CHIRP MARITIME

Annual Digest

Reports and Insight Articles

2020

www.chirpmaritime.org

Annual Digest of Reports and Insight Articles 2020

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Impact Statements

"It is noticeable, and even more so since the success of the CHIRP Maritime COVID papers, that the CHIRP Maritime programme is gaining recognition and attracting interest from the most senior governmental and non-governmental organisations."
Core sponsor

"... Con Coughlin, Defence Editor, The Daily Telegraph, Elizabeth Kolbert, Writer, The New Yorker, Bill McKibben, Freelance Journalist, Fortune, George Monbiot, Environmental Correspondent, The Guardian, Dominic Nicholls, Defence Correspondent, The Daily Telegraph, ***CAPTAIN JEFF PARFITT DIRECTOR, CHIRP MARITIME,*** *Alan Tovey, Shipping Correspondent, The Daily Telegraph, Ben Webster, Environment Editor, The Times, Kate Whitehead, Freelance Journalist, South China Morning Post..."*
List of Nominations for the Maritime Media Awards 2020,
The Desmond Wettern Award for Best Journalism

"We really appreciate your hard work and superb 'delivery'."
InterManager

"Our charitable activities are international, so we were impressed by the now global outreach of the programme and its effect in significantly influencing for the good, safety at sea"
Lloyd's Register Foundation.

"Thank you for your email, the issue has been relayed to all our vessels and re-enforced during my visits for audits etc. It has created much discussion in the fleet... Keep up the good work!"
Company DPA

"Last week we completed the modification on the last of ... vessels under our ship management as per modification previously shared with CHIRP. Thank you for your relevant input to this case."
Deputy DPA

Reporters' comments:

"With regards to the report, it covers all the issues and I appreciate the confidential manner in which it has been written."

"Thanks for taking my report on board and taking action on this serious issue... this WILL save lives of seafarers who work on this type of vessel."

"By the way, I really appreciate CHIRP's work, and study the reports carefully, I always learn something and share with crews."

"Thanks so much for all the hard work that you and your team in CHIRP do to spread the safety message and help us all to learn from the experiences of others."

"Good day. I want to thank you for responding in my report, it is a very big help to me... Thank you very much and God Bless."

Capt. Jeff Parfitt FNI
CHIRP Maritime Director

Maritime Director's Foreword

CHIRP Maritime has an important role to play in enhancing and strengthening the maritime safety sector so that it can respond to the existing needs of the seafarer and raise safety standard practices. We aim to promote good practice and encourage collaboration and exchange so as to create positive solutions that empower seafarers.

This year has proven to be an even greater challenge to the global maritime community due to the ongoing COVID-19 pandemic, with over 400,000 mariners trapped at sea beyond their agreed tours of duty. The plight of these mariners, and those awaiting return on board – approximately the same number and largely unpaid, has not diminished and there does not appear to be a satisfactory resolution in sight.

We now confidently assert that *CHIRP* Maritime is the world's foremost maritime near miss reporting programme

Our reports received remain strong and our readers will note that the depth and diverse nature of this year's reports are indicative of the trust and reputation that *CHIRP* Maritime has built up over the preceding 18 years. We now confidently assert that *CHIRP* Maritime is the world's foremost maritime near miss reporting programme and we would like to take this opportunity to thank our sponsors without which, *CHIRP* Maritime would not exist. It is hoped that our impact through their generous support is reflected in this Annual Digest.

We continue to reach out to an international audience, and this is reflected in our quarterly FEEDBACK magazine which is now published in four languages. In addition, the *CHIRP* Maritime insight articles continue to receive wide acclaim from many sectors of the industry. On the opposite page are some of the impact statements that we have received from reporters, industry organisations, and shipping companies. These statements only encourage us to further our efforts in improving safety for the mariner.

Our small crew of dedicated advisors and volunteers continue to support our colleagues at sea in whatever capacity they might serve. It is our belief that our contribution will in some way highlight the seemingly unending challenges to safety at sea as we continue to serve as the "Voice of the Mariner."

***CHIRP* Maritime the Voice of the MARINER**

Introduction

Welcome to the fifth annual review of *CHIRP* Maritime reports, covering all the cases we published during 2020 and including a number of in-depth articles specially commissioned to highlight important safety topics.

This has been a strange and disturbing year, dominated by Covid-19 and the global disruptions it has caused. The impact upon shipping has been particularly severe, both as a result of infections and outbreaks at sea and because it has been so difficult to arrange crew changes. Many seafarers are still at sea months after they should have been relieved – they are continuing to shoulder their burdens with courage and fortitude. As I write this, our crew change problems have still not been resolved, and it is a tribute to the world's seafarers that they have continued sending us their reports despite all the difficulties they are facing. At *CHIRP* Maritime we tried to do something for our colleagues at sea, and commissioned experts to produce guidance for serving seafarers. The guidance was published as a booklet entitled '*Seafarer wellbeing during the Covid-19 pandemic*' which was widely circulated within the maritime community and the papers, including medical advice, are reproduced in this Annual Digest – where our Health section appears first to reflect its importance. We salute all the world's seafarers who have kept trade moving despite the difficulties, and hope you will all soon make it home to your families.

The pressures on mariners who are forced to spend more than a year at sea, working every day and having no prospect of shore leave, are immense. Add to this their constant worry about the safety of their friends and families ashore and it is guaranteed to result in increased levels of stress and fatigue. Whether it will also lead to an increase in accidents and incidents remains to be seen but, if it does, we hope the people who investigate such cases will bear in mind the almost intolerable pressures on our seafarers.

Fortunately for *CHIRP* Maritime, our small and compact team has remained intact during 2020. Jeff Parfitt (Director, Maritime), Ian Shields and Howard Nightingale, ably assisted by Stephanie Dykes in the United Kingdom are still supported by two Maritime Advisors – Ranjith Cheerath in Singapore and me in Hong Kong – so our services have not been disrupted. Stephanie is currently on maternity leave, so we send our congratulations and best wishes, and look forward to seeing her again before too long. Meanwhile, Howard Nightingale is retiring early in 2021, so the search is on for his successor. It has been a pleasure working with him and he will be a hard act to follow. We wish him a long and happy retirement.

As always, we are guided by our Maritime Advisory Board (MAB) who are an outstanding group of men and women with over 700 years of combined shipping experience. They volunteer to vet our reports and provide comments and expertise, and also contribute many of the Insight articles which appear in the Annual Digest. All our work is overseen by the Trust, Executive Director Robert Robson and a distinguished team of Trustees, while our Ambassadors continue to promote our work around the globe. We were delighted to welcome Capt. Kumar from Chennai to our team of Ambassadors during the year, and he has already developed useful links for us in this important maritime nation.

Our Maritime FEEDBACK magazine is now published in English, Chinese, Filipino and Portuguese, so we are most grateful to all the sponsors and translators who help make this happen. Please let us know if there are other languages you would like to receive or, even better, if you would like to sponsor a version in another language.

We have again been fortunate in finding generous sponsors who have made it possible to produce this Annual Digest. They are listed at the end of the publication and we are extremely grateful for their support and their ongoing commitment to safety.

The generosity of all our sponsors is acknowledged in our publications, and we could not function without them, but our reporters (both individuals and companies) remain anonymous for obvious reasons. It is a pleasure for me to once again acknowledge them all and thank them for their support, without which we would not exist. The usefulness of their reports is demonstrated by the increasing amount of feedback and comment which we receive as a result of the published reports, and we are delighted that we have been able to publish many of these comments in Maritime FEEDBACK and in this Digest.

We continue to receive approaches from organisations around the world who wish to cooperate with us, which is proof that we are contributing to safety in many ways.

Once again, we have divided the Digest into themed sections to assist readers to find the topics which most interest them, but we seem to be receiving even more reports which could be allocated to several different sections. I am not sure whether this means incidents are becoming more complex, or whether our analysis is becoming more sophisticated, but we urge you to study all the sections because they all contain reports which will be of interest both to seafarers and people in shore positions. One message which does come through, unfortunately, is that not all companies are able to demonstrate a robust safety culture, so there is still a great deal of work to do to reach our goal of ensuring that every seafarer returns home safely at the end of every tour of duty.

Within most sections you will also find Insight articles that illuminate topics covered in that section or provide additional information. They are written by experts and are well worth reading.

All our videos, publications and databases are easy to access through our website www.chirpmaritme.org, so we hope you will look at them when time permits. For more detailed and focused research, we recommend the searchable database on the website. There is a useful guide in the banner on our home page which explains how to use our site if you are in any doubt.

We hope you will find this Annual Digest both interesting and informative, but please let us know. Your comments are important, and we read them all to ensure CHIRP Maritime continues to provide the information you need to make our industry safer.

Until next time, take care and may all your voyages lead you safely home.

Editor: Captain Alan Loynd
FNI FITA MCIArb BA(Hons)

Please note all reports received by CHIRP are accepted in good faith. Whilst every effort is made to ensure the accuracy of any editorials, analyses and comments that are published in this digest, please remember that CHIRP does not possess any executive authority.

Many seafarers are still at sea months after they should have been relieved – they are continuing to shoulder their burdens with courage and fortitude. As I write this, our crew change problems have still not been resolved

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Section one

Health and seafarer welfare

It seems entirely appropriate to begin this edition of our Annual Digest with a section on health and the welfare of seafarers. 2020 has been a terrible year for much of the world's population, but seafarers have suffered more than most. Some have been forced to serve intolerably long tours of duty, often through no fault of their own and despite the fact that their employers have worked tirelessly to persuade governments to permit crew changes. Staff aboard passenger vessels have been particularly hard-hit but they have responded with professionalism and fortitude which does them great credit.

Meanwhile, crew members who were on leave have been barred from returning to work which has placed a significant emotional and financial burden on them and their families.

The shipping industry as a whole made determined efforts to persuade governments around the world to permit crew changes, and they have been successful in a number of cases. Unfortunately, some irresponsible manning agencies sent replacement crews who were infected with the Covid-19 virus, which caused several administrations to reverse their position or tighten the rules to make crew changes more difficult again.

As we go to press, the situation has not been resolved and could even be getting worse. One question which hangs over our industry is whether, and to what extent, the pandemic might contribute to accidents and incidents. Will fatigue, worry or the desire for contact with loved ones ashore cause more maritime disasters? We will not know until all recent incidents have been thoroughly investigated, but if it is shown that health and welfare aspects contributed to any of the recent cases, then we hope the authorities will take this into account, and temper justice with mercy and common sense.

CHIRP Maritime responded to the crisis by commissioning experts to write three papers giving advice to masters and crew, highlighting the plight of seafarers trapped on board, and offering guidance on seafarer wellbeing during the pandemic. These were combined into a booklet entitled Seafarer wellbeing during the Covid-19 pandemic which was widely circulated by everyone from the IMO to individual shipping companies, and we also published separate medical advice.

The advice in our booklet is still relevant, so the papers are reproduced in this section. We also include a report which demonstrates one of the unforeseen consequences of the pandemic. They are all of vital importance in these troubled times, and we commend them to all our readers.

Article. 1

COVID-19: Do you understand me?

Outline: An unexpected consequence of COVID-19 precautions.

What the reporter told us:

As a pilot undertaking a routine pilotage in these extraordinary times, I wear a facemask which has resulted in an unusual side effect. On this occasion, it was noted that the master's knowledge and understanding of the English language was excellent. However, his ability to understand me whilst my voice was somewhat stifled by the protective mask proved to be questionable. The master frequently said "yes" when it seemed to be inappropriate and I needed to confirm several important communications to be certain that I was getting a correct response.

The learning from this is to ensure that all communications are properly understood by using closed loop reporting, and by ensuring that any queries are made in an open manner as opposed to being leading or suggestive.

CHIRP Comment:

This is a simple report illustrating that a mask can stifle the full audible range of communication and can also obscure the more subtle aspects of communication such as body language and visual signs e.g. smiling or scowling. Whilst this report is specific to COVID-19, on a broader front it can be related to multinational ships where conversations and verbal communications are easier and more free flowing in a face-to-face situation, rather than remotely via telephone or radio. There may also be an element of lip reading between people, particularly in areas of high ambient noise and with older people in general.

The merits of wearing a mask or other face covering for personal protection or to prevent any potential spread of infection have been debated widely. Advice changes rapidly and varies in different parts of the world, but as a general principle masks are now highly recommended, and mariners should follow the latest WHO and national recommendations on the wearing of masks and face coverings. If there is a variance then the strictest precautions should be followed. A ship-specific COVID-19 threat and risk assessment also needs to be taken into consideration by those boarding the vessel for whatever reason. In a similar manner, a vessel may be required by a port to follow specific procedures.

It was noted that some pilots take their masks off during critical manoeuvring but increase social distancing to compensate. There is a need to balance the risk between critical communication and possible contagion.

Finally, if an operation cannot be carried out safely, including satisfactory safety-critical communications, then the operation should not be undertaken.

The above article was published in MFB 60

Finally, if an operation cannot be carried out safely, including satisfactory safety-critical communications, then the operation should not be undertaken.

Article 2.

Insight: **Focus on seafarer wellbeing during COVID-19 pandemic**

This paper was prepared in April 2020 for *CHIRP* Maritime by Dr Claire Pekcan, Director of Safe Marine Ltd., and a member of the *CHIRP* Maritime Advisory Board.

Introduction.

The world is in lockdown during this unprecedented global health crisis. A total of 181 countries have reported incidents of COVID-19 infection and are at war with this unseen enemy, the coronavirus. Governments' only weapon is to restrict the movement of its citizens within their country's borders and to deny entry to the foreign visitors they would normally welcome. The disruption to lives and livelihoods is incalculable. We are consumed with media reports of the numbers of fatalities around the globe and are urged, commanded, to shield the vulnerable, to protect our key workers and stay at home. However, there is one group of people the world's media attention has overlooked; a group of people on whom we all depend without even knowing it; a group of people who help our interconnected, interdependent world to function; a group of people who are caught up in the crossfire of this war on Covid-19. These people are the seafarers of the world; the men and women who operate the ships that carry our food, our medicines, our energy, our raw materials that we need to see us through this pandemic. Through this piece, I want to focus our attention on the plight of seafarers and their well-being in these most difficult of times.

Sea traffic.

The majority of world trade is facilitated by shipping with 95% of all products and raw materials carried in the hold of a ship. In the current crisis, airplanes are grounded, roads are empty, yet shipping continues to operate out of sight and in many respects, out of mind. A screenshot from Marine Traffic's ship tracking website (MarineTraffic.com; 2 April 2020) shows the number of ships currently at sea. Our towns and cities may be quiet, but our sea lanes are not. Each of these ships will be crewed with seafarers, some of whom may have already been on board their vessels for many months before news of the coronavirus outbreak started to surface.

(Source: MarineTraffic.com)

Seafarers' work and employment.

Seafarers' work and employment is governed by international conventions and laws of the sea. These laws

and conventions restrict the length of time that seafarers can spend on board, the number of hours they can work in a 24-hour period and the amount of rest they can expect to receive over a working week.

Two significant instruments that govern seafarers' working conditions have recently been revised or ratified by the international shipping community; namely, the International Labor Organisation's (ILO) Maritime Labour Convention (MLC, 2006) and the International Maritime Organisation's International Convention on the Standards of Training and Certification for Watchkeepers (STCW, 2010 Manila Amendments).

These are not the only instruments that affect the quantity of work that ship operators can demand of their seafarers or the quality of rest they must afford them. Other instruments can have an indirect influence on working conditions and include the Principles of Safe Manning in Annex 6 of the International Convention for Safety of Life at Sea (SOLAS), which determines the number of people that must be on board to safely operate the ship; and, the Convention on Facilitation of International Maritime Traffic (FAL Convention), which contains directions to national administrations to permit shore leave to seafarers regardless of their background.

The next section explains the mandatory terms and conditions of employment contained within these instruments that serve to govern operations in normal circumstances. Subsequent sections will explain how the COVID-19 pandemic is affecting both operators and seafarers in this regard and the likely social and psychological consequences of the virus outbreak through its impact on seafarer mental health directly and indirectly through increasing on board service, reducing access to shore leave, increasing hours of work and reducing hours of rest.

Seafarers' Employment Agreements (SEA)

In 2013, the Maritime Labour Convention (2006) came into force and introduced an important protection for seafarers. It requires employers to draw up legally enforceable employment agreements with each seafarer, outlining the capacity in which they are to work; detailing the duration of their contract or if indefinite, the notice period; explaining their health and social security benefits; setting a limit to their contract lengths; detailing the specifics of their repatriation, such as destination and mode of transport; specifying the amount of compensation in the event of loss of their property; and, informing the seafarer about details of any collective bargaining agreement in place. Seafarers who are employees of the ship owner or manager can also expect their Seafarers' Employment Agreement to contain information about how their wages are arrived at and how they will be paid, the number of hours they will be expected to work, the paid leave they can expect as well as any pension benefits and grievance procedures. For those seafarers who are not employees, the SEA needs to outline the amount they will be remunerated as well as the manner and the dates on which they will be paid.

Contract Duration

The maximum duration of service on board a seafarer can be expected to provide before he or she is entitled to repatriation is now less than 12 months. However, in practice, there is considerable variation in the duration of seafarers' on-board service reflecting the variety of contract types in force. Contract types range from those given to permanent salaried employees who are paid when ashore on leave as well as when on board, through indefinite contracts given to employees who are not paid when they are on leave, to a whole array of temporary contracts where the seafarer may be signed on with an agency and only paid for a single voyage with no obligation on the part of the ship owner / operator to re-employ them at some future date.

The duration of on board service and the ratio of work to leave can also vary from a number of weeks, such as 12 weeks on: 12 weeks off, to several months, with on board service lasting for up to 9 months including an implied holiday entitlement of 3 months included in the monthly payments made to the seafarers. The more secure forms of employment and shorter service durations are generally associated with the higher ranking positions on board, such as the master or chief engineer. The insecure and longer employment contracts are more often offered to those with fewer qualifications such as the deck, engine and mess crews. Nationality can also play a large part in determining the terms and conditions of employment, with northern Europeans and North Americans commanding more open-ended forms of employment and seafarers from the Indian sub-continent and Asia subject to far more contingent and insecure contracts. In situations of multi-national crewing, individuals who fulfil the same position on board can be on very different contracts by virtue of their nationality.

In practice, some flexibility is often written into the contracts to help ship operators manage crew changes when relief officers and crew are unavailable due to leave, sickness absences or staff turnover. Seafarers may be asked to agree to be called back early or to stay on board for longer than their SEA stipulates if the company is having difficulty finding a suitably qualified relief with many contracts having an automatic one-month service extension written in to cover these eventualities.

Hours of Work and Rest.

The Seafarers Employment Agreement sets the absolute limit of time seafarers can spend on board, but it is other provisions in the MLC and STCW that determine the hours of work and rest that need to be adhered to when the seafarer is working.

Internationally trading ships that operate 24 hours a day, 7 days a week need to distribute the work and work hours amongst the workforce on board in order to maintain a continuous operation. They are obliged under international law to ensure that their staffing levels also ensure a safe operation.

Typically, the work schedule is organised into watch patterns or duty rosters with different departments and different designations of individuals following different work schedules according to the demands of their role. The safe manning certificate will determine the minimum number of people of various occupations and ranks that need to be on board and consequently will set the lower limit for the number of people amongst whom the work hours can be shared. The MLC and STCW set the upper limit of the number of hours that any one watchkeeper or rostered individual can work and the minimum numbers of hours of rest they are entitled to in an 7-day period. These limits are designed, in principle, to minimise fatigue and to maintain a safe ship operation and are based on the standard of an eight-hour day with one rest day per week and rest days on public holidays.

Currently these limits are as follows:

The limits on hours of work or rest shall be as follows:
a. maximum hours of work shall not exceed:
   ii. 14 hours in any 24-hour period; and
   iii. 72 hours in any 7-day period; or
b. minimum hours of rest shall not be less than:
   i. 10 hours in any 24-hour period; and
   ii. 77 hours in any 7-day period.

Hours of rest may be divided into no more than two periods, one of which shall be at least 6 hours in length, and the interval between consecutive periods of rest shall not exceed 14 hours.

Parties may allow exceptions from the required hours of rest provided that the rest period is not less than 70 hours in any 7 day period and on certain conditions, namely:-

- Such exceptional arrangements shall not be extended for more than two consecutive weeks. The intervals between two periods of exceptions shall not be less than twice the duration of the exception;
- The hours of rest may be divided into no more than three periods, one of which shall be at least 6 hours and none of the other two periods shall be less than one hour in length;
- The intervals between consecutive periods of rest shall not exceed 14 hours; and
- Exceptions shall not extend beyond two 24-hour periods in any 7-day period.

Summary

Taking together the provisions of the MLC and STCW, the maximum time a seafarer can serve on board is 12 months, minus any leave entitlement. The maximum total number of hours they can work in a given week is 91 (the result when the minimum 77 hours of rest is subtracted from the total number of hours in 7 days). Not all seafarers will work on board for this amount of time and at this level of intensity, but research suggests that a working week in excess of 60 hours is not uncommon (Zhao et al., 2016).

Work and health

For most people that work in shore-side occupations, the idea that they could be asked to work 7 days a week for up to 12 months of the year would be completely abhorrent. However, for a large proportion of seafarers, this is the reality of their working lives.

In this section, I want to examine what science tells us about the way work impacts our physical and psychological health and explore how seafarers' 'ordinary' work and employment conditions might affect their wellbeing. In subsequent sections, I will turn the focus of our attention on the impact that the pandemic is having on seafarers' working lives and the likely consequences that might ensue.

Seafarer Occupational Mortality.

In order to understand the impact that any changes to seafarers' work and conditions of employment, we first have to understand which factors are important in considering the relationship between work and health. Studies in the area of occupational medicine lead us to understand that seafaring is a high-risk occupation with annual seafarer deaths at work from accidents or ill-health numbering anything between six (Borch et al., 2012) and twenty-six times (Roberts & Roberts, 2005) that of shore-side occupations, although the number of fatalities recorded in some national databases have declined in recent years (Roberts et al., 2012).

Epidemiological studies that examine premature deaths associated with ill-health and disease among working people again reveal that male seafarers have some of the highest mortality rates due to alcohol, drugs and sexual habits (Coggon et al., 2010). Seafarers are also reportedly more obese than shore-side workers (Hoeyer & Hansen, 2005) and tragically, greater numbers take their own lives than many people working in other occupations do (Iversen, 2012).

Exact figures are difficult to come by, but the general picture is that seafarers' work, under normal circumstances, can have significant deleterious consequences for an individual's longevity, health and well-being.

In order to understand why seafarers' working conditions can have these negative effects, we need to consider how the human body and mind respond to physical and mental exertion associated with work. We also need to understand how recovery occurs and define the limits beyond or below which injury, ill-health or poor psychological well-being are the likely result.

Work Demands.

It was in World War I that we learnt from studies of workers in munitions factories that the relationship between the length of time that people work and the amount they produce is not linear – people are simply not able to produce more the more they work (Mcivor, 1987). Exhaustion, fatigue and poor health are the likely outcomes of overworking employees. Industrial fatigue as it came to be known was prevalent in Victorian workplaces in industrialising Britain and recognition grew that 'the human element' suffered from physiological and psychological limitations to the amount of work it could endure without adequate rest.

The principal finding from that era was that increased work duration does not translate into increased productivity. In fact, individuals who worked shorter hours were shown to be more productive than those who worked longer hours.

> **Industrial fatigue** – a state of overstrain or exhaustion resulting from excessive work not being balanced by adequate rest and exhibiting itself primarily in diminished personal capacity for doing work-that is, declining productivity
>
> **(McIvor, 1987; p.724)**

It is worth noting and drawing comparisons between the length of the working week in Victorian Britain and modern merchant shipping. McIvor reports that Parliament responded to the inhumane conditions in the British factories and the working week started to reduce. By the 1890s, the typical hours worked had reduced to between 52 and 57 a week, with a few "sweated trades" demanding 70 hours or more (McIvor, 1987; pp 725).

In a recent survey of European and Chinese seafarers, Zhao and colleagues (Zhao et al., 2016) found that in 21st century shipping a typical working week is over 60 hours long. This would suggest that currently, seafarers work on average eight hours more a week than workers in factories did 130 years ago.

Sleepiness, Fatigue and Stress

Two disciplines provide us with considerable information about the consequences of excessive demands on an individual's physiological and psychological resources: occupational medicine and health psychology. Both disciplines point out that fatigue is a multi-dimensional phenomenon and needs to be differentiated from sleepiness. Figure 2 on the next page shows graphically how the two are related.

Sleepiness.

Sleepiness is defined as, "the lack of ability to maintain a wakeful state of attention without the aid of situational factors" (Jepsen et al., 2015; pp. 107). Sleepiness has a simple cause and a simple cure. It occurs when people have had insufficient quality sleep and is remedied by sleep of sufficient duration and quality to replenish the sleep debt. It is acute, meaning that it is usually of short duration – a day or two – and one good episode of sleep is sufficient to replenish several recent episodes of sleep deprivation.

Shift work, watchkeeping and on-call duties are specific instances of work scheduling practices that can have a significant impact on sleep duration and thus sleepiness. Our bodies operate according to a circadian rhythm – a sleep-wake cycle that means we are programmed to sleep at night and be awake during the day. Shift work interferes with this sleep-wake cycle, either by forcing us to be awake when we would naturally be asleep, such as on the 0400 to 0800 watch in a three-watch system, or does not give us the opportunity to have a long enough sleep when we are off duty, as in the 6on 6off watch pattern.

Another cause of sleep deprivation that has become apparent in modern times is technology; smart phones, tablets and laptops that give us access to social media, news, music and games 24 hours a day impacts our sleep in two ways. First, we choose to engage with the technology when we should be sleeping thereby staying awake too long to get sufficient sleep. Second, these technologies emit blue light, which is one of the signals to our brains that it is daytime and therefore time to be awake.

Sleepiness is particularly problematic for safety on account of the fact that lack of sleep or short sleep duration robs us of our cognitive faculties. Depending on the extent of the sleep deprivation, the consequences can range from momentary lapses of attention through to difficulty making decisions and a complete inability to focus our minds on the tasks that we need to perform. Without restorative sleep, eventually a person will be unable to stay awake and will fall asleep while working.

Fatigue

Fatigue is a phenomenon that has been difficult to define because it contains many things, from how much energy we feel we have to how motivated we feel to do things. It can be experienced as lethargy and physical weariness or mental tiredness and people can have both physical and mental symptoms concurrently. It affects many systems of the body, such as our digestive system, our body clock, our immune system, our cardio-vascular system and our nervous system (Jepsen et al., 2017) with excessive or chronic exposure to fatigue hazards leading to sleep disorders, diabetes, coronary heart disease, gastro-intestinal disorders, obesity, depression, cancer, and greater susceptibility to infections (Jepsen et al., 2015).

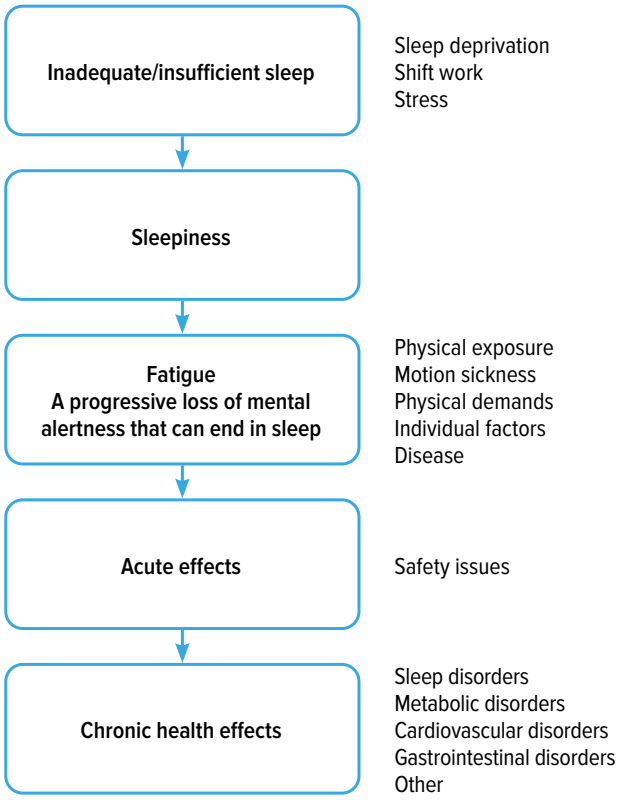

Figure 1 – Source: Jepsen et al (2015; p.108) The relationship between sleepiness and fatigue.

Fatigue may only be experienced after many weeks and months of exposure to the fatigue inducing hazards. It is often insidious in nature with people reporting signs of weariness or disease when it is too late to prevent it from happening or considerably more difficult to rectify its consequences.

When it comes to the causes of fatigue in working people, work stress, shift work and physical workload are important risk factors (Åkerstedt et al., 2002). Repeated episodes of sleep deprivation associated with shift work, incomplete recovery from working such as lack of weekends off and working more than two 6 hour periods in 24 hours all increase the risk of fatigue for seafarers in particular. Individuals who work excessive hours or shifts are more likely to consume problematic amounts of alcohol, smoke more, exercise less and consume high calorific foods thereby adding to the assault on their bodies.

Due to its insidious nature, fatigue is difficult to treat and thus it is better to avoid the risk factors than to try and remedy their effects. Jepsen and colleagues suggest that companies are advised to consider a range of measures from proper work scheduling, to improving individuals' sleep hygiene through education – e.g. recommending going to bed promptly, avoiding stimulants before bed time, etc., However they also have a stark warning,

advising us that," ...there seems at present to be no way of eliminating most negative effects of shift work on human physiology and cognition (Jepsen et al., 2015, p. 117). In effect, the only way to reduce its effects on workers is to reduce their exposure.

Stress

Another phenomenon predictive of poor health outcomes and associated with modern-day working practices is stress. As with fatigue, stress is a complex topic, not helped by the fact we use it to describe both the causes of our emotional state "Trying to plot a target using this ARPA is very stressful" and to describe the consequences of our work experiences "I was completely wound up after my watch and didn't get any sleep last night. Now I feel completely stressed". The UK's Health and Safety Executive define stress as "The adverse reaction people have to excessive pressures or other types of demand placed on them at work."

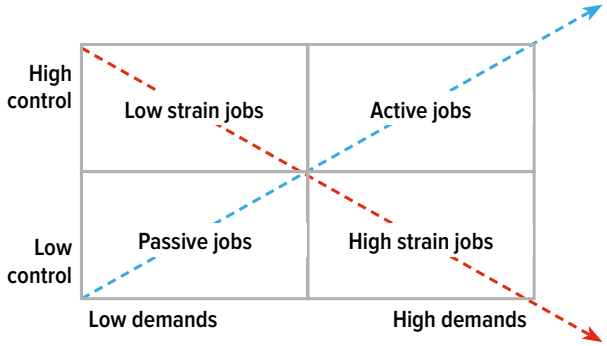

Figure 2. High Strain Jobs. Adapted from (Karasek, 1979).

