handbook, and Battery Safety to generate knowledge about risks related to batteries in vessels.

HUMAN FACTOR

Crew competence is another key factor to enhance safety, given most accidents are due to human error, and the vital role of seafarers in preventing incidents has been highlighted during the Covid-19 pandemic.

But there could be underlying safety issues going forward as the pandemic has led to crew fatigue, and hit survey, inspection and maintenance work because of restrictions in boarding vessels and obtaining spare parts, meaning the necessary control mechanisms have been largely absent for most of 2020/2021.

A lack of port state supervision in certain parts of the world allows older and poorly maintained vessels to continue trading, increasing the risk of casualties and losses. These vessels are not subject to the same strict statutory inspection regimes as other ship types with more risky and valuable cargoes such as crude tankers, which have shown the best safety performance.

The number of vessel detentions dropped dramatically over the review period, mostly due to 55% fewer detentions of general cargo carriers, even as the global fleet increased by nearly 12,000 vessels, though there were notably also fewer inspections – primarily in the general cargo segment.

However, stricter class requirements for newbuilds and a stronger focus on preventive maintenance, combined with tightening supervision, have raised the safety bar and should curb detentions as sub-standard vessels find it increasingly difficult to trade in the future shipping regime.

← Machinery damage was the single biggest factor in maritime casualty incidents in the past decade

LOSSES

A TOTAL lost vessel is a catastrophe for all concerned. Most important is the human factor, in those cases where a loss also resulted in injuries or, at worst, loss of lives. The financial implications from a loss can jeopardise an entire business if insurance cover is insufficient or successfully disputed.

Many actions have been taken to reduce the risk of casualty and loss. Improvements in vessel construction, onboard technology and communication have all resulted in safer navigation and better manoeuvrability.

The result has been positive. The casualty numbers have decreased, and the number of losses has followed that trend. A 30-year perspective on the total number of annual losses shows a clear, declining trend at the same time as the world fleet has grown by 78%.

A closer look at Lloyd's List Intelligence data for the past 10 years shows that the number of casualties resulting in losses has declined from 132 in 2012 to 57 in 2019, 58 in 2020 and 39 up to mid-August 2021.

This is a 57% drop in the number of losses per year at the same time as the fleet of ships has increased by 16% in numbers of ships and 46% in dwt.

The work with safety improvements is never ending. New safety challenges are continuously added in the shape of new designs, new technologies, new fuels, digital vulnerability, and climate change. To ensure a sustained, positive trend on reducing losses, safety must be at the core of development.

In 2012, the loss ratio to the world fleet was 0.11% if measured in numbers of ships, and 0.08% based on gt. By the end of that decade, the loss ratio had dropped to 0.04% and 0.02% respectively. The gt-based ratio was slightly higher in 2020 than in 2019, but by August 2021 were indications that it may be lower than in 2019.

The initial cause of casualty that resulted in the highest number of losses was foundering (submerge, capsize, sink). There were 947 losses over the measured period, 575 (61%) of which followed foundering.

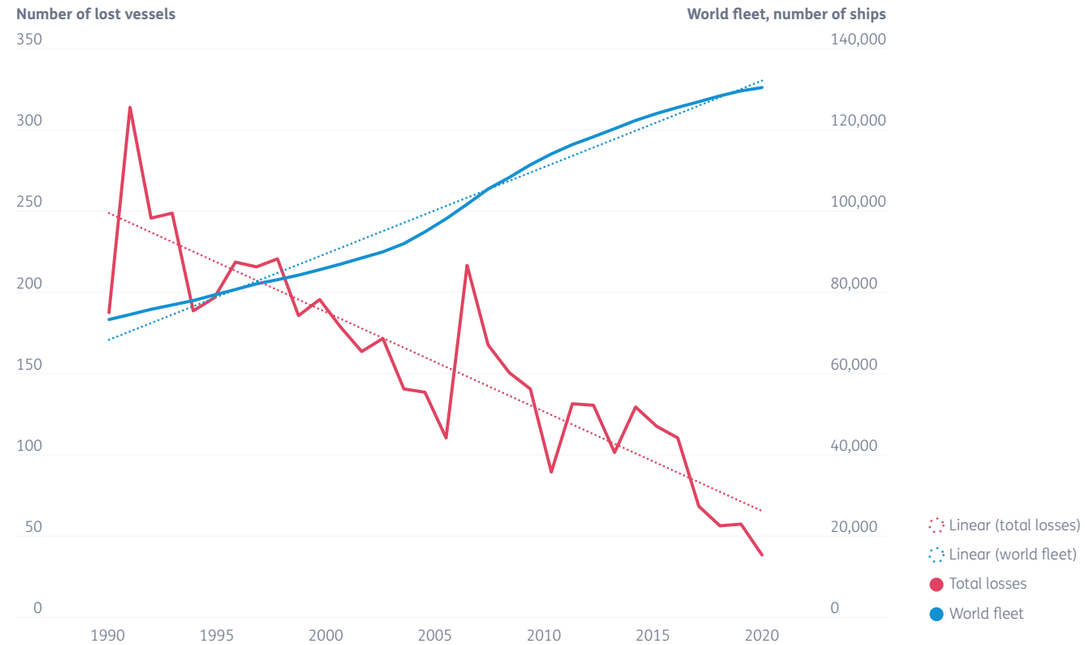


Figure 1: Lost number of vessels and world fleet 100 gt+, 1990-2021

Wrecked and stranded vessels resulted in 151 losses, equal to 16%. Fire and explosion were responsible for 12% of losses. The most common cause of casualty is hull and machinery damage. The share of losses caused by hull and machinery damage was 8%.

