
inmarsat
RESEARCH PROGRAMME
THE FUTURE OF
MARITIME SAFETY
REPORT
AUGUST 2021

# THE FUTURE OF MARITIME SAFETY REPORT

# CONTENTS


# THE FUTURE OF MARITIME SAFETY MOVING FROM REACTIVE TO PROACTIVE

**PETER BROADHURST**
Senior Vice President of Safety & Security, Inmarsat Maritime

Technology holds the key to making long term structural changes to maritime safety. At present, the most commonly seen issue is the fact that the captain of a ship acts as a single point of failure – which stands in opposition to the recommended "swiss-cheese" model of risk, where there are multiple safeguards in place to prevent an incident occurring. However, there are obvious steps that can – and should – be taken to resolve this situation.

Perhaps the lowest hanging fruit is to use technology to be proactive about safety. At Inmarsat, our vision for proactive safety is driven by the power of fleet data. We believe that the creation of an online anonymised data lake for maritime safety information will allow the industry to identify weak spots, identify solutions, allocate resources and measure progress. This data could be shared with stakeholders such as the coast guard or regulators, and result in a reformation that benefits the entire industry by creating a level playing field that prioritises safety.

## EASY STEPS TO SAFETY

Gathering this data shouldn't be too difficult. Many vessels are already equipped with sensor technology and in fact, we are seeing these sensors being used extensively in autonomous ships trials. These sensors should be linked to onboard and shoreside notifications so that stakeholders have access to the same level of information and can provide support.

Ideally, all this information should be logged for an official record and for learning purposes. It will also ensure that crew onboard a ship will feel accountable for their behaviour and be aware that they are likely to be held legally responsible for deliberately continuing to operate in an unsafe manner.

In the case where a ship goes off-course, the obvious solution would be to have alarms go off to alert both the captain and also the staff in the office that act as a support system for the crew. The technology to track vessel movement already exists and it would be a small matter to automate an alarm system to alert both ship and shore decision makers when certain parameters are met. These parameters could be a vessel not moving at all (which could indicate a loss of propulsion), being too close to the shore (risking running aground), or even maintaining a route that would take the ship into dangerous weather.

Distress calls for vessels meeting certain safety criteria should also be automated, so that local authorities can check in with these vessels rather than the onus of asking for help resting on the shoulders of a crew dealing with a fraught situation.

## CONSTANT LEARNING

Although this proactive support for the captain would revolutionise maritime safety, the tools to provide this support

are not revolutionary themselves. In fact, this technology is in use in the aviation and automobile industries - where we see alarms sound if your car is too close to another, or if your plane is flying too low. It is obvious that similar systems would benefit ships.

In the long term, the focus must be on information accuracy, data transparency and ensuring that we implement the lessons learned. Patterns must be identified as early as possible so that we keep loss of life to a minimum and players must regularly share critical data about maritime operations, such as information about accidents, deaths at sea, near misses, illness, etc.

Having reliable information about risk factors allows us to identify a baseline from which to track our progress and deploy resources more cleverly, thus driving down the cost of search and rescue operations.

Investing in monitoring technology and data sharing will not only give us insight into issues with technologies but also our industry's safety culture. This is vital to transforming the way we invest in safety, moving us from a tick box exercise or afterthought to a transparent industry that rewards good players.

## DANGEROUS CULTURE

The biggest hurdle to progressing safety is the current culture in maritime. Despite checks and balances such as regulators, class societies, insurers, flag states and more, things continue go wrong with unacceptable frequency – which I believe is due to the well-documented reticence on the part of maritime to evolve unless there is a direct financial gain to be had.

The ability to point the finger of blame for many accidents at the captain or crew has not only meant that safety is an afterthought, but has incentivised us to design systems that use the human element as a loophole. It is common practice to see vessels that are distinctly unsafe operating because a


company has found a way to make a profit, or has found crew that are desperate for work.

Some owners regularly take unnecessary risks to maximise profits, such as driving crew to the point of fatigue, refusing to provide crew with connectivity to call their loved ones – which is important to mental health. They rely on the fact that crew are either too tired/afraid to push back, or too stressed out to objectively analyse the situation. And when the ship is too close to shore or runs aground, they immediately absolve themselves of any responsibility despite setting up the situation that led to these unsafe actions.

Without changing the culture being adhered to by the decision makers, who would rather risk an occasional fine by port state control than invest in systemic operational improvements, this ethos will remain dominant.

Combined cultural and technological change may sound like an expensive endeavour, but we must remember that shipowners make similar decisions when building vessels and choosing expensive technologies to reduce operating costs - and investing in safety will undoubtedly reap rewards in areas such as insurance, crew retention and industry performance. What is required is a long term mindset when it comes to safety decisions and a willingness to learn from data.

## THE FUTURE OF MARITIME SAFETY

This Inmarsat Research Report, which showcases three years of distress call information, grants readers insight into some of the trends within the maritime industry today and highlights certain areas where more must be done to prevent further loss of life and assets.

It also contains calls to action by industry leaders and sets the stage for conversations about the future of our industry and our willingness to create a safer tomorrow together. I hope you enjoy reading it.

# METHODOLOGY



## OVERVIEW

This 2021 Future of Maritime Safety Report compiled by Intent Communications on behalf of Inmarsat aims to identify safety issues of concern to the maritime industry by assessing three years of vessel distress signal data gathered between 2018 and 2020.

The report categorises this data based on grouped vessel types (see page 48 for further information on these categories) and analyses them primarily with regard to type of vessel, incident numbers and location. Additional context is provided through an analysis of class societies, seasonal periods of high incidence and corresponding weather patterns, and manufacturing yard.

Opinions were solicited from industry leaders with regard to particular sectors, ensuring that this report not only offers its readers comprehensive data analysis, but also indicates how this information sits alongside current understandings of the maritime Industry.

The final report has been created by the team at Intent Communications Ltd on behalf of Inmarsat with inputs from all relevant parties.

## GATHERING DATA FOR ANALYSIS

Under the Safety of Life at Sea (SOLAS) convention, cargo ships of 300GRT and upwards and all passenger ships on international voyages must be equipped with satellite and radio equipment that conforms to international standards.

Being a provider of such communication services, Inmarsat gathers and stores GMDSS data from its terminals for regular record keeping and liaises with authorities such as the International Mobile Satellite Organization (IMSO), the International Maritime Organization (IMO) and others.

Upon commissioning this report, Inmarsat began by processing its own recorded data for the three- year period running between January 2018 and December 2020. Following this, the data was then matched against internal Inmarsat vessel grading information, processed to remove duplication points and was then verified against a variety of vessel databases.

The final data set therefore contained information that included the year of the distress call, location information (such as ocean region, latitude and longitude), the IMO number (where available), the vessel's name, the vessel's flag state, the vessel's classification society and the type of vessel (when matched against both Inmarsat and available vessel data classification).

This information was then used to map trends and patterns and draw conclusions where possible.

It is of note that in the process of processing the GMDSS data, Inmarsat has removed duplicate calls from the same vessels to present a cleaner data set as in some cases, there would have been multiple GMDSS alerts per incident.

## SOLICITING INDUSTRY OPINION

Inmarsat, in collaboration with Intent Communications, approached experts in the maritime industry to solicit their opinions on topics relevant to vessels in distress and industry safety standards. (For further information on how these interviews were conducted and complied, see page 46.) They were invited to share their views on current safety issues facing the maritime industry and changes they would like to see made going forward.

Drawing on their extensive knowledge of contemporary shipping, Peter Broadhurst from Inmarsat, Kitack Lim from the International Maritime Organization, Guy Platten from the International Chamber of Shipping, Ashok Srinivasan from BIMCO, Kuba Szymanski from InterManager and Stuart Edmonston of the UK P&I Club, each provided inputs to this report in the form of opinion pieces.

Further, the IMO was approached for an official comment on fishing vessel safety. A statement regarding the Cape Town Agreement was provided and added to the report.

# MARITIME SAFETY IS A SHARED GOAL

## KITACK LIM

Secretary-General, International Maritime Organization (IMO)

The International Maritime Organization's (IMO) vision is to significantly enhance maritime safety, security and the quality of the marine environment by addressing human element issues to improve performance. Safety is therefore at the heart of the IMO's mandate. To this end, over the past decades, IMO has developed a comprehensive framework of standards, to ensure the safety of shipping, seafarers who remain at the core of our industry.

The world is changing faster than ever before, but this creates the opportunity for constant improvement. Keeping an open mind to change allows us to rapidly incorporate the benefits that science, technology and social evolution bring to the table.

## SEAFARERS: AT THE CORE OF SHIPPING'S FUTURE

The World Maritime theme for this year is "Seafarers at the core of shipping's future". No discussion about safety would be complete without mentioning the role of the human element. The world's seafarers have gone above and beyond during the pandemic to keep the supply chains moving and to deliver personal protective equipment, food, medicines and other vital supplies.

Nonetheless, fluctuating access to crew change continues to cause seafarers unacceptable physical, mental and emotional strain. Seafarers are crucial to maritime safety. Being trapped onboard is a humanitarian and safety crisis that must be resolved immediately, to prevent vessel accidents. Motivated by the welfare of seafarers, the safety of shipping and the protection of the marine environment the IMO continues to work with Member States industry and the international community to bring an end to the crew change crisis.

We must also embrace diversity in the maritime workforce. This increases the talent pool and makes our systems and culture more robust. We need the best and brightest individuals working to safeguard our sector and it is up to us to ensure that we create an attractive work environment.

In the longer term, we must ensure that seafarers are given the right tools and support adapting to evolving work requirements. Our goal should be to properly prepare them for life on board a ship, with quality training, mental and physical health resources, appropriate shore-side care and a supportive working culture.

## COLLECTIVE EFFORTS FOR MARITIME SAFETY

Improving safety should be the primary shared aim of the maritime sector. Each and every one of us should be doing everything in our power to reach this goal. Sharing knowledge, pooling resources and working collaboratively have proven successful time and time again.

It is important to emphasise the crucial role played by the Global Maritime Distress and Safety System (GMDSS) and providers of GMDSS-approved satellite communication services, including Inmarsat to maritime safety. The future of safety must include input from a wide variety of participants including shipping companies, service providers, ports, regulators, national governments, equipment manufacturers, and more. The high level of collaboration to address the impacts of the COVID-19 pandemic has shown just effective it is to work together.