Researchers and academics who have studied stress at work suggest that there are a number of work characteristics or job demands that can overwhelm an individual's resources leading to them to experience stress or strain. A prominent Swedish researcher in the 1970s, Robert Karasek, studied the effects of these work characteristics on workers and taught us a lot about work-related stress. Karasek concluded that excessive demands such as the amount of work, pace of work, the extent of risk associated with the work combined with little discretion over how one responds to these demands, leads the worker to experience job strain, which in turn can lead to cardio-vascular disease (Karasek, 1979).

Both under-utilisation as well as over-utilisation of our resources can have negative consequences for our physical and mental health

Contrarily, we can also suffer if we are deprived of sufficient stimulation or suffer from a lack of 'stress' at work. A series of studies that looked at the consequences of assembly-line work in the 1990s showed that boring, repetitive work that gave the worker no control over the pace and method of work also leads to poor mental health outcomes (e.g. Mullarkey et al., 1997). Thus both under-utilisation as well as over-utilisation of our resources can have negative consequences for our physical and mental health, although the most critical factor appears to be our sense of control over what is asked of us and the choices that we have over how to respond.

Jepsen and colleagues list the principal characteristics of seafarers' jobs that cause strain as follows:

"*Separation from family, loneliness on board, fatigue, multi-nationality, limited recreation activity and sleep deprivation* " (Jepsen et al., 2015, p. 108).

Characteristics of work that can lead to job stress or strain

Job Demand Type	Example
Quantitative	• The amount of work • The pace of work • The time available to complete the work • The significance of the work
Cognitive	• How abstract or unclear information for decision-making is • How complex the task is
Emotional	The effort required to manage difficult emotions; e.g. • Dealing with difficult 'others', such as customers, inspectors, officials • Breaking our promises to our families because of work commitments • Missing out on social interactions • Feeling isolated and lonely • Having to endure boring, repetitive work • Dealing with the fear of being injured or getting sick
Physical	• The amount of load placed on the musculo-skeletal system of the body

Source: Adapted from European Foundation for the Improvement of Living and Working Conditions (2007). 'Work-related stress'. Retrieved 9 April 2020, from www.eurofound.europa.eu

Supports

In more recent times, researchers have also included the idea that we need to consider the supports available to workers in their workplace in order to understand how and when demands translate into job strain. Demands are extended to include jobs that place the worker in emotionally demanding situations and the extent to which it places them in conflict with their family obligations, so-called work-life balance. Supports include, having autonomy or choices about how to do the work, having good support from colleagues and the appropriate levels of training and development to perform one's job (e.g. Schaufeli & Bakker, 2004).

The Maritime Context

The consequences for maritime safety of overwork and inadequate rest have been a subject of concern in the maritime industry for many years. In 2001, the IMO published its Guidelines on Fatigue, non-mandatory guidance on the cause, consequences and the management of fatigue at sea. These guidelines have been updated recently in MSC.1/Circ1598 and contained therein is IMOs definition of seafarer fatigue (IMO, 2019; Annex p. 1)

"*A state of physical and/or mental impairment resulting from factors such as inadequate sleep, extended wakefulness, work/rest requirements out of sync with circadian rhythms and physical, mental or emotional exertion that can impair alertness and the ability to safely operate a ship or perform safety-related duties.*"

This IMO document acknowledges that fatigue is indiscriminate and affects seafarers regardless of their skill, knowledge or training. It also warns that the attitude that fatigue "comes with the job" is no longer acceptable given the risk this hazard poses to safety of life, property, health, security and protection of the marine environment.

Seafarers' Risk Factors

The particular circumstances of seafarers that can exacerbate fatigue are now recognised and the IMO guidance enumerates a number of these that set this industry apart from other enterprises (IMO, 2019; Annex pp. 3-4).

The demanding nature of shipping means that:

1. *seafarers may be required to work long and irregular hours;*
2. *seafarers may spend an extended period of time working and living away from home, on a ship that is subject to unpredictable environmental factors (i.e. changing weather conditions);*
3. *the ship is both a seafarer's workplace and their home while on board; and*
4. *while serving on board the vessel, there may not be a clear separation between work and recreation, which can influence their mental and emotional well-being.*

Within the confines of a ship, the causes of fatigue are many, ranging from lack of sleep to disruption of the body's clock, personal worries and poor nutrition. The IMO Circular MSC.1/Circ1598 provides a comprehensive list of seafarer-specific and management-specific factors that might bring on or exacerbate symptoms of fatigue and these are listed below (IMO, 2019; Annex pp. 4-5).

Seafarer-specific factors

The seafarer-specific factors are related to lifestyle behaviour, personal habits and individual attributes. Fatigue varies from one person to another and its effects are often dependent on the particular activity being performed.

.1 sleep and rest:
- .1 quantity, quality and continuity of sleep;
- .2 sleep disorders/disturbances; and
- .3 recovery rest/breaks;

.2 body clock/Circadian rhythms;

.3 psychological and emotional factors:
- .1 fear;
- .2 monotony and boredom; and
- .3 loneliness;

.4 health and well-being:
- .1 diet/nutrition/hydration;
- .2 exercise and fitness; and
- .3 illness and onset of illness;

.5 stress:
- .1 skill, knowledge and training as it relates to the job;
- .2 personal issues of concern in personal life; and
- .3 interpersonal relationships at work or at home;

.6 medication and substance use:
- .1 alcohol;
- .2 drugs (prescription and non-prescription);
- .3 supplements; and
- .4 caffeine and other stimulants;

.7 age;

.8 shift work and work schedules;

.9 workload (mental/physical); and

.10 jet lag.

Management-specific factors

Management factors relate to how ships are managed and operated. These factors can potentially cause stress and an increased workload, ultimately resulting in fatigue. These factors include:

.1 Organizational factors:
- .1 manning policies, levels, and retention;
- .2 role of riders and shore personnel;
- .3 administrative work/reporting/inspection requirements;
- .4 economics;
- .5 duty schedule-shift, overtime, breaks;
- .6 company procedures, culture and management style;
- .7 shore-based support;
- .8 rules and regulations;
- .9 other resources;
- .10 maintenance and repair of the ship; and
- .11 drill schedules and training of crew;

.2 Voyage and scheduling factors:
- .1 frequency and duration of port calls;
- .2 time between ports;
- .3 routeing;
- .4 weather and sea condition on route;
- .5 traffic density on route;
- .6 nature of duties/workload while in port and at sea; and
- .7 availability of shore leave.

Seafarer Mental Health

Such is the growing concern about the decline in seafarer wellbeing in recent decades, in 2019, two large scale projects were commissioned. One, carried out by Yale University funded by the ITF Seafarers' Trust and the other, carried out by the Seafarers' International Research Centre in Cardiff, funded by the Institute of Occupational Health (IOSH). Both studies report disturbing statistics and describe worrying trends in the incidence of poor mental health amongst seafarers.

Key findings from the ITF Seafarers Trust and Yale University study (Lefkowitz et al., 2019, p. 5):

- *25% of seafarers completing a patient health questionnaire had scores suggesting depression (significantly higher than other working and general populations).*
- *17% of seafarers completing a generalised anxiety disorder questionnaire were defined as seafarers with anxiety.*
- *20% of seafarers surveyed had suicidal ideation, either several days (12.5%), more than half the days (5%) or nearly every day (2%) over the two weeks prior to taking the survey.*
- *Incorporating all demographic, occupational, and work environmental factors, final determinants of seafarer*

depression, anxiety, and suicidal ideation included work environmental factors (non-caring company culture, violence at work), job satisfaction, and self-rated health (the strongest predictor of anxiety and depression).

- *The most significant factor associated with workplace violence was seafarer region of origin. Seafarers from the Philippines and Eastern Europe were most likely to report exposures to workplace violence.*
- *Depression, anxiety, and suicidal ideation were associated with increased likelihood of injury and illness while working on board the vessel.*
- *Seafarer depression, anxiety, and suicidal ideation were associated with increased likelihood of planning to leave work as a seafarer in the next 6 months.*
- ***Periods in work/life cycle associated with high-risk of mental health issues included, most notably, during extension of a voyage.***

The Yale University study found that significant numbers of the 1572 seafarers surveyed – up to one-quarter on some indicators – were suffering from depression, anxiety and suicidal ideation (Lefkowitz et al., 2019) – thought to be an important precursor to someone taking their own life.

Lefkowitz and colleagues also report that the most 'at-risk' time for a seafarer experiencing an episode of mental ill-health is when their voyage is extended beyond the time they were expecting to be relieved.

The Seafarers' International Research Centre in Cardiff document contains informative and insightful analyses into the plight of many of the world's seafarers and reports that, "There is evidence of an increase in recent-onset anxiety and depression among serving seafarers" and that, "Employers do not recognise the importance of mental health and welfare on board to the same extent as maritime charities and stakeholders"(Sampson & Ellis, 2019, p.4).

Impact of the COVID-19 Pandemic on Seafarers.

The World Health Organisations categorised the COVID-19 as a pandemic on 11 March of this year. Like a domino effect, country after country went into lockdown and airline companies started to ground their planes. By 16 March, shipping companies were reporting that all crew changes, world-wide, were stopped. Since this time, most seafarers have been unable to leave their ships to go home and new relief crews have been unable to join their ships to relieve those on board. Some estimates suggest that 150,00 seafarers are trapped at sea who were due to sign off have had their leave cancelled and remain on board (e.g. Safety4Sea).

At the time of writing, with a few exceptions (e.g. the UK), in many places around the world seafarers are not yet recognised as key workers, a designation which might afford them some dispensations to travel on account of the vital role they fulfil in maintaining the supply chains helping to keep country's stocks of medicines, food, and raw materials replenished.

Seafarers are subject to the same restrictions on movement within their countries as other citizens are and are unable to leave their ship to travel home because airlines have grounded their fleets and nation states have stopped the flow in and out as well as the transit through their countries for non-native individuals. Seafarers are also prevented from getting off the ship for shore leave when in port because of the virus transmission risk they may pose. Those on board have to remain on board. Those ashore have to remain on shore. Those in port have to stay on the ship. Those in transit have to stay where they are no matter how near or far they are from home.

Negotiations are taking place at an international level between IMO, the ILO, ITF and the ICS to try and open corridors into and out of hub ports so that crew changes can take place, but as yet, the international maritime community has not managed to get key nation states to lift the travel restrictions they have levied.

Analysis of the Impact of COVID-19 using the Job Demands Model.

Using the Job Demands – Resources model to analyse the impact on seafarers' on board, we can conclude that the likely consequences of the pandemic on seafarers is to increase their exposure to the aspects of their jobs that cause harm and to remove or reduce the supports that can give them relief from their daily toil and anxiety about COVID-19. The following table identifies the type of impact of that COVID-19 is likely to have by increasing the job demands and reducing the seafarers' sense of control over their situation.

Added to this, seafarers, like all humans will be affected on a personal level by the crisis: they will be scared of the disease and getting infected; fearful for their families and loved ones; worried about the financial implications of the pandemic, particularly if they are unable to work; and feeling a sense of isolation and powerlessness to make the situation better thus adding to the stresses and strains that they normally experience as part of their work.

Supporting Seafarers through COVID-19.

As the two reports cited above suggest, at the best of times, seafarers' work can be very damaging to their health and well-being, particularly if they are not given adequate support through proper work scheduling, reasonable job demands, support from colleagues and management, access to social activities, time away from the ship, opportunities and time for contacting loved ones ashore, and support in the form of training and development to help meet the demands of their role.

As the Yale study identified, a critical event important for seafarers' wellbeing is to be relieved on time. One of the principal impacts of the COVID-19 is to deny seafarers timely relief at the end of their contracts. All seafarers who were already on board at the time of the outbreak will have to stay on board, potentially indefinitely or until such times as restrictions on travel are eased.

The international maritime community is working together to try and overturn travel bans for seafarers and to open up transport hubs to get seafarers on and off ships. However, these are likely to be several weeks away and many seafarers' contracts may have already long expired. Therefore, there may be many individuals whose situation is placing them at risk of experiencing a mental ill-health episode.

There are actions that can be taken by individuals, by ship's teams and by management to help alleviate the suffering and stress that seafarers on board might be experiencing in these most difficult of times. Shipping companies, seafarers' employment agencies and the seafarers themselves may not have the power to overturn government restrictions on their travel, but there are constructive actions that they can take to tackle many of the challenges that COVID-19 presents.

Table 2. Potential Impacts of COVID-19 on Seafarers

Job Demand Type	Job Characteristic	Impact of COVID-19
Quantitative	Amount of work	• Length of on board service extended beyond contractual arrangements • Increased exposure to effects of shift work • Continuing exposure to work schedules in excess of 60 hours
	Speed of work	• Increased demand for quicker port turnaround times to keep communities supplied
	Significance of work	• Obligation to maintain performance standards even if suffering from distress or fatigue because of the consequences for safety • Obligation to deliver cargo in compliance with contract despite distress or fatigue as commercial pressure to keep ship trading
Cognitive	Unclear situation	• Normal ship routines of inspections and training etc., disrupted • Lack of information or answers regarding crew relief • Unclear whether ship and crews are in compliance with rules and obligations as certificates about to expire, inspections unable to be performed
	Complexity	• Unknown risk posed by visitors to ship and those coming on board such as pilots, port officials, stevedores etc. • Normal activities to support life on board and vessel operability increasingly challenging, such as victualing, bunkering, garbage disposal • Increased anxiety making it difficult to concentrate and make decisions
Emotional	Fear	• Fear of contracting the virus from visitors to the ship • Fear of their loved ones contracting the virus and being unable to protect them
	Anxiety	• Worry about keeping one's self healthy • Worry about access to medications for already-diagnosed health conditions • Financial worries if ashore and on agency contract with no income coming in
	Isolation	• Trapped on board with people who are not from their community • Lack of, or restricted access, to broadband and the internet so cannot communicate with friends and family how and when choose • Increased feelings of loneliness as disconnected from communities and loved ones
	Conflict	• Increasing stress, frustration and irritation leading to conflict to break out on board • Having to break promises and deal with distressed family and friends • Dealing with unhelpful or difficult officials
	Low mood	• Worries leading to uncontrollable thoughts which disrupt sleep and sap energy levels
	Depression	• Having to cope alone with the loss of family members who have succumbed to the virus • Feeling helpless and unable to support sick / bereaved family members
Physical	Musculo-skeletal	• Increased exposure to physically demanding work
	Environmental	• Increased exposure to working in extreme physical environments, e.g. engineers in engine room, deck crew in tropics etc.,
	Health	• Lack of facilities, PPE and equipment for preventing infections and treating infections on board • Unable to evacuate sick or injured seafarers due to ship denied port access

I will present the information that can be used to help seafarers through this crisis using a framework, called the Six Category Intervention Analysis, developed by John Heron in 1976, a researcher at the University of Surrey (Heron, 1976) . This framework is used in many settings, both clinical e.g. counselling and non-clinical e.g. policing, for guiding people who are helping those who face challenging circumstances. It defines and describes six categories of intervention, divided into two groups, that can be used to help people with difficult problems. The six categories of intervention are listed in the following table.

The interventions are divided into two groups, Authoritative and Facilitative. The former group is more directive in nature, where the helper may command, guide, or instruct the individual to follow particular problem-solving strategies and solutions. The latter group is more collaborative in nature where the helper works with the individual to discover problem-solving strategies and solutions. The circumstances of the individual or group of individuals affected will dictate the choice of intervention strategy that is most appropriate and likely to be the most effective. It is worth noting that each intervention needs to be offered in such a way that the recipient feels free to acknowledge that it does, and equally acknowledge that it does not, meet with his or her true needs or interests.

A list of sources and resources structured according to Heron's intervention categories follows. These sources and resources are chosen if they aim or are designed to reduce the demands on seafarers' resources and / or alleviate any accompanying or consequential reduction in psychological capacity and increase in emotional distress.

Heron's Six-Category Interventions

Intervention Category	Description
Authoritative	
i) Prescriptive	Give advice, be judgemental/ critical/ evaluative, seek explicitly to direct the behaviour of the other person
ii) Informative	Be didactic, instruct/inform, interpret; seek to impart new knowledge or information to the other person
iii) Confronting	Challenge, give direct feedback; challenge the restrictive attitudes, beliefs, behaviour of the other
Facilitative	
i) Cathartic	Release emotional tensions in; enable the other person to abreact; i.e., get out of their system – painful emotions
ii) Catalytic	Encourage self-directed problem-solving, elicit information from; enable the other person to learn and develop by self-direction and self-discovery
iii) Supportive	Be approving, confirming validating – affirm the worth and value of the other person

Guidance and Advice organised using Heron's Six-Category Interventions Analysis

Prescriptive Interventions

Many of the international bodies representing shipping companies are producing guidance to help direct seafarers' behaviour to prevent them from being harmed, to enable them to remain in compliance with their contractual obligations and to avoid coming into conflict with port authorities. Primarily, these are aimed at protecting seafarers from contracting COVID-19 and providing advice on what to do in the event of a seafarer showing symptoms on board a ship.

International trade bodies, such as INTERTANKO and INTERMANAGER, are providing instructions and advice to their members on how to navigate through the commercial and legal challenges posed by the pandemic. Only those that are publicly available are listed in the table below.

Prescriptive:
Resources that seek explicitly to direct the behaviour of the other person

Title	Description	Support	Source
International Health Regulations (2005)	Directions to port States: e.g. ships shall not be refused 'free pratique' Directions to Masters to cooperate with authorities	Directions	World Health Organisation (WHO)
Outbreak of COVID-19 on board ship	Directions on the management of an outbreak on board ship	Directions	WHO
Protection against COVID-19	Accurate advice on when and how to wear medical masks to protect against coronavirus	Advice	WHO
INTERTANKO Covid-19 ('Coronavirus') Clause – Time charterparties	A model clause for inserting into a time charter party agreement	Legal Advice	INTERTANKO
Best practice precautions for carrying out the pre-transfer conference during the COVID 19 Pandemic	Ship-shore safety checklist for completion by both tanker and terminal personnel including a range of precautions to safeguard against COVID-19 infections	Directions	OCIMF
10 Commandments of Sleep	A short video on getting good sleep aimed at shift workers	Directions on good sleep hygiene	The Sleep Council

Informative Interventions

International bodies, trade associations, unions and charities are all doing the best they can to support seafarers through this crisis with information, instructions, and helplines where experts can be contacted to provide advice with a range of issues.

Additionally, charitable bodies have developed a range of resources over recent years to inform and guide companies and on board management teams on how to promote wellness and deal with mental health issues should they arise. These resources provide useful advice that is as relevant to the current crisis as it is to 'normal' operations.

Informative:
Resources that seek to impart new knowledge or information

Title	Description	Support	Source
Information note on maritime labor issues and Coronavirus (COVID-19)	Information about seafarers' labour rights during the current pandemic. Emphasises seafarers' Rights –Downloadable document	Information	ILO
Fatigue Guidelines	Information about mitigating fatigue risk on board ship contained in MSC.1/Circ.1598	Information	IMO
Crew changes and the ship-shore interface	Guidance on protection of the health of seafarers during port entry. Instructions and information on what to do when entering port	Information	International Chamber of Shipping
World map of COVID-19 Port Restrictions	Live map of ports placing restrictions on port entry. Up-to-date information on ports where seafarer exchanges may be possible.	Information	Wilhelmsen Ship Services
Worldwide Lawyers Directory	Telephone numbers and addresses of lawyers who provide free specialist advice to members in the event of an incident	Advocacy	Nautilus International
Nautilus Coronavirus FAQs	Webpage with answers to Frequently Asked Questions regarding Coronavirus and Seafarers Employment Agreements	Advocacy	Nautilus International
World map of ports with ITF representatives	Interactive map with helpful information about travel restrictions and contact details of ITF representatives in ports around the world	Advocacy	International Transport Federation (ITF)
Mental Health First Aid	Website detailing web-based mental health first aid training courses available for shore-based staff	Training	Illuminate
Wellness at Sea	A coaching programme that seeks to enable seafarers to improve their on board health and well-being by exploring five different aspects of wellness and the impact that they can have on the safe running of a ship	e-Learning	Sailors' Society

Title	Description	Support	Source
Mental Health First Aid "ALGEE" Action Steps	Gard P&I club online article	Briefly outlines the "ALGEE" action steps for rendering mental health first aid. A: Approach, Assess and Assist the person with any crisis L: Listen and communicate non-judgementally G: Give support and Information E: Encourage the person to get appropriate professional help E: Encourage other supports	GARD
Six ways to improve your sleep at sea	A web article offered by the Marine Society on actions that people can take to improve their sleep quality at sea	Guidance on good sleep habits	The Marine Society

Confronting Interventions

In stressful situations, particularly those that appear inescapable, people can very easily become trapped into a cycle of thinking that spirals downwards into a well of despair. Resources that challenge unhelpful thought processes and encourage people into more constructive thought patterns are presented in the next table.

Confronting: Resources that challenge, give direct feedback; challenge the restrictive attitudes, beliefs, behaviour of the other			
Subject	**Description**	**Support**	**Source**
Digital Technology and Seafarers' Mental Wellbeing	A report on the pros and cons of digital technology on board ship by Drs Olivia Swift and Rikke Jensen of Royal Holloway, University of London	Unbiased information about digital technology on board that challenges some of the assumptions regarding its benefits and ill effects	ISWAN
Seafarers Coronavirus FAQs	Downloadable pdf containing seafarers' FAQs and responses in regards Coronavirus	Information / instructions promoting constructive thoughts and behaviours in response to Coronavirus	ISWAN
Mindfulness-based Stress Reduction Online	Web-based course in how to retrain our minds to deal with stress, anxiety and uncertainty	8 week web-based learning for shore-based people	The Mindfulness Project
COVID-19 Resource Page	Downloadable pdf short guides to managing anxieties around COVID-19, from Hunterlink – a provider of Employee Assistance Programmes	Guidance on dealing with anxiety and help to change mindset and thinking	Hunterlink

Cathartic Interventions

Cathartic interventions are a collection of actions and services that can be offered to enable the person who is distressed to release emotional tensions. These are usually face-to-face, but can be accessed via the telephone or internet in real-time or asynchronously via email.

Cathartic: Interventions that are designed to release emotional tensions and help people get painful emotions out of their system			
Title	**Description**	**Support**	**Source**
Wellness at Sea	For subscriber shipping companies, online training with coaching, a telephone helpline, the Wellness at Sea app and peer-to-peer support	One-to one, and group counselling sessions facilitated by a Sailors' Society counsellor via internet	Sailors' Society
SeafarerHelp	Free, confidential, multilingual helpline for seafarers and their families available 24 hours a day, 365 days per year dial +44 20 7323 2737 email help@seafarerhelp.org	Talking / Listening service	ISWAN
National Suicide Prevention Lifeline	The Lifeline provides 24/7, free and confidential support for people in distress, prevention and crisis resources Based in America	Talking / Listening service	National Suicide Prevention Lifeline
National Hopeline Network: IMAlive:	Crisis intervention chat line for people contemplating suicide or others worried about someone's intentions Based in America	Online Chat Talking / Listening service	IMALive
Nautilus 24/7 Helpline	Help for members in emergencies via SMS, Skype or Online Chat	Crisis support	Nautilus International
Seafarers Assistance and Information Line (SAIL)	Help for UK seafarers in financial hardship via email, Skype or phone	Financial crisis support for UK seafarers	SAIL
Global Mental Health Resources Guide 2018	A pdf document produced by The American Club and available on the Safety4Sea web pages, listing all the crisis helplines around the globe available to seafarers and their families	Emotional support Crisis support	Safe4Sea

Catalytic Interventions

As the name suggest, these interventions act as catalysts for individuals to change their situation for themselves. Primarily, these resources are provided by seafarers' charities, but there are also resources available around the globe from health services and other charities that are concerned with mental health.

Catalytic: Resources that enable the other person to learn and develop by self-direction and self-discovery			
Subject	**Description**	**Support**	**Source**
Seafarers mental health and well-being	Online video on how to maintain good mental health	Training / Instructions Self-help	ISWAN
Coronavirus – how to beat it	Online video with instructions on how to prevent COVID-19 infections	Training / Instructions	Seagull Maritime and Videotel
Good mental health guides • Steps to Positive Mental Health • Psychological Wellbeing at Sea • Managing Stress and Sleeping Well at Sea	Information guides on how to promote good mental health including infographics and audio relaxation soundtracks	Self-help guides to prevent sleepiness, fatigue and stress	ISWAN
Managing your mental health during the COVID-19 Pandemic	Online Video containing information and guidance from clinical psychologist Dr Kate Thompson	Emotional support Self-help guidance	ISWAN
Mental Health Self-help Leaflets	A series of 29 downloadable self-help leaflets covering a range of subjects from Abuse, through Eating Disorders to Sleep Problems and Stress	Targeted self-help on a range of mental health issues	UK National Health Service
Preventing social isolation	A series of articles from Sea Health & Welfare, Denmark containing suggestions and advice for reducing social isolation on board	Ideas to prevent social isolation	Sea Health & Welfare
Preventing Conflict	An article from Sea Health & Welfare on how managers can keep conflict from escalating beyond disagreements	Ideas and advice to prevent conflict escalating	Sea Health & Welfare

Supportive Interventions

Support can come in many forms, from companies writing to their seafarers and their families to express their gratitude for the continued service during the COVID-19 crisis, to the setting up of Facebook pages and Twitter campaigns. These interventions communicate to those who might be having a difficult time that they are not alone and the work that they do is valued.

Supportive:
Resources, campaigns, support groups that affirm the worth and value of the other person

Subject	Description	Support	Source
Coronavirus advice and support • Podcasts • Facebook support community • Top Tips • Travel Advice	Webpage listing resources that seafarers can access; including podcasts downloadable tips and links to Facebook pages	Emotional support Self-help advice	Sailors' Society
Sailors' Society Find a Chaplain	Webpage providing contact details of Chaplains available for support via telephone and email	Emotional and spiritual support for all	Sailors' Society
Mission to Seafarers	The Mission to Seafarers' offers an email response to seafarers and their families who need help during the COVID-19	A contact email that is monitored by the Mission's chaplains: crewhelp@mtsmail.org	Mission to Seafarers
#Isupplytheworld	International Maritime Employers' Council Twitter campaign to raise awareness of seafarers' key role in keeping supply chains open	Championing seafarers Moral support	IMEC

Summary

There is a vast array of resources available to seafarers, whether designed to be proactive and prevent problems from occurring, to those containing advice on how to deal with situations as they arise, to reactive measures that help people to deal with their own and other's reactions to the circumstances that they find themselves in.

The above compendium is far from exhaustive and is offered to give an indication of the many ways in which people can be helped, or help themselves, to manage their way through the COVID-19 pandemic. They have been chosen because they offer affirmations that endorse people's worth and capability to see their way through the crisis and can countermand the job demands associated with seafarers' work and exposure to physical and mental health challenges. No doubt more resources will continue to be made available as the pandemic unfolds and likely will be added to those outlets identified above.

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The above article was published in April 2020 on the *CHIRP* Maritime website, and widely promulgated by other organisations including Lloyds Register Foundation and Seafarers UK.

Article 3

Insight – **Trapped by COVID-19 – Highlighting the plight of seafarers on board vessels**

Introduction

The current COVID-19 pandemic has affected the shipping industry in many ways. Operations that usually occur as part of the standard routine of a ship are being severely disrupted, delayed or even cancelled. Examples include the delay in loading or unloading cargo, granting of permission for a ship to dock in port and, of course, crew changes. Many shipping organisations, not least the International Maritime Organization, have highlighted the importance of maintaining and facilitating the uninterrupted flow of maritime trade. The transportation of essential safety, food and medical supplies has rightly been cited as a clear reason to ensure that maritime trade continues without being disrupted.

What is less frequently highlighted is the plight of the seafarer on board. *CHIRP* Maritime has recently published two Insight articles concerning the medical and psychological impact on seafarers resulting from the COVID-19 pandemic. The Insights may be found on our website publications page, entitled COVID-19 General Medical Advice, and Focus on Seafarer Wellbeing during the COVID-19 Pandemic.

Added to this is the fact that, with many countries now enforcing a lockdown, seafarers are unable to be repatriated – meaning there are hundreds of thousands of seafarers around the globe who are now effectively "trapped on board". Some of these have completed their contractual tours of duty, which can be up to nine months long. The concern is beginning to be recognised in some quarters, but what is actually being done, and is it enough?

> This is a global crisis, and seafarers should not be excluded from the international response

CHIRP Maritime believes that more could and should be done, and in line with major global maritime organisations we seek to ask questions of our industry to highlight these concerns. The problem of seafarer repatriation can lead to serious medical and psychological issues which need to be recognised and addressed. We all know this is a global crisis and seafarers should not be excluded from the international response.

This Insight article seeks to further explore the difficulties that mariners are encountering during these extraordinary times. It suggests topics that shipping companies might consider in order to mitigate seafarers' concerns, in particular contact with their families back home.

Background

In a recent open letter to United Nations agencies, the International Chamber of Shipping (ICS) and the International Transport Workers' Federation (ITF) wrote,

"*Every month, around 100,000 seafarers need to be changed over from the ships which they operate in order*

to comply with relevant international maritime regulations governing safe working hours and crew welfare, so that they can continue to transport global trade safely."

They went on to request that professional seafarers, whatever their nationality, be considered as key workers and therefore be "*treated with pragmatism and understanding when seeking to travel to and from their ships*".

These issues were also highlighted in a statement from the Special Tripartite Committee of the Maritime Labour Convention 2006, as amended (MLC). The MLC clearly states that seafarers have the right to be repatriated at no cost to themselves, and also states a default period of a maximum service of 11 months. In addition the International Labour Organization has issued an Information note on maritime labour issues and coronavirus (COVID-19).

Issues

Notwithstanding the admirable actions of the governmental and shipping organisations highlighted above, it is apparent that with very few exceptions crew changes are not being carried out – those that are require intricate planning and often complex logistical solutions. Some of the issues being discussed include:

- the availability, or not, of air travel from the seafarer's home country to the port,
- entry restrictions to the country concerned,
- the possible need for quarantine on arrival (by air or by ship) in that country before joining a vessel or prior to being repatriated, and
- local travel restrictions that may hamper reaching the necessary port from the airport.