It would be reasonable to assume collision to be a common cause of casualty that led to a lost vessel, but there were only 26 records of that the past 10 years, less than three per year on average.

Losses due to war are not common. The tug Midi was damaged during an airstrike at Mokha Port, Yemen, in October 2016 and was declared lost a few weeks later.

Most losses due to foundering were reported in the South China Sea region which also included Indo China, Indonesia, and the Philippines. Another region where there was a high number was in the waters of Japan, Korea, and north China. These combined regions account for 40% of losses due to foundering.

An example of a foundered ship was the ship Duban. On March 12, 2020 Duban sank about 13 nautical miles off the coast of Oaxaca, a southern Mexican state, while it was carrying 1,500 tonnes of cement. Twelve crew members were rescued. There was water ingress, and the engine room was flooded. The vessel was sinking on even keel, even as it was proceeding at reduced speed.

The general cargo carrier fleet is large in numbers and old. The fleet also bears a large share of losses. Over the period, 346 losses were general cargo carriers. However, the number of lost vessels per year dropped by more 70% – from 60 in 2012, to 17 in both 2019 and 2020.

Foundering caused most (63%) of the losses, followed by wrecked and stranded. The incidence of hull and machinery damage – the next biggest cause of losses in the reviewed period – has significantly declined, resulting in very few such losses in recent years.

Only 7% of losses involved bulk carriers. Wrecked and stranded bulkers resulted in 26 of 63 losses, and 20 vessels foundered as the initial casualty cause.

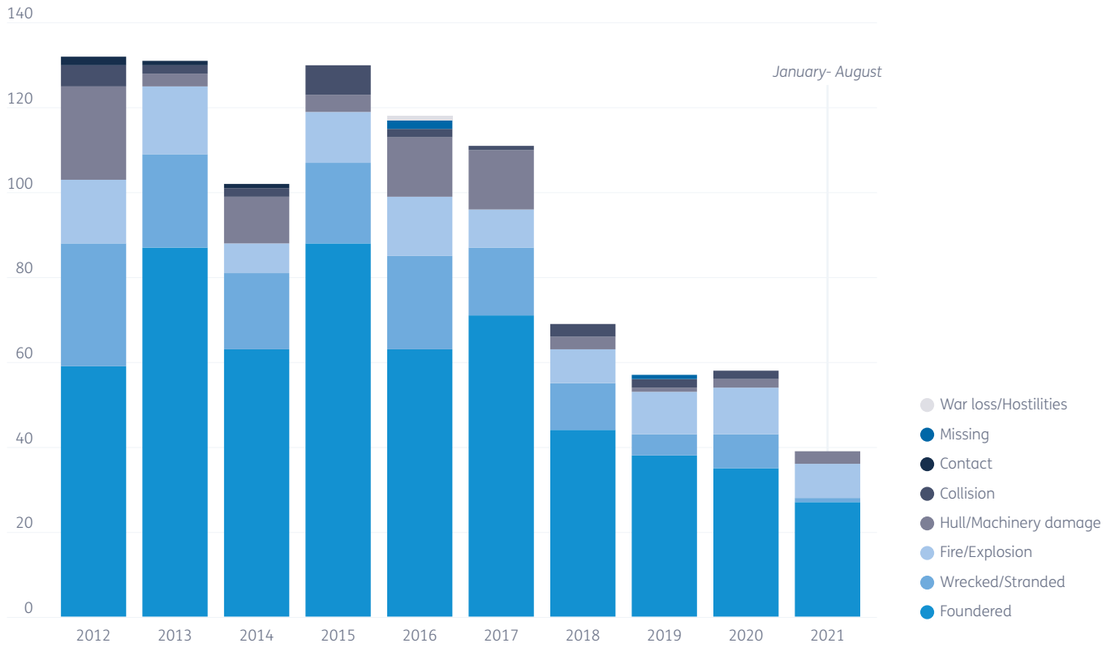


Figure 2: Losses by casualty type 2012-2021, number of ships

The passenger/ferry sector suffered a high number of casualties between 2012-2021, of which 94 resulted in losses. Slightly more than half were vessels for which foundering was the prime cause of loss. Fire and explosion were behind a further 28% of the losses. Hull and machinery damage was involved in 58% of the casualties in that sector, but there were only four such incidents which resulted in a lost vessel.