A dedicated focus on safety makes it easy to identify the best path forward when making decisions.

Information sharing is crucial. We must share information about incidents to ensure that the lessons learned permeate our culture and minimise the chance of such situations recurring.

## CONTINUING PROGRESS IN STEP WITH TECHNOLOGY

When it comes to safety, our work will never be done.

Although it is impossible to completely eliminate incidents, we must track our safety progress and hold ourselves accountable. Emerging technology is making it easier than ever to gather and analyse data, and this will allow us to identify roadblocks and weaknesses that need to be addressed.

We are already seeing technology companies deliver innovation through digitalization that can be used to support seafarers, ease the administrative burden and bridge the gap between ship and shore. I hope that these efforts will continue.

For safety to truly be a shared goal, it must be practised daily by everyone in a company and across the entire maritime sector. This will create an environment that benefits everyone, individually and as an industry – and in the long term, will save countless lives.

# IMPROVING SAFETY THROUGH COLLABORATION

## GUY PLATTEN

Secretary-General, International Chamber of Shipping (ICS)

Safety and the human element are intrinsically intertwined, and it has been proven time and time again that collaborative working practices help us save lives. Sharing information, breaking down barriers and working towards a shared goal are tangible ways to advance safety in the maritime industry – and are areas where it is clear that we have room to improve.

One of the most important tasks we have is to move away from a blame culture, towards one that views safety as a shared responsibility. Finger pointing never helps and creates a culture that holds us back from working together and reaping the benefits of such practises. Accidents are usually the cumulative result of a number of factors, such as issues with training, mechanical failure, or even cultural misunderstandings, making it problematic to lay the blame at the hands of an individual seafarer. Of course, this is different in cases where individuals have been criminally negligent and made deliberate decisions that led to disaster.

Effective collaboration, interaction, data sharing and speaking to each other regularly is transformational: we all improve when we talk to each other. This is something that particularly rose to the forefront during the COVID-19 pandemic, which dominated most of 2020 and has fundamentally changed maritime operations.

### SILVER LINING

The virus, which became prominent globally in March, created numerous hurdles that required creative problem solving such as the need to limit in-person interactions, adopt new digital technology virtually overnight and

perhaps most prominently, created barriers to travel that prevented access to crew change. Although we have been working on these problems and will continue to build on the headway that we have gained, we must also make time to acknowledge that dealing with this crisis united us in unprecedented levels of global cooperation

The biggest change has been the transition to digital working, which the industry adapted to in a short period of time. We modified our processes to offer remote surveys, transitioned most of our paperwork online, and embraced flexible working whenever possible. Although the industry was already making some of these changes, the pandemic accelerated the digitalisation wave such that we have jumped ahead at a faster pace than many of us originally envisioned.

The ability for individuals to work remotely made it easy to collaborate and share information in new ways. During the course of 2020, I had regular interactions with the IMO, ILO and other organisations and often found that we had people all around the globe all on the same call despite the time differences. At ICS, we even had 50 member states dialling into a call, which is a level of participation that would have been impossible to achieve if that had been an in-person meeting. After all, it is much easier to spare two hours to work on a project as compared to the two days of travelling it may take to reach a meeting venue.

In fact, these types of interactions have been so effective that we have made the decision to revamp the ICS committee meetings to facilitate online participation and boost information sharing. We believe that other companies all over the world are also working along the same lines and that this will be a lingering change within the sector.

## ONGOING INTERACTIONS

While there is no doubt that face to face contact can never be replaced and will continue to be important (especially for relationship building), remote interactions are ideal for task-based work – including progressing projects relating to topics such as safety, emissions, etc. I believe that it is important to continue building on those practices that have proven themselves most useful during this crisis.

We are already seeing a recalibration in the level and quality of safety information shared, and lessons are being learned more readily. There are more opportunities to attend online meetings and we have seen increased participation as these tend to be less intimidating than speaking out in a meeting in a hall (Of course, there are limitations to the medium and it is important to ensure that the meetings are structured and that all participants are given the opportunity to speak by the chair).

The advantages go beyond meetings. In some cases, we are seeing that certification is more useful as it is being done in real time – although this is a double-edged sword and there are instances where some things are missed.

There is no acceptable substitute for a seafarer exercising good judgement, but we should carry forward the ways in which we are currently supporting crew – such as with increased shore support via online and telephone interactions.

## DATA SHARING

Perhaps the most important advantage of transitioning to digital operations is the ability to collect and share data so that we can make meaningful, targeted safety improvements. Data can be used to identify weaknesses, track improvements and mitigate risk – and, if used correctly, result in structural change.

It is important to know what it is that you want to achieve with the information – and simply collecting data for the sake of it is a fool's errand. However, we have already seen how big data and collaborative projects such as HiLo are extremely important and are revolutionising the maritime industry's safety performance. During the pandemic, ICS made a point of collecting data on crew change and we shared this with various stakeholders – and this helped inform conversations with governments.

I truly hope that we can carry forward the boost to information sharing that we have seen as a result of COVID-19. The relationships between ship and shore have become far closer over the past year than have ever been seen before, and this cooperation holds the potential to ensure the safety of our crew members and the ships on which they sail, and also benefit the industry as a whole.

# WEAVING A SYSTEMATIC SAFETY NET

**ASHOK SRINIVASAN**
Manager, Maritime Safety & Security at BIMCO

When building a future for maritime safety, it is important to consider the foundations on which the sector operates at present. Unless we address the weaknesses in our existing structures, we will carry these flaws forward as they will become seen as part of the system. This has certainly been the case with how we view the human element and safety, where our focus is often incorrectly placed on trying to train individuals to change their behaviour rather than looking at technological means of creating a safety net that addresses risk.

Let's look at this topic through the lens of an ongoing issue: deaths in enclosed spaces.

Enclosed spaces are the areas that have limited openings for entry and exit, inadequate ventilation and are not designed for continuous worker occupancy, such as cargo holds, ballast tanks, cofferdam spaces between engine rooms and cargo areas, fuel oil tanks, etc.

However, seafarers, inspectors, dock workers and/or engineers enter these spaces from time to time to conduct inspections, carry out maintenance

or cleaning. There can be a lack of oxygen due to formation of rust, which uses up the moisture and oxygen in such spaces. Another complicating factor is toxic gases like carbon monoxide, hydrogen sulphide etc that can be in spaces such as a sewage tank or areas with a build-up of engine exhaust gas. If these spaces are entered without good preparation i.e. proper ventilation, personal protective equipment etc, the results can be fatal.

## HUMAN ELEMENT

The risk to life in such situations has been recognised for many years as can be seen by the fact that the International Maritime Organization (IMO) has created regulations to address this point, which most companies include in their safety training and procedures. However, there is still an unacceptable number of incidents that lead to loss of life every year.

In a vast majority of cases, accident investigations highlight the fact that seafarers have not properly followed a company's written procedures and then usually recommend more training. While there is an argument to be made for improvements to training, and regular reinforcement of best practices is integral to ship-board safety culture, this way of thinking misses an essential point: that the system is structured around a single point of failure.

It is irresponsible to lay the responsibility for safety in enclosed spaces on human beings who are vulnerable in such situations. If the human body does not have a continuous supply of fresh air, it almost immediately shuts down. At times, there are no warning signs, perhaps not even any discomfort, just an immediate urge to sit down and the person collapses within minutes. If fresh air is not provided within four minutes, the damage that occurs to the body is invariably irreversible and can result in death. As most enclosed spaces onboard ships are neither designed for good ventilation, nor for easy entry and exit, the level of danger is high.

## ADDRESSING RISK

The most effective way to boost safety is to prevent accidents from happening in the first place – in other words, prevention is better than the cure. If we want to create a safer future for the maritime sector, we need to design safety support systems that fill the gaps in human behaviour. We want to make it as difficult as possible for a human being to be in danger. We, as an industry, need to invest in safety. This means choosing better ship designs when ordering vessels, upgrading equipment and ensuring that it is fit for purpose, etc.

Let's come back to our example of enclosed spaces. Investigations reveal that in several fatal accidents, improper ventilation has played a role. Can we improve our ventilation systems, or can the enclosed spaces be designed in a way to improve ventilation? A typical enclosed space entry procedure involves carrying out a risk assessment, ventilating the space, removing or isolating any other dangers, safety briefing, preparing rescue and first aid gear, checking the atmosphere to see if it is good enough for human occupancy and donning personal protective gear before actually entering the space.

One aspect that can be remedied going forward is how narrow the entry and exit points including the passageways into these spaces are. These entry/exit points are called manholes because they are designed for the passage of an individual. Just passing through these points wearing a self-contained breather apparatus (SCBA) seems a daunting task, let alone rescuing an unconscious person out of such a space in less than four minutes. Future ship design should consider the requirements of an emergency scenario when looking into improving the so-called manhole. It should also improve the ventilation for those spaces that

are regularly inspected, such as a cargo hold/ tank, fuel, ballast tanks etc.

A second aspect that should be addressed is that of protective gear. The SCBA was actually designed for firefighting, but is being used by individuals entering enclosed spaces. Although IMO regulations recommend that individuals be provided with a multi-gas detector that detects four gases including oxygen, by the time the sensor analyses the atmosphere and alarms, the person has been exposed to the unsafe air – and maybe too compromised to make their way to safety. Could a future solution to this problem include a user-friendly device that not only raises the alarm but also provides enough fresh air to escape and is sufficiently lightweight to be worn in an enclosed space?

It is vital that we think pro-actively about safety and see if our existing systems fall short of the mark. For example, as there are pockets of dangerous atmosphere in the bottom of the tank, it may be prudent to wear another detector on the leg, to detect the dangerous gas slightly earlier and warn the worker before they start breathing the oxygen-deficient air.

We must also ensure that crews are given the time to perform their duties safely as time pressure is an area that has not been sufficiently explored in accident investigations and may provide insight into why well-trained seafarers are still carrying out work in a dangerous manner.

These lessons can be applied to other safety issues, with the takeaway being that shipboard systems must be designed to take care of the safety of our seafarers. This isn't to absolve workers of responsibility, but rather to ensure that there is no single point of failure that can result in a fatality.