As an example of problems being experienced, Filipino crew arriving back in Manila are unable to leave the city to reach home on another island due to the current restrictions on movement within the metropolitan area of Manila. Equally, some other countries have forbidden any persons to enter, including their own citizens. Therefore, seafarers are often unable to enter their own country, leaving them stranded at the port of disembarkation or en-route. With travel advice and restrictions changing rapidly, it can be difficult to predict if and where issues will arise.

For seafarers trying to join ships this is a very difficult period. The need for prolonged journey times, possibly up to two weeks in quarantine before they can join a ship, and the continued uncertainty that they will get on board even after all of that, can lead to anxiety and stress. On the other hand, we know that many of the world's seafarers are not only the principal money earner for their immediate family but often the extended family as well. Not being able to go to sea as planned can cause all sorts of issues, particularly financial, and not every country has a social security mechanism that can assist.

For seafarers on board a ship approaching the end of their contract it is also an uncertain time. There are daily reports in the international press of ships denied permission to dock and even if they can come alongside, crew may not be able to disembark. Sometimes such permission is denied at the last moment leading to more uncertainty. If they can disembark and head home, they may also face travel restrictions and disruption as above, quite possibly leading to them spending long periods in an unfamiliar place, with no support network and restricted access to family and friends.

If a crew change is not possible due to any combination of the issues discussed, crew must stay on board and extend their contract. They may already have been at sea for many months and an extension can lead to all sorts of problems such as:

- Expiry of STCW certificates – many flag states have now arranged for certificates to be extended for a variable length of time and port state inspectors are understood to be adopting a pragmatic approach in this respect.
- Expiry of medical certificates - again most flag states have arranged for certificates to be extended. However, for seafarers on time-limited certificates, for example in order to receive scheduled tests for a known medical condition, this may mean that they cannot access planned medical care and may be at an increased risk of a medical event related to their underlying medical condition.
- Extension of period of service beyond 11 months. Whilst this may be necessary in extreme cases due to the reasons outlined above, if a good opportunity to change crew was not utilised, then this should be questioned by the appropriate authorities.
- Fatigue among seafarers may be associated with a decrease in efficiency, potential lack of concentration, and consequently an increased risk of accidents
- Demoralized crew who refuse to extend their contracts, but still have to stay on board because they are not able to disembark anywhere. There are examples of crew who are so actively opposed to being on board that their opposition destabilizes the general well-being of other crew members.
- Psychological issues such as anxiety, depression, lack of motivation and potential to harm themselves or others.
- Running out of regular medication, which is very difficult to obtain given the restrictions of access to shoreside services.
- Difficulty in accessing shoreside medical care for any medical issue, due to the restrictions described. Suddenly, treatment of a toothache or investigation and treatment of chest or abdominal pain become logistically challenging and seafarers may not be able to access shoreside facilities for optimal care. Medevac options are limited, and crew may need to be managed on board rather than being transferred ashore.
- Increasing concern amongst crew on board for family and friends at home, and the strong desire to be with them in these strange times.

It should be noted that if a ship has been at sea with no contact with others for 14 days or more and all on board are well, it is highly unlikely that anybody on board will develop COVID-19. Crew joining the ship may introduce the virus and this uncertainty can cause stress and anxiety amongst the crew.

Ensuring the health and wellbeing of mariners

CHIRP Maritime accepts that whilst many countries and ports remain in a lock down situation, the above issues will remain unresolved until such time as restrictions are lifted. Nevertheless, this does not mean that the mariner should be neglected. Some companies have suspended all crew changes until such time as travel restrictions are lifted, and it is fair to say that some unscrupulous shipping operators will quite simply wash their hands of the whole affair and take little interest in the health and wellbeing of the mariners on board their vessels, *CHIRP* Maritime does not believe that the more responsible companies are taking

that view but what, in fact, is being done to assist seafarers in this respect?

There are plenty of areas where companies might consider the wellbeing, health and safety of crews which are currently "trapped on board". These include, but are not limited to:

- Regular updates from the company with information about the current status of the pandemic particularly focused on information from the seafarers' home countries,
- Access for seafarers to make regular contact with their families by telephone, social media, or perhaps company email if a specific crew mail system is not installed on board,
- Similar information and assistance from manning agencies should be the norm and not the exception
- Shore leave in many ports is currently banned or severely restricted. Thus, if the vessel does not have a slop chest, companies could instruct their masters to see which crew members need essential toiletries and perhaps medication, then instruct the vessels agents to order and supply,
- Where seafarers have an urgent financial requirement then this should be treated in a pragmatic, compassionate, and urgent manner by shipping companies,
- Perhaps a financial incentive such as an additional bonus and/or increased leave,
- A reduction in hours worked to allow for more relaxation, and
- A guarantee of future employment on completion of leave would give the seafarer some reassurance.

In addition, *CHIRP* has recently become aware of a European Commission initiative which will designate "fast track" ports in order to alleviate the crew change issues brought about by travel restrictions during the coronavirus epidemic. Member states are being requested to create a network of ports to facilitate and expedite crew changes and the Commission has issued guidelines related to health, repatriation and travel. Further information may be found here (https://www.imarest.org/themarineprofessional/item/5536-european-commission-moves-to-designate-fast-track-crew-ports).

This initiative, and others where countries, e.g. Singapore, are reportedly starting to permit crew changes, albeit with restrictions imposed, are to be applauded and *CHIRP* trusts that they will rapidly bear fruit.

Mariners – staying safe to ensure that essential trade is maintained (Photo courtesy of Grieg Star Shipping – acknowledged with thanks)

Summary

In summary, these are difficult times. Both the health and wellbeing of crew currently on board, and well-planned crew changes are essential to the safe and efficient running of the ship. Where operators are planning to change crew, a full risk assessment must be carried out. This includes but is not limited to:

- International travel restrictions
- Restrictions to entering certain countries and gaining the appropriate visa to do so
- The potential need for quarantine on arrival in a country
- Issues affecting travel in a country, obtaining hotel rooms etc.
- The length of time crews have been on board, their experience and skill set and how effective they are as they approach the end of their contract
- Any medical or psychological issues of crew on board that necessitate them leaving the ship as planned

With respect to the wellbeing of crews who are understandably concerned about their families back home, shipping companies should adopt a pragmatic approach, and assist all mariners as far as they are able to do so.

The current global crisis is a people issue – our people. In the meantime, it is essential that we all work together to ensure that seafarers are not neglected or forgotten about, and that they are treated as key workers. Everything possible should be done to ensure the health and wellbeing of seafarers currently on board and, when possible, to facilitate necessary changes of crew to keep the world's supply lines open. There is after all an H in HSE. The vital aspects of medical, psychological and general seafarer wellbeing require the attention of all parties at this critical time.

The current global crisis is a people issue – our people. It is essential that we all work together to ensure that the health and wellbeing of seafarers on board is maintained

The above article was published in April 2020 on the *CHIRP* Maritime website, and widely promulgated by other organisations including Lloyds Register Foundation and Seafarers UK.

Article 4

Insight – **COVID-19 – General advice to masters and crew**

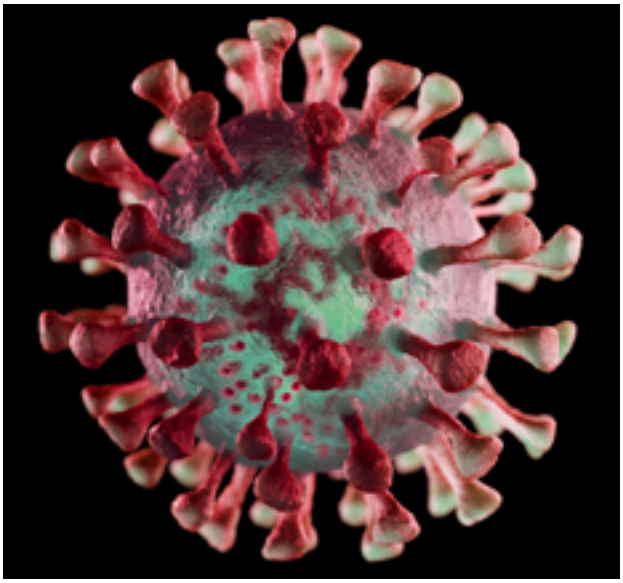
This paper was prepared in April 2020 for *CHIRP* Maritime by Dr. Suzanne Stannard, Consultant, Norwegian Centre of Maritime and Diving Medicine and member of the CHIRP Maritime Advisory Board.

COVID-19 is an infectious disease caused by a newly discovered coronavirus.

Most people infected with the virus will experience only mild or moderate symptoms of a respiratory illness and recover with no specific treatment. However, the disease

can be more serious and patients may require hospital admission and advanced medical care.

At the time of writing over 1.1 million people have been infected worldwide and the maritime industry has already been affected with confirmed or suspected cases on both passenger vessels and merchant ships. The best way to prevent and slow down transmission is to be well informed about the COVID-19 virus, the disease it causes, and how it spreads (source: https://www.who.int/ health-topics/ coronavirus#tab=tab_1. Accessed April 5th 2020).



A 3D rendering of the nCov novel coronavirus responsible for COVID-19.

Sources of information.

The Norwegian Centre for Maritime and Diving Medicine has developed an online, interactive tool to assist in the management of possible COVID-19 cases on board. This is freely available to all and can be found at www.covid19atsea.no

There are many sources of information about COVID-19 and we would suggest the following sites:

- World Health Organisation (WHO) https://www.who.int/emergencies/diseases/novel-coronavirus-2019
- International Maritime Organisation http://www.imo.org/en/MediaCentre/HotTopics/Pages/Coronavirus.aspx

These sites reference other sources of information from, for example, the International Chamber of Shipping, International Maritime Health Authority and the International Labour Organisation. The following summarises the main points from the information available at these and other websites.

In addition, Seagull Maritime and Videotel have launched a new programme called: “Coronavirus- How to Beat it.” This is available free to the maritime industry. It outlines the common symptoms that seafarers need to be aware of and details the key precautions that individuals on board can take to minimise the spread of this highly contagious virus. You can see the video here: https://vimeo.com/398986642

Preventing the spread of COVID-19

There is currently no vaccine or known effective treatment against COVID-19. It is spread in the same way as a cold and flu illness and can be spread from the airways of an affected person in three ways:

- As droplets in the air from an infected cough or sneeze that then come into contact with the mucosa membranes in the eye, nose or mouth of other people close to the infected person.
- Through direct contact, for example, when the patient touches another person with virus on their hands.
- Through indirect contact when the virus is transferred by coughing/sneezing/touch of an infected person onto an object that is then touched by another person.

To prevent the spread of infection, avoid coughing or sneezing on others. Try to cough or sneeze into

a paper towel that is thrown away immediately or, if this is not possible, cough or sneeze into a bent elbow. Avoid close contact, (1–2 meters if possible), with anyone showing symptoms of respiratory illness and wash your hands regularly and thoroughly.

Proper hand washing by sick and healthy people is important to prevent transfer of the virus.

Wash your hands often and thoroughly with soap and hot water, especially after contact with others. Using appropriate hand sanitiser is a good alternative if hand washing is not possible. If your hands are dirty or wet, hand gels are less effective, and hand washing is preferred.

When to seek help on board

People on board who develop signs of respiratory disease, should contact the medical officer. Signs of respiratory infection include coughing, fever, sore throat, chest pain and difficulties breathing.

If required, the medical officer can seek assistance from Telemedical Assistance Services (TMAS).

Management of suspected coronavirus illness on board

- The patient should be isolated in the sickbay, or in their own cabin. They should wear a medical facemask when in contact with other people.
- The patient’s condition should be assessed regularly either in person or by telephone.
- If there is any deterioration in the patient’s condition, TMAS services should be contacted.
- Contact with the patient should be limited to one or two other crew members. Anybody in contact with the patient should use Personal Protective Equipment (PPE), such as facemask, apron or gown, gloves and goggles, when entering the patient’s cabin. Make sure to follow advice on hand washing and wash hands immediately after leaving the patient’s cabin.
- Initiate routines for the disinfection of surfaces that many people may touch, for example, mess areas, door handles, railings, toilet flush buttons, telephones, navigation panels etc.
- Laundry, eating utensils and garbage from the cabin of an isolated person must be treated as contaminated by the virus. Use gloves when handling these items and cover them when in transit to the washing machine/ dishwasher/appropriate bin.

When going into port

- The Maritime Health Declaration must be completed and submitted according to usual procedures before entering a port.
- If illness due to COVID-19 is suspected on board, the port authorities must be informed and asked for

instructions regarding the management of the patient. Guidance on how to manage contacts and other persons on board should also be requested.

Crew changes

- When planning a change of crew, careful consideration of local and international travel advice is essential. Travel advice from the WHO is available here: Travel advice (WHO) – Travel advice (WHO) – https://www.who.int/emergencies/diseases/novel-coronavirus-2019/travel-advice
- Any planned crew change should be considered on an individual basis and subject to a thorough risk assessment by the ship and ship owner.
- Port authorities should be contacted regarding local regulations.

The above article was published in April 2020 on the *CHIRP* Maritime website, and widely promulgated by other organisations including Lloyds Register Foundation and Seafarers UK.

The best way to prevent and slow down transmission is to be well informed about the COVID-19 virus, the disease it causes, and how it spreads.

Section two

Human factors

With increasing numbers of women at sea, it is important that ships provide a suitable environment for them to flourish. One aspect we investigated during 2020 was the suitability of personal protective equipment (PPE) for female mariners, and our findings were alarming. We discovered that there are numerous examples where PPE is unsuitable, or where the sizes provided do not fit female crew members. This is a serious failing and one which is likely to become more significant over time. We therefore urge all our readers to study the first report in this section. Needless to say, if you discover any other areas where the equipment is not suitable for female mariners or anyone else on board, please let us know.

We also include two reports about communication. The first describes a case where a new chief engineer changed some valve settings without informing the engine room team – a situation which might have led to a serious accident. In the second report, we learn from a pilot of three examples of poor communication during a single pilotage operation. They all stemmed from the master and crew having a very limited command of the English language, which is very dangerous since the international language of the sea is still English.

Our final report is another example of people working aloft without considering all the risks. We remind all our readers that the most common accidents at sea are still slips, trips and falls!

This section concludes with two excellent Insight articles. The first describes the latest thinking on seafarers' mental health and wellbeing, and we are grateful to the Maritime and Coastguard Agency for their leadership on the topic. The second is about how we can think of accidents and near-misses as 'learning opportunities' and use them to achieve cost savings. This is an intriguing prospect, and we urge you all to study the article and consider adopting it in your own organisations.

Article 5

Unsuitable PPE for female seafarers

Outline: *CHIRP* was invited to comment upon ill-fitting PPE for female seafarers and initiated a survey to determine the extent of the issue.

What the reporter told us:

In an effort to encourage females to take up a career in the maritime sector, certain administrations have prepared a number of articles giving practical guidance. One such article related to female-friendly PPE which among other things points out that asking female seafarers to wear over-sized PPE isn't safe, and that simply giving them a small man's size doesn't do the job. For example, goggles designed for the male face, which is typically larger and broader than a woman's, would not fit a female face as closely, leaving gaps with greater potential for foreign bodies to enter and cause injury.

Further Dialogue:

The *CHIRP* Maritime staff were initially unaware that a problem existed. However, the question having been asked, *CHIRP* investigated further and initiated a very small-scale basic survey with the assistance of a female seafarer to promulgate our questions to other female seafarers.

The response was rapid and enthusiastic, and the results showed overwhelmingly that there appears to be an issue with women's PPE and also with regard to fireman's outfits and LSA equipment.

The original findings were written into an article which was posted on the *CHIRP* website. https://www.chirpmaritime.org/wp-content/uploads/2019/11/20191119-PPE-for-female-mariners-Fit-for-Purpose-1.pdf. It also appeared in our Annual Digest 2019.

There are manufacturers who supply female-specific personal protective equipment – all BS, EN, and ISO compliant as applicable (although they may lack company logos on helmets and boiler suits). Nevertheless, the correct equipment is available on the market. The challenge is to increase awareness in order that it will become readily available on board merchant vessels.

CHIRP Comment:

- While there may be a limited requirement on any single commercial vessel there is clearly a requirement for all mariners to have appropriate personal protective equipment
- It is not a gender issue - the regulations give a minimum requirement irrespective of gender
- Regulations state that PPE must be suitable and **must fit**
- Shipping companies have a duty of care
- The ships safety committee should be consulted on PPE and should be the conduit to the company
- There is a direct correlation between safety culture and the provision made by the company

Following on from the original article, Solent University contacted *CHIRP* to advise us about a new research programme that is being undertaken into the issue of PPE for seafarers – which encompasses all seafarers, male and female. Solent University has requested *CHIRP*'s assistance to promulgate the research programme and the associated questionnaire to the wider seafaring community and on completion of the research to further promulgate the findings to seafarers who may not normally be aware of or read academic research.

The following paragraphs highlight the reasons and need for the research and *CHIRP* would encourage as many readers as possible to participate.

The Seafarers' Personal Protective Equipment project explores seafarers' experiences of using personal protective equipment (PPE) on board. PPE is vital in reducing the risk of workers experiencing injuries, yet we know anecdotally and from our own experience that PPE at sea is not always fit for purpose. For some workers, boiler suits can be much too large, causing a safety hazard in itself, for others safety boots are ill fitting resulting in painful blisters and cuts. We know that when PPE is not comfortable or practical to wear, workers are less likely to use it. So, finding out about seafarers' day-to-day experiences of using PPE is really important.

We need you to help by taking the Seafarers PPE questionnaire. Your individual results will contribute to important research, helping researchers at Solent University understand the issues seafarers are currently facing in regard to PPE. The more seafarers who complete the questionnaire, the more we can learn about the PPE provided to those working at sea today, and the difficulties seafarers are experiencing and how these could be addressed to improve working conditions for seafarers in the future.

Please get involved, go online, visit the Solent University website and complete the questionnaire.

The website is:
https://www.solent.ac.uk/research-innovation-enterprise/rie-at-solent/projects-and-awards/seafarers-ppe-project.
Alternatively go straight to the questionnaire at:
https://solent.onlinesurveys.ac.uk/ppe

The above article was published in MFB 58

Article 6

Communication is essential

Outline: *CHIRP* received the following report from a vessel's captain

What the reporter told us:

At the end of a long river pilotage, the ship was about a mile from the berth and proceeding upstream at slow ahead whilst awaiting tugs. The pilot ordered 'half astern', but the engine failed to kick astern. After waiting a few seconds, the telegraph was moved to 'stop'. The air pressure in the starting air cylinders decreased to 12bar. After waiting a few seconds, a further attempt was made, but again the engine failed to start. The pressure in the starting air cylinders dropped to 7bar. Attempts to call the engine control room were unsuccessful, as nobody answered the telephone. After a further short period, the pressure in the air start cylinders was seen to increase to 22bar, the telegraph was moved to 'half astern' and the main engine responded and started to run astern. After this, there were no further issues.

During the subsequent onboard investigation, it was discovered that the new chief engineer had closed the

valve between the two start air cylinders but had not told anyone about his action. According to his explanation, he wanted to have one start air cylinder full and ready for use.

Further dialogue:

CHIRP suggested that a chief engineer on a vessel is at liberty to run the engine room in whatever configuration he believes to be the best and safest, assuming the setup is not contrary to any statutory regulations, SMS requirements or pre-existing standing orders. However, in changing an existing arrangement, it is the chief engineer's responsibility to ensure that all members of the engine room team are made aware of the change. *CHIRP* would suggest a written instruction for all engineers to sign, acknowledging the change, should be standard practice. Sadly, on this occasion, that did not happen.

Another worrying aspect of this report is the fact that the engine control station was left unattended during manoeuvring / pilotage operations. Yes, there was an issue in the engine room which needed to be addressed, but good practice would suggest that someone should have remained at the control station if only to answer the telephone. If the engine room were short-handed, a call to advise the bridge that the control station would be unmanned for a few minutes would be preferable to leaving the bridge team guessing.

CHIRP comment:

For clarity, the isolation of engine room starting air receivers should not be encouraged as this potentially minimises the 'consecutive' starts of the main engine and may prevent compliance with the IACS rules which state the following:

M61.1.5: The total capacity of air receivers is to be sufficient to provide, without their being replenished, not less than 12 consecutive starts alternating between Ahead and Astern of each main engine of the reversible type, and not less than six starts of each main non-reversible type engine connected to a controllable pitch propeller or other device enabling the start without opposite torque. The number of starts refers to engine in cold and ready to start conditions. There must be at least two starting air receivers, the total capacity of which will give 12 consecutive starts for a reversing engine or 6 consecutive starts for a non-reversing engine with CPP.

Further to the communication issue, the chief engineer and engine room duty staff must keep in very close contact with the captain and the bridge team – especially when manoeuvring or during pilotage. Sadly, ship operators / owners will often invest in Bridge Team Management training but not Engine Room Team training.

The above article was published in MFB 59

Article 7

Communication and language barriers

Outline: Without effective communication safety is compromised.

What the reporter told us

I would like to report three issues I encountered on what should have been a routine pilotage operation, that effectively resulted in a complete lack of effective BRM and communication.

The initial area of concern was that communication with the bridge team was particularly difficult due to the almost complete lack of spoken English. We resorted to a well-known online translation app on a couple of occasions. The crew were willing enough but unable to communicate.

Secondly, the pilot card lacked some basic information. Neither the direction of rotation of the propeller, the astern power, nor the number of consecutive starts of the main engine were mentioned on the card. Given the language problems, I never received this information.

Finally, upon approaching the berth, the master was unable to start the bow thruster and despite repeated attempts, the bow thruster was unable to be used for the whole berthing operation. The master did not communicate this fact to me until pressed to do so. The translation app came to the rescue again, and it is believed that the problem lay with an auxiliary engine.

Two days previously the starboard windlass brake had failed to operate correctly when the vessel arrived at the inner anchorage.

CHIRP comment

SOLAS V - Regulation 14 states among other things that "*English shall be used on the bridge as the working language for bridge-to-bridge and bridge-to-shore safety communications as well as* ***for communications on board between the pilot and bridge watchkeeping personnel****, unless those directly involved in the communication speak a common language other than English. The IMO Standard Marine Communications Phrases (SMCP) Resolution a.918(22), may be used in this respect*".

The use of an online translation app had two downsides (although it is completely understood why it was used). First, the pilot was potentially distracted from the job he was doing. Second, generic online translation apps, as good as they are, may not effectively be able to translate marine technical terms, particularly to and from languages that do not share a common alphabet.

In this case almost all the human element factors of the Deadly Dozen, as highlighted in Merchant Shipping Guidance Notice MGN 520 come into play; training, communications, local practices, and culture are particularly relevant. The vessel's managers have a responsibility to ensure that crews employed on vessels engaged on international voyages have acceptable standards of English. Not only is it a safety-critical issue, but a SOLAS requirement.

CHIRP did attempt to contact the vessel managers regarding this report, but they did not reply.

The issue concerning the non-availability of the bow thruster was never satisfactorily explained, it was possibly an issue with the auxiliary generator, in any event it was not properly declared to the pilot.

Pilot card information is a flag state and class requirement so to find it missing is a flag state non-compliance issue. The information might have been available on board, but without communications the pilot never knew.

All vessels should be aware that it is entirely within a pilot's authority to turn the vessel around and take it out to anchor if safety-critical communications are not possible.

The above article was published in MFB 60

Article 8

Working aloft

Outline: Nobody ever deliberately sets out to have an accident or to injure themselves, but some people appear to try very hard.

What the reporter told us

Whilst our vessel was alongside, I observed the following on an adjacent vessel. A crew member (or possibly a contractor) was standing on the outside of the back scratcher (ladder cage) of the mainmast ladder. He stretched from this position to change a lamp on the forward end of the mast. He descended the ladder and then returned, on both occasions climbing through the back scratcher. Upon inserting the lamp the light immediately illuminated, suggesting that the power was not switched off. On the first occasion, another crew member was standing at the starboard bridge wing door watching. He did nothing to stop the job and seemed to be taking an observing / standby role.

Further dialogue

After identifying the ISM managers, *CHIRP* emailed the DPA who engaged immediately, allowing *CHIRP* to pass over details of the report. The following day the DPA contacted *CHIRP* with the information that the photographs in the report did indeed show a member of the ship's crew. The DPA said this was very disappointing as the actions shown were completely contrary to the vessel's SMS. Furthermore, earlier in the month the DPA had sent out a fleet-wide safety bulletin emphasising the need to complete risk assessments and permits to work for all hazardous activities.

Working aloft with no safety harness or PPE

CHIRP comment

The prompt response and engagement by the DPA was very encouraging and their obvious disappointment at this incident occurring on a company vessel was clear. However, individuals should not be prepared or willing to engage in such unsafe actions so it would appear that the company's safety message is not always getting through. Even if there are some maverick individuals who continue to work unsafely either through unawareness of the inherent risks, or deliberate disregard of the rules, other crew members have a responsibility to act for the safety of the individual and the whole crew. This responsibility has many names, but a term in general use today is "Stop Work Authority" and it is important that all crewmembers feel that they can use this without any fear of reprisal.

Genuine safety starts at the top and must be embraced by everyone within the company, from senior management ashore to the most junior member of the crew. It requires the company to provide the necessary tools to do the job in the shape of training courses (in house or external) if available, procedures, equipment and PPE and most importantly, the manpower and time to do the task while following the correct procedures. A number of courses for working at heights are available from offshore sector training establishments.

In this case, a proper risk assessment, toolbox talk, and an electrical lockout work permit all appear to have been missed. A perfectly reasonable question to ask is "Why was this, and could it happen on your ship?"

CHIRP has long been a champion of engineering solutions to remove hazards. Whilst a mast-head navigation light will still be at the top of the mast, fitting a platform with guard rails or installing horizontal foot and hand rails around the mast at an appropriate level with securing points for safety harness lanyards, would have made access for a routine task easier and safer.

CHIRP is aware that the 2019 annual report from the Marshall Island Registry has just been published. The report has accidental falls as the top critical issue – accidental falls were the leading cause of death during 2019, with seven lives lost from very serious marine casualties that were reported. In addition, 21% of all serious injuries were associated with accidental falls.

The above article was published in MFB 60

Article 9

MCA Insight **– Improving the mental health of seafarers' worldwide**

Seafarer wellbeing is a hot topic and now is the time for industry to drive forward this issue supported by seafarer charities and the Maritime and Coastguard Agency.

The working conditions, wellbeing and mental health of seafarers has been an ongoing concern which the MCA has been working on for some time, but the pandemic has brought this to the forefront of discussions throughout industry.

The Covid-19 pandemic has had a big impact on the shipping industry and the wellbeing of seafarers. The response of the UK and support given to seafarers has shown why it is a world class flag bearer. The Red Ensign is recognised globally for the maintenance of high standards, maritime safety and the welfare of seafarers.

Besides intrinsic respect for the wellbeing of these essential key workers, why is seafarer welfare so important? Research has overwhelmingly shown that safety and wellbeing are inherently linked. Poor employee wellbeing is often associated with a greater accident and error rate, reduced productivity and increased absenteeism at work. The benefits to organisations of improved staff wellbeing are numerous. Historically seafarers have relied on the essential support of the maritime charities, but long-term strategies to improve seafarers' lives and working environments can help to prevent wellbeing and mental health issues from arising.

Seafarers work in unique environments that can be immensely rewarding and at times challenging. As

understanding of health, wellbeing and safety increases, the industry is becoming increasingly aware that some characteristics inherent to the environment on board (e.g. prolonged periods away from loved ones, noise and vibration) can have a negative effect on the wellbeing of seafarers.

The impact of the Covid-19 pandemic

The Covid-19 pandemic and resulting crew change crisis has brought seafarer welfare issues to the fore. The Mission to Seafarer's quarterly happiness index identified workload, social interaction and shore leave as areas where the pandemic is being felt most by seafarers. The same survey found that seafarers felt trapped, isolated, worried and desperate to return home to their families. A Lloyds Register survey identified workload and fatigue, quality and variety of food, and lack of exercise as areas of particular concern.

The economic impact of the Covid-19 crisis on the fishing industry in particular was devastating, as demand for products ceased, markets shut down and businesses could not operate. Large numbers of fishing vessels were left tied up, with fishers not knowing when they could resume fishing or when their next pay cheque was coming. This undoubtedly led to an increase in anxiety and stress amongst fishers and their families – mental health suffered across the industry.

The events of 2020 have the potential to result in long-term impacts on the mental health and wellbeing of seafarers, which could in turn reduce safety. It is therefore more important than ever to put long-term measures in place.

The welfare of seafarers was of paramount importance to the MCA and its UK Ship Register, who joined forces with the Department for Transport to form a specialist crisis support working group. Exceptional measures were put in place to help people and to keep vital shipping moving.

The goal of this group was to act quickly to ensure the welfare of seafarers and passengers who were on board ships when the pandemic escalated in March. 15,527 crew members from 112 nationalities were on board ships in British waters and needed help to get home.

The UK was the first to designate seafarers as key workers and the first to carry out mass repatriations, facilitated through colleagues at the Department for Transport.

Understanding the relationship between safety and wellbeing

Time and again, we see accidents and near misses as a result of a poor safety culture. A culture in which distraction was tolerated, slips and lapses covered up, work-rest hours fabricated and near misses not reported. A just culture, where individuals feel collectively responsible for maintaining safety and empowered to speak up contributes to seafarer self-esteem, feelings of autonomy and overall safety. A true just culture means a fair place to work and an understanding of how seafarer fatigue, stress and mental health contribute to the culture on board.

The most influential source of a good safety culture is the seriousness with which senior management approaches it via training, staff investment and the implementation of work processes that accommodate the time that safe practices take. Workforce mistakes increase not just because of the absence of this investment, but also because of the meaning people attach to the absence of the investment by their senior management. Investment in people, in training and development, as well as in supporting their wellbeing, similarly sends strong messages to seafarers.

Industry is beginning to take seafarer wellbeing seriously

It is great to see maritime charities and industry increasing welfare services for seafarers and proactively trying to improve wellbeing. Some examples of current initiatives are:

Maritime UK launch mental health network

Maritime UK launched a mental health network in May 2020 as part of the Diversity in Maritime programme. The network identified creating a holistic approach to mental health and a culture of care as important steps in creating a better industry.

Aims of the network:

1. To provide a collaborative platform to share information among all organisations, in support of aiding others to achieve and develop mental health management practices by: engaging, connecting and collaborating with organisations which have developed mental health and suicide prevention strategies for the UK maritime sector; bench-marking current training provisions; and providing bench-marking tools for the maritime sector against mental health standards.
2. To gather and share case studies profiling maritime organisations' best practice guides and policies to assist and improve mental health across the sector including, but not limited to, time to speak and toolkits for bringing crews together on board.
3. To provide individuals and companies in the maritime sector with relevant information about mental health resources, best practice guides and toolkits including, but not limited to, creating a mentally healthy workplace, treating people well and creating a safe space.