The diverse fleet of vessels included in the sector named 'other' showed 325 records of casualties resulting in losses. That equates to 34% of all losses over the period. Three quarters of them were the result of foundering, and 12% from fire and explosion. The number of losses averaged 34 per year. The year with most losses was 2015. Recent years have seen numbers of losses in the mid-20s, but the declining trend has not been as steep for the sector as for some of the others. Since this sector consists of very diverse vessel types, it is not possible to draw any obvious conclusions as to why, or what should be done to accelerate the decline, without further delving into the working histories of all the individual subtypes and vessels.

Tankers are generally vetted and scrutinized more than other vessel types and consequently the casualties and losses are relatively few in this sector. Ten years ago, we had 10 losses per year. Since then, we only have 0-8 cases per year. Container carriers, roro/PCTC, and gas carriers only have a handful of losses per year.

INJURED, KILLED, AND MISSING

Lives lost following a casualty in the period 2012 to mid-August 2021 counted 2,340 people. The year in which most lives were lost was 2015, when the ferry *Don Fang Zhi Xing* foundered and sank in bad weather on the Jianli section of China's Yangtze River. Only 12 of the 454 people onboard were rescued.

In 2019, there were 7 incidents resulting in the loss of 135 lives. The incident with the highest number was the passenger vessel *Conception* that had a fire onboard and sank off Santa Cruz Island, California, taking 25 lives.

There were 1,116 people reported missing during the close to 10-year period reviewed. Most were

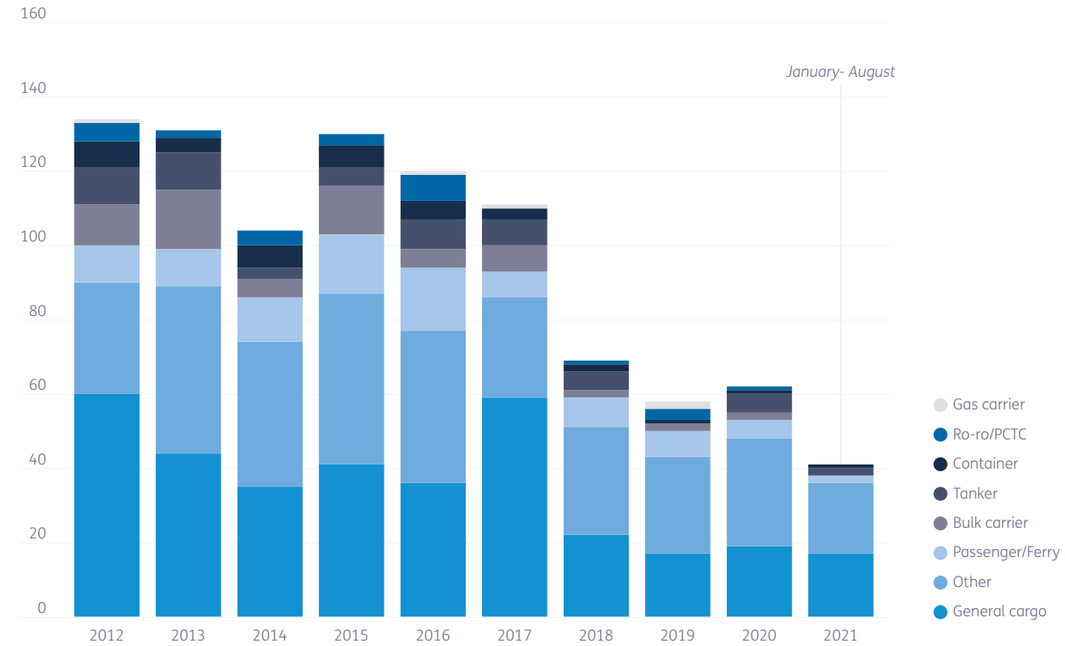


Figure 3: Losses by vessel type sector 2012-2021

onboard general cargo vessels or vessels in the sector termed 'other' that foundered. The years in which most reports of missing people came were 2012 and 2019. In 2019, three vessels were involved in incidents that resulted in 51 people missing.

The number of reported injuries averaged 198 per year. 2017 was the year with the highest number of reported injuries. Two incidents contributed to the higher-than-average number that year. The passenger ferry *Maria Mathilde* ran ashore on the Island of Tablas in the Philippines, which resulted in 87 people reported injured, and the passenger ferry *Maria Buono* was in contact with a pier at the Italian port of Casamicciola on Ischia Island, with 55 injuries.

The impact of a casualty incident on those injured, missing or killed is, potentially, dependent on the number of people who are onboard the vessel. For that reason, passenger vessels are high on the list of the number of injured, missing, or dead.

Every single incident resulting in injury or worse is one too many, and efforts should never be spared to minimise the numbers. It is noteworthy that the passenger vessel fleet comprises more than 7,500 ships (not including thousands of yachts), with a passenger capacity number exceeding 4 million. Many of those ships make several journeys per day, cumulatively carrying millions of passengers. Safety work done in the past has kept the number of injured, missing or dead people low, but the ambition must be to approach zero.