# SUPPORTING THE HUMAN ELEMENT IN SAFETY

## KUBA SZYMANSKI

Secretary-General, International Ship Managers' Association (InterManager)

When discussing the future of maritime safety, it is vital that we address the human element issue that has plagued our industry for many years and will continue to impede progress unless we resolve it. Seafarers are frequently the scapegoat for maritime safety investigations which regularly identify them as the cause of accidents without properly examining the factors that led to that particular situation.

Many investigations conclude that the chief officer acted badly and rushed into action but did not ask questions that would really afford insight into the situation. These can range from 'what made him take that action – was he under pressure?' and 'why didn't anyone stop him or question him?' to 'who educated, employed and promoted him–how did he get to this position without the knowledge that his actions could have this specific consequence?'

## EXAMINING MOTIVATION

It is illogical for crew members to willingly put themselves in harm's way, which means that there must be specific motivation for their actions. While someone can make the argument that one person was lazy, the fact that we see identical accidents taking place multiple times across the industry means that this cannot always be the explanation.

We are not taking the time to question the situation more deeply and highlight the actual patterns, and thus we are not taking the correct actions to address wider issues.

When it comes to investigations, maritime should take a leaf out of the airline industry's book, where they aim to eradicate human error. If they see two or three instances of a particular incident, they don't assume that this is being caused by individuals. Instead, they assume systemic factors and work to make the environment safe for their human workers by making it more difficult for such accidents to occur.

Take the example of the Boeing 737 MAX: when they discovered there were issues, they grounded the whole global fleet in order to fix the problem. It seems ridiculous that our industry would rather believe that we have hundreds of incompetent people instead of looking at the design of a lifeboat hook or any other issue that is repeatedly killing people.

## INSIGHTFUL INVESTIGATIONS

The maritime industry has numerous official tools at its disposal for a thorough investigation of any accident, including the IMO's Casualty Investigation Code, the Global Integrated Shipping Information System (GISIS) for reporting, and more. We could easily have identified the issues that keep cropping up and ensured that we fixed them. This would not only save lives but also safeguard the ships and cargo. However, no country uses these tools, preferring to investigate according to their own standards – and more often than not, seafarers end up in jail.

Rather than re-inventing the wheel in the future, we should use and improve these systems. I think it would be ideal for the IMO to elect trusted investigators across different nationalities for a fixed term position to investigate any shipping accidents. This would mean that all investigations are independent and that these unbiased findings would be fed directly into the IMO.

I believe that the biggest reason that we are not performing fit-for-purpose accident investigations is marine insurance. Shipowners are insured against crew negligence so there is a financial incentive to blame humans. It is much cheaper to find out who did it rather than find out why they did it. Can you imagine the costs that Carnival Cruises would have had to pay if they had been found liable for the running aground of the Costa Concordia rather than its captain, Francesco Schettino?

If P&I clubs were to create a financial incentive to improve safety, this would shift the focus away from always blaming human error towards making meaningful change. The current system we are operating within denies us the ability to learn lessons, making it difficult to make progress.

## MANAGING RISK

It's worth remembering that, in many cases, human intervention often saves the day; but because the accident has been avoided, this is not something that we factor in. Viewing safety best practice as a form of risk management is the ideal way to ensure that we don't continue to have human beings as the single point of failure. If companies consider every accident as a case of failed risk management, they will stop asking the question 'how can we avoid hiring another incompetent person?' and instead begin to ask 'what training should we be providing to ensure that our seafarer isn't going to make a rash decision?' or even 'what measures can we take to make sure that no seafarer can make an obvious mistake?' It's a game changer.

In 2018, InterManager did a seafarer survey about deaths in enclosed spaces which revealed that confusing information and opaque procedures were the biggest causes for mishaps of this nature. This is just one example of a situation in which, although the impact takes place for the human being at the end of the chain, the real risk failures are further up the hierarchy of control. We must recognise that our system is not only making us repeat the same mistakes but wasting money and taking lives.

## PROACTIVE CHANGE

What we need is cultural change if we intend to ensure long lasting safety improvements. At present, a lot of safety attitudes come down to cost. Although there are organisations like InterManager or INTERTANKO that work towards best practice and have good safety KPIs, this means that our vessels are more expensive than others who cut corners and are thus less attractive to some cargo owners. In an ideal world, there would be a race to the top in terms of quality rather than a race to the bottom on price, but this is a complex solution that will require the education of all stakeholders.

What we should be striving towards is a world where, just as people aspire to purchase cars with a five-star safety rating, owners look to buy a five-star ship that will be valued by charterers. We need people to realise that minimum standards shouldn't be the deciding factor when making choices, but rather a baseline to eliminate unacceptable safety practices. It's a tool to narrow the field so that they choose an operator that is constantly and pro-actively improving safety and managing the risk to their asset, the customer's cargo and, of course, our seafarers.

# INVESTING IN SAFETY CULTURE

## STUART EDMONSTON

Loss Prevention Director at UK P&I Club

Ship safety is a complicated structure, which relies on many layers of systems in order to be effective. Each of these layers has strengths and weaknesses, with the sum adding up to more protection than the individual parts. In order for safety to advance, it is vital that the industry invests time, money and thought into each of these to prevent a perfect storm.

Perhaps the most important layer to be addressed is the human element. We have repeatedly seen collision reports by flag states identify the human element at the centre of big incidents, whether this comes in the form of a tired individual, communications, leadership, or even company culture. Although there are occasional technical failures such as engines stopping that lead to vessels grounding, the majority of these instances usually boil down to a person failing in their performance.

We must make sure that we allocate resources to prepare our seafarers as much as possible. In some cases, this means investing in the right technology (more on this point later), but the core of the matter comes down to mitigating human behaviour.

## UNDERSTANDING HUMAN BEHAVIOUR

The low-hanging fruit for maritime safety is to address how people behave on board a ship and determine why they take high-risk actions. In my job, I look at the root cause of claims, and in most cases, it is an instinctive human reaction. We have seen instances where even a highly trained seafarer sees a colleague in trouble in an enclosed space and their desire to help circumvents their training and they go into the tank without an appropriate breathing apparatus.

We need to ensure that there is sufficient training so that it is at the forefront of the crew's minds. It is ridiculous that we train a seafarer once and then only give them a refresher course five years down the line, but expect them to consistently perform to a high standard. We need to follow in the footsteps of the aviation industry, which has regular training every year and ensure that we are reinforcing best practise in our crew.

This is one of the reasons that we made the decision to launch the aviation standard Human Element safety training initiative in partnership with Montreal-based aviation training experts CAE. UK P&I members will have access to CAE's comprehensive Maritime Crew Resource Management (MCRM) learning materials as well as MCRM 'Train the Trainer' courses. We are updating the resources available and have recently put together 12 aviation case studies that have learnings for the maritime sector. Additionally, our members can also access modern maritime human element video drama clips set in the Engine Room and Bridge as part of their computer-based training.

When discussing the interplay between the human element and safety, we must not forget that culture plays a large part in this equation. I've seen numerous cases where the cause of an accident was people not speaking up to challenge the master or a pilot, even if they have noticed that there was no passage plan in place or that the pilot was boarding the vessel too late.

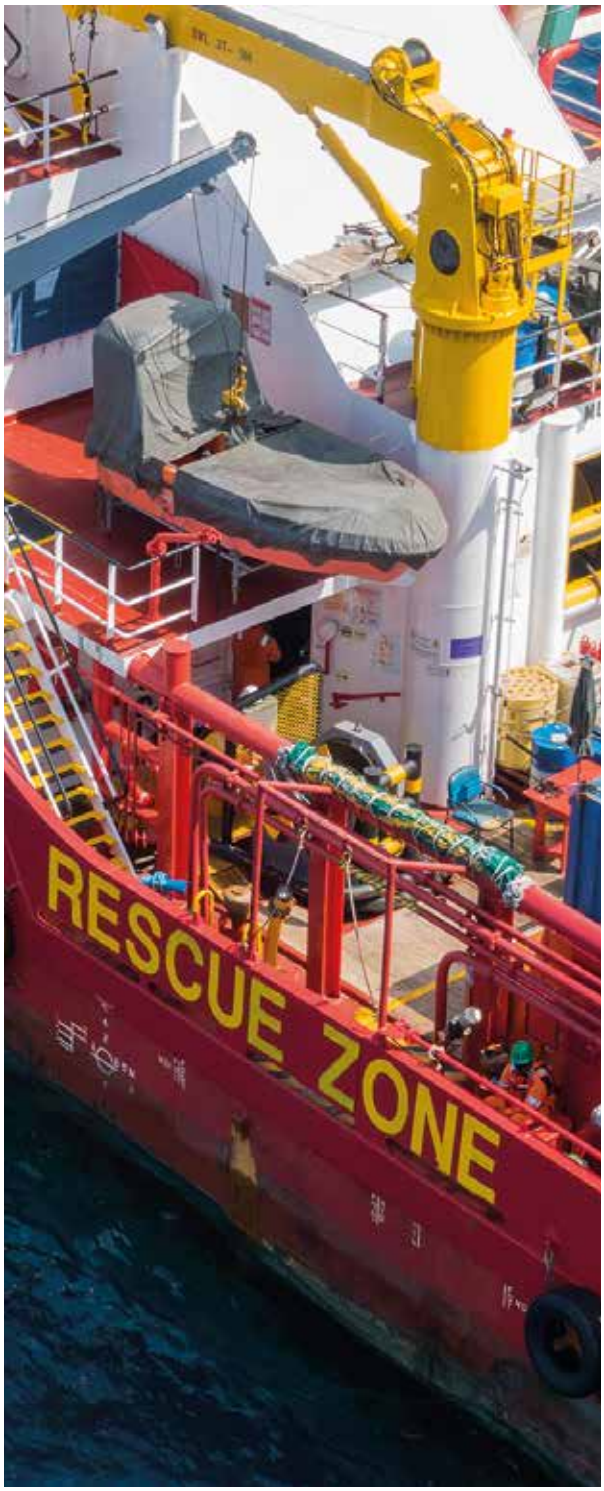
It's important to recognise that for high-risk endeavours like navigating big ships, team thinking is far more effective than a hierarchical system with an individual in charge of the whole ship. We must create an onboard culture where even junior seafarers are encouraged to speak up if they feel that something is unsafe. A bad system cannot be fixed by a single person, so we need the whole team to work together.