The MCA supports this network and attends its meetings, often contributing with vital information in support of the aims of the charity. For example, in December, the MCA will speak about seafarer medical examinations and mental and organisational resilience.

MCA wellbeing guidance

Earlier this year the MCA produced basic guidance to support seafarers and ship owners worldwide in creating better environments for seafarers to live and work in.

'*Wellbeing at Sea: A Guide for Organisations*' and '*Wellbeing at Sea: A Pocket Guide for Seafarers*' address a range of issues that can threaten wellbeing at sea to empower seafarers and management (companies and personnel) to make improvements that will enable all crew to stay safe, healthy and well.

Figure 1 – Wellbeing at sea booklet cover

'*Wellbeing at Sea: A Guide for Organisations*' provides pragmatic advice for organisations on how policy, procedures and company culture can be adapted to improve crew wellbeing. 'Wellbeing at Sea: A Pocket Guide for Seafarers' provides practical personal advice for seafarers to empower them to take care of their own, and be aware of others, wellbeing. These publications are non-mandatory but support mandatory texts such as the Code of Safe Working Practices for Merchant Seafarers.

Mental Health Training Standard

Earlier this year, the Maritime Charities Group, a coalition of 10 major maritime charities, and the Merchant Navy Training Board published a standard, which sets out what should be covered in training courses for seafarers on mental health and wellbeing awareness. Written by experts from the maritime and education sectors, the standard gained widespread endorsement from key stakeholder groups. This was produced in response to the growing number of mental health courses, which are of varied quality and relevance to seafarers.

Measuring wellbeing

In September 2020, Maritime UK launched a Mental Health in Maritime benchmark survey in collaboration with Safer Highways. Along with the Mission to Seafarers Happiness Index, and Lloyds Register's survey on maritime workers' wellbeing during COVID-19, we are starting to get a better picture of mental health at sea. This is an important step in being able to address seafarer issues with an evidence-based approach.

The MCA is working with maritime charities, key stakeholders and researchers to further develop this evidence base and find lasting ways to improve the lives of seafarers, not just through the pandemic but beyond.

What's next

The MCA Human Element and Seafarer Safety team are working on a variety of projects, including the development of a wellbeing application for shipping companies to assess the wellbeing of their workers. Many organisations don't know where to start when it comes to wellbeing, and finding out how staff are doing is a good starting point. The wellbeing tool will take the form of an anonymous survey which seafarers and other personnel will complete. The results will give management insights into areas where wellbeing could be improved, such as communication, environmental factors, fatigue, social factors, company culture and more. Advice and ideas based on the areas of concern will be provided to organisations. The survey can be repeated as changes are made to ensure that wellbeing initiatives have the desired impacts. Meanwhile, seafarers will be provided with tailored information and advice via an app, based on their responses.

At this stage, we are collecting data using an initial iteration of the survey, which will guide us in creating the final tool. Seafarers interested in completing the survey, or organisations that can help to promote this initiative, should contact MCA's Human Element Policy Specialist, Pav Hart-Premkumar (Pav.Hart-Premkumar@mcga.gov.uk)

In addition to the development of this tool, the MCA are actively seeking ways to promote seafarer wellbeing and collaboration with other organisations. We also continue to review our guidance through the lens of the human element.

Whilst the increased discussions around seafarer wellbeing as a result of the Covid-19 pandemic is positive, it is important that we remember that seafarer issues are ongoing. In addition, wellbeing needs to be looked at holistically – every part of seafarers lives and working conditions impact on their long-term mental health and wellbeing. The impacts on productivity and safety should not be underestimated, or forgotten

More information:

Printed and PDF copies of '*Wellbeing at Sea: A Guide for Organisations*' (ISBN 9780115536076) and 'Wellbeing at Sea: A Pocket Guide for Seafarers' (ISBN 9780115537875) are available from tsoshop.co.uk

A Standard for Seafarers' Mental Health Awareness and Wellbeing Training (eBook) is available from https://www.witherbyseamanship.com/a-standard-for-seafarers-mental-health-and-wellbeing-training-ebook.html

Article 10

Insight – **Achieving cost savings from learning opportunities**

This article was prepared in November 2020 for CHIRP Maritime by Captain John Wright, Owner and Director of WrightWay Training Limited, and a member of the CHIRP Maritime Advisory Board.

Introduction

Do your people, for any reason, 'roll the dice' in your organisation and take chances, cut corners, and/or break procedures to get a task completed? In *CHIRP*'s experience, if you ask seafarers today whether they sometimes do this, the answer will be "Yes!" In the analogy of a pair of dice, rolling 'two sixes' is experiencing the accident, damage to equipment, injury, loss, etc. and the more often the dice are rolled, the higher the chances are of rolling a double six! But why are the dice rolled so frequently? We shall look at this.

This Insight article explores why it is so important to the business health of any organization to gather the enormous harvest of 'learning opportunities' or 'learning events' (as we much prefer to call them) commonly called 'near misses' and 'unsafe acts & omissions' (the occasions the dice are rolled). Such events are commonplace and therefore it makes good business sense to calculate their financial costs based on the worst probable outcomes, especially the high potential learning events (a 6 and a 5 on the dice), where, but for luck, the uninsured costs to an organization would have been substantial.

The article also looks at how the industry can capture these important 'learning opportunities', through the use of a workforce-owned process that encourages the personal safety involvement of all. The key to success is achieving an 87% learning event close-out rate **at source**, with this being the measure and control that demonstrates effectiveness in improving **all** aspects of the business.

All seafarers have experienced a "Phew, that was close!" moment – but unless these close calls or 'learning events' are reported to the company, then whilst individually we might have taught ourselves a lesson never to be forgotten, the organisation (and sometimes the entire industry) has learnt nothing. Consequently, the risk of a similar event occurring remains, with perhaps the consequences next time being very expensive indeed, in both financial and human terms. When one only learns from actual accidents, all the potential lessons from near misses are lost.

So, what exactly is a near miss (or learning event)?

IMO defines a near miss in their Circular MSC-MEPC.7 Circ.7: as follows:

"A sequence of events and/or conditions that could have resulted in loss. This loss was prevented only by a fortuitous break in the chain of events and/or conditions. The potential loss could be human injury, environmental damage, or negative business impact (For example, repair or replacement costs, scheduling delays, contract violations, loss of reputation).

CHIRP examples of 'learning events'

Mooring:

Preparing to take a tug's line – signaller is in the correct position, and correctly supervising. Several AB's are taking the line, setting it up on the winch drum, and preparing the stopper. When taking weight on the line, the tug moves forward unexpectedly. Crewmembers are not in a safe area when the line parts, but thankfully nobody is hurt.

Falls from height:

- Spanner falls from an engineer's pocket and drops through several decks of the engine room narrowly missing an oiler on the bottom plates.
- Rusty steps give way on the lower part of a mast ladder, which was being climbed for maintenance - luckily the AB was only a couple of steps up and he suffered no injury.
- Working aloft and somebody starts the radar scanner narrowly missing the person working – no lock out, no communication, no risk assessment, no permit to work, no standby safety man.

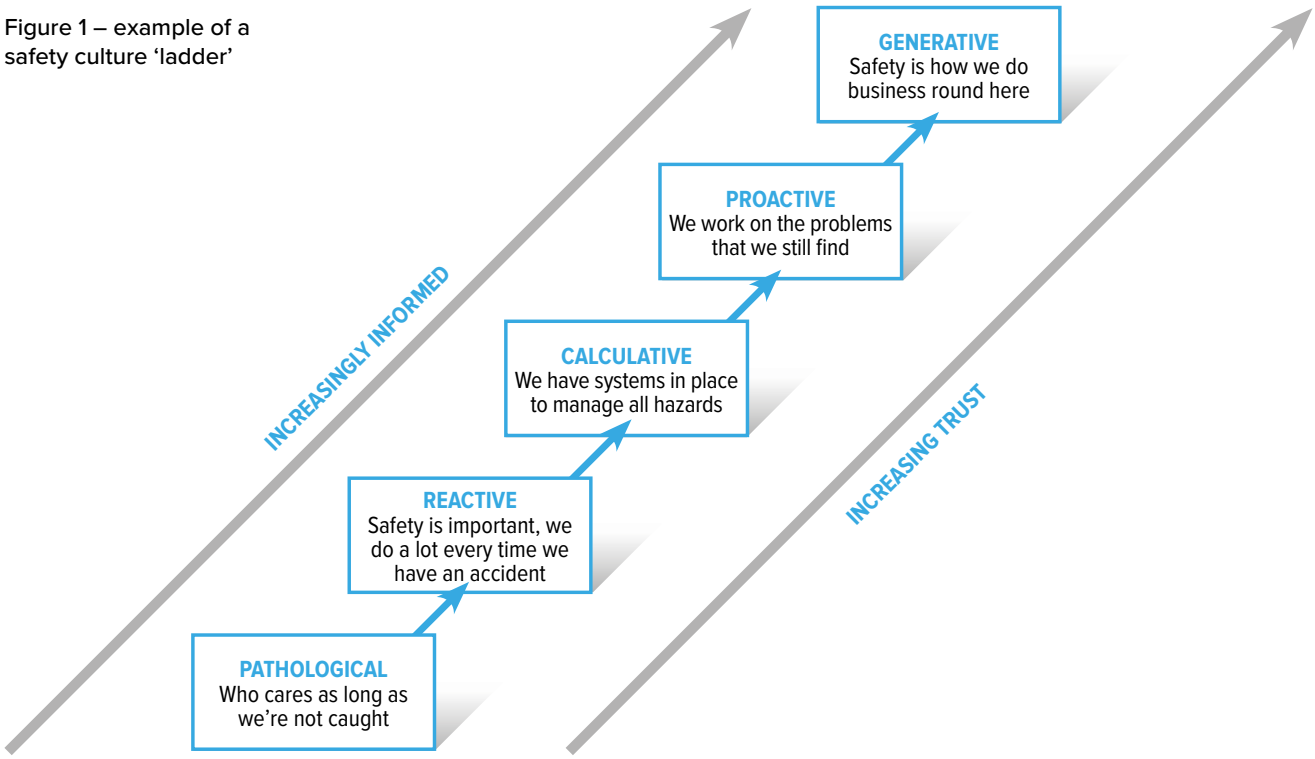
Near Collision:

Stand-on vessel had slow manoeuvring characteristics. The give-way vessel was an offshore service vessel with twelve industrial passengers on board and was passing close ahead. The OOW on the stand-on vessel, decides to increase the ahead passing distance by altering a few degrees to port, just as the give-way vessel decides to go hard to starboard to cross astern of the stand-on vessel. The stand-on vessel's OOW goes hard to starboard to correct his error. A near miss and a very shaken OOW.

Many more examples could be quoted from other on-board tasks - enclosed space entry, failures to electrically isolate and lock out numerous systems, using non-compliant pilot ladders, etc.

All of these examples are 'Learning Events' stemming from the 'dice being rolled' and all worst probable outcomes (6 & 6 on the dice), would have had a significant, or even catastrophic financial, as well as human, cost. *CHIRP* has received hundreds of similar incidents, which themselves are but the tip of the iceberg. Individuals may have learnt lessons but in the cases where the company is not informed, then where is the learning and what prevents it happening again with a very different outcome? Indeed, where is the certainty that even if an event is reported, that the corrective actions, which fit within a Just Culture, are carried out?

Figure 1 – example of a safety culture 'ladder'



A Just culture may be defined as "*A concept related to systems thinking which emphasizes that mistakes are generally a product of faulty organizational cultures, rather than solely brought about by the person or persons directly involved. In a just culture, after an incident, the question asked is, "What went wrong?" rather than "Who caused the problem?" A just culture is the opposite of a blame culture.*"

Rolling the dice

The above IMO official definition, together with the *CHIRP* examples, while useful, do not intuitively demonstrate the critical importance to every business of discovering how often we are 'rolling the dice'. The question is, exactly how many '6 & 5's' are being rolled? In other words, what high potential learning events are we experiencing and how close are we to having a '6 & 6' event and suffering the associated uninsured costs? Indeed, even insured costs are paid for through higher insurance premiums.

CHIRP's experience is that while seafarers will confidentially admit to frequently 'rolling the dice' for any number of reasons, it is common for them to also admit they do not report these incidents. On the other hand, it is equally common for boards of directors, from many industries, not just shipping, to be labouring under the illusion that the Key Performance Indicator (KPI) covering their 'Learning Event' reporting quota is being met, with each incident being acted upon. Sadly, this rarely proves to be the case when scrutinised closely, which the author has done in many organisations from a variety of industries. This fact is critically important because a real, robust and healthy reporting system is absolutely essential to both business and safety success, with safety and efficiency being two sides of the same coin, as we will demonstrate later in this article. The fuel that powers healthy reporting is a mature safety culture that is at least Level Four (Proactive) and preferably Level Five (Generative) – see Figure 1. It is simply wishful thinking to believe that reporting will happen if the culture is not at these levels. Furthermore, it is only at these levels of workforce engagement and mutual trust that a 'Just Culture' can be created and maintained.

In the next section we will explore why robust, efficient and thorough incident reporting matters so much to the industry and the companies operating within it.

So, why does this matter?

Figure 2 below demonstrates why it is critical to uncover the numerous learning opportunities (numbers of times the dice are rolled) at the bottom of the triangle – unsafe acts & omissions / unsafe conditions, 'near misses' ('learning events'). All of these present the organisation and/or the industry with learning opportunities and are the leading indicators of safety risk. However, uncovering the bottom of the triangle in the first place, so the lessons can be learned, depends entirely on the level of open and honest reporting, which in turn is determined by the safety culture.

Figure 2 – The safety triangle

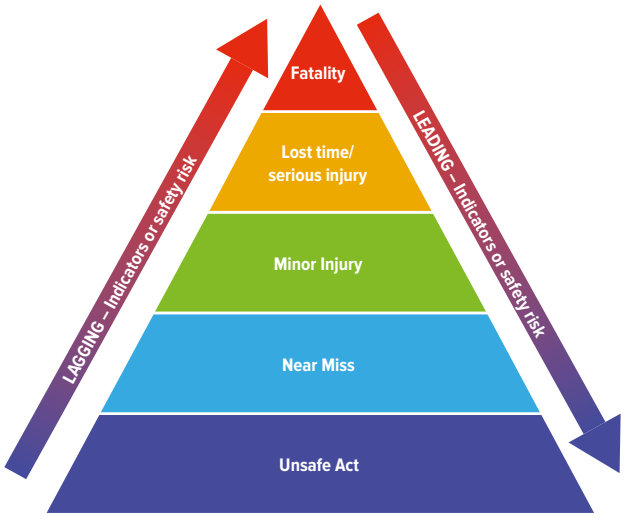
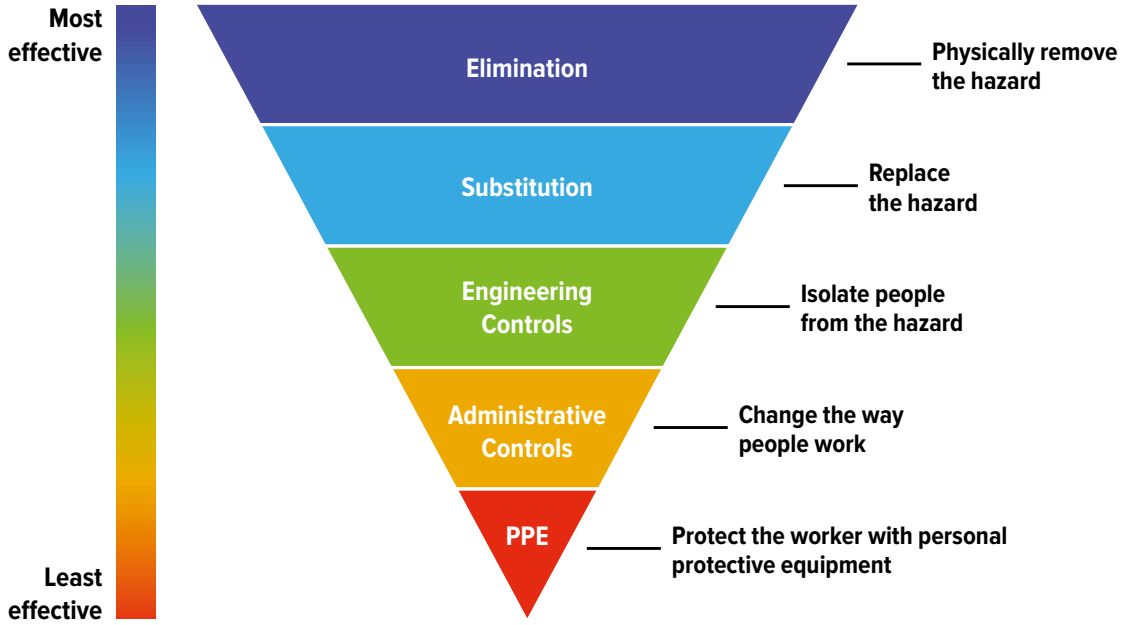


Figure 3 – Hierarchy of risk controls



However, even when incidents **are** reported, Figure 3 shows that the tendency in risk reduction measures is to choose the least effective corrective actions. These are often limited to either PPE (put your hard hat on!) or by writing another procedure! These are the least effective controls when attempting to reduce the risks associated with any given hazard, and limiting corrective actions in this way is likely to lead to the dice continuing to be rolled!

So, the company culture is critical to successful risk control and that in turn plays a large part in business success. The next section will deal with how we get there.

OK, so how do we achieve a Generative safety culture?

Put simply, we have to create a 'one team' environment in the steady pursuit of operational excellence. In this culture people are:

- properly trained in both technical and non-technical skills, including leadership and management (especially at management and supervisory levels ashore and on board). Training must then be validated through coaching and mentoring.
- trusted, empowered, treated like adults and listened to.
- asked to identify their challenges within a 'safe' environment, to offer solutions to those challenges and then be allowed to implement the changes **for themselves**, with the help and support of their managers. When asked, people will always tend to simplify, improve and make operations safer, and also more efficient. This works because people are committed to their own ideas and believe in their own solutions.
- involved with the derivation of all procedures so they become workforce-owned. When this is the case, procedures will tend to be simple, relevant, brief, ship-specific, useful and used!

It is the absence of a Generative safety culture, or at least a Proactive one, that causes people to 'roll the dice' so often in the first place. This is because, in a poor safety culture, the people perceive that using a non-approved method is often the only way to get the job done in a timely manner.

When a genuine one-team approach is achieved it leads to:

- mutual trust – the fuel for achieving a Generative Culture.
- effective communication at all levels. People always need to know the reason 'why'.
- genuine empowerment of employees.
- regular problem identification with suggested solutions submitted at all levels.
- a robust feedback system.
- improved job satisfaction. There is a direct correlation between high job satisfaction and excellent safety performance.
- reduced turnover of personnel – people don't leave safe, well-run companies. This reduces re-training costs and prevents crucial company-specific knowledge being lost.
- reduced claims for sick leave.
- increased productivity and efficiency.
- Safety, Health, Quality, Environmental and Finance being managed as one.
- human performance supported and monitored to ensure consistently high levels.

All of the above, once achieved, lead to the dice not being thrown so frequently. Why? Because gone are the reasons for doing so, namely, to try to get the job done despite the hurdles people perceive have been placed in front of them to stop that happening. Once they own their own simplified, ship specific and approved procedures they will follow them.

Health Warning! New leaders, at all levels from the top down, can collapse this hard-earned trust almost overnight, by coming in to 'try to make his or her mark', often in an overbearing manner. This can be catastrophic to the company culture. So please beware, since once the trust is lost it will take many years to regain! This explains why high-quality leadership & management training, incorporating non-technical skills, is so critically important.

Now we know how essential it is to the business to create this culture and gather in the harvest of valuable

'learning opportunities' to fuel continuous improvement. In the next section we will demonstrate an objective method of costing 'learning events'. They are costed based upon their worst probable outcome (6 & 6 on the dice), which is an objective phrase used in risk assessment, so that the subsequent corrective actions are selected from as high up the Hierarchy of Risk Controls as reasonably practicable, as required by law. The cost benefits of so doing will now become demonstrable and transparent.

Deck department – example:

Achieving cost savings – an example

From a legal and moral perspective, it clearly matters to companies that avoiding injuries to personnel and damages to equipment is important. This can be seen in company policy statements and safety management systems. Companies learn the hard way from accidents, which unfortunately are invariably expensive exercises. However, very few go that one step further to look closely at near misses / learning events and thus close the gaps that cause the accidents or incidents in the first place.

Therefore, we have set out the business imperatives below with two fictitious examples, the first of which is calculated to show the costs associated with rolling a double six!

Commercial software is available which is designed to calculate **initial estimated, actual** and **worst probable** costs associated with incidents and learning events. It also assembles the associated workforce owned corrective actions. The programme can be developed to feed into all other major company operating systems and software, for example Legal, Insurance, Finance, Human Resources, Training, Maintenance Management and Operations & Logistics, etc. The calculated financial costs, with control measures, provides the organisation with the tool they require to demonstrate the cost benefits of introducing the measures that reduce the chances of a repeat incident to as low as reasonably practicable (ALARP).

Scenario:

The following example is one to which many ship's masters and officers will relate and is certainly worthy of a cost calculation:

- reduced visibility for several hours on passage and on the approach to the pilot station. A container ship master is on the bridge throughout, snatching occasional naps on the bridge settee when safe to do so.
- pilot embarked for a long inward river pilotage. Fog experienced during the entire pilotage, with subsequent delays caused by the weather.
- once vessel berthed, master has spent in excess of twelve continuous hours on the bridge. He then conducts port formalities, etc. for a further two hours.
- this is the vessel's home port, and the master is further engaged in meetings with company representatives.
- master manages to snatch two hours of fitful rest.
- master required to attend the outcome of a Port State Control inspection, accompanied by the ship's superintendent.
- master attends to administration, catching up on paperwork and emails that he has not been able to complete due to the time spent away from his desk - all of which are hugely important from each sender's point of view and each of which requires an instant response.
- during the 24-hour port stay, the fog slowly gives way to windy and squally weather.
- the master, having had very little rest is now feeling the effects of sleep deprivation, with the associated increased levels of stress and anxiety.
- despite the promise of a lengthy passage to the next port, the master feels the commercial pressure to depart on time in order to meet the E.T.A. and therefore avoid any delays that could incur penalties.
- two tugs ordered for departure, one of which is dispatched to another vessel experiencing difficulty in staying alongside due to the increase in the wind speed. The master makes a decision to depart the berth using only one tug.
- after leaving the berth, the vessel drops off the wind, narrowly avoiding contact with another vessel at an adjacent berth. Tug master is having difficulty manoeuvring in the prevailing conditions. Ship did not make contact with the other vessel, but it was a very close call. (6 x 5 on the dice – phew!).
- outbound passage proceeded thereafter without incident.

Cost calculation

The cost calculation below is based on the example above – a high potential 'learning event' (6 x 5 on the dice). Costs illustrated are based on the risk assessment category 'worst probable outcome' (6 x 6 on the dice) which didn't in fact happen, **purely** because of chance! Costs are also based upon the UK Health and Safety Executive cost calculator.

In compiling information to assess costs, the following major categories of loss events must be kept in mind: **People; Property; Environment; Production/business opportunity**. Information is required for calculating the costs of:

- actual loss events (6 x 6 on the dice).
- high potential 'learning events' by worst probable outcome (6 x 5 on the dice).
- selected risk assessments with a worst probable outcome.

Please note that general advice covering the costs associated with all types of incidents is included in the 'Costs to consider' sections below to help the reader to cost other incidents. Please also note that the cost categories are not comprehensive and must be fine-tuned to industry and company requirements. Therefore, the costs in this worked example are estimates and are shown purely for illustration.

Calculation form – initial data:

This example template can be tailored to existing company incident report forms:

Date of loss event	
Time of loss event	
Place of loss event	
Name of person(s) involved	
Name of person completing form	
Position of person completing form	
Description of the event	

Dealing with the incident (immediate action): Time spent in decimal hours: (For example. 3hrs 30min = 3.5) Rate in USD (For example 10)				
Category	**Man-Hours**	**Rate in USD**	**Cost in USD**	**Notes**
1. First-Aid treatment	N/A	N/A	N/A	
2 Taking Injured person(s) to hospital/ home	N/A	N/A	N/A	
3. Securing the site – making the area (of collision) watertight and safe	100	50	5,000	
4. Putting out fires	N/A	N/A	N/A	
5. Immediate crew downtime (For example. work activity stopped)	N/A	N/A	N/A	
6. Additional wages for crew overtime	64	25	1,600	
7. Human Resources costs: PTSD counselling, coaching and policy review	200	50	10,000	
8. Initial costs accrued by the port (not included in next section) and payable by company	200	100	20,000	
9. Dealing with all matters pertaining to the other vessel in the collision and their insurers	200	100	20,000	
TOTAL	**764**		**56,600**	

Costs to consider:

- cost of first aid equipment used. Salary costs of first aider whilst responding to incident. Salary costs of person contacting/liaising with emergency services.
- cost of taxi fare or public transport. Running costs/ fuel of work's vehicle(s) if used. Salary cost of person taking injured person to hospital. Salary cost of person remaining with injured person at hospital.
- port operations costs including tugs, linesmen, pilots and oil dispersant vessels & equipment.
- cost of measures taken to make area immediately safe, for example, making the ship watertight; putting the ship safely back on the berth; making any equipment in way of the collision safe; stopping machinery; provision of scaffolding; erecting barriers; costs of evacuating the area; emergency rescue; costs of any materials used; for example. sand or absorbent material to contain spillage, neutralising agents for chemical spills, etc.
- financial costs of people involved (if met by company); cost of firefighting equipment used; for example. fire extinguishers, fire blankets; refreshments for emergency personnel if on site for extended period.
- salary costs of all people temporarily not working, if not recorded elsewhere.
- consider the four loss event categories above.

Investigation of incident:				
Category	**Man-Hours**	**Rate in USD**	**Cost in USD**	**Notes**
1. Fleet Operations time to report and investigate incident	500	50	25,000	
2. Meetings to discuss incident	100	50	5,000	
3. Senior manager's actual time spent with authorities, hence not being used to run the company	300	100	30,000	
4. Consultant's fees to assist company in investigation	N/A	N/A	N/A	
5. Internal incident investigation costs – reliefs, backfills, overtime, HR involvement, etc.	300	50	15,000	
TOTAL	**1200**		**75,000**	

Costs to consider:

- time to complete paperwork, for example accident book, company report forms, incident report form for your enforcing authority; time taken to report incident; investigation time, including interviewing injured person, witnesses, photographing site, taking measurements, etc.; time spent writing investigation report; management time, including reviewing reports.
- Health and Safety Committee meetings; management meetings; staff meetings; Meetings with trade unions and safety representatives; meeting with P&I Club and Hull & Machinery insurance company personnel.
- salary costs of staff involved when inspector visits; salary costs of people preparing information for inspector.
- costs of finding and engaging an independent consultant if required, consultant's fees for services.
- consider the four loss event categories above.
- note that in order to complete this section quickly, the hourly rates for all personnel are required, including contractors involved on the vessel, in the port and in the office.

Getting back to business:				
Category	**Man-Hours**	**Rate in USD**	**Cost in USD**	**Notes**
1. Assessing/rescheduling work activities	50	100	5,000	
2. Recovering work/production (including staff costs)	50	100	5,000	
3. Cleaning up site and disposal of waste, equipment, products, etc.	200	150	30,000	
4. Bringing work up to standard (for example, product reworking time/costs)	N/A	N/A	N/A	
5. Repairing any damage/faults	500	200	100,000	
6. Hiring or purchasing tools, equipment, plant, services, etc.	200	150	30,000	
TOTAL	**1000**		**170,000**	

Costs to consider:

- managers and/or supervisors time to reschedule, reprioritise and reallocate work following incident.
- costs if staff redeployed; their original tasks may not be done. Costs of additional lighting, heating, running machinery, etc. to meet original targets.
- staff costs to clear up site; costs of cleaning contractors used; cost of material, dispersants, or equipment used to clean up; cost of disposing of waste (less any scrap value); wasted packaging material. Any write off costs for products, which cannot be used, i.e. the value of work in progress.
- product reworking time/costs; cost of extra parts and material to bring up to acceptable standard.
- cost of replacement parts; labour costs for repairs.
- cost of replacement machinery, etc. if it cannot be repaired; provision of temporary accommodation, for example, office rental, portacabins. Note: Here we need the lease and/or capital cost of replacement of all regularly used plant, equipment, and vehicles.
- consider the four loss event categories above.

Business costs:				
Category	**Man-Hours**	**Rate in USD**	**Cost in USD**	**Notes**
1. Uninsured vessel downtime (10 days off hire)	10 (days)	15000 (per day)	150,000	
2. Cost of disruption to liner container service (both reputational and actual)			500,000	
3. Salary costs of injured person	N/A	N/A	N/A	
4. Salary costs of replacement workers	N/A	N/A	N/A	
5. Lost worktime (people waiting to resume work, delays, reduced productivity, effect's on people's productivity, etc.)	200	30	6,000	
6. Overtime costs – impact on sailing				Included elsewhere
7. Recruitment costs for new staff	N/A	N/A	N/A	
8. Contract penalties			100,000	
9. Cancelled and/or lost orders			50,000	
10. Legal costs	300	450	135,000	
11. Increased insurance premiums directly caused by loss event			85,000	
12. Fines (pollution, etc)			50,000	
13. Crewing Department extra costs	2.0	22	44	
14. Human Resources extra costs	36.0	50	1,800	
15. Safety Department	36.0	50	1,800	
16. Retraining costs	160	50	8,000	
17. Costs due to company retraining and re-drafting of relevant Standard Operating Procedures, etc.	30	50	1,500	
TOTAL	**764**		**1,087,344**	

Costs to consider:

- the costs to a company when employees are off sick. You should adjust the figure to take into account any statutory sick pay scheme. You should also take into account non-wage costs, for example, pensions, administration costs, etc.
- consider the situation carefully. If the cost of agency labour is cheaper and they achieve the same output, there may in fact be a financial gain. If agency labour is more expensive, you should record the difference in cost to meet the same production between internal labour and agency staff.
- only include salary costs if not included elsewhere on the form (i.e. people waiting to resume work). Costs of reduced productivity, for example, delayed sailing, delays in dry dock; value of lost/delayed sailing; costs of contractor's staff standing idle, if used; costs of waiting on weather, waiting for deliveries, waiting for other trades.
- include additional non-wage costs. For example, in UK - National Insurance Contributions, etc.
- agency fees if temporary workers used; advertising costs; salary costs during interviewing; administration costs of recruitment exercise; training costs for new staff.
- any penalty clauses invoked by customers due to late delivery, reduced quality, etc.
- consider the value of both current and future work.
- include salary costs of people preparing information for lawyers, attending meetings, answering letters, etc. if not included elsewhere.
- include salary costs of people preparing information associated with all aspects of this incident.
- ensure the time spent in administration is included.
- consider the four loss event categories above.