Since 2012, reports of the number of injuries total 1,853 of which 1,338 were on **passenger vessels**. The majority of injuries on passenger vessels happened as the ships were in some kind of contact, often with port infrastructure. Other common casualty causes that resulted in injuries were collisions, wrecked and stranded.

There were 215 reported injuries involving vessels from the sector known as 'other'. There were on average 22 injuries per year for that sector, but in 2016 there were as many as 60. That encompassed eight incidents of which three involved more than 10 injured. One of the incidents involved a tug that collided with a Panama Canal Authority craft near the old locks in Balboa; 19 people were injured.

The US flagged 1975 built *El Faro* lost propulsion in a hurricane in 2015, en route from Florida to Puerto Rico, and sank 3 days later

Slightly more than half the reported number of deaths in the past decade were on passenger vessels. Almost all of them happened as the ship foundered. Statistically, there were fewer than four incidents per year involving passenger vessels that resulted in deaths. There were 11 incidents that resulted in double-digit death numbers. Four of those incidents cost a total of 1,006 lives lost.

Since the start of 2016, the number of recorded deaths has dropped significantly. The previously mentioned *Conception* incident claimed the highest single number of lost souls in that period.

From a geographical perspective, more than 75% of passenger vessel deaths occurred in the Far East, and another 12% in East African waters. Eighty-eight per-cent of lives lost on passenger vessels in the past decade were on ships that were 20 years old or older and sailing in those waters.

Tankers were involved in 40 incidents that together led to 107 injured people. The only double-digit incident happened in 2018 when a large crude oil tanker collided with a fishing vessel off the coast of Munambam in India, causing 12 injuries. The most common causes of injuries onboard tankers were fire and explosions.

Fire and explosions were also behind most tanker vessel deaths. There were 27 incidents in the past 10 years, that resulted in 67 deaths. Some vessels caught fire and/or suffered an explosion while dry-docked. Others had engine room fires, but there were also various other accidents or incidents that caused fires and explosions. Eleven incidents caused by foundering took another 28 lives.

The large fleet of **general cargo carriers** has suffered from a significant number of casualties over the years, but many of them have been hull and machinery damage or wrecked and stranded. These casualty incidents have fortunately not resulted in high numbers of injuries, deaths, or missing people.

Most deaths and missing people were caused by foundering. They were incurred in a relatively high number of incidents, mostly in smaller vessels, thus limiting the number of people such vessels could accommodate.

One third of deaths occurred on ships that were 25 years old or older, while slightly more than another third took place onboard ships younger than 10 years.

The Far East is where most casualties took place that resulted in the loss of lives, but 18% happened in the East Mediterranean and Black Sea. There is a similar geographic spread for the number of missing people. It should be underlined that a significant share of the general cargo fleet trades in these aforementioned waters.

Bulk carrier casualties impacting on the safety of lives onboard are generally low. In the measured period, six ships foundered and later sank, taking 75 crew members' lives. Two incidents in recent years led to 29 people reported missing. The *Habco Pioneer* collided with a fishing vessel north-east of Jakarta, and the *Vienna Wood N* was involved in a collision with a fishing vessel outside Paluan Town in the Philippines.

There were 67 people injured in 9 incidents following fire and explosions onboard **container carriers**. The 1998 built *KMTC Hongkong* experienced fire while docked in Thailand's Laem Chabang port in May 2019 and 50 workers sustained burns. The Indonesian flagged vessel *Pemudi* sank in bad weather in 2013 while transiting through the Banda Sea in Indonesia. Two of the 21 crew members were rescued. In the same year the *Guangyang Xingang* sank near Longkou in northern China; 12 of the 14 crew members died in the incident.

There were few incidents involving **gas carriers** that led to injuries, deaths or missing people. In 2019, the LPG tanker *Maestro* suffered fire and explosion in Kerch Strait, eastern Europe, and later sank. 14 people died in the incident.

Ro-ro/PCTC vessels were similarly involved in relatively few incidents impacting loss of life. However, two incidents were stark. The US flagged 1975 built *El Faro* lost propulsion in a hurricane in 2015, en route from Florida to Puerto Rico, and sank 3 days later. The entire crew of 33 people perished. In 2012, the then five-year old ship *Baltic Ace* collided with another vessel in the North Sea and subsequently sank. Thirteen of the 24 members of crew were rescued.

There were comparatively many reported injuries, deaths and missing people associated with the diverse and large group of vessels collectively termed 'other'. Most deaths followed foundering. In 2021, a barge with 273 people onboard started taking in water, south-west of Mumbai, in a cyclone, resulting in more than 80 deaths. A fish factory sank in the Sea of Okhotsk between Russia and Japan in 2015 resulting in 69 deaths.