## TECHNOLOGICAL SAFETY NET

Technology is perhaps the best tool in the maritime industry's arsenal to bridge the gaps between human performance and the ideal bar for safety, but it is not a silver bullet. For one thing, it is no substitute for a well-trained, alert seafarer. We have seen this with collision avoidance software, which may only tell you to deviate by a few degrees to avoid a fishing vessel, but an OOW would ensure that their ship gives the vessel a wide berth. In this case, what the OOW is compensating for is the capacity of the other crew to make a mistake or move into the path of the ship – which is not something that the software would necessarily factor in.

There is no doubt that if technology is well designed and used with its limitations in mind, it can be a game-changer. A good example of this is ECDIS, which is invaluable in the hands of a properly trained crew, but if used improperly can lead to groundings and other incidents.

I know a lot of people believe that un-crewed




vessels are the future, but I don't see this being widespread in my lifetime even though the technology has been proven for the simple reason that cargo owners will not accept a ship with no one on it. Even in the aviation industry, where planes can take off and land themselves, we have pilots onboard to ensure that they can step in if there is an emergency. Similarly, I think that rather than fully-automated vessels, we will see smaller crews of about five seafarers or more who are in charge of intervening in case of mechanical failure, fires, navigational errors, etc. There is sufficient room in maritime safety for both, seamanship and technology.

## REWARDING PROACTIVE SAFETY

One of the changes I'd like to see in the marine insurance industry in the future is rewards for proactive safety. Just as the automotive industry has lower premiums for drivers that use technology to show that they observe speed limits, we should be offering lower rates to shipowners that are making safety a priority. There could be many markers ranging from collecting onboard data to looking at crew retention patterns (which is something that insurers already take into consideration).

I would be very keen to see the development of any new technology that makes it easy for companies to prove that – all the way through, from a CEO to crew member – they are following best safety practice. This has the power to fundamentally change the way that we quote for insurance as it would be very easy to identify which companies are genuinely a low risk rather than relying on no-claims information.

This type of technology would see great demand and benefit everyone involved, and emphasise what we have shown time and time again: a safe ship is a profitable ship.

# REPORT



# INTRODUCTION

In the wake of the COVID-19 pandemic, it has become more evident than ever that the maritime industry is a mainstay for global economies of supply and demand as ships remain responsible for transporting roughly 80 per cent of the world's cargo. Additionally, the fishing industry provides much needed fish and seafood, playing a vital role in trade, food security and nutrition, as well as larger industries of consumption.

Per the United Nations Conference on Trade and Development's (UNCTAD) Review of Maritime Transport 2020, the commercial shipping fleet grew by 4.1 per cent by 2019, leading to a total world fleet of 98,140 commercial ships of 100 gross tons and above, equivalent to a capacity of 2.06 billion dwt at the start of 2020.

Measuring the number of ships making up the global fleet against the number of distress calls recorded over the same period - with 761 distress calls logged by Inmarsat's GMDSS during the course of 2019 and 834 distress calls in 2020 - would suggest that the maritime industry is largely safe. However, the numbers, while indicative, may not paint the whole picture as there may be a handful of accidental distress alerts included in these figures, in addition to the fact in some cases, vessels may not have sent out GMDSS alerts - particularly in instances of near misses.

Recent technological and regulatory developments alongside advances in risk and safety management have meant that incident numbers in shipping have remained consistent in the face of a growing global fleet. However, there remains ample room for improvement and lessons to be learned - particularly from tragedies like the MOL Comfort to the Stellar Daisy and most recently the Wakashio that spotlight a continued need for vigilance.

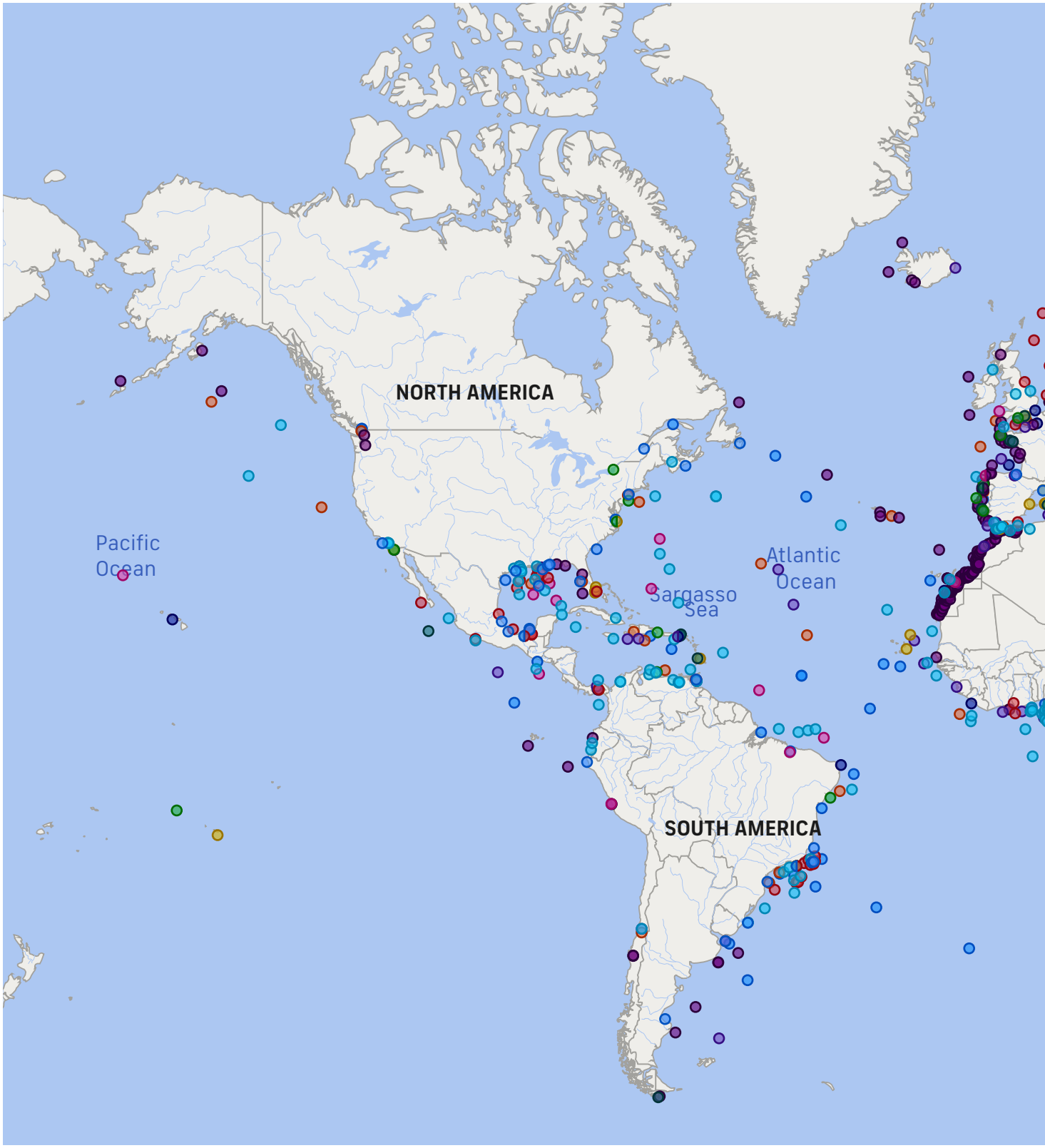
This report analysing patterns in distress calls offers one means by which to ascertain ongoing trends in the maritime industry and suggest where further attention may be warranted.

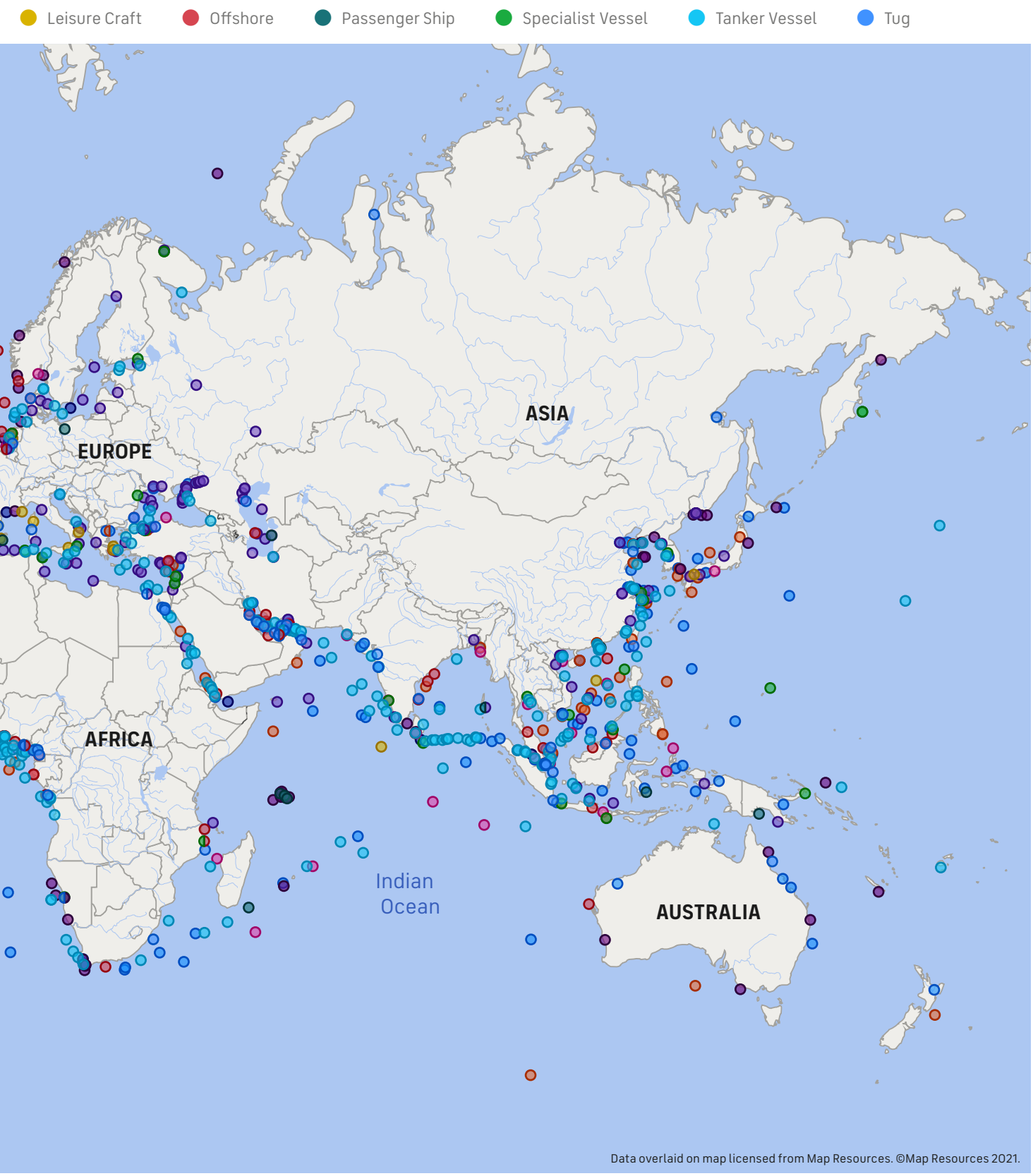
Inmarsat GMDSS data that was gathered between 2018-2020 and used to compile this report offers significant information about distress signals that allows for the gauging of patterns at a local and global level. With this knowledge in hand, we can seek solutions to ongoing challenges to safety in the maritime sector.