Action to safeguard future business:				
Category	**Man-Hours**	**Rate in USD**	**Cost in USD**	**Notes**
1. Reassuring customers	200	50	10,000	
2. Providing alternative sources of services for customers	100	50	5,000	
3. Other	N/A	N/A	N/A	
TOTAL	**300**		**15,000**	
GRAND TOTAL	**4028**		**1,403,944**	

Costs to consider:

- time and cost of contacting key customers to reassure them that existing services will be fulfilled, and that future services will not be affected. Publicity and marketing costs to re-establish reputation.
- include salary costs of people administering this provision of alternative services.

NOTE: The reader should bear in mind that the total uninsured cost is lost directly from the company's bottom line (profits). So, if a company is making 10 cents on the dollar profit (10%) which most do not; then the business would have to turn over ten times that bottom-line number to pay for the incident! In this case, if the costs had been carefully calculated, then the estimated total of USD 1,403,944 would mean the business would have to gross USD 14,039,440 in turnover to make up the uninsured losses.

Engineer department - example:

The following example is one to which many chief engineers, as well as masters and officers will relate and is certainly worthy of a cost calculation:

- a relief chief engineer flies out to join a ship – long twelve-hour flight in tourist class with no proper rest.
- C/E is booked to stay overnight in a hotel, but the agent informs him that there is a problem on board, and he is required to join on arrival.
- C/E boards and finds that the engineers are working on two main engine units. One is for class, the other as a result of a defect found on the inbound passage.
- the off-going C/E conducts a hasty handover, and proceeds on leave.
- there are insufficient spares on board, so priorities are decided upon inspection.
- soon after sailing, having just cleared a narrow buoyed channel and proceeding at slow speed, the main engine shuts down.
- fortunately, at the time of the shutdown, the vessel was adjacent to an anchorage and the master, using steerage way only, was able to clear the channel and successfully anchor the ship.
- on close inspection the cause of the breakdown was water ingress to the sump caused by a reused cylinder liner O-ring.
- there followed a twelve-hour delay before the fault was rectified and the engine could be successfully restarted.
- the incoming C/E was not involved in any of the initial maintenance planning and was completely exhausted at the time of the shutdown.
- the vessel did not go aground or suffer a collision. Again, it was a close call. (6 x 5 on the dice – phew!)

As an exercise and using the categories above, you may wish to calculate the approximate costs of the uninsured costs associated with this incident if it had been a '6 x 6'! Even the '6 x 5' costs are considerable!

Conclusion

This Insight article set out to demonstrate the **business case** for:

- developing a Generative safety and business culture (you can only have one company culture!)
- creating a 'Just' incident reporting culture that develops from the trust created within a Generative company safety culture. Remember that trust is difficult to establish and can be lost in a heartbeat!
- establishing real workforce involvement and ownership that stems from the senior leadership team, ship's superintendents, masters and C/E's all being trained and becoming trusted company managers, who in turn are effective team leaders who efficiently harness the untapped 'horsepower' residing within the workforce. They are not autocrats, nor are they laissez faire leaders, both of which are frequent default positions of untrained managers!
- efficient and open incident reporting, whereby people are happy to admit to their errors, mistakes and violations because they will be dealt with appropriately within a Just Culture. Remember! Unless your people have criminal intent – and that is very rare - they will not have meant to achieve the undesirable outcome. Violations are deliberate, but seldom malevolent, breaches of safety rules.
- costing all loss events, especially high potential ones, so as to identify corrective actions in a cost-effective manner, to avoid future losses and to use this tool as the primary business improvement method.

The incident calculated in this Insight article did not actually happen but is typical of much anecdotal evidence compiled by the author during training courses conducted over the past twenty-five years. These stories have been confirmed as being frighteningly realistic by various accident investigations and reports of sometimes tragic events, which have been every bit as costly to the companies concerned as the calculated example above.

Much productive learning can be achieved from the myriad of 'rolling the dice' moments, provided they are reported! And they simply will not even begin to be reported unless and until the company has at least declared its sincere intentions to pursue a Generative safety culture and then, in close cooperation with the workforce, followed that statement of intent with definitive actions.

When boards of directors recognise the need to embrace this change, so that they are able to transparently see the cost savings to be made, albeit invisible ones, by encouraging and then analysing these reports, especially the high potential ones (6&5's), then they are on their way to successfully pursuing safety and business excellence in all that they do. These reports have the capacity to literally provide the 'fuel' that helps to transform and then maintain the company safety culture since, when the 'learning events' are caught in good time, they prevent the chance of them becoming actual losses, because the cost beneficial corrective actions are put in place in a timely way and the dice are no longer being rolled!

This paper has been prepared for *CHIRP* Maritime by:
Captain John Wright, of WrightWay Training Limited, and member of the *CHIRP* Maritime Advisory Board.

> "Change is the Law of Life. There is a need to focus on the future and you will miss that if focussing only on the past and present"
>
> **John Fitzgerald Kennedy, 35th president of the United States**

Section three

Fishing, tugs, yachting and recreation

It is encouraging to note that in 2020 we received reports from all the different sectors which are covered by this chapter.

We begin with an account of fatigue in the harbour towage sector. Although this refers to the experiences of a single individual, we feel sure it happens elsewhere, so please let us know if you encounter other cases. It will be interesting to see whether the onset of autonomous tugs will change the situation at all. I have seen the trials in one port justified for a number of reasons, including that the crew will be able to rest on the way to and from towing jobs, and will only need to emerge during the actual towage. This sounds wonderful, but I question whether crews will really be able to relax while their tug is controlled by the technology. It is even possible to imagine a scenario where autonomous controls cause more stress and anxiety. We await the outcome with interest.

Our report about drug abuse on fishing vessels generated a lot of feedback, so this section contains the original report and an example of the correspondence we received on the topic. We always try to publish letters from our readers, and you will find examples throughout this Annual Digest. Naturally, we only publish them if the authors give their permission.

Yet again we have a report about a vessel passing another at high speed and generating dangerous wake wash. This is basic seamanship, so it is disappointing that we continually receive reports of this nature.

The final report is an alarming tale of an unmanned jet ski which demonstrates that boats and alcohol do not mix. It also raises the question of whether untrained and unqualified people should be permitted to take control of any vessel, let alone a vessel capable of high speeds. In this case nobody was hurt, but it could easily have been a disaster.

We conclude with an Insight article focusing on the work of the UN's Food and Agriculture Organization (FAO) as it relates to fishing and fishing safety. Readers will discover that a great deal of work is being done to make fishing safer, although it remains probably the most dangerous job on the planet. We are delighted that we have now forged a link with FAO which we hope will be beneficial in spreading the safety message to fisherfolk around the world, and we encourage anyone working in the sector to submit reports to us.

Article 11

Fatigue in the harbour towage sector

Outline: The following report was received in response to the request in Maritime FEEDBACK 56 for seafarers with experience of fatigue at work to contact *CHIRP*.

What the reporter told us:

After reading your latest *CHIRP* Maritime publication where you requested examples of fatigue occurring in the maritime industry, I will try to explain the fatigue which is present in our harbour towage sector.

All crew work 7 days on / 7 days off. The main issue is that crews can and regularly do work 14 hours in a 24-hour period with 10 hours of rest. This is not unusual, but twice a week the rest hours can be broken down into 3 separate periods e.g. 6,2,2 which is unusual. This is further exacerbated by the crews working to no recognised marine watchkeeping pattern. The routine is allowed under a long-standing agreement between the owners and a union. The agreement has been accepted by the flag state administration which has granted a dispensation to allow the rest hours to be split into three periods rather than the maximum two periods stipulated in the STCW Hours of Rest regulations.

Being a long-standing agreement over many years, the system we work was never analysed for the effects of fatigue and the long-term health consequences, even though the technology is now available and has been used on other agreements.

During the working week crews will work days, nights and a combination of both, with no scheduled rest periods. Instead we take rest periods at random times through the day and night between ship movements in a non-tidal-restricted port. Furthermore, meal preparation, cooking, eating and cleaning up is not classed as work time so is carried out three times daily within the random rest periods. This leads to unhealthy meal choices and due to the nature of the work schedules we follow, meals can be taken late at night.

Further dialogue:

In the past few years there has been a marked increase in the number and size of ships calling at our port which results in more tug movements, but there has been no increase in the number of tugs or crews.

When the agreement was first introduced there were enough crews and the system worked well - fatigue and stress were not issues - but since then the crew numbers have been reduced from 72 crew manning four tugs on a 1 day on / 3 days off rotation to the present 30 crew manning four tugs on a 7 days on / 7 days off rotation. Virtually all crew members struggle to get enough rest.

All crew members experience difficulties sleeping with the rotating day and night working, and experience the effects of fatigue whilst engaged in safety-critical operations. Crew members speak of experiencing headaches, feeling jet lagged and not feeling normal until after the 2nd or 3rd day of their week off as a result of the massive disruption of their circadian rhythms.

Crewmembers that have declared themselves fatigued have been met with a negative attitude from the company, with the crewmembers having to explain why they have declared themselves fatigued.

During a recent shipping medical after several crewmembers mentioned the situation, the doctor had serious concerns regarding the working conditions in our towage sector, prompting the doctor to notify the chief medical officer of the flag state administration. As yet there is no satisfactory outcome.

A local risk assessment on fatigue was carried out by a combination of lower management and crew representatives, as part of the company's required Fatigue Management Plan. However, none of the participants had any specific training or specialised knowledge about fatigue.

The problem described is not limited to a single port but is widespread wherever this work pattern is followed.

CHIRP Comment:

- A proper risk assessment, carried out by qualified people, would immediately identify the risks the current working arrangement presents to the health, safety and welfare of the crews.
- Use of modern technology and scientifically recognised programmes (see Project Martha – www.chirpmaritime.org/wp-content/uploads/2017/02/MARTHA-Final-Report.pdf) would readily identify and quantify the levels of fatigue and risk present.
- The company have a duty to reduce such identified risks to as low as is reasonably possible.
- The flag state administration has not granted any exemptions to trading vessels but for some reason is treating these tug and towage operations differently.
- While this long-standing agreement has been revalidated every 5 years, *CHIRP* would argue that due to changes in the workings of this port and others, the additional workload on the tugs renders the present agreement no longer fit for purpose and a full review needs to be carried out by all parties.
- The STCW Hours of Rest regulations set the internationally agreed minimum number of hours of rest for seafarers and the maximum number of periods those hours of rest can be divided into. *CHIRP* cannot see the justification for any exemption that is detrimental to the health, safety and welfare of the tug crews.
- *CHIRP* has written to the Harbour Master, as the responsible authority within the port, to share our concerns with him over the present situation. Furthermore, *CHIRP* has written to the national administration expressing concern at the consequences of the current dispensation arrangement.

The above article was published in MFB 58

Article 12

Drug abuse on fishing vessels

Outline: *CHIRP* has received two reports from official sources highlighting the use of drugs on board commercial fishing vessels.

What the reporters told us:

Increasing drug abuse has been identified on several commercial fishing vessels operating in a specific area. Allegedly cocaine is being used by a number of crew members and it was reported that some are actually being paid in cocaine.

The above was backed up by witnessed incidents of irrational and violent behaviour, including verbal outbursts, to such an extent that another vessel was required to take avoiding action to prevent collision. Furthermore, there are recorded incidents of collisions between the reported vessels and fixed offshore structures and the tragic loss overboard of a crew member from one of the boats who was a known drug user.

CHIRP Comment:

The problem of drug taking within the global fishing industry is well known and *CHIRP* has been aware of it for some time. However, this is the first time *CHIRP* has received any reports on the subject. Since the reports are based upon illegal activity, the issues are in the hands of the local and national authorities – *CHIRP* cannot investigate further but can publicise the issue. The drug of choice varies from region to region, but all drugs have the same adverse effects on the users. Rational thought processes are impaired, leading to poor decision making on both an individual and group basis. This of course increases the risk of an incident or accident and is a cultural issue which requires addressing both at company and national administration level. A mandatory drug and alcohol policy may be considered a good starting point.

Some companies have introduced a "zero tolerance" policy for both drugs and alcohol. Many seafarers are familiar with some form of breathalyser used to detect alcohol in exhaled breath and they are often carried on board for self- regulation. However, *CHIRP* is not aware of any similar type of simple device on board vessels for detecting the presence of drugs. Such a procedure usually requires third party involvement, similar to the monitoring of sports personnel.

Whilst this article started with commercial fishing vessels, the same issues apply to all aspects of seafaring, including professional seafarers, offshore workers, recreational sailors and fishermen.

DRUGS AND THE SEA DON'T MIX

The above article was published in MFB 58

Article 13.

Correspondence Received **Regarding – Drug abuse follow up**

Further to your article, "Drug abuse on fishing vessels" in MFB58 I was interested in the comment "However, *CHIRP* is not aware of any similar type of simple device on board vessels for detecting the presence of drugs. Such a procedure usually requires third party involvement, similar to the monitoring of sports personnel". It is possible to test for 13 separate recreational drugs by using the saliva, urine or hair follicle testing method depending on what is required. Each one has a different 'Detection Timeline' with saliva detecting 2 to 3 days back, urine up to 30 days and hair follicle dependent on the length of the hair.

Many flag states have adopted a zero-tolerance drug policy, but they have no method of enforcing this and pass on the directive to management companies to enforce. 'Captain-managed' superyachts frequently carry out their own testing.

One of the directives from the STCW 2010 Manila amendments states; "In order to identify drug and alcohol abuse, screening programmes should be implemented for all whose duties involve designated safety, prevention of pollution and security duties to prevent alcohol and drugs from impairing the ability of crew". It would seem that many companies are not aware of or are ignoring this regulation.

CHIRP looked into the matter further and learned that simple urine sample, multi-drug detection kits are available.

A basic (13 drug spectrum) urine test kit costs around £12 / 15 USD and its primary function is to indicate if a seafarer is "drugs free". If this initial (13 drug spectrum) test does not come back as 'clear', the same urine sample can be used for a more detailed testing, but for that a separate kit is required for each of the 13 drugs you are testing for. These more specific single drug test kits cost approximately £48 / 60 USD per drug being tested for.

CHIRP notes that the reporters' comments apply to all mariners and not just the fishing sector. It is also worthy of note that, for drug and alcohol testing, there are several companies which offer services to conduct initial and follow up D&A testing. The services are not cheap, which simply reinforces the adage "What price HSSE?"

The above article was published in MFB 60

Article 14

Wake wash and unsafe speed passing anchored vessels

Outline: There are two sides to every story.

What the reporter told us

We were anchored in a creek in a river estuary and had taken alongside an accompanying boat for repairs to their anchor winch. Both boats, motor cruisers of around 12m in length, were well fendered.

Whilst anchored, we noticed a pilot boat heading in our direction at some speed. The pilot boat made no attempt to slow down and passed us at a distance of 20m at an estimated speed of 12 knots, creating a wash 1 metre in height. The wash threw both boats violently together, damaging the rubbing strake of our boat and bending and ripping out the accompanying boat's stanchions. In addition, four of the fenders burst.

I immediately called the pilot boat on VHF asking for them to stop and come back and assess the damage. The pilot boat asked where we were and identified itself. The pilot boat returned to our location and I asked for their company name and insurance details. I was given the name of their company and was informed that they had to maintain speed due to the strength of the wind – they were, however, apparently able to hold station 4 metres from us without any problem. After a brief exchange the pilot boat circled us a couple of times and then another crew member appeared in an aggressive manner and proceeded to inform us the incident was our fault for not fendering properly. When challenged about their speed he declined to comment and proceeded to insult us at which time our skipper lost his temper and swore at the crew member. I tried to calm the situation and then the pilot boat

circled us again. A crew member appeared from the pilot vessel's wheelhouse with outstretched arms shouting at us that we could do nothing to them at which point they left. Upon checking our AIS, they did not show up.

Further dialogue

The reporter wrote to the managers of the pilot boat who requested that a report be submitted for evaluation. *CHIRP* also wrote to the managers. The operations manager promptly responded by telephone and advised *CHIRP* that the facts were still being gathered from the reporter, the launch crew and the local Vessel Traffic Service but initial indications showed discrepancies between the three accounts. Subsequently, the reporter failed to respond to *CHIRP*'s request for an update on two occasions but the operations manager for the launch responded by telephone and advised *CHIRP* that the incident was closed and whilst there were still discrepancies between the different accounts, the pilot boat operators had agreed to pay for the repairs to the motor cruisers as a show of good faith.

CHIRP comment

Situational awareness is essential. All seafarers, whether professional or recreational, need to be mindful of and considerate towards other boat users at all times.

Whatever the situation there is no need for aggressive behaviour or abusive language, it is unnecessary and invariably counterproductive.

The willing engagement by the operations manager with *CHIRP* was noted and is encouraging.

The above article was published in MFB 60

Article 15

Un-manned jet ski

Outline: A report highlighting a complete lack of respect for the water that could have turned into a tragedy.

What the reporter told us

At approximately 16:15 a friend and I were anchoring a RIB just off the beach. I was approached by a man in a wetsuit who asked for assistance as he had lost his jet ski. We then noticed an unmanned jet ski that was underway (approximately 3 knots) about 100m offshore. Using our RIB, we made our way out towards the unmanned jet ski. In the interim another jet ski intercepted the unmanned jet ski. We then noticed the rescue jet ski had recovered an unknown person from the water who looked tired and was not wearing a wetsuit or life preserver.

The owner of the jet ski shouted across and asked where the other jet ski occupant was. Realising the urgency of the situation I asked him to confirm if there was somebody still missing. On receiving confirmation, we set off to look for the missing person and very quickly located the second individual and recovered him. On being dragged aboard the RIB it was apparent that this individual was extremely tired, wearing no equipment and was intoxicated. He thanked us for "saving his life". We returned to the rescue craft and the owner of the unmanned jet ski informed us that it was his brother's friends who had been drinking all day and had taken the jet ski without permission. They had obviously not worn the kill cord and had fallen off the jet ski, which then continued unmanned.

Both recovered persons were transferred to the local beach lifeguard station by the rescue jet ski. Upon returning to my original location I noticed a lifeboat rescue craft whose crew confirmed they were looking for a jet ski and two persons in the water. I relayed the above information and advised that they liaise with the beach lifeguard station to confirm the casualties were safe and well.

Further dialogue

CHIRP engaged with the reporter who revealed he was an off-duty Coastguard SAR pilot, which explained his familiarity with lifeboat procedures. The reporter also stated, "It was an eye opener to be involved in some small part with an incident as I was, and to witness the issues and confusion that can quickly arise at sea level".

CHIRP comment

This report contains many learning points but at the top of the list is the fact that alcohol and the water do not mix. If that simple fact is not taken on board, then all the rest are a little bit blurred. Such as:

- Always wear the engine kill cord
- Always wear a PFD (buoyancy aid)
- Always wear suitable clothing – once outside the tropics, even in the summer, a lightweight wet suit is appropriate.

Jet skis are great fun and reasonably affordable to many people, and while most jet ski owners are responsible and conscientious, this particular mode of water sports has attracted a hooligan element. Those people who, through ignorance or temperament, do not care about the safety or enjoyment of other people using the water, and who think that the guidance, rules and regulations, which are there for the safety of everyone, do not apply to them, yet still seem to expect others to come to their aid when they get into trouble.

Many organisations are working very hard to educate and encourage jet ski and other water sport users to enjoy their sport responsibly and safely. Proactive videos have been produced and new signage developed to guide and educate. However, jet skis and other personal watercraft slip through gaps in the regulations, and these gaps need to be closed up so that deliberate and persistent exhibitions of hooligan-type behaviour can be prosecuted.

The above article was published in MFB 61

Article 16

Insight – **FAO – their role in international fishing safety standards**

The Food and Agriculture Organization (FAO) is a specialised agency of the United Nations and is an independent international organisation funded by both voluntary and assessed contributions, working in over 130 countries worldwide. Recently, *CHIRP* Maritime has engaged with this agency with a view to promoting their work alongside that of *CHIRP* Maritime. To that end, a link to our website now exists on the FAO website.

Commercial fishing remains one of the world's most dangerous occupations. The FAO revised its global

estimate of the number of fatalities in fisheries in 2019 to 32,000. The basis for this revision was the increase in the number of fishers worldwide from around 30 million in 2000 to 40 million in 2016. The 1999 ILO established rate of 80 fatalities per 00,000/year of active fishers was maintained for this new estimate. It should be noted that the revised FAO global estimate is likely an underestimation. Reports from the few developed countries that collect fisheries accident data commonly show rates of more than 100 fatalities per 100,000 active fishers. In fact, in some industrial fishing fleets, accident and fatality rates have recently been on the rise. Furthermore, there is anecdotal evidence that in developing countries with small-scale fishing fleets the fatality rates among fishers are significantly higher.

25 years of FAO'S Code of Conduct for Responsible Fisheries

Adopted 25 years ago by the International Conference on Responsible Fishing, the Code of Conduct for Responsible Fisheries (http://www.fao.org/tempref/docrep/fao/005/v9878e/v9878e00.pdf) remains the reference for national and international efforts to ensure sustainable fisheries and aquaculture.

The Code sets out principles and international standards of behaviour for responsible practices with a view to ensuring the effective conservation, management and development of living aquatic resources in harmony with the environment.

Its success can also be measured by the number of languages it has been translated into – 27 to date – making it one of the Organisation's most translated publications.

The FAO Directorate General is a depository for a number of conventions, agreements and treaties that relate to food and agriculture (http://www.fao.org/treaties/en/). These include, for instance, the 2009 Port State Measures Agreement (http://www.fao.org/port-state-measures/en/) and the 1993 FAO Compliance Agreement (http://www.fao.org/iuu-fishing/international-framework/fao-compliance-agreement/en/), which both aim to contribute to responsible fisheries and marine resource conservation. They also work to assist member countries to develop and implement these agreements, standards and guidelines.

In addition, FAO have built an extensive legislative database (http://www.fao.org/faolex/en/) to give users quick access to national laws, regulations and policies on food, agriculture and natural resource management. They also provide information papers on the subject of safety at sea and decent working conditions in fisheries and aquaculture.

The FAO Code of Conduct for Responsible Fisheries is explicit in relation to the principle of "safety" in Article 6.17, where it is emphasized that "States should ensure that fishing facilities and equipment as well as all fisheries activities allow for safe, healthy and fair working and living conditions and meet internationally agreed standards adopted by relevant international organizations". Article 8.1.5 expands on the principle of safety, requesting states "to ensure that health and safety standards are adopted for everyone in fishing operations and that such standards should not be less than the minimum requirements of relevant international agreements on conditions of work and service". Moreover, Article 8.4.1 requests that "States should ensure that fishing is conducted with due regard to the safety of human life".

Figure 1 – Fishing crew life jacket practice in Yemen (photo courtesy of Khalid Zanoqi)

COFI (Committee on Fisheries – a subsidiary body of the FAO Council) has repeatedly highlighted the importance of safety at sea in the fisheries sector and welcomed the cooperation in this regard between the International Labour Organization (ILO), the International Maritime Organization (IMO) and the FAO. At their recent (1-5 February 2021) 34th session, COFI members issued a Declaration for Sustainable Fisheries and Aquaculture (http://www.fao.org/3/ne472en/ne472en.pdf) in which the Members agreed to "Promote the attainment of safe, healthy and fair working conditions for all in the sector, support efforts to prevent and halt forced labour, facilitate access to social protection programmes for fishers and aquaculture producers and their communities, support measures to improve safety at sea, and work towards enhancing the standards of living for all in the sector, in cooperation with other relevant international organisations, including the International Labour Organization and the International Maritime Organization".

FAO activities on safety at sea in the fisheries sector

The FAO has developed capacity building programmes and materials on safety at sea for small-scale fishers. These activities are carried out jointly with government counterparts and include emergency preparation, outboard engine repair and maintenance, safety risk management, boat handling and basic marine traffic rules, as well as emergency first aid and communications.

Nearly 600 fishers in the Caribbean received specific Information and Communication Technology (ICT) training, supported by the FAO, in 2019/2020, focusing on the three ICT devices that are most important to safety at sea for small-scale fishers: the VHF radio, the Global Positioning System (GPS) and cell phones. FAO trained small-scale fishers through performing drills on the radio, GPS and cell

phone in a classroom environment, as well as at sea. In the Pacific islands of Tokelau, the FAO Safety at Sea for Small-scale Fishers programme in 2019 included the provision of appropriate safety gear, training on the use of gear and safety education at schools. It also included training on engine repair and maintenance.

Figure 2 – Radio communication training of fishers in Dominica (Caribbean) (photo courtesy of Iris Monnereau)

Figure 3 – Outboard motor repair training of small-scale fishers in Tokelau (photo courtesy of Jessica Sanders)

The FAO also has a Bay of Bengal programme and has published a practical manual on "Safety at sea for small-scale fishers", containing comic-book style illustrations. This manual is available online in English (http://www.fao.org/documents/card/en/c/ca5772en), French, Spanish, Chinese, Portuguese, Tamil and Sinhala. It is distributed through various projects and partners in Asia, Africa and the Caribbean. Other language versions and regionalized versions of the manual are under preparation.

Decent work in fisheries

Since 2018 FAO and the Apostleship of the Sea, in cooperation with the IMO and the ILO, facilitated a series of regional technical seminars on the linkages between vessels' safety, working conditions and illegal, unreported and unregulated (IUU) fishing. The seminars took place in Asia (Manila, March2018), in the South-West Indian Ocean (Seychelles, May 2019) and in West Africa (Accra, October 2019). Other regions are expected to be covered in 2020.

At the regional level, FAO published in 2019 the outcome of a regional study conducted with the General Fisheries Commission for the Mediterranean (GFCM) in five countries (Albania, Egypt, Lebanon, Morocco and Tunisia). The study reviewed available social protection programmes and access of small-scale fishers to these programmes. The review found several success stories as well as areas of improvement and recommended practical measures to be taken by national authorities as over 90 percent of the world's fishing vessels are small-scale vessels which are not covered by the IMO instruments. FAO aims to expand the capacity-building efforts to other regions, provided funding from resource partners becomes available, and the FAO "Safety-for-fishermen" website will be modernized.

Fisheries accident and fatality reporting has been on the agenda of the international community for the last four decades, particularly within IMO, ILO and FAO. However, up to today most countries lack an effective reporting, investigation and analysis system. The IMO Cape Town Agreement and ILO Convention No.188 both stress the need for states to report and investigate fishing accidents but are either applicable to large-scale (>24m) fishing vessels only, or limited in scope by the low number of ratifying states. FAO proposes to collaborate with governments and other stakeholders to achieve the necessary progress on this topic.

The FAO started collaborating in 2020 with IMO, PEW Charitable Trust, Lloyds Register Foundation and the FISH Safety Foundation on the development of global accident and fatality reporting and data management systems for the fisheries sector. Other stakeholders are welcome to join in this endeavour, which will hopefully result in one or more voluntary and formal accident and fatality reporting systems for the sector in the near future.

With thanks to Raymon VanAnrooy (NFIO)
FAO, Rome – Fishing-safety@fao.org
http://www.fao.org/home/en/

ILO, IMO and FAO instruments, improving safety at sea and working conditions, and reducing accidents and fatalities in capture fisheries and aquaculture

Section four

Engineering, technical, environment and regulation

We begin this section with an interesting discussion about the rules which apply to vessels such as FPSOs, and this is followed by a report about a defective rate of turn indicator.

Much modern shipboard equipment is highly accurate, but there are sometimes settings which must be correctly adjusted to ensure the equipment gives the most accurate results. This is illustrated by reports concerning echo sounder displays and under keel clearance, and how portable pilotage units can be affected by incorrect settings in a ship's ECDIS and AIS. These reports clearly demonstrate the importance of knowing what settings are used in all navigational equipment. We urge all our seagoing readers to take these lessons to heart. To assist you in getting the best out of your ECDIS, we draw your attention to an excellent new report by OCIMF, which can be found through the following link: https://www.ocimf.org/media/169980/recommendations-on-usage-of-ecdis-and-preventing-incidents.pdf

Once again we feature a report about engine problems when ships were entering or leaving port. This underlines the need to understand your ship's manoeuvring responses, and to clearly explain them to the pilot during every passage.

Leading on from an earlier report, we feature correspondence we received about minimum speed when putting the engines astern. The lesson, yet again, is that you need to know your ship's responses and navigate accordingly.

This is followed by a worrying report about the flooding of a superyacht, which calls into question both design features and crew training. The lessons we can learn go far beyond the yachting sector and should be studied by all mariners and naval architects.

Article 17

When is a ship NOT a ship?

Outline: A report was received from an engineer, with 10 years' experience on the same vessel, who was concerned about changes to the vessels' status and the potential consequences.

What the reporter told us:

The vessel was built in 1997 and has always been registered in the same flag state – even when the name was changed the flag state remained the same. The vessel was purpose built for its role as a Floating Production and Storage Unit (FPSU) but has always been recognised and registered as a motor ship with multiple engines. As such it always had a Minimum Safe Manning Document (MSMD) and was crewed to STCW requirements with regards to certificates of competency and numbers.

Further dialogue:

A few years ago, the owners took a corporate decision to move away from the requirements to have STCW certificated personnel onboard by applying for an exemption to the MSMD. This was granted by the flag state for a 5-year period which expired in 2019, but since that date neither a MSMD nor an exemption has been displayed. When asked, the flag state advised that the vessel did not need either as it was not self-propelled, (which came as a surprise to the reporter who had spent 10 years maintaining and running the engines and thrusters which are frequently used for heading control and on more than one occasion prevented a potential disaster when elements of the mooring arrangements failed in heavy weather). Instead the flag state issued a letter stating the vessel should be manned in accordance with IMO Res.1079.

IMO Res.1079 deals with manning requirements for Mobile Offshore Units (MOU). Flag states usually publish their own guidance based upon IMO resolutions but so far, the flag state in question has not done so.

There is a common argument that, as the vessel comes under HSE regulations (as an installation), the flag state rules do not matter. However, HSE regulations do not deal with manning requirements and the vessel is still floating and needs to be maintained to class requirements. It seems the IMO have long recognised the need for the manning on MOU's to be regulated, as all over the world these vessels seem to fall into a grey area between HSE regulations and flag state rules.