> The flags with the highest number of people affected by vessel casualties were China, South Korea, Indonesia, Hong Kong and the US

If we summarise the number of injuries, missing, and deaths to get an overview of onboard casualties, we find that 5,309 people suffered in 624 incidents. Among them were 2,800 injured in 206 founderings, a similar number of fires and explosions caused 821 human casualties, and 773 people were casualties resulting from 52 contact incidents.

Passenger vessels, general cargo carriers and 'other' vessels recorded the highest number of injured, missing, or dead people.

The flags with the highest number of people affected by vessel casualties were China, South Korea, Indonesia, Hong Kong and the US. Together they represented 23% of casualties with people impact, but 45% of the total number of impacted people.

The Chinese flagged incidents were dominated by one passenger vessel incident that impacted a high number of people, and 21 general cargo carrier incidents. The Korean flagged incidents included the sinking of a ferry in 2014 that claimed the lives of 304 people.

Indonesian flagged vessels were involved in 50 casualties that resulted in 453 people either injured, missing, or dead. Hong Kong flagged vessels recorded 16 incidents, seven of which impacted 10 or more people, and one incident left 124 people with injuries.

For US flagged vessels, six of the 30 incidents resulted in 10 or more people hurt, and one resulted in the death of 144 people.

SAFETY MUST COME FIRST

Marine insurance plays its part in the safety chain by helping shipping maintain secure and adequate risk management

By Helle Hammer
Managing Director, Nordic Association of Marine Insurers (Cefor)

SHIPPING companies have the primary responsibility for the safe operation of their vessels and the safety and welfare of their crew.

Flag states and classification societies have the overall responsibility for the implementation and enforcement of international maritime regulations and ensure safety at sea.

Marine insurance is first and foremost a risk management tool, established to provide large and stable risk carrying capacity to the shipping industry and support shipowners with various forms of asset, income, liability and cargo insurances in their daily operation.

Safety at sea is at the core of our business. On a daily basis, marine insurers contribute to this end through their risk selection and insurance conditions, loss prevention activities, and claims handling to prevent an incident from escalating.

FREQUENCY

With improved regulations, operations and standards, we have seen a stable and somewhat downward trend in the overall frequency of claims. The frequency of claims is also, unsurprisingly, connected to the world economy and how it impacts shipping markets. In periods with less activity, we also observe fewer claims, and vice versa.

As evidenced elsewhere in this report that focuses on recorded casualties, statistics from our own Nordic Marine Insurance Statistics (NoMIS) database[1] confirms that machinery insurance claims represent the highest percentage compared with other claim types.

Many of these are fuel related. This is becoming increasingly complex, and we did see a number of such claims stemming from the IMO's sulphur content limit in fuel oil that came into effect from 2020. The challenges observed were related to the tank cleaning, filtering, lube oil, viscosity and stability, but incidents were fewer than initially feared, and most owners had prepared well.

Also encouraging were learning outcomes from incidents in 2020 that gradually reduced throughout the first year.

Fire/explosion frequency, on the other hand, is low in percentage terms compared to other claim types. However, the cost of fire/explosion claims is typically high, and incidents pose a serious threat to the crew and the environment. Consequently, there is a concern today that this claim type represents a noteworthy exception to the overall positive trend in claims frequency. A particular worry is a recent increase in the frequency of container vessels' fires costing in excess of $500,000.

INCREASED EXPOSURE

While total losses may be down, the individual risks are increasing due to the growing size of vessels and the number of vessels in the global fleet, environmental concerns and requirements from coastal states. This means that the potential implications of a single incident represent a higher exposure and risk to seafarers and marine life.

A reduction in the number of total losses should never be an excuse for complacency or any pivot away from safety first, or falling behind industry developments.

For instance, with more goods transported in containers and a given probability of a fire starting in one container, the probability of a fire increases with the number of containers on board a vessel. At the same time, firefighting capacity on board large container vessels is insufficient, and an amendment of the rules is urgently needed along with efforts to prevent un/misdeclared dangerous cargo on board.

1 https://cefor.no/statistics/nomis/

← Lloyd's underwriting room: Marine insurance is first and foremost a risk management tool, established to provide large and stable risk carrying capacity to the shipping industry and support shipowners with various forms of asset, income, liability and cargo insurances in their daily operation

DETENTIONS

Marine insurers pay close attention to port-state controls and requirements from recognised classification societies in order to assess individual risks and keep substandard ships out of their portfolios. In the event main class is lost, the insurance contract also terminates.

Detentions as described in this report have been analysed by Cefor to detect whether these could be an indicator of future casualties. In the analysis, based on our claims data as of 2018, it was revealed that the total loss frequency for vessels below 10,000 gt was 7 to 9 times higher for vessels that were detained in a 3-year period prior to the year in which the total loss incurred[2].

MORE THAN AN AFTERTHOUGHT

Going forward, maritime safety must remain at the forefront and not be an afterthought in the drive towards more sustainable solutions and digitalisation.