# DISTRESS CALLS MAP

**Vessel Type:**

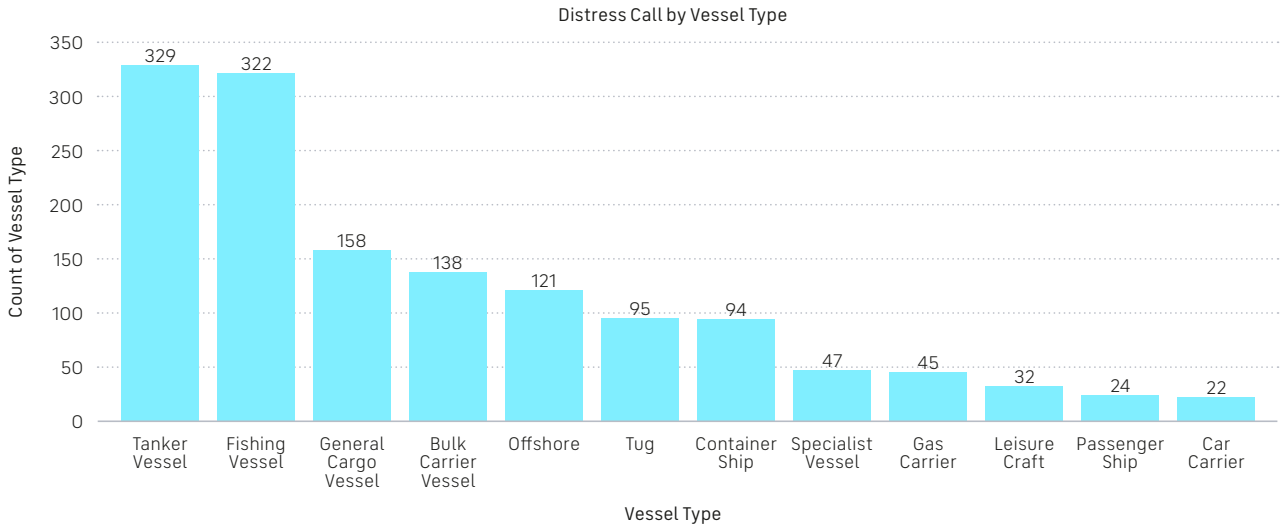
Bulk Carrier Vessel  Car Carrier  Container Ship  Fishing Vessel  Gas Carrier  General Cargo Vessel




Leisure Craft
Offshore
Passenger Ship
Specialist Vessel
Tanker Vessel
Tug
ASIA
EUROPE
AFRICA
Indian
Ocean
AUSTRALIA
Data overlaid on map licensed from Map Resources. ©Map Resources 2021.

## 'WHAT IS GMDSS?'

Currently all cargo ships of 300GRT and upwards and all passenger ships on international voyages must be equipped with a Global Maritime Distress and Safety System (GMDSS) as per the IMO's Safety of Life at Sea (SOLAS) convention. The system works by pressing a button to send a security alert from the ship to competent authorities on shore (as designated by the administration) containing information relevant to search and rescue efforts. This information, which is entered by the vessel's crew, includes ship and company identification information, the vessel's location, and information about the threat or ongoing incident. Inmarsat is the leading provider of GMDSS-approved satellite communication services.




## DISTRESS CALL BY VESSEL TYPE

Distress calls were largely consistent with a small rise between 2018-2019 with tankers showing the highest numbers between 2019-2020. During this period, fishing vessels which originally held the highest numbers in 2018 dropped to second among incident calls between 2019-2020. We have reason to believe that a number of the un-identified distress calls could be attributed to fishing vessels (see section on fishing vessels below), but it remains that tankers are a vessel type that are linked to numerous GMDSS alerts.

**Tankers**

Tankers are largely thought of as safe, partly because they are known to have rigorously trained crew - making the high number of distress alerts from this vessel type surprising. The Inmarsat GMDSS data between 2018-2020 showed 80 distress calls in 2018, 127 in 2019, and finally 122 in 2020. These tanker distress calls primarily took place from vessels in coastal regions - anecdotally known to be served by older vessels.

It may be that location is circumstantial to the incidents in question, as was the case of the engine room explosion and consequent fire aboard the MT New Diamond which occurred in September 2020 off the coast of Sangamankanda, Sri Lanka.

Some of the coastal incidents, particularly those that took place in the Gulf of Oman and off the coast of Yemen, can also be explained by escalating political rivalries and tensions between the U.S. and Iran. For example, six oil tankers were attacked in May 2019, with two additional attacks taking place in June.

An additional factor to consider during 2020 is the impact of the COVID-19 crisis which saw tankers largely idle around major oil ports and terminals while acting as floating storage. As Allianz Global Corporate & Speciality (ACGS) note in their Safety and Shipping Review 2020, these activities put these vessels at potential risk with regard to extreme weather, piracy, and political risks. It is possible that these issues could also have contributed to distress calls during this period.

However, it is incredibly likely that the age of the vessels plays an important role in the incidents. The West of England P&I Club points out that it has had a number of claims from oil and chemical tankers built prior to 2016 (when SOLAS requirements to have an inert gas system fitted came into force for newbuilds) that have seen explosions: the Stolt Groenland (which has an incident in September 2019), Trung Thao 36-BLC (September 2020) and General Hazi Aslanov (October 24, 2020). Loss prevention manager Dean Crossley pointed out that the absence of a legal requirement to retrofit older tankers with inert gas systems increased the risk of explosions, created a need for greater management from crew and increased the reliance on best operating practices to prevent loss of life.

By contrast, the scarcity of distress calls from tankers in deep sea regions may be due to higher standards of compliance required by charterers when tankers undertake longer journeys or the younger age of the vessels increasing the likelihood of an onboard inert gas system.

**Fishing vessels**

Fishing is well known to be a dangerous profession and there are a number of regulatory tools aimed at improving the safety record of this type of vessel, including the IMO's 2012 Cape Town Agreement (see box), the International Labour Organization (ILO) Work in Fishing Convention and the Food and Agriculture Organization of the United Nations (FAO) Agreement on Port State Measures to Prevent, Deter, and Eliminate Illegal, Unreported, and Unregulated Fishing (PSMA).

Inmarsat GMDSS data shows fishing vessels consistently ranking in the top two vessel types for distress calls over the three-year period, accounting for 322 calls in total. It accounted for the majority of GMDSS calls in 2018 with 92 official alerts, and came in a close second to tankers in 2019 (117) and 2020 (113) - a difference of approximately 10 vessels each year. However, there is good reason to believe that the actual numbers for this vessel type are significantly higher than officially allocated to this vessel category.

A large percentage of the distress calls from vessels that did not share ship identification information occurred in areas known for high levels of fishing activity, supporting the assumption that many of the 736 calls from undeclared vessels can be attributed to fishing vessels in distress. Furthermore, the ILO estimated an annual death rate of 24,000 fishers per year in 1999 and recent anecdotal evidence from organisations such as the Fish Safety Foundation estimate that this number may be closer to 30,000 fisher deaths per year as of 2021. It is possible that, as these vessels often operate in coastal waters, many distress calls would have been made via VHF radio.

It is also of note that although Morocco is a comparatively smaller Flag State that does not fall in the top ten either by vessel numbers or by tonnage, it accounted for the highest number of distress calls for all three years. It is extremely likely that this was the result of the lion's share of vessels flagged by Morocco being fishing vessels, which would also explain the fact that the majority of fishing vessel GMDSS alerts are geographically located off the coast of the African country. As of 2021, the IMO Global Integrated Shipping Information System (GISIS) lists 486 out of the 659 vessels flagged by Morocco as fishing vessels.

Although the Inmarsat GMDSS data does not contain sufficient information on the causes of the distress alerts, experts in the fishing safety sector have indicated that the best way to address the issue would be via more robust national regulation for fishing vessels of all sizes, combined with training for crew.

## IMO OPINION
## CAPE TOWN AGREEMENT WILL BOOST FISHING VESSEL SAFETY

Fishing is one of the most dangerous professions in the world, with worrying uncertainty around estimated numbers of fishers losing their lives by tens of thousands every year.

Inmarsat's GMDSS data for 2018-2020 supports the view that there is significant room for improvement in fishing vessel safety, with the majority of distress calls over the three years attributed to fishing vessels.

There are around 4.6 million fishing vessels in the world, of which about 64,000 are 24 meters in length or over, with the remainder falling under this threshold. The IMO is working closely with the FAO and the ILO and a number of stakeholders to enhance fishing vessel safety, as this will mean many lives saved at sea each year.

Regional webinars are being organised to sensitise Governments to the obvious and long-awaited advantages of the entry into force of the 2012 Cape Town Agreement (CTA) - currently expected in 2023. The CTA holds the power to boost safety and provide a level playing field for the industry, and a particular focus is present on those countries who made a commitment by signing the Torremolinos Declaration.

The Agreement sets out minimum safety standards for fishing vessels of 24-meters in length and over that are flagged with a country which has become a Party to the Agreement. It will come into force 12 months after at least 22 States, with an aggregate 3,600 fishing vessels meeting the length requirements operating on the high seas, have expressed their consent to be bound by it.