CHIRP Comment:

- This is a confusing problem that is also a global issue because these specialised vessels are in service all around the world.
- There are numerous vessels that fit into this category in the offshore industry from MODU's to FSU/FPSO's. What they have in common is that their respective flag states appear to have technical definitions that allow them not to be treated as a ship in the STCW definitions. Instead, their watchkeepers must have qualifications under the flag state definition, such as "MODU Master" and/or "OIM" qualifications. This even applies to MODU's using dynamic positioning, if they remain in the same location.
- A problem arises if they have to transit to another location, whereupon crew certification might dictate that the unit is towed. If they transit under their own propulsion, they would require STCW certification.

The above article was published in MFB 58

Article 18

Defective rate of turn indicator

Outline: Failure to highlight a defective rate of turn indicator at the MPX.

What the reporter told us:

The ship's digital rate of turn indicator at the bridge front was lagging considerably behind the ship's true rate of turn. Once the ordered rate of turn had been held steady for a period, the digital rate of turn indicator would then catch up and show the correct rate of turn. However, the rate of turn indicator at the helmsman's position showed the correct rate of turn throughout.

Further dialogue:

The ship's own bridge team were aware that the digital rate of turn indicator was lagging but it was not highlighted at the time of the MPX. The amount it lagged even appeared to surprise the crew when the ship started the first major turn.

On a positive note, when the helmsman was ordered to put the ordered rate of turn on immediately – whilst it was not showing on the bridge front rate of turn indicator – the Master was quick to point out that the helmsman's RoT indicator was working correctly and the required rate of turn was already on.

At the debriefing after the ship was berthed, the Staff Captain raised the topic that at future MPX's, the bridge team must highlight that the digital RoT indicator was experiencing significant lag, but that the helmsman's indicator was functioning correctly.

CHIRP comment:

Failure to highlight the defective rate of turn indicator not only caused the pilot a brief period of consternation but also raised the question whether there were any other deficiencies which had not been mentioned? Suspicions like that could trigger the pilot to request a Port State inspection. Malfunctions do occur at times, but they must be brought to the attention of the pilot at the MPX and repairs must be arranged as soon as possible.

The above article was published in MFB 59

Article 19

Echo sounder display and under keel clearance

Outline: This report from a captain reinforces the need to be thoroughly familiar with the equipment on board your ship.

What the reporter told us

During the handover prior to taking command, I noted the echo sounder manufacturer and the type of installation.

This ship had two transducers, one forward and one aft. There was a single display and forward or aft transducer could be selected. After the handover I carried out a familiarisation meeting with the bridge team to make my requirements and standing orders known, and to answer any questions that the team might have. During the meeting I offered the following question, "*On departure of the ship from port with forward draft 5 metres and aft draft 8 metres, we have to drift awaiting orders. After a while, the officer of the watch checks the depth under the keel which reads 3 metres. Is it safe or not?*" All the watch officers replied that it was safe, and none pointed out that it depends upon which transducer was in use.

Lessons learned

Proper familiarisation should be conducted by all the bridge team before they take responsibility as a watch officer. All officers were instructed to check which transducer was in use and the opportunity was taken to reinforce the company's requirement for under keel clearance. Additional information was inserted in the watch officer's handover information template.

CHIRP comment

The learning here is to ensure that bridge watch officers are familiar with all the bridge equipment fitted to their vessel. There are many different types of echo sounder; some have only a single transducer (normally forward) while others have two (commonly fore and aft) but normally and commonly are not good enough – bridge watchkeepers need to know exactly. Not all echo sounders equipped with two transducers readily indicate which transducer is in use. Equally the display may indicate the depth below the transducer or the total water depth depending on input settings and selection.

This report clearly demonstrates that assumptions can be dangerous and lead to an incident. The more familiar you are with equipment and the more you train with it, then the safer you and the ship will be.

It was also noted that whilst vessels may require a minimum aft draft to ensure propeller immersion the practice of good seamanship would suggest, where possible, to minimise sailing draft and trim in areas of shallow water. Additional ballast can always be added later once the vessel is clear of shoal waters.

The above article was published in MFB 60

Article 20

ECDIS / AIS position data affecting a portable pilot unit (PPU)

Outline: Defects, errors and anomalies with equipment do occur, but once they are identified they need to be addressed and resolved in a timely fashion.

What the reporter told us

The vessel's ECDIS displayed an incorrect position – the vessel was displayed halfway over the wharf when alongside. In addition, the vessel's AIS had significantly incorrect vessel dimensions programmed into it. The AIS is linked to and feeds the pilot's portable piloting unit (PPU) through the 'pilot plug'. Thus, errors were introduced into the PPU.

The last time the reporter piloted this vessel the same errors were noted, so the captain was requested to check and correct the errors. During this port call the master advised that they had tried to correct the errors but had no success. This is a significant concern and port state control have been requested to attend the vessel.

Further Correspondence

Three months ago on the vessel's previous visit, the same errors had been observed, at which time the reporter had discussed the issue of antenna offset settings with the captain who had assured the reporter that the issues would be addressed. However, on this port call the master stated they had attempted to adjust this, but the settings kept reverting back to zero. This could mean that the ship had adjusted the GPS position offset, not the antenna offset, or they might have adjusted the antenna position offset but the internal battery could be dead, leading to a loss of the settings and the unit defaulting to zero offsets.

The AIS is another matter. Whilst it would also be affected by the incorrect antenna offset, the vessel's dimensions were incorrectly programmed into the AIS unit. It was thought that this data was not programmable by the vessel but would require the attendance of a service technician. This requirement had been discussed with the captain on the previous visit, three months earlier.

This known issue has not been resolved to date.

Pilots use all navigational aids available, our own and the vessel's, but having incorrect data coming through the electronic navigation aids is potentially a high safety risk.

A separate report about this event was sent to the port state authorities requesting them to attend to try to get corrective action taken.

CHIRP comment:

We did attempt to contact the DPA to bring this report to their attention but the ISM managers declined to engage with *CHIRP*. The MAB recommended contacting the vessel's flag state regarding this report, which was duly done. The flag state positively engaged with *CHIRP* and details of the report were passed to the flag.

Issues like these are reportable to Port State Control and appropriate Vessel Traffic Service (VTS) stations so that vessels can be entered onto databases for monitoring, and ship inspections can be arranged.

This report does raise some general questions. *CHIRP* is aware that there are commercially available PPUs with independent AIS capability that can be carried on board by the pilot. These do away with the need for a data feed interface from ships' systems.

AIS is covered by SOLAS and, whilst not a GMDSS requirement, it has become a de facto part of a vessel's GMDSS equipment with the advent and acceptance of the AIS SART from 2010. On both counts the AIS equipment on board a vessel is required to be working and transmitting correct data. Indeed, the USCG highlighted the need for correct AIS data in a recent safety bulletin (04-20) relating to an incident where a causal factor in a number of fatalities was incorrect information entered into the vessels' AIS. In this case, the fact that the vessel was sailing with a known defect for at least three months and had been advised to call a service technician, but had not done so, is completely unacceptable. Human factors here include culture, awareness of risk, and communications, both on board and ashore.

There is a limit to what a ship at sea can achieve, but advising management about issues is an obvious step. Once management have been advised about a known error in a critical piece of onboard equipment, the onus is on the management to ensure the issue is resolved because failure to do so could, in the event of an accident, be considered to render the vessel unseaworthy with the potential to negate a vessel's insurance.

The above article was published in MFB 60

Article 21

More main engine problems whilst arriving and sailing

Outline: Although this topic was extensively covered in a recent issue of Maritime FEEDBACK, (MFB55), these two reports serve as a timely reminder to always be prepared for the unexpected.

What the reporter told us (1)

The vessel in question recently suffered a main engine problem shortly after departing her berth. It was found that the vessel could only proceed at a maximum of Slow Ahead, thus she proceeded to a local anchorage under pilotage to effect repairs. At the time of the pilot's disembarkation, the cause of the problem had not been identified.

What the reporter told us (2)

Approximately ten minutes after departing the berth and mid-stream on an outbound passage, the main engine developed a fuel leak which required the vessel to be stopped for approximately ten minutes. The channel does not have much room for manoeuvring, but we managed to hold station with the assistance of two tugs. With the fuel leak repaired the vessel got underway again, only to have to stop four minutes later due to a hydraulic pipe leak on the main engine. This time the delay was about thirty-five minutes. Nevertheless, the tugs again assisted us in holding station. Eventually the Chief Engineer cleared the vessel for transit, albeit at a maximum speed of half ahead. Upon clearing the channel buoys the vessel proceeded to anchor to effect full repairs.

CHIRP comment

The testing of main engines and a thorough inspection of the machinery by a responsible engineer is essential. During such inspections existing leaks and faults will be detected, although in these two specific reports there is no guarantee that testing of the main engine prior to departure would have prevented the stoppages.

Good communication and integrity of communications between different departments will allow prudent decisions to be made.

Planning for "what if" scenarios such as having to stop mid-channel with no anchorages in the vicinity and submarine pipelines precluding anchoring, form part of passage planning and the practice of good seamanship. Consider when tugs should be standing by and when they can safely be released, bearing in mind the topography of the approaches, nature of the seabed and the prevailing weather conditions.

The introduction of new low sulphur fuels has been much heralded in the maritime press and technical publications. *CHIRP* would be interested to receive reports dealing with any proven or suspected issues resulting from the use of these new fuels.

The above article was published in MFB 60

Article 22

Correspondence Received **Minimum speed for going astern**

With respect to your article in MFB56 regarding the master pilot exchange, it mentions that the main engine failed to start astern because the vessel was travelling at 3.5 knots. When the vessel reduced to 3 knots then there was no problem in getting the engine to go astern.

Is the 3 knots figure an owners, IMO, or similar requirement? I have never experienced any problem going astern at whatever speed the ship or engine has been running and would be grateful if you could advise where this came from and reasons for this arrangement.

Following discussion, the Maritime Advisory Board responded as follows

Assuming the vessel does not have a controllable pitch propeller, then in many cases, with way on the ship, the engine will not be able to go astern until a minimum speed is reached – in this case 3 knots or less.

It is normal in a critical, emergency situation for the master to instruct the engine room to perform a crash astern manoeuvre. This procedure should always be posted in the wheelhouse and all the bridge officers must be familiar with it.

A fully loaded motor ship of about 14,000 tonnes displacement manoeuvring from "sea speed" to standstill from a speed of about 14 knots, will still be moving ahead at approximately 2 to 3 knots around fifteen minutes after the 'Stop' order was given. The engine rpm will fall from 110 to 40 in about 7 to 8 minutes and gradually come to rest after about 12 minutes.

If a crash stop is demanded, the engine can usually be reversed after about 3 minutes, while still running ahead at about 30 rpm and can be running at 60% power astern in about 5 minutes. A slower vessel, or one in ballast, would take less time to accomplish this. It should be noted that a crash astern manoeuvre causes very high stress levels within the engine and may cause damage.

A master, and indeed a pilot, needs to know the maximum ahead speed through the water at which he can obtain an astern movement. It varies from ship to ship.

Some modern vessels with "optimised" designs of engine are not able to apply braking air for a substantial period – on one class it was a full 17 minutes at loaded draught – from slow ahead. This was discovered after delivery from the yard and had been designed-in, presumably for fuel efficiency and environmental factors rather than concentrating upon vessel manoeuvrability. The company in question ensured that this "quirk" was made a prominent opening part of every Master / Pilot information exchange - standard practice became that a braking tug with a large bollard pull was attached as soon as possible.

The above article was published in MFB 60

Article 23

Flooding of a superyacht

Outline: A report about flooding that could have had a tragic outcome.

What the reporter told us

A large yacht (100m+) weighed anchor and got under way with the intention of completing a 2-hour passage to another anchorage. The weather was good and the sea calm. Approximately 10 minutes after getting under way, an alarm for the elevator was received in the engine control room (ECR). The Chief Engineer dispatched the ETO to investigate. A minute later the ETO called the ECR to report that a vast amount of water was coming down the stairwell and out of the elevator shaft doors. It was quickly ascertained that the port side, lower deck, shell door was not closed. The bridge was called and requested to stop the ship. The shell door was closed.

Water had flooded down two decks via the stairwell and the elevator shaft. On the bottom deck the water collected on the tank top and was contained between the closed watertight doors. The incident was responded to and dealt with quickly, but this could have ended very differently.

Cause: The vessel has several shell doors on the lower deck (at the waterline) and the main deck (normal freeboard deck). Some of these had been open at anchor and all should have been closed prior to departure. The bridge pre-departure checklist requires that all shell doors are checked as closed. The checklist was completed, but the task was not. The shell doors can be visibly sighted from the port and starboard bridge wings. They are also monitored by CCTV and by a mimic monitoring panel on the bridge that displays the status of the openings. None of these were checked by the bridge team prior to departure.

Conclusion: Various methods were available for checking the status of the shell doors however the bridge team appeared to be unfamiliar with them or complacent about their use. The SMS pre-departure checklist is a wipe-clean laminate with a series of boxes to be ticked, but it had not been signed as completed. The checklist was completed by 'box ticking' without verification that the tasks were actually done.

Further dialogue

CHIRP engaged with the reporter who confirmed that a new pre-departure checklist, which requires the ECR staff to check the hull doors are closed, had been drafted and submitted for approval before he left the vessel. He also asserted that in his 20-year sea going career he had never seen an incident like it. Apparently, most of the crew on board had never heard of the *Herald of Free Enterprise* disaster.

CHIRP comment

With the amount of money this vessel cost to build it is hard to understand why the mimic monitoring system which was installed on the bridge was not duplicated in the ECR. However, the consensus of our Maritime Advisory Board members was that individuals have to be responsible and accountable for their actions or lack of them. On this vessel the bridge officers had a clear duty to carry out the pre departure checks diligently; there was a checklist to follow, there were multiple methods to monitor and confirm that the shell doors were indeed closed and yet they failed to do so. Was the failure incompetence, a lack of safety culture, complacency or negligence? There was certainly a lack of oversight.

The above article was published in MFB 61

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Section five

Deck safety, deck operations and cargo operations

Sadly, there are a number of all-too-familiar reports in this section. We begin with a lost crane load which would have been fatal to anyone working below. Upon investigation, it became clear that the stevedores were aware of the potential problem, but had not passed on their concerns to management. Better communication was obviously called for.

This is followed by reports about parting wires which clearly demonstrate the need for regular inspection and frequent renewal, and a near miss where a crew member was almost buried by a bulk cargo.

We also have a report about lifejackets which were returned after servicing in an inoperable condition. It is a good policy to trust nobody where your safety is concerned, and always check the equipment when it returns from servicing and, of course, before you use it.

We learn about a fairly new LPG tanker with unsuitable mooring arrangements, and a case where an incorrect valve alignment was spotted just in time.

There is correspondence we received about incorrect windlass brake band adjustment, and we would also draw your attention to a report on this topic which appears in Section 7.

Finally, we include correspondence about a situation where a rescue boat was found to be waterlogged and severely overweight, and we provide useful advice on checking this aboard your own vessels.

Article 24

Lost crane load during cargo operations

Outline: *CHIRP* was amongst a list of organisations to receive a completed accident investigation report from a port authority with the sole purpose of promulgating the findings to a wider audience so more people can learn from the issues highlighted.

What the report told us:

The vessel involved was a small Lift On / Lift Off general cargo vessel engaged on a regular container freight service. On arrival the ship had been unloaded of the containers and 'flats' (see photo below) destined for the port and back loading was in progress. The lower level of the hold had been 'boxed out' with containers leaving no gaps, and the loading of flats had begun. As normal, the flats were being placed directly on top of the containers.

With the intention of leaving no gaps, the loading of flats had started forward, working aft. The first flat, containing a red van, was landed facing astern parallel to the ships side. The next flat, containing a white van was landed athwartships. The following lift was the flat containing the 4x4 vehicle involved in the incident.

Cargo operations were being carried out by a shore crane operator and contract stevedores; no ship's crew were involved. All personnel engaged in the loading were suitably experienced and were in date for training with regards to their respective roles, there were current certificates where applicable and all lifting equipment used was in date within a six-monthly inspection routine. A six-monthly inspection routine was carried out by a third party contractor instead of a more normal annual inspection.

The 4x4 after the incident

The 4x4 vehicle concerned had been placed on the flat and secured using tensioned webbing straps and a standard lifting plan was then used by the stevedores and crane operator. There are normally three lifting options for such a flat bed and light vehicle combination using the shore crane and spreader bar arrangement, these involved a combination of open or safety hooks and chains, side lifting lugs or top lifting lugs with webbing slings.

In this case slings were chosen in order to avoid any risk of damage to the vehicle by chains. Lack of space in the hold precluded the use of side lifting lugs or hooks. Top lifting lugs were therefore chosen in combination with 5m webbing slings for the vehicle lifts.

The crane pre-start-up and pre operations check procedure had been properly signed off by the crane operator. However, unknown to anyone until after the accident, the CCTV in the crane cab, whilst working, was not recording so no direct coverage of the incident was available after the event. None of the port CCTV cameras were covering the area over the vessel's hold (one camera covered the lift from the quay but not the lowering into the hold)

The flat involved in the incident was to be placed athwartship, parallel and close to the white van. Whilst lowering down into the hold, the forward right-hand side of the flat struck the track of the moveable bulkhead. The contact was enough for the 'top lock' lifting equipment to become detached. This corner then dropped, causing the second 'top lock' on the same side to become detached, which caused the flat to tip over. The lashings attaching the vehicle to the flat then failed, and the vehicle dropped into the hold on its roof.

In the hold was the 'hatch man' – in constant radio contact with the crane operator – and two other stevedores. All were at a safe distance and no-one was harmed. No ship's crew were in the hold.

During the investigation it was found that although care is always taken to avoid standing under suspended loads, particular care is taken by stevedores with this type of "flat" due to perceived risk with the top-lifting attachments. **Such concerns had not been passed on to the management**. The process for operating the top lifting lug involves inserting each corner into the socket then turning the lug through ninety degrees and manually depressing the locking bar to hold it in place as weight is taken on the strops. If the locking bar is not fully located then, if weight comes off the lug, it would be possible for the lifting lug to rotate in the socket and for the lug to disconnect from the "flat". Port CCTV coverage showed that, just prior to the incident, two attempts were made to lift this particular "flat" from the quay with adjustments to the lugs being made in between.

Inspection of the flat involved showed that the top plate thickness of the lifting socket of this type of unit is (at approximately 20mm) some 8mm thinner than the standard fittings on other more modern flats and the industry standard (approx. 28mm). Given that the top of the plate is chamfered, only a parallel plate thickness of 8-10mm is available for the tab to connect with. This increases the risk of the tab on the lug moving enough to enable the lug to twist and disconnect especially if there was a twist in the strop. the light rain at the time may also have lubricated the surfaces.

At ≈20mm the top plate thickness was 8mm thinner than more modern "flats" and the current industry standard, ≈28mm

Chamfer on the lifting socket can be clearly seen.

CHIRP Comment:

- LoLo cargo operations are considered high intensity cargo handling and are being replaced by RoRo operations in some ports and routes. However, that option is not always suitable. Small vessels going to small ports will still be using LoLo for many years to come.
- This accident could have been avoided if just one of the many layers of risk had been rectified.
- If you are aware of an issue or potential issue don't keep it to yourself - always tell someone. Pass it on to your supervisor, put in a Hazard Observation Card or whatever method is available to notify management. Raise it at the next safety meeting.
- If there is an issue, don't try to work around it, address it and eliminate it for your own and everyone's safety.
- **This report clearly demonstrates why we should never stand under suspended loads.**

The above article was published in MFB 58

Article 25

Parting wires

Outline: Three reports that all relate to wires parting in service.

What the reporter told us (1):

The vessel had berthed safely, and the deck crew was instructed to deploy the starboard accommodation ladder. When the crew started lowering the ladder, the wire rope parted about two metres from its inboard thimble eye, in way of the outrigger's outboard guide sheave. The gangway fell and hung vertically down the ship's side. Fortunately, no one was injured. The ladder was recovered and secured, and the portable wharf gangway was deployed and used at the port.

Further Dialogue (1):

The company operated a maintenance programme that called for wires to be end-for-ended after 30 months and renewed every 5 years. The parted wire had only been installed 29 months earlier. The maintenance programme also called for the accommodation ladder to be thoroughly inspected every six months, however no specific instructions or guidance were provided for determining the condition of the wire. On board records showed that the last inspection of the accommodation ladder took place 2 weeks prior to the wire failure, at which time no defects were reported, the wire had been greased and all rollers and moving fittings were free to turn with no signs of defects. Subsequently the company amended their maintenance programme to include monthly inspections and maintenance requirements for the wires. Accommodation ladder wires constructed of galvanized wire rope must be renewed after 24 months.

What the reporter told us (2):

During mooring operations on arrival one of the ship's forward mooring wires parted at the eye whilst being heaved tight. The damaged wire was released from the shore bollard and replaced with a soft mooring line. The mooring operation was completed safely without further incident.

Further Dialogue (2):

According to the ship's records, the wire in question had been greased three days before arrival in port. A periodic inspection of the wire had been carried out less than 3 months before the failure, at which time the wire was assessed as acceptable. However, the records also showed that the wire had been in service for 5.7 years. No records of cutbacks, re-termination or periodic load tests were available. Spare mooring wires were available onboard.

What the reporter told us (3):

During routine discharge operations, 4 out of 6 strands of the inner breast mooring wire parted at a position 35-40 metres from the eye. The terminal was immediately informed, and permission was granted for the replacement of the damaged wire. The mooring wire was replaced and the discharge operation was completed without further incident.

Further Dialogue (3):

The wire in question had only been in service for 15 months. Records showed that an inspection one week before the vessel arrived in port had assessed the condition of the wire as 'very good'. The wire had been lubricated 3 weeks before arriving in port. Furthermore, vessel records also showed that the last brake holding capacity test for the mooring winch was performed less than three months before the failure. Spare wires were available on board. At the time of the failure, the breast lines were not equally tensioned, and the mooring brake of the parted wire had not slipped.

A company investigation concluded that the wire failed due to:

- Unequal tensions in the mooring lines and/or improper adjustment of the mooring brake and/or
- a hidden defect in the wire, although its general condition was very good

CHIRP comment:

Wire rope maintenance on board ships can be a major issue. Not all ships carry pressure lubricators for the wire ropes, while bigger ships mean bigger and heavier mooring wires being handled by smaller crews. Few ships have the capability to run a wire off the mooring winch drum for routine maintenance. Consequently, for many wires, surface dressing with a suitable wire rope lubricant (or simple grease) whilst still on the drum, is the best that can be hoped for.

From the very first time the mooring wire dips into the water, insidious saltwater corrosion begins to weaken the wire from the heart out. *CHIRP* would suggest that no mooring wire should be considered fit for purpose and 'acceptable' beyond 5 years.

The smaller wires used on an accommodation ladder may never go into the water, but their location at the ship's side is very exposed and renders the wire liable to constant attack

from saltwater spray. The wires are also exposed to sunlight and, potentially, tropical heat and dust, which is not ideal.

The first report is a perfect example of why combination pilot boarding arrangements , where the pilot ladder is secured directly to the accommodation ladder platform, are just inherently unsafe and wrong and should never be allowed.

In the first report, *CHIRP* commends the company who moved away from a 30-month end-for-ending and 5-year renewal policy to a straightforward 2-year renewal policy. One also has to question the wisdom of SOLAS permitting lifeboat fall wires to remain in place for up to 5 years. A simple 2-year renewal policy would have been so much easier and safer – surely?

The above article was published in MFB 59

Article 26

A very near miss

Outline: A moment's thoughtlessness could have had fatal consequences.

What the reporter told us:

A bulk carrier had arrived at a major iron ore terminal and commenced loading without delay the previous evening. At approximately 06:27, loading of No2 hold was completed and the shoreside loader was relocated to the next hold. Moving the loader to No6 hold was completed at 06:36 and the operator confirmed readiness with the chief officer to continue loading.

A few seconds before resumption of loading, the operator observed a crew member in the bottom of No6 hold. The circuit was suspended immediately, and the crew member was ordered to exit the hold by the deck officer on watch. Loading was resumed and completed uneventfully. The captain reported the Near Miss incident to the authorities, as required, and informed the company.

Further Dialogue:

The subsequent investigation noted the following:

From the ship/shore safety checklist review, it was noted that the main communication method between both parties was via handheld radios provided by the terminal on a given channel. It was also agreed that "the ship loader will be informed before access is made to any cargo compartment and that the covers of that compartment will be kept partially closed during the period of such access".

The chief officer had issued his standing orders for the cargo operation providing, amongst other things, specific precautions to be observed by the crew.

No 6 hold was in ballast condition on arrival, and it was planned to be de-ballasted and then mopped prior to being loaded. Once the de-ballasting was completed, an entry permit was issued at 05:00hrs for two AB's to enter and carry out the hold wiping.

A Risk Assessment for this operation had been carried out and communicated to the involved personnel. The entry into the hold was being supervised by the bosun. The deck officer on watch was attending to the cargo operations whilst maintaining contact with the chief officer and the terminal.

The work activities of the crewmembers in the cargo hold were completed at 06:30 hrs and both AB's were ordered to exit. Whilst exiting the space, one AB noticed that his cabin keys had been dropped in the hold and returned immediately to pick them up. Fortunately, the loader operator noticed the AB in the hold and the loading was suspended.

The officer on watch had not given any specific notice to the loader operator to commence or withhold loading operations to No 6 hold whilst he was expecting both AB's to exit the cargo hold.

From the review of the work/rest hours there was no indication that the involved crewmembers had inadequate rest periods prior to the incident.

Investigation conclusions:

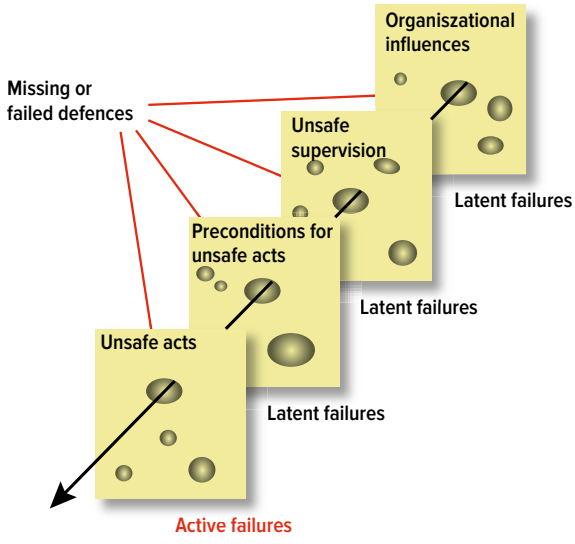
There was no proper notification given by the responsible ship's personnel to the ship loader in order to delay the shift to the next hold as required by the ship/shore safety checklist (inadequate communication/non-compliance with established safety reporting procedure).

The supervision/control of the enclosed space exit was not adequate since the supervisor failed to see that one of the crew had returned to the hold without obtaining permission. In addition, the AB who returned to the hold to pick up his keys failed to report this to the responsible watch personnel (inadequate implementation of cargo hold entry procedures).

The risk assessment carried out prior to the operation had not adequately identified the hazards related to the entry of personnel in the hold during cargo operations (inadequate risk assessment).

CHIRP comment:

A classic 'swiss cheese' incident. There were various checks and precautions either in place or available which should have made this potential accident impossible. One by one they failed because assumptions were made, or possible checks were not followed through and the final hole to line up was a momentary lapse in concentration by an AB who turned back into the hold to recover his dropped cabin key without thinking of the potential consequences. Luckily, the operator of the shore loader noticed the crew member before starting to load the hold. If the ship had kept the No 6 hatch covers partially closed, as required by the ship / shore safety check list during the mopping, it would have been obvious to all parties that the hold was not ready to load.



ACCIDENT!

The above article was published in MFB 59

Article 27

Inflatable lifejacket – service tag fitted incorrectly

Outline: The following report was received from a company DPA.

What the reporter told us

I want to share the following with you as I feel it would make a worthwhile safety flash to share across the industry. One of our vessels has reported that on two of its inflatable lifejackets, the servicing tags had been fitted in such a manner that they made it impossible to adjust the waist strap. Please see the attached photographs which illustrate the issue.

Further dialogue

CHIRP engaged with the reporter to confirm that the 'next service' tags in question had been fitted by a third-party service centre – they had been. After checking other vessels in the company, the reporter advised *CHIRP* that four other ships had equipment serviced by the same service provider. However, it appeared that this was an isolated incident which had not been replicated elsewhere. The DPA forwarded full details to the servicing company who gave assurances that it would not happen again.

Demonstrating how to adjust the lifejacket waist strap

Highlighting that the positioning of the service tag renders waist strap adjustment impossible

CHIRP comment

Beyond this specific report there is a wider issue with regards to the integrity and quality of service provided by some third-party service centres around the world. Ships' staff frequently assume that equipment sent ashore to a recognised third-party service centre is correctly serviced and returned in good, safe, operational condition. Complete with a new certificate, the equipment can be put into service around the vessel without further consideration.

However, *CHIRP* would suggest that upon return from third-party servicing, LSA and FFA equipment needs to be checked by ship's staff and, if possible, tested before being put into service. *CHIRP* is aware of liferafts being returned with time-expired equipment and survival rations out of date – only discovered on a subsequent service in a different country. BA sets have been returned in an inoperative condition and fire extinguishers returned with either time-expired CO_2 cartridges or unpressurised stored pressure units. It is possible that the renewed certificate is considered more important than a proficient health check on equipment.

The above article was published in MFB 60

Article 28

Mooring incident on an LPG tanker

Outline: This reporter sent details of an incident that occurred on his ship, a medium sized LPG tanker only 2 years old, which raises some questions about mooring arrangements.

What the reporter told us

The ship was moored alongside engaged in loading operations, with the deck watchman standing by the manifolds monitoring the ships position. The OOW was in the cargo control room. The watchman reported that the vessel had moved a few metres off the berth and at the same time the OOW noticed the wind had increased from 20 to 30kts. The OOW called the crew to stand by. The loading arms were not disconnected but all crew including the C/O were on deck and the master was on the bridge. The wind eased and the master ordered the crew to use the mooring ropes to bring the ship back alongside – which was done. No injuries were sustained, there was no damage to the vessel or terminal equipment and no pollution occurred.

An onboard investigation was carried out which noted the following:

- The berth in use was more exposed than others in the port.
- The vessel is fitted with soft line mooring ropes throughout whilst similar vessels are equipped with mooring wires.
- The vessel's length and fairlead positions are not ideally suited for the quayside bollards.
- The vessel is fitted with Panama fairleads throughout which are not best suited for soft lines.
- Mooring ropes on board are a mixture of split drum and loose ropes which turn up on the bitts.