Cefor supports the ambition to decarbonise shipping. As marine insurers, it is our job to support shipowners in their transition to low or zero carbon fuels safely, and with all associated risks fully understood and managed.

Environmentally friendly fuels carry their own risks; ammonia is both toxic and corrosive, and hydrogen has a wide flammability range and ignites easily. As these new fuel types are largely un-tested, the insurance industry has no history or loss records to help it assess the potential risks involved.

We need to learn about these new fuels and engage with our clients to ensure the risks are fully understood and managed. Just as importantly, we need IMO regulation and class rules on the implementation and use of these new fuels. Along with necessary training, this will ensure the safety of the crew and enable marine underwriters to assess and offer financial protection for this new risk profile.

With the support of digital solutions, maritime safety might be improved. But the use of more complex, integrated solutions also challenges the traditional rules and operation of vessels.

Seafarer education and training must change with the increased use of digital solutions, and safety must be maintained in the transition between humans and technology. Cyber risk only adds to the challenges that come with these new opportunities.

Prevention will always be better than cure, and by being transparent and working together we can all contribute to keep safety at sea our number one priority.

2 https://cefor.no/statistics/analysis-with-special-focus/

KNOW HOW TO TRANSPORT YOUR CARGO SAFELY

Crew familiarity with the nature and properties of onboard cargo can help with safety, as can classification society guidance and instruments on how to ensure safe transport of cargo

By Ivar Håberg
Director of Approval, Ship Classification DNV

FOR ship operators to stay competitive and effective in a challenging market, cargo flexibility and a maximum carrying capacity are key instruments.

However, changing cargo with different properties and behaviour and carrying more cargo increases the need to know the associated risks and implement effective measures to mitigate such risks. It is also on us as a classification society to help ensure the safe transport of cargo.

Fortunately, the data in this report shows that casualties related to cargo carried onboard are not playing a significant role compared to other causes. One essential safety driver is crew familiarity with the nature and specific properties of the cargo carried. This is especially important for hazardous materials, but also for cargo that may become hazardous under certain conditions.

Early detection of fires on board, and effective equipment to control them, also helps prevent major incidents that lead to vessel and crew losses.

BULK CARRIERS NEED TO TACKLE COMPLEX CARGO RISKS

A number of factors can compromise the cargo integrity on bulk carriers. They can originate from the physical and chemical properties of the cargo itself or from changing temperature and air humidity conditions. Knowing and controlling those factors are key to avoiding hazards to humans, as well as reducing claims for cargo damage.

To keep bulk cargo safe, suitable equipment must be available onboard to measure key influential parameters, such as sea temperature, cargo and ambient temperature, relative humidity and dew point inside and outside the cargo hold. All readings, events and measures taken with regard to the cargo and its condition should be logged to provide a continuous record in case any issues emerge.

HAZARDS ON BOARD

Several cargo types may pose fire, explosion and health risks. Furthermore, non-odorous toxic gases or an oxygen-depleted atmosphere in a cargo hold pose an immediate danger to anyone entering. What is more, toxic gases exiting from cargo holds – whether by natural or mechanical ventilation or through leaks – could enter crew accommodation and, worst case, cause injury or death if not detected at an early stage.

Certain cargo shipments produce dust that can also pose a health hazard. Mixing hygroscopic and non-hygroscopic cargo shipments with different inherent temperatures in the same hold adds additional risks.

Cargo hold ventilation is the established means to mitigate these risks. The critical question is how and to what extent ventilation is advisable. INTERCARGO, the Standard Club and DNV have jointly developed a guidance document called 'Cargo and cargo hold ventilation' which looks at the specific risks associated with particular types of cargo and how ventilation should be applied to mitigate them.

BULK CARGO LIQUEFACTION

Transporting large quantities of bulk cargo can be tricky. The material, depending on its physical properties, granularity and water content, may

> Changing cargo with different properties and behaviour and carrying more cargo increases the need to know the associated risks and implement effective measures to mitigate such risks.

change its behaviour under the influence of ship movements and vibration, and adopt the properties of a liquid and develop the so-called free-surface effect, and then begin to move similar to a liquid in response to the vessel's attitude, which can cause the ship to lose stability and capsize.

Another challenge associated with liquefied cargo is hull strength. The weight of the compacted cargo can put extreme pressure loads on the sides of the cargo hold, that can exceed the yield strength of the structure.

The IMO addresses these issues in its mandatory International Maritime Solid Bulk Cargoes (IMSBC) Code. To support operators to enhance loading flexibility, efficiency and safety of specially constructed cargo ships (SCCS), DNV's class notation BCLIQ interprets the IMSBC Code and specifies stability and strength requirements.

CARGO FIRES ON CONTAINER SHIPS – EARLY FIRE DETECTION IS KEY

Container ships have grown much larger in recent years and the volume of cargo carried on deck has expanded exponentially. Container fires, especially with the volume of cargo now being carried, can present a substantial risk to the safety of the crew, cargo and vessel.t

Standard firefighting equipment onboard is usually not sufficient to fight a fire spreading across several containers. A spreading container fire can easily turn into a catastrophic event that is extremely difficult or even impossible to contain or extinguish.