Entry into force of the Agreement will require fishing vessel owners/ operators to comply with internationally binding regulations and prevent practices that place crew lives at risk. With that, mandatory global safety regulations for fishing vessels would be brought into force.

In addition to providing standards on the design, construction and equipment of fishing vessels for national fleets, the CTA also empowers national authorities of Parties to the Agreement, often belonging to regional Port State Control (PSC) regimes, to carry out inspections to take action against unsafe foreign fishing vessels in cooperation with regional fisheries management organisations.

Once in force, the CTA will support the progress made by existing international measures in force for fishing vessels, namely, the International Convention on Standards of Training, Certification and Watchkeeping for Fishing Vessel Personnel (STCW-F); the FAO Agreement on Port State Measures to Prevent, Deter, and Eliminate Illegal, Unreported, and Unregulated Fishing (PSMA) which seeks to prevent vessels engaged in IUU fishing from using ports and landing their catches; and the ILO Work in Fishing Convention (C188) which sets minimum requirements for working conditions for crews onboard fishing vessels.

IMO Member States, even landlocked ones, should consider becoming a Party to the Cape Town Agreement irrespective of the size of their qualifying fishing fleet in order to contribute to the global safety of fishers and protection of fishing stocks, as well as to address IUU fishing, poor working conditions of fishers and marine pollution due to abandoned, lost or otherwise discarded fishing gears.

The IMO welcomes efforts from the industry and other stakeholders to improve fishing safety and supports increased transparency in this sector.

**General cargo**
Although the European Maritime Safety Agency (EMSA) notes that general cargo ships have the highest percentage of maritime casualties based on their 2019 annual review, this sits in contradiction to the number of distress calls recorded during this period. General cargo ships showed a slight but steady increase from 39 distress calls in 2018 to 54 in 2019 per GMDSS data. Despite claims of plummeting cargo volumes during 2020 due to the pandemic, Inmarsat recorded 65 distress signals from cargo ships in 2020, suggesting that there remained a fair number in transit.

Arguably, the gap between distress calls made and vessel casualties and incidents suggests that ships experiencing distress may have chosen to use the VHF radio to signal for help if close enough to land.

Geographically, many of these distress calls appear to be clustered around Europe, with a significant number located in the Mediterranean Sea and the Black Sea in particular. A smaller additional cluster is located along the eastern coast of China.

Given the upward trend during 2020, it would be worth keeping an eye on this category in the future.

**Bulk carriers**
Bulk carriers distress calls have remained largely consistent, rising only very slightly from 42 alerts in 2018 to 50 in 2020. There is a distinct cluster of distress calls located along the Eastern coastline of China, in the Yellow Sea between China, North Korea and South Korea.

With several reports such as the collision and subsequent sinking of the Harmony Rise with a bulk carrier (2013), the collision of the bulk carrier He Bo with the cargo ship Fang Zhou 568 (2017), and even the collision of the cargo ship Hong Yun 9888 with a shipping vessel (2020), it is reasonable to assume that collisions are commonplace in the Yellow Sea. Indeed, even in April 2021, the tanker A Symphony and bulk carrier Sea Justice have collided in this region, resulting in an oil spill.

Given this information, unless explicitly addressed by the maritime industry, collisions and distress calls may continue to rise in this region.

**Offshore vessels**
GMDSS calls from offshore vessels have risen from 23 received in 2018, to 40 in 2019, and finally to 58 in 2020. As is expected, most of these distress calls are clustered around areas involved in the oil and gas industry. Groupings of distress calls are visible in the Persian Gulf around the borders of Qatar, Kuwait, the U.A.E., Oman and Iran. Another set of distress signals is grouped near Rio de Janeiro in Brazil, while another group is visible in the North Sea. Finally, there is a gathering of distress calls near Campeche Bay along the coast of Mexico as well as near Louisiana in the U.S.

The cluster of distress calls along the Gulf of Guinea that follows the coastline of Ghana, Nigeria, Cameroon, and Gabon is likely to involve incidents of piracy, as the region is known for this issue. Indeed, the 2020 figures shared by the International Maritime Bureau (IMB)'s annual piracy report state that the Gulf of Guinea accounts for over 95 per cent of global crew kidnappings, with 130 crew members kidnapped in 22 separate incidents. Urgent security action is needed to stem this growing threat.

**Tugs**
Records of distress signals made by tugs show incidents that follow along the Eastern coast of North and South America, and a cluster in the Persian Gulf in particular. While Inmarsat data shows that there were roughly consistent distress calls made by tugs between 2018 and 2019 (showing 27 and 28 distress calls respectively), in 2020 these numbers rose to 40.

Notably, though the International Transport Federation (ITF) in 2018 highlighted the increase in risk and fatigue-related incidents caused by reduction in manning and overwork of crew, there were no calls made from large waterways such as the Panama Canal. However, this is likely to change in next year's report as there have been several incidents in 2021 where fatigue appears to have played a role, suggesting that this is a trend for the industry to address before it becomes endemic.

**Container ships**
In spite of the global Container ship fleet encompassing 5,374 vessels as of January 2021 according to Alphaliner, the number of distress calls for these vessels is relatively low and quite consistent. Inmarsat data shows 29 calls made in each, 2018 and 2019, with a slight rise to 36 in 2020. It is likely that the fixed routing and comparatively frequent port calls for these vessels gives the crew on these vessels the opportunity to keep pace with maintenance requirements, but it is possible that these vessels also rely on VHF for incident support.

Many of the calls in the data set originate from the eastern coast of Asia. While these are consistent through all three years of Inmarsat GMDSS data, they are particularly marked in 2020 suggesting that distress signals were concentrated in this region during the period of the pandemic.

**Specialist vessels**
While this category covers a wide range of vessel types (please see the vessel grouping information on page 52), it is notable that distress call incidents for this category are largely located in coastal regions. While alerts were relatively low in 2018 (11 calls) and 2020 (12 calls), 2019 showed a mild spike (24 calls). This could potentially correspond to the rise in incident numbers due to extreme weather conditions that took place between August and November in 2019 (see page 42).

**Gas carriers**
Gas carriers have a relatively positive safety record, and are a vessel type subject to stringent regulation and carrier requirements due to the hazardous nature of the cargo. Inmarsat data shows incidents primarily reported fairly close to coastal regions, particularly in the Gulf of Mexico, the Strait of Malacca and the South China Sea bordering Indonesia, Vietnam, Malaysia, and the Philippines. The number of recorded distress calls from vessels rose from 11 made in 2018, to 13 made in 2019, and finally to 21 made in 2020.

**Passenger ships and leisure crafts**
Passenger ships show consistently low numbers in the Inmarsat GMDSS data, ranging from 8 distress calls in 2018 to 7 in 2020. Given the higher visibility of incidents involving public-facing sectors of the industry such as passenger ships, these low numbers are likely in response to risk awareness and fear of negative publicity. With previous incidents such as the 2012 sinking of the Costa Concordia, and the 2019 loss of power and subsequent evacuation of the Viking Sky, incidents onboard passenger ships can have long-term reputational consequences for the company involved.

It is worth remembering that the global pandemic will have meant that many passenger vessels would have been anchored in place with a skeleton crew for the majority of 2020.

Leisure crafts also show low numbers, with 12 distress calls placed in 2019 and 10 in 2020. Notably, many of the incidents between 2018-2020 took place in the Mediterranean Sea.

**Car carriers**
Following high profile incidents such as the loss of stability of the MV Cougar Ace (2006), the MV Höegh Osaka (2015) and the MV Golden Ray (2019), car carriers have anecdotally held a reputation of high risk. A presentation by John Waite, the Director of Marine Investigations &

Survey Services Ltd, at the 2016 International Union of Marine Insurance conference in Geneva highlighted risk factors for car carriers such as instability, potential to capsize given moveable cargo, as well as fire hazards.

However, Inmarsat GMDSS data indicates that car carriers have a low number of distress calls, showing that although incidents of listing or capsizing may be memorable, there are few incidents reported overall. There were only 6 calls reported in 2018, 9 in 2019, and 7 in 2020.

## EXTREME WEATHER INCIDENTS

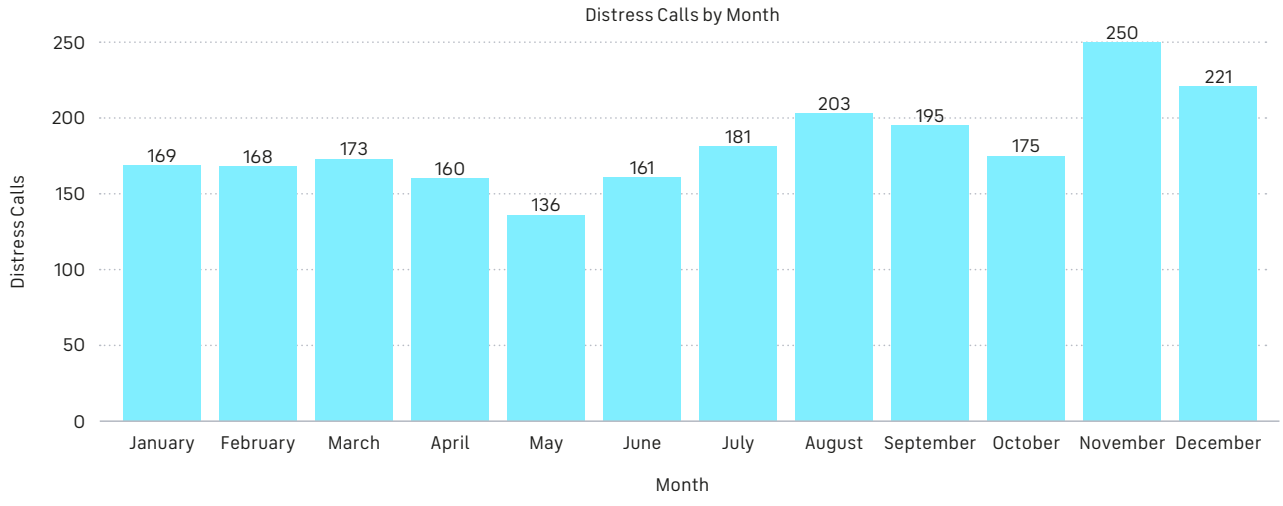
Climate change and the impact of extreme weather conditions are a growing cause for concern in the maritime sector. It is notable that all three years of data show a consistent rise in distress signals during November and December, which are months known for bad weather in the northern hemisphere.