The reporter also noted that similar incidents happened on two subsequent occasions on different voyages.

Example of a typical modern mooring arrangement
(Not the vessel in the report)

Further Dialogue

The excursion limit permitted by the loading arms was not known by the reporter and, while stopping the loading would have been a prudent precaution, it was not stopped on the orders of the captain.

The reporter had been sailing for 11 years on gas carriers and his present ship was the first one with all soft rope moorings, and whilst roller pedestals were fitted to improve the lead of some ropes; all the shipside fairleads were panama chocks.

The scope of the mooring ropes was nominally 60-65m for springs (split drum), 25m for breast lines (turned up) and 50-60m for head and stern lines (split drum).

The results of the shipboard investigation were sent to the company, but the reporter was not aware of any feedback.

CHIRP comment

A lot of modern ships are built with Panama fairleads (chocks) throughout, which are ideal if used in conjunction with mooring wires but are detrimental to soft mooring lines when compared to roller box fairleads. Equally, some modern ships are designed and built to moor using unrealistic mooring systems. Ports and terminals all over the world invariably demand additional mooring lines which challenge shipboard mooring arrangements - which maybe ill-designed and/or ill-equipped to comply with such demands.

This report highlights many human element issues and learning opportunities not least individual inexperience, vessel familiarisation and SMS procedures. In addition, Mooring Equipment Guideline 4 published by OCIMF gives invaluable guidance for all types of mooring systems and usage.

The above article was published in MFB 61

Article 29

Incorrect valve alignment

Outline: A fresh pair of eyes identified an incident waiting to happen on a chemical / oil product tanker.

What the reporter told us

The vessel had orders for several loading ports, and in each port different parcels of cargo were to be loaded. The cargo loading plan was made out and sent to various parties for approval (including the office ashore) and agreed by everyone. The vessel's design gives two options to collect oil / cargo in the event of a spill on deck.

- In the port slop tank (aft)
- In bulk ($1m^3$) spill drums (stb'd side midships)

Before arrival at the first loading port, spill collection was lined up to the port slop tank. In the first loading port the ship loaded a parcel of fish oil into a group of tanks, including the port slop tank.

On arrival at the second port, to load a parcel of ethanol, the spill collection arrangements were left lined-up to collect any cargo spillage into the port slop tank. A delayed crew change also took place at the second loading port.

After the crew change, during handover, the new Captain noted this arrangement and immediately had it changed to collect any cargo spillage into the spill drums.

Further dialogue

CHIRP engaged with the reporter and whilst there was no further information to add to the initial report, the reporter considered that the extended trips being worked by the crew (8-9 months) during the COVID-19 pandemic was a contributary factor in this human error.

CHIRP comment

This is a simple report about a human factors incident where a mistake was made. The question is why did those people make a mistake?

99% of the time, the people involved would not have made such a basic mistake, but on the rare occasion when a mistake is made (because mistakes do happen) the normal checks and balances that are incorporated into this routine operation would have identified and rectified it. However, on this occasion those checks and balances failed to identify the mistake and so the holes in the hypothetical swiss cheese aligned and waited for the final hole (a spillage of cargo) to line up, which would allow the near miss to by-pass the incident stage and turn into an accident.

Was fatigue and distraction caused, or exacerbated, by the extended tours of duty due to COVID-19? Potentially this was a contributary factor leading to this human error. Procedures, instructions and operational checklists with regards to using the slop tank to carry cargo should be reviewed, because this mistake slipped through the net too easily.

The above article was published in MFB 61

Article 30

Correspondence Received
Incorrect windlass brake band adjustment

On many vessels I have sailed on we have the same situation – the bosun tightens the bolts and chief officers and masters do not pay any attention to this problem. But the consequences of this wrong adjustment are slow speed of winch, damage to the brake liner, slackening of ropes and anchor and possibly injured crew members, hydraulic oil spills and damage to the vessel. The following investigation report was made by a previous company I worked for:

Following the windlass brake failure and subsequent loss of the starboard anchor and all 12 shackles of chain aboard one of the company's vessels, the opportunity

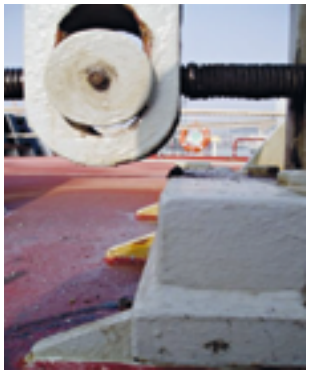
was taken to thoroughly investigate the possible cause of failure by inspecting the starboard windlass and braking mechanism aboard the sister vessel.

With the starboard anchor and chain tightly secured using the guillotine bar and a wire rope stopper, the weight was removed from the windlass brake. The brake band adjusting bottle screw and fixing plates were removed to the engine room workshop where the threads were thoroughly cleaned and lubricated.

On refitting the fixing plates and bottle screw the adjustment of same was kept to a minimum with only approximately 5 threads entered at both ends of the screw. The brake was then fully applied using the strength of two able seamen. With the drive clutch engaged, the hydraulic motor turned the windlass gypsy wheel with ease and there was absolutely no braking effect.

The reason for the freedom of movement was that the crosshead, located between the brake application shaft and the brake tensioning plates, was in contact with the windlass foundation, as shown in the photograph below:

Incorrect Brake Adjustment



Correct Brake Adjustment

The bottle screw was then tightened to the correct setting, i.e. allowing the gypsy to rotate freely in the brake 'off' position, but in the brake 'fully on' position the hydraulic motor could not rotate the gypsy. The clearance between the crosshead plates and the foundation with the brake fully applied was in the region of some 30 – 35mm.

Brake 'Fully On'

Bottle Screw Adjustment

Both port and starboard foundations were showing signs of contact with the crosshead plates, therefore it would seem that it is not uncommon, on this type of windlass, to have the brake tensions incorrectly set.

Conclusion: The loss of the starboard anchor on board the sister ship was probably due to incorrect brake adjustment.

Corrective Action: With immediate effect, all in the same class are to strip down and clean the internal and external threads of the bottle screw arrangements, insuring that before removal the anchors are fully secured using the lashing wire and compression bar. With the bottle screws refitted the brakes are to be adjusted to give 30 – 35 mm clearance between the foundation and the crosshead plates when the brake is 'Fully On'. To test the holding ability of the brakes, engage the drive shaft clutch, with the brake 'Fully On' and try and rotate the drum in a chain lowering direction using the hydraulic motor, there should be no motion of the gypsy wheel relative to the brake.

Prior to every anchoring operation it is the responsibility of the deck officer in charge on the forecastle deck to apply the brake fully and report to the master that there is a suitable 30 – 35 mm gap as previously described. (The engine department is to manufacture a two ended feeler gauge, one end with a 35mm thickness the other a 30mm thickness, this gauge is to be kept by the bosun who will measure the gap in the presence of the aforementioned deck officer).

Training: All personnel involved in the anchoring operation and the maintenance of the anchoring equipment are to be trained by the Chief Engineer and Chief Officer in the correct procedures prior to being permitted to operate or carry out any work on the equipment. The senior personnel are to include this message in their handover notes and give instruction to their relievers.

The above article was published in MFB 61

Article 31

Correspondence Received **Overweight rescue boats**

Several years ago, I was reading an article about a rescue boat that parted the fall wire and fell into the dock during a practice drill because it was overweight due to water entering the buoyancy spaces – one person was killed and two others badly injured.

The next day I checked our own rescue boat, and it was a surprise when we found that the covers of some openings were broken, and we found water inside.

- we stopped all drills with the rescue boat, awaiting instruction from the office.
- we were not able to check the weight of the rescue boat on board because we had no appropriate load cell. It should be included on the dry dock job list.
- on board newly delivered vessels, these openings should be filled up with silicon and then closed with a plastic plug.

We tried to mop out the water for two days, but it kept coming back, so the company instructed us to turn the boat upside down for a week to allow any water in the foam inside the compartments to drain out, which was successful. We then turned the boat up the right way and used silicone to seal the openings before fitting new plastic caps.

CHIRP comment

The article mentioned in this correspondence referred to the MAIB report into the fatal accident on board the car carrier *Tombarra* in 2011. https://assets.publishing.service.gov.uk/media/547c71c1ed915d4c0d000149/SB1-11.pdf

While acknowledging that this report is historic, the topic is still relevant today and while it was widely promulgated by certain flag states at the time, there are many vessels around the world and a whole generation of seafarers who may not be aware of the incident, the report or the remaining dangers.

The above article was published in MFB 61

Section six

Collision regulations and navigation

We begin this section with an all-too-familiar report about a vessel's failure to comply with the collision regulations in a routine crossing situation. The fact that the offending vessel altered course shortly afterwards towards a port entrance indicates the bridge was manned, and makes the case even more shocking. Sadly, this is not an isolated case, and perhaps research is needed to determine why some people are incapable of obeying even the most basic rules of the road. It is hard to believe our watchkeeping training is fit for purpose when there are so many examples of egregious behaviour.

This is followed by a report of a vessel which had laid off incorrect courses on her ECDIS for departure from a port, which we remind you could have led to her being deemed unseaworthy by the courts, and another of a passenger vessel blatantly crossing a Particularly Sensitive Sea Area (PSSA). These areas are only established for very good reasons, so all ships should avoid them.

We also feature an unusual case initially reported by our colleagues in *CHIRP* Aviation, where an aircraft on final approach had to take avoiding action when a passenger vessel crossed close to the end of a runway. There are a number of major airports where the runway lies close to the shipping lanes, and there are normally warnings posted on the chart to remind mariners to keep clear. We urge you all to avoid impeding aircraft near the ends of a runway.

Finally, we have an important account of a collision with a wind farm structure, which appears to have been caused when the master of the vessel was distracted by his mobile telephone. Mobile devices are very useful, but there is a time and place for using them, and during your watch is neither the time nor the place. It seems inevitable that incidents like this will become more common, but it should not be a given. Think before you act, or you may find that mobile devices are banned at sea. Please do not be like the watchkeeping officer who texted to the BBC during coverage of a cricket test match (T20 South Africa v. England on 1st December 2020) to say how much he was enjoying the cricket during his bridge watch!

This section concludes with a revised version of our earlier Insight article on anchoring. It has been revised and updated, particularly with respect to smaller vessels, and is a brilliant explanation of everything you need to know about anchoring. We commend it to all our readers.

Article 32

Failure to comply with Collision Regulations (Rule 15)

Outline: A 12m ketch on a night passage in the Mediterranean had to take evasive action to avoid collision with a 72m luxury motor yacht which failed to comply with the requirements of Rule 15.

What the reporter told us:

It was a clear night with good visibility, and we were approaching the outer reaches of our destination port, when we noticed a power-driven vessel approaching from our port side. We observed it visually and on our AIS unit (Note: the ketch's AIS was a receive only unit, not a transponder). We were making 5.8 knots under power and the approaching vessel was making 13 knots. The AIS showed a CPA of around 100m so we closely monitored the approaching vessel expecting it to alter course to starboard and pass astern of us. Our navigation lights were on and bright but the approaching vessel closed without altering course, so we turned on our deck lights to further illuminate our ketch and reduced speed to 2 knots. As the approaching vessel remained on what appeared to be a collision course, I altered course hard to starboard and eventually completed a full 360° round turn. Once the other vessel had passed, I resumed my original course. I tried calling the other vessel on VHF Channel 16 to alert her to the near miss, but there was no reply. I then took a screen shot of the AIS.

Screen shot of AIS display after the round turn to starboard

A few minutes after this, the other vessel turned hard to port to enter the ports' inbound channel so there was clearly someone on the bridge. I have no doubt that if I hadn't altered course so dramatically, we would have either been run down or had a *very* close call.

Despite clear navigation lights, (and by all accounts usually creating a good radar echo), it appeared we were invisible, perhaps because of our lack of an AIS transponder? I will be fitting an AIS transponder soon.

Further dialogue:

In clear visibility at night with navigation lights on, a 12m ketch is as visible as any other small craft, assuming of course that a visual lookout is being kept on the other vessel. In a modern enclosed wheelhouse full of every kind of electronic device and screen, the light pollution can be such as to render a visual lookout almost impossible unless great care is taken with dimmer settings.

The reporter did not mention if the ketch was fitted with a radar reflector but even if it was, that would only aid detection if the other ship had its radar turned on and somebody was actually monitoring the radar screens.

Potentially the only additional thing that could have been done was to flash an Aldis lamp into the wheelhouse of the approaching vessel in an attempt to attract their attention.

The reporter did exactly what he should have done by following the Collision Regulations, and the system worked. Regardless of the failure of the other vessel to comply with the regulations, the actions of the reporter ensured the safe arrival in port of both the reporter's ketch and the other vessel despite the latter's demonstration of poor seamanship.

The 72m motor yacht safely at anchor the following day

At the end of the report the reporter stated that he would be fitting an AIS transponder unit which would be prudent, but even that is not infallible. On every voyage there is always a chance to encounter a rogue vessel which through poor seamanship fails to comply with the requirements of Colregs. Always hope for the best but plan for the worst.

CHIRP Comment:

This report is an example of both bad and good application of Colregs. Taking into account that AIS is not intended for collision avoidance, the members of the *CHIRP* Maritime Advisory Board (MAB) noted that there was no mention of any bearings being taken to ascertain if a risk of collision did exist, which might suggest an over-reliance being placed upon the AIS. They also noted that when undertaking night voyages, an Aldis lamp or similar high intensity signalling light is a prudent addition to any craft's equipment inventory.

It was also noted that the visibility of navigation lights can be adversely affected by the movement of a small vessel and can easily be lost in the background lights of the shore. Furthermore, there is some suggestion of "confirmation bias" on ships' bridges so that even if a light is seen, if there is no confirmation by AIS or radar the visual sighting may be ignored or given a lower priority than a visual sighting corroborated by AIS.

That said, the reporter's assessment of the situation and the actions that were taken to avoid a potential collision were completely correct. The MAB members were also pleased to note that VHF communication was only attempted once collision avoidance action had been taken and proven to be effective.

The above article was published in MFB 58

Article 33

Learning opportunities from non-compliance reports

Outline: Two reports were received recently that contained references to unusual recommendations, rules and regulations. Following the adage 'take every opportunity to learn', *CHIRP* is publishing details in the belief that they need to be promulgated more widely to prevent ships' crews falling foul of them. Remember that other legal truism 'ignorance of the law is no defence'.

What the reporter told us (1):

Prior to sailing, it was noticed by the pilot that the vessel had totally incorrect tracks on the ECDIS for departure. The master was requested to remove the incorrect tracks within the port limits and to monitor the vessels progress against the recommended tracks permanently displayed on both ENC and paper charts. Shortly after clearing the berth, one of the bridge team put the correct tracks into the ECDIS.

In a recent report, it was highlighted by an admiralty court that a ship was deemed unseaworthy if the correct passage plan to and from the berth was not on the ship's charts or in the ECDIS system.

(This refers to a ship which grounded whilst leaving a port in China in 2011 – however the admiralty court ruling was only made in March 2019)
https://www.shipownersclub.com/robert-shearer-update-on-unseaworthiness-the-cma-cgm-libra/

CHIRP comment (1):

Once upon a time, course lines on a paper chart stopped on arrival at the pilot boarding station and commenced at the pilot station when sailing. With the advent of the requirement for berth to berth passage plans, the course lines were extended, often vaguely up the middle of the buoyed channel, into the port. As the ship rarely knew which berth it was going to before the pilot boarded – by which time the vessel was already in manual steering following courses TMO/PA – that was considered perfectly adequate.

Not so nowadays when pilots often come onboard and connect their own PPU's. If the captain and the bridge team are to effectively monitor the ships progress, then the track lines loaded and displayed on the ships ECDIS need to match those already in the pilots PPU. Plotting waypoints and tracks takes time, so unless the Master/Pilot exchange (MPX) is going to become a very lengthy affair, which is not desirable, then it is beholden on the port and pilot station to inform the ship in good time before arrival at the pilot station as to which berth the ship is going to utilise and the appropriate waypoints to input into the ships ECDIS to get them there. There is an argument that by utilising a port authority's waypoints the passage plan would no longer be the vessel's, but if the new section of the passage plan is auto-checked with the vessel's criteria of draft and required under keel clearance etc. by the ECDIS system, it seems to make little difference who instigated a waypoint co-ordinates.

The above article was published in MFB 59

Article 34

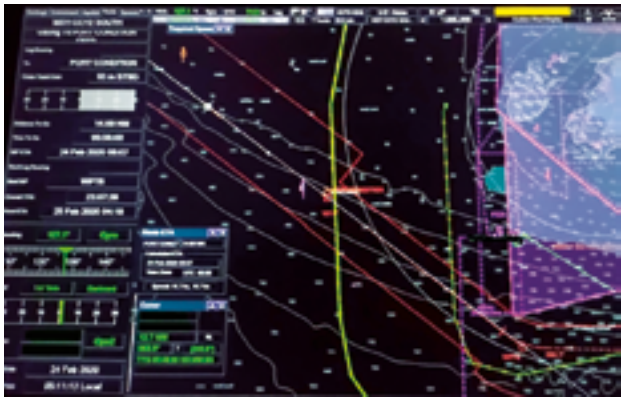
Violation of PSSA restricted area

Outline: Navigation through a PSSA (Particularly Sensitive Sea Area) is prohibited for vessels over 50m in length. However, not everybody obeys the rules.

What the reporter told us:

While on watch, I noticed another large cruise ship clearly enter and sail for over an hour through the PSSA we were passing. The other ship's AIS was on and identified the ship and showed her port of destination.

The reporter included a screen shot of the Radar/AIS clearly showing the reported ship transiting within the adjacent PSSA.



Screen shot of the Radar/AIS showing the reported ship transiting within the adjacent PSSA.

Further Dialogue:

The reporter confirmed that he had not reported the matter to the local maritime authorities due to poor internet access. The reported vessel was nearly 300m long and it is possible that it was cutting a large corner off the transit to make an ETA, or to make up some earlier lost time. At the very least, it is poor attention to passage planning. Contravening the PSSA restrictions for commercial interests would seem particularly cynical. There is a reason for the restrictions on navigating within a PSSA.

CHIRP Comment:

According to the IMO website: **A Particularly Sensitive Sea Area (PSSA)** is an area that needs special protection through action by IMO because of its significance for recognized ecological or socio-economic or scientific reasons, and which may be vulnerable to damage by international maritime activities...

There are 17 PSSAs in the world – including 3 extensions to the original Great Barrier Reef PSSA.

We would also add that, although by the time we received this report it was very much a historic event, we considered it important enough to forward the report to the appropriate maritime authorities for future reference.

The above article was published in MFB 59

Article 35

Conflict between aircraft and ships

Outline: This unusual report was received from *CHIRP* Aviation.

What the reporter told us:

While flying by ILS (instrument landing system) inbound to runway 35 at an island airport, we broke out of low cloud conditions several miles out, on final approach. I saw a very large cruise ship steaming from left to right out of the harbour with a course that would cross the short final in front of Runway 35.

It appeared that the ship's vector would cross ours on a very short final 1 mile. I directed the First Officer to query the tower if this ship was going to be a problem with our final. The tower's answer was something like "...they (the ships) don't coordinate with us." I elected to fly high on the final glide path, approximately one dot high, to ensure adequate clearance over the cruise ship but was also considering a go-around because of the height of the ship. It turned out that we did, in fact, cross directly over the ship on short final. If I had stayed on the ILS glideslope the clearance would have been very uncomfortable. Had this been IMC (instrument meteorological conditions) and with any deviation at all below the glideslope, there may have been inadequate clearance over the ship. Although I was able to fly a little high and conduct a stabilized approach in this instance, it seemed like a potentially hazardous situation that should be better coordinated in the future.

CHIRP comment:

There are several international airports around the world that are in close proximity to maritime traffic movements, including Singapore's Changi airport, Hong Kong's Chek Lap Kok airport and Gibraltar's North Front airport. At these locations there is organised co-ordination between the aircraft requirements and the vessel requirements, by having a restricted area or a vessel reporting scheme during approach to and passing of the end of the runways.

Aerial view showing proximity of the runway and port entrance

However, in this case, according to the air traffic control tower, the ships do not liaise with the tower and there does not appear to be any restricted area to limit the approach and passing of vessels in the vicinity of the end of the runway.

Historically, small vessels and fishing craft were not going to be of concern to the pilot of a commercial aircraft making a landing approach. However, with the massive expansion in both the popularity of cruise holidays and the size of the cruise ships being used (modern cruise ships can have air drafts up to 72m), perhaps a review of the arrangements, at this and every other airport where potential for conflict between aircraft and large vessels exists, is overdue.

Final thought:

The original report was generated by a commercial aircraft pilot and was extensively promulgated but all the recipients listed appeared to be involved in aviation . As the other part of the potential conflict involved the maritime world, *CHIRP* Maritime decided to draw the report to the attention of the relevant port state control and maritime administrations.

The above article was published in MFB 59

Article 36

Distraction results in allision

Outline: Distractions can lead to serious, potentially fatal, consequences.

What the reporter told us

CHIRP received a report concerning the allision of a vessel with an offshore wind turbine tower. We attempted to clarify some points and gain more information, but the reporter declined to engage further. However, during our own investigation, the basic details of the allision were found in the public domain.

The vessel involved was a service vessel engaged in transferring personnel between a shore base and wind turbines in offshore locations. The only other details initially available were that the hull had been breached at the bow and suffered water ingress, and that three persons on board sustained injury during the allision. The damaged vessel had then been escorted to port by an offshore lifeboat.

The Consequence of distraction.
(Photograph taken from the Flag State Administration Final Report – vessel name obscured)

Further dialogue

CHIRP attempted to contact the DPA and managers of the vessel, but they did not respond. We later learned that, following an investigation, the flag state administration had published a report into the incident. *CHIRP* contacted the flag state administration who readily engaged and welcomed promulgation of the report to a wider maritime audience.

From the final report

The service vessel had finished the day's tasks and was released to return to port for the night; but whilst transiting through the wind farm at a speed of approximately 20 knots, it hit a tower. In the summary of findings, the final report notes "the primary reason why a proper lookout was not being kept was because the Master, who had the conduct of the vessel, was distracted from his primary role".

The report contains images taken from the wheelhouse CCTV that show the captain looking to his right and downwards prior to impact with the rapidly closing tower.

View the full report at https://cdn.ports.je/web/2020-04-23-Njord-Forseti-Incident-report-FINAL.pdf

CHIRP comment

Nobody sets out to have an accident, nobody plans to be distracted. On this occasion it happened to be the master who had control of the vessel and was distracted, but anybody can become distracted and as a result could suffer the same consequence, or worse.

Distractions come in many different forms, from fleeting momentary ones to ongoing long-term distractions. This is particularly true if you consider the current COVID-19 pandemic where seafarers are being obliged to work much longer tours of duty than normal with possibly no prospect of relief on the horizon.

Modern, open bridges have many sources of potential distraction, including telephone calls both internal and external, numerous alarms – ECDIS, AIS, GMDSS, IAS (integrated alarm system), fire alarm control panel, ballast control system, CCTV systems and e-mail systems; so there can be little surprise that officers of the watch become distracted.

Some companies designate sea areas with high traffic density or numerous obstructions etc. to be Red Waters as opposed to areas of open sea with normal traffic density. The latter require normal levels of diligence whereas the former require heightened levels of attention and concentration. This may well require an additional person on the bridge as a dedicated lookout or even doubling-up of the watchkeepers. If that is not possible, one has to ask if there is a manning issue?

On virtually every vessel there are standing orders for both bridge and engine room personnel and those orders will usually include an instruction to call the Captain or C/E if required, and if in doubt to utilise an additional person. However, if the Captain or C/E have the watch, who do they call upon for back-up?

The above article was published in MFB 61

Article 37

Insight – **Anchoring and anchoring equipment – Revision 1**

The following Insight article was originally published by *CHIRP* Maritime in 2017 but has been revised following correspondence with the smaller vessel leisure sector. A new section relating to smaller vessels has been added to the Insight.

Introduction

Recent incidents reported to *CHIRP* have highlighted that a more informed use of anchoring equipment may lead to safer practices and outcomes. In addition, P+I Clubs and classification societies state that "anchor losses and associated costs have been on the rise since 2012, but the large majority could have been prevented" (DNV-GL, GARD, and the Swedish Club 2016).

Guidance for best practice navigation in the vicinity of anchorages has been widely discussed in maritime industry circulars and papers. In this paper, *CHIRP* underlines the principles and good practices for anchoring and preserving equipment and describes aspects of navigation practice that will ease the stresses on equipment to reduce failures.

Safe anchorages

Safe anchorages are normally clearly marked on charts and most anchoring will preferably be done within them. This reduces the risk of fouling anchors on uncharted obstructions and the nature of the seabed normally makes for good holding ground. If choosing to anchor outside of a charted anchorage risks may well be greater and will not be known.

Safe swinging distance.

Safe anchorage location is best achieved by selecting the largest available distance from other anchored vessels or the shore within the anchorage. If the authorities have allocated designated locations within it, A1, A2 etc., you will often be instructed where to anchor, which makes things much easier. In this case, safe swinging distances from other vessels are assured, providing you locate your anchor in the centre of the allocated anchoring circle.

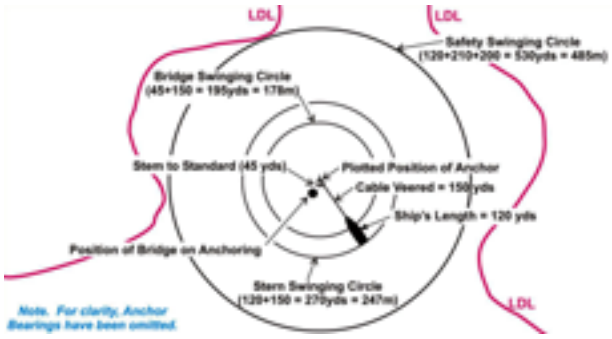


Figure 1 – Safe swinging distances. (Illustration courtesy of the Royal Navy).

In the diagram above, LDL references the "Limiting Danger Line", possibly more commonly referred to as a safety contour in ECDIS, or "no go area" when shaded on a traditional chart. The concept is further discussed in Figure 3.

Safe swinging distances are calculated from the length of cable paid out, plus the length of the vessel, with the minimum comfortable passing distance from another vessel added. It is important to allow for the fact that on change of tide or wind not all vessels will swing to their new heading at the same time or in the same direction of rotation. It is therefore quite possible that two vessels lying quite safe to their cables at the turn of the tide may well then find their sterns swinging towards each other – often quite quickly. This is the point at which a minimum safe passing distance must be assured by choice of initial anchoring location. In doing so this very worst case, with adverse timing and environmental influence, will still ensure that a safe distance is maintained. If the luxury of a comfortable safe swinging distance cannot be assured in the initial choice of anchoring location, consideration must be given to having the ship's engines on standby for immediate use at the time of the turn of the tide or when any adverse influence such as weather is predicted. Having the ship's engines ready for immediate manoeuvre will mean they are available to be used in an emergency to move your stern away from a swinging vessel coming into close proximity, or indeed if you have to weigh immediately. It should be noted that any anticipated engine shut down for maintenance at anchor, a common need during this normally quiet period, must only be considered if a safe anchor swinging distance is assured and the prevailing weather forecast is favourable. If not, the engines may well be needed quickly, and they may not be ready until it is too late. A general safety allowance for larger vessels may be considered to be three cables. However, this is to be considered as a minimum and should be increased if there is to be a long duration of stay at anchorage, forecast of deteriorating weather, prolonged unavailability of engines, etc. Marking a safe swinging distance on the chart as a circle centred on the anchor position and not the vessel's position will be a helpful indicator to judge safe proximities.

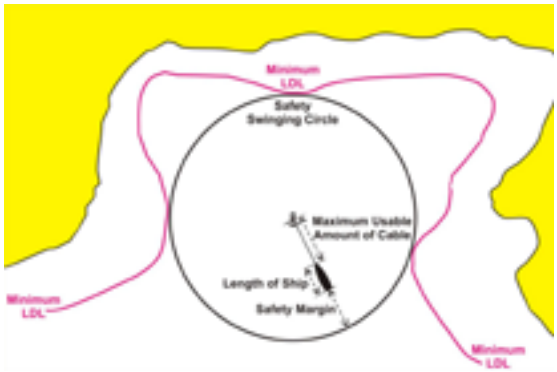


Figure 2 – Safe swinging circle. (Illustration courtesy of the Royal Navy).

Anchoring principles

Ships anchor primarily to the weight of the catenary in the cable and not solely to the anchor, length of cable, brake, stopper or any other equipment. This is a point of principle in anchoring that needs to be well understood. Neglect of understanding of this essential principle underlies many failures of anchors, cables or windlass brakes. It is worth considering this carefully for a moment, since anchoring equipment failures may be avoided if this key principle is both clearly understood and taken into account with anchoring procedures. The catenary in the cable is that length of anchor cable that curves upwards in an arc from the seabed and includes where it comes up from the surface of the sea and into the hawse pipe. Ships are best anchored to a gentle curve in this cable so most of that catenary lies under the surface of the water. It is largely gravity acting vertically down on this length of catenary that actually anchors the vessel. If the length of cable catenary paid out for anchoring is too short, this curve is too steep for gravity to act successfully upon it. When the strain on the cable is high the anchor will be raised from lying flat on the seabed and dragged in the direction of load. The vessel will drag her anchor down tide, wind or current. Even if a long length of cable is paid out, if that cable is under high load and straight from the hawse pipe to the sea this indicates that the limit of gravity on the catenary anchoring the vessel has now been exceeded. A straight lead, whatever the length of cable, indicates it is only the anchor that is now holding the vessel and it may already be dragging. Vibration in a straight cable may exist if the anchor is dragging. Generally, a straight anchor cable lead indicates the need to pay out more cable so that a catenary curve is re-established, and gravity is restored as the principle by which the vessel is anchored to her cable. A straight cable lead is also indicative that the cable is under excessive forces, which are outside of the design parameters, (see section on Technical Constraints).