Furthermore, after suffering major fire damage, a larger vessel and its cargo may be difficult to recover or find a port of refuge. Injury and damage to people, cargo, vessel and environment can be immensely costly. Thus, early fire detection should be given a high priority to avoid loss of control.

ADVANCED FIREFIGHTING TECHNOLOGY

A number of technological advances in recent years have greatly improved the available options for improving fire safety on board, both in terms of fire detection and fire control. Temperature scanning systems can be used to identify containers which are heating up relative to the surrounding boxes as early as possible and take appropriate steps to contain the fire inside before it causes major damage.

Powerful water jets can be installed in suitable locations from where they can cover the entire deck area and pinpoint any row of containers to cool them down or even extinguish flames. In addition, there are water-powered, self-drilling firefighting lances that can be used to extinguish a fire inside a container (HydroPenTM), and other advanced fire containment devices.

In response to the increased risk of uncontrolled fires on container vessels, DNV has developed the FSC notation, which employs a function-based approach, for an enhanced safety level beyond present SOLAS requirements, an increased hazard awareness, and an enhanced ability to detect and fight container fires. This approach is designed to foster the application of the new and advanced technologies and ensure that safety objectives are met in the most efficient way.

One aspect requiring further discussion is that container crew often don't receive sufficient detail on what lies inside containers. Just as it is important for bulk carriers to know the nature and specific properties of their cargoes, risks onboard container vessels can be minimised if crew members get more detailed information about the cargo, so they can specify risks and separate hazardous goods from others.

SEAFARER SAFETY AND WELL-BEING SUPPORT PEAKS IN PANDEMIC

The Covid-19 pandemic continues to take its toll on seafarers' mental health and well-being around the world

By Ben Bailey
Director of Advocacy and Regional Engagement, The Mission to Seafarers

AT THE Mission to Seafarers (MtS), our welfare services remain in high demand as crews navigate the fast-changing and often confusing requirements of travelling during the worst global health crisis of modern times.

One of the most visible signs of MtS is our network of port chaplains in 200 ports across 50 countries. Colleagues providing quayside support have had to negotiate rolling national lockdowns, crew shore leave restrictions and, in some locations, reduced port access.

However, despite this, they still managed to visit more than 30,500 ships in 2020, providing more than 187,000 seafarers with onboard access to communication facilities and care packages.

With many countries still denying shore leave, our teams have been completing shopping requests and collecting items for seafarers such as medication. Fulfilling prescriptions has been particularly important for those seafarers living with conditions such as HIV and diabetes; without a constant supply of medication, a life-threatening situation can quickly develop.

> The pandemic has contributed to a rise in seafarer abandonments. 137 entries were recorded in the ILO Database on Seafarer Abandonment in 2020 – a record number. Another depressingly high toll looks set to be reached in 2021

Like many organisations, elements of our digital strategy have been brought forward to ensure seafarers can access support when they need it. Over the past 18 months, MtS has provided a 24/7 Chat to a Chaplain service, through which seafarers can get help and advice.

Much of those interactions have involved consoling seafarers working on extended contracts, or providing local port information. Others have required intense interventions, such as counselling bereaved families whose seafarer relatives died from coronavirus.

The pandemic has also contributed to a rise in seafarer abandonments. 137 entries were recorded in the ILO Database on Seafarer Abandonment in 2020 – a record number. Another depressingly high toll looks set to be reached in 2021.

In many such situations, crews are not only left without salaries, far too many have no provisions on board and are forced to rely on charities and local communities for food and water. In the UAE, Kenya, and Vietnam, local MtS teams have worked hard to ensure crews have enough food to eat, and fuel to run generators and air conditioners while they advocate for resolution with the authorities.

It's not just seafarers who have suffered during this pandemic; their families have also been hard hit. Often living in countries with underdeveloped healthcare systems, those 'left behind' have had to deal with curfews, communication blackouts and food shortages.

When the Delta variant of the virus surged through India, many families in the port city of Tuticorin in Tamil Nadu state found themselves without adequate supplies to guard against the virus. Working with our partners, the MtS team in Tuticorin helped more than 20,000 individuals. Over a period of six months, parcels of rice, spices, fruits and vegetables, together with face masks, hand sanitiser, digital thermometers and pulse oximeters were given to maritime families in need.

Elsewhere, our family support network in the Philippines has facilitated online community meetings, delivered food parcels and emergency utility grants to families. We have also been offering Covid-safe transportation for crews returning from their contracts.

As parts of the (mainly developed) world begin to re-emerge from their Covid-induced isolation, seafarers continue to bear the brunt. Too many nations have yet to designate mariners as 'key workers' – a designation that affords them certain freedoms – and despite a growing number of seafarers having received a vaccination, bans on shore leave remain in place, denying seafarers access to a moment of refreshment, to re-charge their batteries and reconnect, before starting the next leg of their journey.