In 2019 there was an extended rise in distress alerts between August and November which is likely to have been caused by the large number of extreme weather events that took place that year. Notably, the Arabian Sea saw five tropical cyclones through 2019, while the Bay of Bengal saw three major tropical cyclones, largely within this period.

Although these regions traditionally see high storms during cyclone season, there was a noteworthy spike in the 2019 data. The Bahamas were also heavily impacted by Hurricane Dorian which raged in the Atlantic Ocean in August and September that year, followed soon after by Hurricane Humberto.

Additionally, Hurricane Lorenzo heavily impacted the Atlantic basin during September and October 2019, affecting vessels in its vicinity. For example, the offshore tug Bourbon Rhode was caught up in this weather event while approximately 1,200 nautical miles off Martinique island in the Caribbean Sea, and sent out a distress signal which was eventually received by French authorities.

The extreme weather events noted here are just a small selection of those recorded around the globe in this period, and it is concerning that scientists have predicted that the frequency of such events is likely to increase. While some vessels may receive adequate warning that allows them to prepare, it is possible that in extreme weather conditions these preparations may or may not be adequate to the conditions at hand. The lessons learned from the total loss of the ro-ro El Faro in October 2015 must not be forgotten.



The maritime industry must make increased efforts to safeguard both crew and vessels from this growing risk and an emphasis on improved weather routing is an obvious solution.

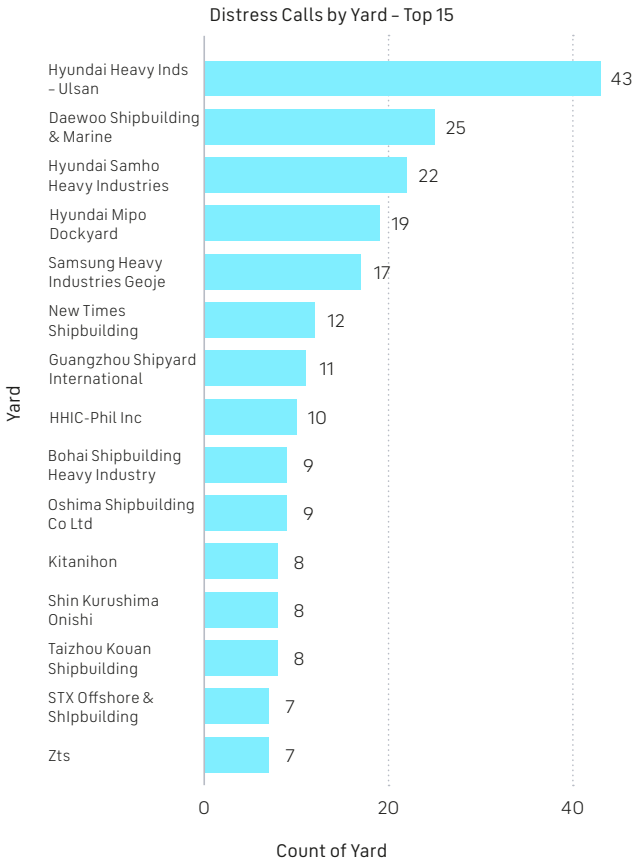
## SHIPYARD

The list of shipyards responsible for construction of vessels issuing distress calls largely corresponds with the leading global shipyards by vessel (assembled using IHS Markit data), with South Korean builders leading the pack. At the top in terms of both, GMDSS calls from vessels over the three years of data and global tonnage is Hyundai Heavy Industries in Ulsan (HHI - Ulsan), followed by Daewoo Shipbuilding and Marine. Also in the top five on both counts are Hyundai Samho Heavy Industries and Samsung Heavy Industries Geoje. When looking at the top five for distress alerts, Hyundai Mipo Dockyard also makes the cut, while in terms of tonnage, we see the inclusion of Chinese yard Shanghai Waigaoqiao Shipbuilding.

However, it would be extremely irresponsible to make any causal links between construction at a South Korean yard and distress calls/ incidents as there are many factors that play into the state of a vessel after launch. It is worth remembering that many of these yards build multiple vessel types, which require different construction techniques, equipment and will be sailing on different routes.

As an illustration, HHI-Ulsan builds a number of different vessel types including bulk carriers, container ships, tankers, VLCCs, product carriers, multipurpose cargo ships, ore-bulk-oil carriers, Ropax, pure car carriers, LPG carriers, ro-ro ships, chemical tankers, offshore rigs, offshore barges and LNG carriers.

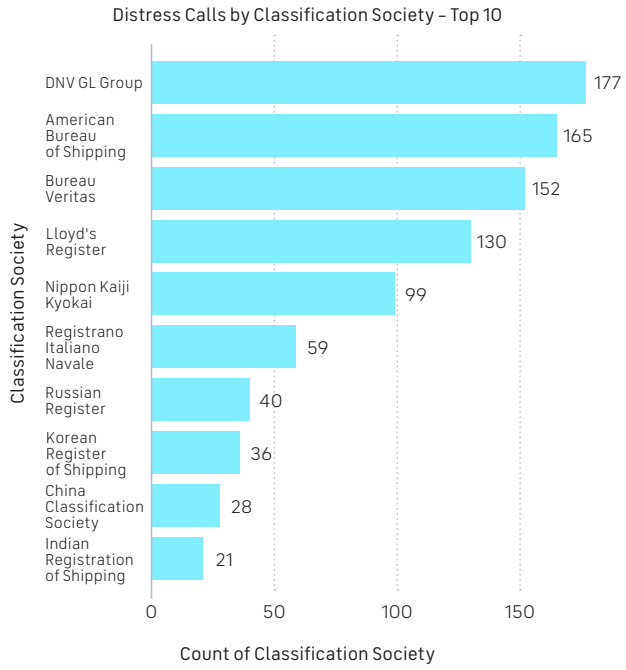
Operating conditions also have a big impact on ship safety and each of the vessels in the global fleet will be working to different




standards based on their class, flag and ship manager. Furthermore, maintenance, inclement weather conditions, crew fatigue and more all have a part to play in the number of distress calls and incidents.

## CLASS SOCIETY

A similar logic to that used in the analysis of shipyards would apply to any attempt to create a link between classification society of a vessel and whether it made a distress call. After all, while vessels must be built and maintained to a specific class standard, these standards have little to do with situations such as collisions, bad weather, etc - and so no causal links can be established with the GMDSS data without additional information about the nature of the distress alert being




made available. It is also worth noting that a large number of distress calls logged over the three year period did not contain information about the distressed vessel's class society, meaning that these numbers can only be looked at in a wider context.

However, given the fact that tankers are the vessel type with the most distress calls, it is unsurprising to see that the American Bureau of Shipping (ABS; which classes a great deal of the global tanker fleet) saw the highest number of distress calls in 2020 at 71 alerts. The class society, which has a total classed fleet of 7,343 vessels amounting to 387,942,666 dwt according to IHS Markit data, is also known for classing US offshore vessels, particularly those operating off the coast of Houston and in the Gulf of Mexico. Inmarsat data indicates that ABS has seen a steady increase in GMDSS calls with 57 alerts in 2019, up from 37 in 2018.

DNV (formerly known as DNV GL) has also steadily been increasing its share of the tanker and offshore market and had the second highest number of distress calls in 2020, with 65 calls. This is down from the 128 GMDSS alerts in 2019, when it was the class society with the highest number of alerts - a distinction it maintains for the 3 years of data analysed.

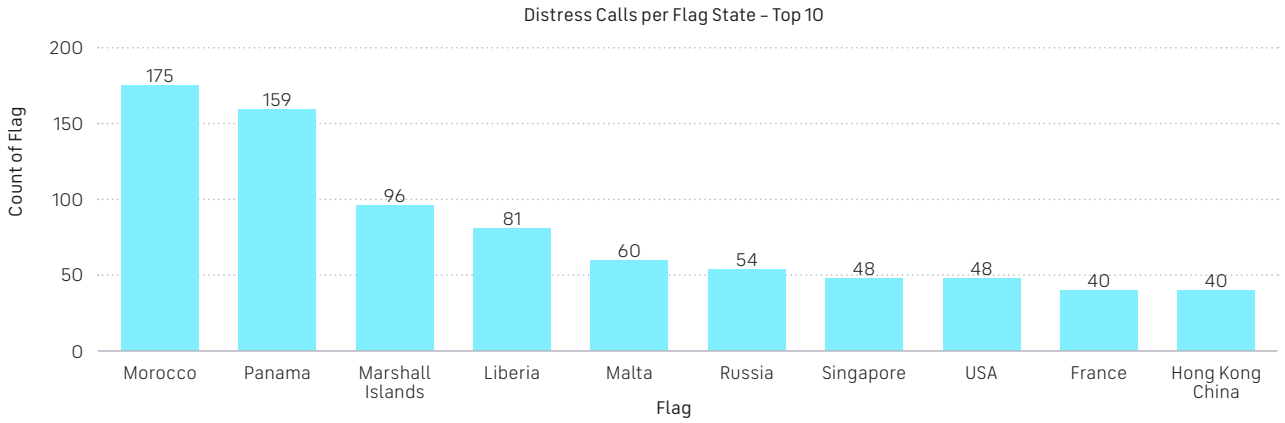
As the classification society with the most vessels in the global fleet (8,733 ships amounting to 350,896,135 dwt), DNV is often pitted against Class NK, which boasts fewer vessels (8,337 ships) but higher tonnage (426,964,734 dwt). However, the Japanese society saw far fewer alerts over the three years, with 34 in 2020, 41 in 2019 and 24 in 2018.

Other class societies of note on the list are Lloyd's Register (8,137 ships at 305,191,362 dwt) and Bureau Veritas (classed fleet of 8,006 ships at 187,588,331dwt), which saw 48 and 50 distress alerts respectively in 2020. In a trend similar to the other class societies, these two also saw higher numbers in 2019 - albeit only slightly, with LR at 55 and BV at 51.

## FLAG STATE

As previously mentioned, Morocco accounts for the highest number of distress calls, which can be attributed to the large number of fishing vessels on the Flag's registry. Given the size of Panama's fleet numbers, it follows that this flag would have the second highest number of recorded calls in Inmarsat's GMDSS data. These range from 47 in 2018 (measured against a total flagged fleet of 8,247 vessels as per data from Lloyd's List), 55 in 2019 (of a fleet of 9,367 vessels) and 57 in 2020 (of a fleet of 9,596 vessels).

While Liberia remains largely consistent - with distress calls numbering 20 in 2018 (of 3,667 vessels according to Lloyd's List), 32 in 2019 (of 4,027 vessels), and 29 in 2020 (of 4,295) - it is of note that the distress alerts recoded for vessels flagged with the Marshall Islands see an abrupt rise in 2020.




Inmarsat GMDSS data shows distress calls numbering 22 in 2018 (of 3,636 vessels flagged with the Marshall Islands as per Lloyd's List), 27 in 2019 (of 4,163 vessels), and there is a rise to 47 distress calls in 2020 (of 4,313 vessels).

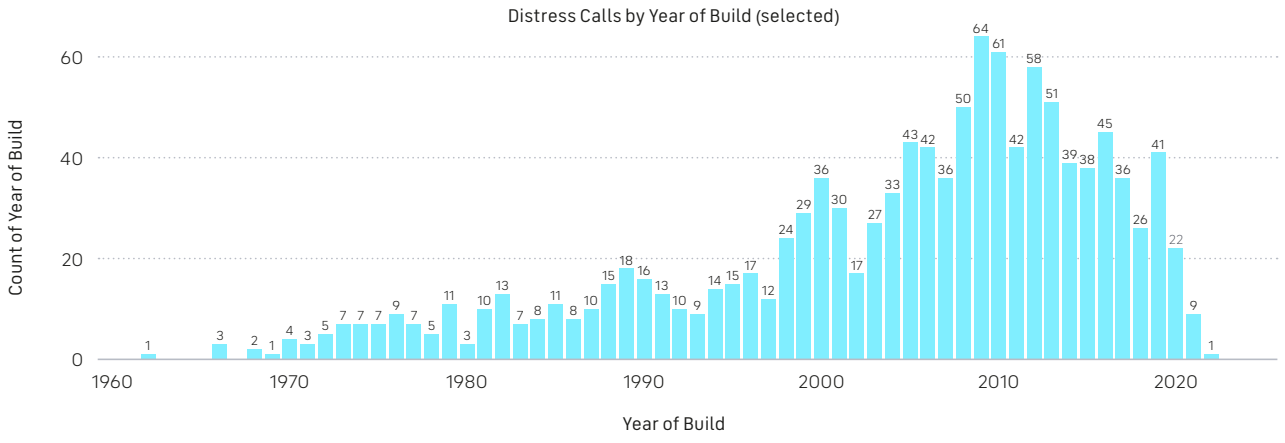
Per Lloyd's List, the Marshall Islands pulled ahead of Liberia in 2019 as a consequence of a number of offshore vessels registering with the flag state. It is possible the small rise in distress calls from offshore vessels from 20 in 2019 to 58 in 2020 is a factor in the overall rise of distress calls for this flag state.

## YEAR OF BUILD

The economic downturn of 2008 and the subsequent maritime recession in 2016 has had a significant impact on the maritime industry. Per The State of Maritime Safety Report 2020 by IHS Markit and DNV-GL, vessel upkeep suffered leading to incidents of hull and machinery damage.

These findings are consistent with the distress call data gathered by Inmarsat. For ships built in 2007, there were 30 distress calls recorded between 2018-2020, whereas these rose steadily for ships built in 2008 (50 distress calls), 2009 (64 distress calls) and 2010 (61 distress calls). This suggests that the impact of the economic downturn not only affected newbuilds being worked on for delivery in 2008 but had a significant knock on effect until 2010.

For vessels constructed in 2011, at a point of economic recovery for the industry, Inmarsat records 42 distress calls. This is a telling reduction that can perhaps be attributed to fewer incidents of hull and machinery damage and greater possibility of vessel upkeep.



# CONCLUSION

While this report provides a comprehensive overview of distress calls from the maritime sector over the past 3 years, the reticence of ship operators and crew to provide more information about the nature of the distress calls - and in some cases, information about the vessel itself - has limited the insights from our analysis.

That said, there are some findings that, if addressed either via regulation or industry efforts, could significantly improve the safety record of the maritime sector. Obvious areas for further discussion include the need to retrofit tankers with inert gas systems, improved regulations for fishing vessels, anti-piracy efforts and more attention paid to weather routing. However, as many of the opinion pieces from industry leaders indicated, the biggest improvements to maritime safety are likely to be achieved by cultural change, which prioritises safer operations over profits.

Looking to the future, it is possible that we will see a spike in distress calls and incidents over the next few years as the combined

impact of the global sulphur cap and COVID-19 pandemic is felt. In addition to transitioning to alternative and low sulphur fuels - a process known to carry risks such as engine blackouts and loss of propulsion - the industry has also been in uncharted waters due to the need to minimise human contact to avoid spreading infections. Minimal maintenance, remote surveys, exhausted crew and delays/extensions to certification are just some of the factors that may contribute to an increase in distress alerts.

Of course, one cannot discount the benefits to be had from the adoption of evolving technology. Increased use of remote monitoring software, the advent of artificial intelligence, the maritime single digital window and more insightful data may all prove game changers. But it is worth remembering that the future of safety is built upon the operating foundations of today, making it imperative that the industry takes every opportunity to improve as much as possible.

## INTERVIEW METHODS

Inmarsat and Intent Communications consulted with each other and agreed upon a shortlist of industry experts to approach for contributions to the report.

The team from Intent Communications then broached the matter with the decided upon industry representatives and invited them to a free-form interview lasting approximately one hour, using video conferencing software such as Teams, Zoom and Google Meet.

The interviews were conducted online between AUGUST and October 2020, with notes taken by the Intent Communications team. These interviews were then transcribed and edited into commentary form by Intent Communications and sent to each representative for approval prior to print.

Upon receiving approval, these were finalised and added to the report.

## VESSEL GROUPING METHOD

Data provided by Inmarsat saw a range of self-declared vessel types. In order to draw meaningful conclusions across the range of data provided by Inmarsat, Intent Communications organised the vessel types into overarching categories.

These include tankers, fishing vessels, general cargo, bulk carriers, offshore vessels, tugs, container ships, gas carriers, leisure crafts, car carriers, specialist vessels and passenger ships.

It was found that a number of cases involved undeclared vessel types, wherein the vessel had either not provided their IMO number, offered no further information to Inmarsat during the distress signalling, did not match relevant databases and offered minimal data for corroboration.

Given this lack of information, these vessel types could not be used to seek significant statistical data or contribute to further analysis. Given the grouped clusters of the distress calls involving these undeclared vessels, it is possible to suggest that a number of them are fishing vessels that may or may not be formally registered. While this has been included as a possibility in our analysis, it has not been framed as a statement corroborated by the vessel's declared data itself.

This grouping was provided to Inmarsat for approval, after which it was laid out in Microsoft's Power BI data visualisation tool for further analysis by Intent Communications.

Following this, meetings between the teams of Intent Communications and Inmarsat took place to conduct joint data analysis. This analysis was then collated and edited to form the report, with additional input offered by Intent Communications.

This report was then submitted to Inmarsat and approved prior to print.

## VESSEL INDEX

All subcategories of vessels that were grouped together per their self-declared vessel type are listed below. The terms and spelling have been preserved to ensure transparency.

Bulk carrier vessels:
Open Hatch Cargo Ship, Bulk Carrier, Ore Carrier, Bulk, Bulk Carrier, Self Discharging, General Dry Cargo (Bulk Carrier)

Car Carrier:
General Cargo Ship (With Ro-Ro Facility),

Ro-Ro Cargo Ship, Vehicle Carrier, Ro-Ro Freight/ Passenger, Ro-Ro, Pass/Car Ferry

Container ship:
Container Ship (Fully Cellular)

Fishing vessel:
Fish Factory Ship, Fishing Vessel, Fishing, Auxiliary Fishing, Fishery Research Vessel, Fish Carrier, Whaler

Gas Carrier:
LNG Tanker, LPG Tanker, Gas Processing Vessel

General Cargo Vessel:
General Cargo Ship, Palletised Cargo Ship, Navire De Charge, Aggregates Carrier, Cargo

Government ship:
Fishery Patrol Vessel, Patrol Vessel, Research Survey Vessel, Search and Rescue Vessel, Government, Patrol, Military, Fragata, Research Ships

Leisure Craft:
Explorer Yacht, Sail Yacht, Yacht, Commercial Racing Yacht, Motor Yacht, Sailing Yacht

Offshore:
Offshore Support Vessel, Landing Ship (Dock Type), Drilling Ring, Jack Up, Diving Support Vessel, Utility Vessel, Supply Tender, Offshore/ Tug Supply Ship, Production Platform, Semi Submersible, Crew/Supply Vessel, Platform Supply Ship, Offshore Construction Vessel, Jack Up, Well Stimulation Vessel; FPSO, Oil; Landing Craft, Work/Repair Vessel, General Cargo Offshore Safety Vessel

Passenger Ship:
Training Ship, Passenger Ferry, Sailing Cruise, Westerly Oceanlord 41, Sail Training Ship, Recreo [recreational], Cruise Ship, Schooner, Sailing Boat, Passenger Vessel, Sailing Vessel, Cruise

Specialist Vessel:
Refrigerated Cargo Ship, Livestock Carrier, Cable Repair Ship, Trailing Suction Hopper Dredger; Hopper, Motor; Logistics Vessel, Cement Carrier, Hospital Vessel, Heavy Load Carrier, Logistics Vessel (Naval Ro-Ro Cargo), Grab Dredger, Stone Carrier, Wood Chips Carrier, Pipe Carrier, Salvage Ship

Tanker vessels:
Crude Oil Tanker, Bunkering Tanker (Oil), Chemical/Product Tanker, Shuttle Tanker, Products Tanker, Asphalt/Bitumen Tanker, Replenishment Tanker, Molten Sulphur Tanker

Tug:
Anchor Handling Tug Supply, Articulated Pusher Tug, Anchor Handling Supply Vessel, Tug, Anchor Handling Vessel, Pilot Vessel, Tugboat, Empurrador (Tug), Offshore Tug/Supply Ship

Undeclared:
Empty Cells, Ship, Unknown, Commercial, Other Commercial Vessel

**For further information and questions**, please contact the Inmarsat Maritime Safety Services team: Maritime.Safety@inmarsat.com

inmarsat.com