We know shore leave is a vital part of maintaining a seafarer's mental health and well-being. Our Seafarers Happiness Index regularly reports crews' anger and frustration at not being allowed off ship, and there are many who are considering going home and not returning. Crews remain tired and frustrated, and their plight proves that the life of a seafarer is still misunderstood and largely forgotten by those outside of the industry.

To ensure seafarers feel valued is one of the reasons for which The Mission to Seafarers exists. We work with a wide range of stakeholders to bring about innovative solutions to meet seafarers' needs – from e-learning courses in financial literacy, to quayside minivans and onboard Mi-Fi units which provide connectivity to the internet while in transit.

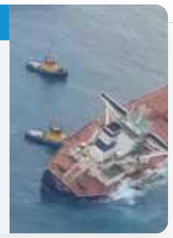
187,000
Seafarers provided with care packages and onboard communication access by The Mission to Seafarers in 2020

For more than 165 years, **The Mission to Seafarers** has been helping crews and their families face the dangers and difficulties associated with a life at sea. With your help, we can continue to serve seafarers long into the future. For more information, visit: www.missiontoseafarers.org

← Crews remain tired and frustrated, and their plight proves that the life of a seafarer is still misunderstood and largely forgotten by those outside of the industry

RECENT BLACK SWAN TIMELINE

24 February 2020



STELLAR BANNER

151,596 gt

The Polaris Shipping owned very large ore carrier, Stellar Banner, ran aground off Ponta da Madeira, Brazil, on 24th February 2020. The ship was scuttled in the Atlantic more than three months after it ran aground.

Bulk carrier/bulk ore carrier | Built: 2016 |
Wrecked/Stranded

4 August 2020

ORIENT QUEEN

7,478 gt

The passenger vessel Orient Queen was severely damaged at berth from the catastrophic explosion at the Port of Beirut on 4th August 2020. The ship listed starboard in the port, capsized, and sank overnight after taking in water. There was no cargo or passengers onboard, but two crew members were found dead and 7 injured.

Passenger/Ferry/passenger (cruise) | Built: 1989 |
Fire/Explosion

23 March 2021

EVER GIVEN

217,612 gt

On 23rd March 2021, the 20,000 teu container carrier Ever Given ran aground in the Suez Canal on a northbound voyage. The Suez Canal was blocked for traffic until the ship was refloated 29th March 2021 and towed to Great Bitter Lake where it was anchored for investigations.

Container/fully cellular containership | Built: 2018 |
Wrecked/Stranded

20 May 2021

X-PRESS PEARL

31,629 gt

A fire broke out onboard the container carrier X-Press Pearl on 20th May 2021 as the vessel was waiting in its approach to a Colombo terminal in Sri Lanka. A container leaking nitric acid may have been responsible for the blaze.

Container/fully cellular containership | Built: 2021 |
Fire/Explosion

25 July 2020

WAKASHIO

101,932 gt

The 203,932 dwt bulk carrier Wakashio ran aground on a reef two nautical miles south-east of Mauritius the 25th July 2020. Bad weather caused a tank breach and on the 15th August the ship broke into two. Ten days later the broken stern was towed and sunk in the open ocean. On the 27th July 2021, the International Transport Workers' Federation called on the government of Mauritius to release the crew, who were essentially held without charges, and had then been away from their families for over two years.

Bulk carrier/bulk carrier | Built: 2007 |
Wrecked/Stranded

3 September 2020

NEW DIAMOND

160,079 gt

Vessel issued distress message, fire engine room in pos 07 03 36.0N, 082 29 00.0E, E of Sri Lanka 3rd Sep 2020. Vsl towed to Port Fujairah, 7th Oct. Found to be beyond repair. Sold to breakers in May 2021. Towed to Gadani scrapyard 6th Jul.

Tanker/crude oil tanker | Built: 2000 |
Fire/Explosion

17 May 2021

AWB PAPAA 305

8,882 gt

The barge AWB Papaa 305 was built in China 2004. The barge was 8,904 dwt and 8,882 gt, and was flying the St. Kitts-Nevis flag at the time of incident. On 17th May 2021, AWB Papaa 305 started taking in water while south-west of Mumbai after being caught in cyclone Tauktae. The barge was deployed by the Oil and Natural Gas Corporation (ONGC) to service the offshore drilling platforms and reportedly had 273 people onboard at the time. The following day, the anchors of the vessel gave way leading to stranding and subsequent submerging of the vessel. More than 80 of the people onboard were killed.

Other/barge | Built: 2004 |
Foundered

20 June 2021

YUNICEE

922 gt

The passenger vessel Yunicee capsized and sank due to a shift in loaded vehicles in Gilimanuk waters, Bali, Indonesia, 29th June 2021. The captain and two crew members were arrested. 10 dead, 16 missing.

Passenger/Ferry/ferry | Built: 1992 |
Foundered

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+44 (0)20 7246 2980

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