A close anchor watch, on both cable lead, weight, changes in weather and tide and of course position are basic principles that should be obvious. It must be stressed, however, that close monitoring at all times will give the earliest indication of any change of state and allow timely decisions to be made. This will avoid the inevitably poor outcomes if a close anchor watch is not maintained

Length of cable

The length of cable needed to anchor a vessel varies according to the depth of water, the safe swinging radius needed from other vessels, length of stay, weather forecast and holding ground suitability. As a general rule for vessels anchoring in a depth of water comparable to the length of a single shackle of cable (20~25 metres of water), allow four shackles for the depth of water (4 shackles for a depth of 1 shackle). Then add an extra shackle to allow for moderate loading and catenary - one shackle length will be taken up from the gypsy to the waterline so that the 4 shackles are from the waterline to the anchor. Then consider adding an extra shackle to allow for deteriorating weather. The reader will see we arrive at 4+1+1 = 6 shackles of cable for a water depth of 20~25 metres. Add another one shackle at a time for worsening factors such as long duration, holding ground warnings, history of strong squalls etc. Then consider the safe swinging distance and remember that more cable will require greater swinging distance.

The following rule of thumb formula for length of cable suited to depth of water, taken from the Admiralty Manual of Seamanship, may be helpful.

Amount of cable required (in shackles) =
1½ √(depth (in metres))

Caution must be taken when anchoring in greater depths of water than a shackle length. Deep water anchorages

such as Fujairah in the United Arab Emirates may be 100 metres deep. Walking the anchor out in gear at depths above one shackle length is almost certainly necessary to avoid an anchor being carried away. Mariners should also be aware of the limitations on the strength of the windlass to recover an anchor and cable from such depths. Wear on the windlass motor over a period will certainly reduce the depths at which an anchor may be recovered. At all times vessels must be absolutely stopped for anchoring and weighing in deep water.

Preparations for anchoring

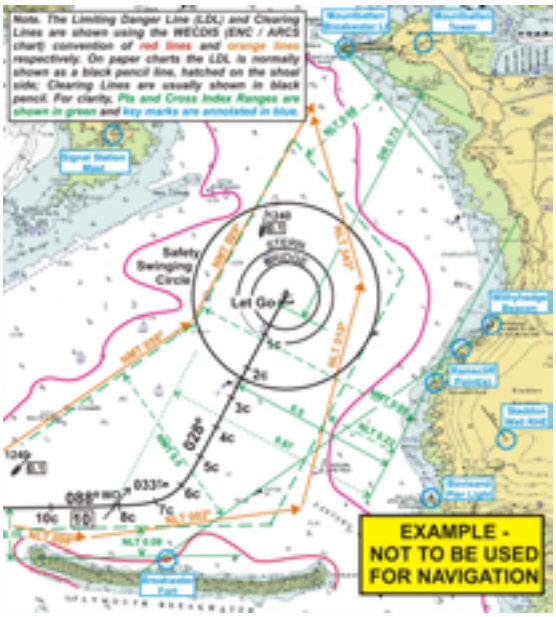


Figure 3 – Limiting Danger Lines and Clearing Lines. (Illustration courtesy of the Royal Navy).

In preparing for anchoring the master may decide to walk the anchor back to the water line. On large vessels, in particular those which may be fitted with a large bulbous bow, and may also have a flush-decked design limiting the clearance of the anchor from the bulb, there is distinct possibility of the anchor swinging into contact with the plating in way of the bulb. This may be further exacerbated by the vessel rolling into the trough as the way is taken off. On such vessels, it is good practice to lower the anchor to a position below the waterline and more level with the vessel's keel. This is best done when most of the way is off the vessel to prevent hydrodynamic forces causing contact. Once in the lower position the anchor will be dampened in any swing by the water, and any contact with plating is likely to be by the chain and not by parts of the anchor. Penetration of the plating could go undetected, and subsequent flooding due to water ingress may result in internal and/or shell plating damage. In very large vessels carrying dense cargoes the resulting trim by the head could seriously threaten the vessel's safety. On such vessels, it is a good policy to regularly inspect shell plating in way of fore peak tanks and anchor paths to detect indentations that could lead to cracking and later failure. Of course, full enclosed entry procedures should **always** be observed during such inspections.

Letting go

Letting go and free running of anchor cable on any but small vessels, is best limited to depths of water equivalent to one shackle length or less. The weight and momentum of free running cable of any long length will tax both the centrifugal brake limiter, (if fitted), and the band brake. In depths over one shackle length walking out the cable in gear to a position just above the seabed may give a more controlled anchoring and save taxing the brake unduly. Note should be made that where an internal automatic centrifugal governor brake is fitted it is this that controls the speed of letting go and not the application of the external band brake. When

P+I Clubs and classification societies state that "anchor losses and associated costs have been on the rise since 2012, but the large majority could have been prevented"

releasing the external brake, it must be fully opened for free running and then fully closed to stop the cable when the necessary amount has been let go. Under no circumstances should control of the letting go speed be attempted by partial application of the band brake to slow the running out speed. This incorrect practice is known as riding the brake. The thin lining will rapidly overheat as it is not meant to be a speed friction brake like the governor. The lining will glaze smooth with the heat, may well catch fire and become completely glazed losing friction and be unable to stop the cable running out at all. The loss of the cable completely and an unsafe uncontrolled release with a real danger to personnel will result. This is a not an infrequent dangerous occurrence when riding the brake is attempted. Be warned "riding" any brake is poor practice and will lead to premature equipment failure.

Brought up and anchored

Being successfully anchored to the catenary of the cable is known as being "brought up". When the cable is paid out to bring the ship to anchor and the vessel moves aft to take the load, the cable will straighten and load with weight. The moment comes when this aft movement is then stopped, and the cable is at its highest load. After this point, the vessel should then move ahead as the gravity acting upon the catenary of the cable is greater than the momentum of the ship moving astern, and the ship starts to move ahead under the force of this gravity. The load on the cable is noted as easing and a dip in the cable is observed. This is the moment of being safely anchored and "brought up". Do note that if the load continues to be high with a straight un-dipped cable, there is the possibility that the anchor is dragging, and the ship will still be moving astern. The bridge will be able to monitor this by observing the speed over the ground and will also be able to detect whether or not the vessel has started to come ahead or is still moving astern and dragging anchor. There may be a period of stretching out any cable that lies piled up on the seabed. This period needs to be carefully observed, and patience is needed until the first signs of being "brought up" are noted with any stern way arrested. Only then is the anchoring complete.

Large vessels

A different anchoring process applicable to large vessels is well worth noting. As the cable tension increases as the vessel is brought up, there is a transfer of energy created by the moving hull. This energy transfers through the anchor, the cable and the point on board the vessel where the windlass machinery is fixed. This peak of energy transfer can, in larger vessels, result in extreme forces at the windlass mountings. The momentum of a vessel of 200,000 tonnes displacement or more is not easily dispersed, and damage can result. One solution known as Orthogonal Anchoring has been advocated by Capt. A. McDowall in his *Nautical Institute Monograph, Anchoring Large Vessels: A New Approach*, (ISBN 1870077563, 9781870077569). Briefly, and where there is room in the anchorage to do so, the technique involves positioning the vessel across the direction of travel imposed by external forces of tide, current or wind so that the cable runs out on the beam. Even without tide, current or wind a hard-over turn will impose a sideways momentum on the vessel that will enable the anchor to run out on the beam rather than being aligned with the keel. As the cable is moderately braked then stopped, the energy, instead of all being concentrated on the windlass mounts as the cable attempts to stop the way of the vessel over the ground, is absorbed by the turning moment that results in the vessel's position becoming gradually aligned with the cable direction. As the hull aligns in this way, the peak of energy will have been dispersed in the force used to turn the hull. At this point, it may also be opportune to use an ahead movement to disperse any remaining momentum and bring the vessel to a complete stop over the ground.

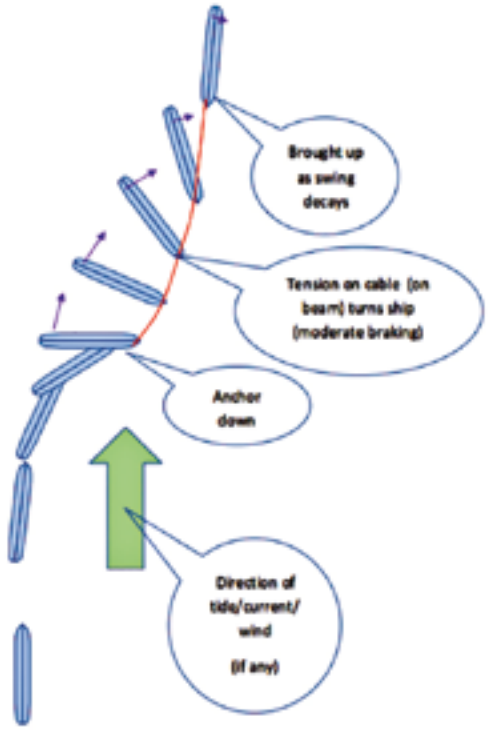


Figure 4 – Example of Orthogonal Anchoring. (Illustration courtesy of D. Barber).

Smaller vessels – leisure sector.

The generally adopted leisure craft rule for the length of chain is three times the depth when using chain, and five times if using a warp rope. If you are in any doubt you just pay out more. Some smaller boats use a mix of chain and warp but, depending on the ratio, the warp can add buoyancy to the system. This may pull the chain upwards and render it less effective. Experience has shown that increasing the 1:1 chain to warp ratio to a 2:1 ratio will be more effective.

The anchor and chain act as one system whereby the anchor is essentially a securing point to the seabed. The anchor relies on the weight of the chain to provide a smooth curved run to the anchor - this will start in the same plane as the dug-in anchor and will gradually curve upwards to the vessel. The more chain resting on the

bottom the lower the likelihood of the anchor lifting. The curve of the catenary is the interesting learning point. Essentially the greater the curvature of the catenary the greater the energy required to straighten the catenary and therefore potentially dislodge the anchor. This is why we employ the tactic of easing more chain out as the weather or swell worsens.

One variable for smaller vessels is the type of anchor which is fitted. A wide variety of anchor styles are available for smaller vessels, whereas larger ships tend to all have similar types.

The official anchoring formula for length of cable suited to depth of water, taken from the Admiralty Manual of Seamanship, is worth repeating: "Length of cable required (shackles) = 1½√ Depth (in metres). Caution must be taken when anchoring in greater depths of water than a shackle length." A rule of thumb for smaller vessels is to lay out four times the depth, add extra for predicted factors such as weather and tide but have a bit more ready to pay out if the wind increases.

For very shallow anchorages, there will be other effects as well, which make the formulae more complicated. Analysis shows that, in order not to put excessive load on the anchor, it is safer to anchor in slightly deeper water and use a little more chain, rather than to anchor in shallow water. Another factor to consider is swell and the direction it is coming from. Only swell from ahead will have a significant effect, but this must be taken into account.

CHIRP Maritime has been advised of the following article, specific to the smaller vessel leisure sector, for those who may wish to investigate further: https://trimaran-san.de/die-kettenkurve-oder-wie-ein-mathematiker-ankert/

Completion of anchoring

Once anchoring is complete, the anchor may be secured by screwing down the band brake and lowering the guillotine over a flat cable link, or applying whatever patent stopper is fitted on your vessel. This may require the crew to clutch in a windlass motor to adjust the exact lay of the cable links. When secured, fit a small flag pole or marker to the top of the gypsy where the cable is visible from the bridge. Note that is essential that the vessel is properly brought up, and that there is no possibility of movement of the chain prior to setting a flag. Retro-reflective tape may be used for night marking. This ensures that the cable is easily observed from the bridge and that no movement under strain takes place unobserved. Some vessels commonly practice leaving a small gap between the cable vertical link and the guillotine to test if the band brake renders onto the guillotine (a form of brake test). Others prefer to rest the vertical link against the guillotine so that although the brake is still fully applied, the main weight is taken on the guillotine. Both practices have merits and disadvantages, and it is a matter of choice and practice, but using them assures an independent means of securing the cable at all times

Weakness of equipment

Consider the weakest parts of the anchor equipment to be:

1. The windlass motor,
2. The brake,
3. The anchor.

A windlass is only rated to recover half the length of the total anchor cable vertically in deep water. In deeper water there is greater risk that an aging motor will not be able to recover the cable. When recovering the anchor cable, the windlass should only be used when the cable is "up and down", meaning only the weight of the cable is acting upon it. Use the vessel's engine to move the ship ahead, guided by reports from the forecastle of the lead of the cable, so that the cable is only recovered with its own weight on the motor. Do not heave a cable leading away from the ship as the windless could become overloaded and stall, and may well be damaged by such overloading and then no longer be capable of heaving any cable at all. Good forecastle reporting of lead direction (by points on the bow) and loading (short, medium or long stay) are essential. Careful use of engines and rudder to keep the cable "up and down" minimises the loading on the weakest part of the equipment.... the windlass motor. Effective communication with the bridge at all times is critical.

It must be stressed that there is a danger of overstressing hydraulic windlass motors, especially when trying to pick up anchors in heavy weather. Anchoring equipment is only warranted to Beaufort Force 6 which emphasises the need for masters to be proactive when the weather deteriorates, i.e. reduce strain on the anchor by sensible use of the engine(s) and pick up the anchor at an early stage before the weather deteriorates to a point where this becomes too difficult, especially when on a lee shore. There have been serious accidents when windlasses have exploded through overpressure when the hydraulic motor has acted like an over-pressured pump (there are usually no relief valves on the system).

In deteriorating environmental conditions the decision to weigh and recover anchor early is a critical one. Experience, judgement and anticipation are key. To postpone that decision and be forced to make it later in failing conditions significantly increases the risk of anchoring equipment failure.

Addition reference material may be found in the following publication – IACS Requirements concerning Mooring, Anchoring and Towing 2017 which consists of the following unified requirements;

- A1 Anchoring Equipment Corr.2 Mar 2017;
- A2 Shipboard fittings and supporting hull structures associated with towing and mooring on conventional ships Corr.2 Mar 2017; and
- A3 Anchor Windlass Design and Testing June 2017.

Securing for sea

When securing the cable for sea, ensure the anchor is fully home and made fast with anchor lashings in good condition, strong enough for purpose, and made as tight as possible to keep the anchor from moving. A moving anchor in heavy seas is capable of fracturing the hull or, in extreme cases, punching a hole in the bow. In heavy weather, turn the vessel daily to ensure safe personnel access and inspect the anchors to ensure they remain secure. What prevents the vessel from moving in an anchorage, can sink her if it starts to move at sea.

Technical constraints.

A consideration of the design technical constraints of anchoring equipment will be helpful. According to a DNV-GL article, "Most Anchor Losses Are Preventable" there is a general lack of awareness of the environmental loads for which anchoring equipment is designed. Class societies have unified rules for the design of anchoring equipment, but the rules are based ONLY upon sheltered waters. Safety Management Systems often ignore this vital fact!

The maximum environmental loads are:
Current velocity: maximum 2.5m/s or 5 knots
Wind velocity: maximum 25m/s or 48 knots
No waves (sheltered waters).

Investigations into the root causes for losses of anchors have shown that, in a majority of the cases, the environmental conditions exceeded those stated above. Many anchoring locations are outside sheltered waters and an equivalent environmental load for such areas is regarded as:
Current velocity: maximum 1.5m/s or 3 knots
Wind velocity: maximum 11m/s or 21 knots
Significant wave height: maximum 2m.

In broad **Beaufort** wind scale terms, it is generally accepted that anchoring limits are set at **Force 6**.

Conclusions

Key points that will prevent most anchoring equipment incidents are...

1. Remember it is the catenary in the cable that anchors the ship.
2. Pay out more cable to establish catenary often re-anchors a dragging vessel BUT....
3. Always allow room for swinging towards other vessels. If adequate room is a concern then engines must be on immediate standby, (or alternatively heave anchor and find a safer location).
4. Never ride the band brake letting go. It WILL overheat and it will FAIL. **Full off – Full on only**.
5. Nurture the windlass motor by only ever heaving in slack cable.... It is the weakest link!
6. Keep anchors tightly secured at sea especially in heavy weather and check securing daily.
7. Always take account of the maximum environmental loads for the equipment as designated by Class.

Class societies have unified rules for the design of anchoring equipment, but the rules are based ONLY upon sheltered waters. Safety Management Systems often ignore this vital fact!

Section seven

Safety culture

We start with a report about the testing of 500-man liferafts off a port. The list of incidents which demonstrate that a robust safety culture was lacking is too long to repeat in this introduction, but we urge you to read it and see for yourselves. This report would make an excellent case study for a ship's safety meeting because it contains so many discussion points.

This is followed by an example of a vessel where the safety culture was sadly lacking, and a report about a vessel which had apparently not tested its pilot ladder for nine years!

We have yet another example of the crew of a superyacht working outside the safety rails without using PPE, and learn about a tug which operated with a defective winch brake for an extended period.

The Insight article in this section is yet another masterful account of risk assessment by our own Ian Shields. His work builds year-on-year and will reward careful study by anyone who cares about safety at sea.

Article 38

Poor communication and lack of command decision

Outline: Poor planning and even poorer communication put crew members in potential danger.

What the reporter told us:

On 4th December two offshore vessels arrived at the port, the lead ship having been a frequent visitor whilst the other vessel was on a first visit. Their berths had been booked directly with the berth operator, and the Harbour Master had been given no information about their visit. The reporter, a duty pilot, learned while bringing the ships in that they would both be sailing the next morning in order to test life rafts.

Both vessels duly departed and a (different) duty pilot learnt that they were testing 500-man life rafts needing about 3m of swell to test them. This was all the information that was given.

In the early afternoon the lead ship called the VTS, indicating it would require a pilot to return to the berth, but that things had not gone 'completely to plan'. The reporter spoke to the master of the inbound vessel who advised that there were still evacuation chutes attached to his ship's starboard side, "*but it wouldn't be an issue as they didn't effect manoeuvrability and the ship would berth port side to. However pilot boarding would not be possible on the starboard side*". The pilot expressed doubts at the vessel being able to berth at all in the prevailing conditions with a 40kt wind directly on the beam when approaching the berth, since it was known that the vessel had a very large forward windage and a single bow tunnel thruster. The master agreed and it was decided to wait until the wind speed reduced before berthing.

Enquiries were made as to the situation regarding the second vessel. The captain stated that she was towing the 2 life rafts, so it was pointed out that she would not be able to enter until daylight slack water the next day. Port procedure is for all tows to enter at slack water as there are strong tides across the entrance.

After the reporter had sailed another vessel, he returned to the VTS. The Harbour Master was speaking by telephone to the project managers. They were unhappy that the second vessel could not enter the port. At this stage the Harbour Master was told that their fast rescue craft had broken down and 4 persons were still in the life rafts, but "they had survival suits on so that is all right". The telephone call ended shortly afterwards.

Within the VTS, it was suggested that the Coastguard needed to be aware of the situation, as it would be dark shortly and the 4 men needed to be removed from the life rafts. A few minutes later the Harbour Master called the project managers and said they should get the men out of the life rafts. He asked if they had informed the Coastguard. They said they had, but the reporter heard them call the Coastguard immediately afterwards.

The Coastguard took control of the situation and established that 1 man was possibly injured. Within a short time, the local lifeboat was tasked to rescue the 4 men. They successfully did this.

When the men were brought ashore (one with a broken ankle) one approached the Harbour Master and thanked him, as he had heard it was the port that had insisted that they were rescued. He stated that conditions in the life rafts were horrendous.

The duty pilot safely berthed the lead vessel at about 21:00 when the wind had eased. The reporter was on duty again the next day and managed to board the second vessel outside. Once through the breakwaters the 2 life rafts were transferred to harbour work boats which allowed the second vessel to berth safely followed by the two life rafts. Note: Each of the life rafts was 28m x10m.

Further Dialogue:

Apparently, there was a flag state surveyor on board the lead vessel to witness the test / trial of the life rafts.

CHIRP Comment:

Regarding this report, the members of the MAB considered that there were some details and other information that *CHIRP* was not privy to, namely the purpose of the test. Was it a prototype test, a product function test or an acceptance trial?

While none of the MAB members had encountered a 500 man life raft before, the basics of good seamanship, proper planning and risk assessment apply to any maritime undertaking and this report highlighted several shortfalls in those areas.

- The members of the MAB found it difficult to comprehend that berths can be booked for ships arriving in a port without advising the Harbour Master, who is the responsible authority for the port
- Accepting that a 3m swell height was required for the trial, planning should have included facilities and redundancies for dealing with foreseeable problems bearing in mind that sea states can deteriorate as well as moderate
- Either the life rafts were always going to be towed back into harbour or it should have been a planned eventuality, but in either case the port requirements and restrictions for tows entering the port should have been ascertained by the project managers
- The tendency for managers to overrule or otherwise usurp the master's responsibility and authority is quite common within the offshore sector
- The masters of the two vessels involved in the trial had a duty of care for the 4 persons in the towed life rafts, even more so because one person was injured. They should have notified the shore authorities and requested assistance as soon as it was apparent that normal methods of recovery had failed or were no longer available

The above article was published in MFB 58

Article 39

Poor safety culture on board

Outline: A report received from a crew member concerned about the safety culture on board his ship and the poor example set by senior crew members.

What the reporter told us:

I have been working on board an LPG carrier for almost three months and I notice the lack of safety here is common. I want to report about the work permit system . The responsible officer is issuing the work permit after the

job is done or whilst the job is ongoing. I tried to ask the bosun but he said, 'it has always been like this'. When I started to argue about this matter, instead of stopping the job until the permit was received, the bosun told the chief officer that I am complaining about the job and the chief officer started to get angry with me. The bosun usually does working aloft jobs without a harness or safety line and it is common for the officer to get mad with you if you question the safety.

Further dialogue:

CHIRP responded and entered a correspondence with the reporter who, from the start, was apprehensive about losing his job if his identity became known. *CHIRP* was able to allay his concerns and the correspondence continued.

The reporter had been working in this company for 10 years and there were similar situations on other vessels, but a lot depended on the bosun.

The reporter advised that the vessel did carry the required PPE and there was even a matrix posted listing all the PPE required for each specific job which suggested a previous good safety culture. However, the present casual approach towards issuing permits and the bosun's poor example and reluctance to insist on having permits in hand before starting a job suggested that, currently, the safety culture onboard was poor.

On one occasion, the reporter had by-passed the bosun and approached the chief officer directly regarding the issue of work permits. The meeting had not gone well, with the reporter saying he could always ask the DPA which was apparently perceived as a threat because the chief officer informed the reporter that he would contact the DPA and inform him that the reporter was a troublemaker. After that, the reporter decided not to contact the DPA.

The issue had started a month previously when a ballast tank inspection was being carried out by an IACS surveyor. Crew members were sent into the tank with the surveyor, but the permit was not signed until the crew came out of the tank on completion of the inspection.

Initial attempts by *CHIRP* to contact the DPA were unsuccessful on two occasions.

CHIRP comment:

At the most recent Maritime Advisory Board meeting, the members of the MAB felt that this report reflected a serious breach of the ISM code and should be pursued further. In addition to putting the crew at risk, the IACS surveyor, who should have made his / her own checks regarding the presence of a valid permit, was also put at risk.

There are tremendous costs, both financial and personal, associated with a poor safety culture and it is not a coincidence that the most safety-conscious companies and ships are invariably the most financially successful.

It was also pointed out that a safety culture can only ever be created and then reinforced from the top of the organisation. It is up to the senior managers to create a good safety culture, both ashore and on board ship. A good safety culture is a constant battle against complacency and indifference.

Final thought:

Following the MAB meeting, efforts were made to contact both the IACS member involved and the relevant flag state administration. The flag state's response was immediate and positive and full details of the report were passed to the administration. Furthermore, a few days later the vessel manager contacted *CHIRP* after being alerted by the relevant IACS authority. A full and frank engagement between *CHIRP* and the vessel manager followed, and appropriate details of the report were passed to the vessel managers to enable an investigation to be carried out.

The above article was published in MFB 59

Article 40

Unsafe crew practices

Outline: A report highlighting dangerously unsafe practices by members of a ships' crew.

What the reporter told us:

Disregarding recommendations for ladders to be stowed away from contamination and protected from UV damage, the pilot ladder had obviously been left on deck throughout the port stay and discharge of palm kernel expeller (PKE), as it was covered in drifts of cargo residue. Prior to rigging for disembarkation, I requested that the dry PKE was brushed off the ladder as it becomes slippery when wet. An AB was issued with a hand brush, but instead of cleaning the ladder while it was on deck, it was put over the side. Even though the vessel was underway the AB climbed down the ladder to the bottom rung with no lifeline, lifejacket or hard hat. He held on with his left hand whilst brushing the steps with his right hand.

CHIRP comment:

The worrying thing about this report is that it was not an individual moment of madness. The crewman in question was issued with a hand brush by his supervisor and the ladder was not deployed by a single man, but rather by a two or three man team who watched without comment as the dangerous and reckless action took place.

Where was the safety culture? Where was the individual responsibility for personal safety? Where was the collective responsibility to look out for the safety of a fellow crew member?

Final thought:

Do similar examples of the breakdown of the safety management system or safety culture occur onboard your vessel?

The above article was published in MFB 59

Article 41

Superyacht – crew working outboard without PPE

Outline: The title says it all, but since *CHIRP* continues to receive a steady stream of reports on this subject, we feel justified to keep publishing them.

What the reporter told us

While conducting on board crew fire training it was noted that two crew of a yacht berthed nearby were working along the outboard (port) side of the yacht, high above

the waterline and without protective or appropriate safety equipment. Whilst one of the two crew members (aft in the picture) might possibly have had a harness attached to the rail above their heads, the other person (fwd. in the picture) certainly did not and was only holding on with his left hand. Neither appeared to be wearing life jackets.

There have been too many incidents within the superyacht industry, and it is almost the 'norm' on a vast number of yachts for crew to proceed aloft or outboard without wearing even the most basic of safety equipment. Indeed, within 2 minutes of spotting this incident another vessel berthed close by had someone walking over the top deck hard canopy around the mast without any harness or lifejacket. Unfortunately, despite deaths occurring, these incidents will continue to happen with no actions being taken by chief officers, captains, management or flag states. It appears all 'too difficult' to put on a safety harness and lifejacket, or for designers and builders to provide vessels with the appropriate means by which crew can attach themselves to specifically designed rails. Perhaps owners find them unattractive and aesthetically unappealing.

Further Correspondence

CHIRP engaged with the reporter and whilst there was no additional information about this specific incident a wide-ranging conversation took place regarding the difficulty of engaging with the yacht and superyacht sector. The reporter suggested that *CHIRP* contact the PYA (Professional Yachting Association) to establish an engagement. Sadly, although *CHIRP* did try, the PYA declined to engage.

CHIRP comment

Why do crew put themselves in harm's way like this? Why don't the captains and chief officers stop this type of behaviour? Why do the managers and owners allow this kind of behaviour on their yachts – surely there is a duty of care to look after the safety and wellbeing of their employees?

Figure 3 – Another example of poor safety culture in the superyacht sector.

The above article was published in MFB 61

Article 42

Defective winch brake on tug

Outline: A captain reports a disconcerting discovery while approaching the berth.

What the reporter told us

My vessel was arriving at a regularly visited port at which we take a pilot and two tugs for manoeuvring when berthing in a cargo basin with a narrow entrance channel. My ship was proceeding at less than 2kts past a ferry pontoon when the pilot ordered 25% power from the tug secured aft to stop the vessel. The tug master called back to the pilot that his tug's forward winch brake was not holding, and we heard banging noises from the aft tug and could see the winch rendering the tow line. My ship was not slowing, and the pilot ordered the main engine to 'slow astern'. As the aft tug was still not towing, I ordered the telegraph to full astern and advised the pilot of my actions. He acknowledged, and my ship was stopped close to the berth before very cautiously going alongside. Once alongside the pilot spoke to the tug master who said his company knew about the issue and he was hoping the company would soon fix the problem.

For me there was no problem since my ship did not suffer any damage, but the next time I arrived at this port, some weeks later, we took the same tug on my ships bow. I asked the pilot if the tug's winch was repaired and we talked about the previous arrival. The pilot said he would be gentle with orders for the tug and not too much towing power would be used. I asked if it was possible not to use this tug and I would call the local agent to get another tug. The pilot said this was not possible as there were only two tugs on station. We berthed safely, and during our time alongside I spoke to the tug master and chief engineer. The tug captain apologised but also told me that the company were saying that the winch is fine and will be repaired at a later date. The tug captain said he had tightened the winch brake up to the limits and it now only slipped at about 50% power.

Further dialogue

CHIRP engaged with the reporter and also contacted the Harbour Master's office to corroborate the vessel name and port arrival dates, which were verified.

CHIRP wrote to the ISM managers for the tug; the fleet manager responded and was given the details of the report. Following their internal investigation *CHIRP* was advised that "The tug had conducted an intermediate dry-docking for 5 days and during this period planned maintenance had been undertaken, including overhaul of the winch and replacement of the brake bands".

CHIRP comment

With the pilot on board and tugs fast fore and aft what can go wrong? Be prepared for any eventuality and react positively to any unexpected event, but keep the pilot informed.

The pilots at this port were obviously aware of the situation regarding the tug's defective winch. Switching the tugs around so the suspect tug was at the passive end made sense. However, was this a formalised arrangement and had a risk assessment been carried out? The obvious solution was to take the tug out of service to rectify the issue

with the winch brake, but it would appear there was a lack of redundancy. If a formal risk assessment had been carried out, *CHIRP* fails to see how the reduction in towing capability could have been mitigated. Was this a case of commercial considerations overriding safety and common sense?

One point that should be highlighted, – *CHIRP* occasionally reports on ship's captain's failing to make full disclosure during the Master / Pilot information exchange upon pilot boarding. But this is a two-way street and pilots are also obliged to notify the captain of all relevant facts that could affect a successful pilotage.

Finally, the tug management's engagement with *CHIRP* and their final update regarding the tug's winch is recognised and welcomed.

The above article was published in MFB 61

Article 43

Insight – **Risk Assessment – Fit for purpose?**

Introduction

The list of reports from national regulators involving incidents related to entry into enclosed spaces, mooring incidents, lifeboat or rescue fall failures and falls from height just to name a few, is seemingly endless. Invariably these reports are related to tragic events which could have been avoided with a little forethought and planning.

The reports highlight many areas where various defences were breached leading to an incident, but one recurrent theme which is mentioned in the vast majority of reports is the question of risk assessment. Time after time you will read that the company does in fact have risk assessments and associated procedures which are all written into their Safety Management System (SMS). It is not uncommon for the report to stop there and not dig any deeper as to the efficacy of the SMS and actual root cause(s) of the incident – far easier to "blame" the crew for not carrying out the risk assessment or use its sister tools – permit to work, toolbox talk and stop work authority.

This insight article examines whether risk assessment is actually fit for purpose and suggests practices which may improve how risk assessment is handled, in order to assist in preventing the incidents highlighted above.

Current regulations

If we start by looking at the current regulations, paragraph 1.2.2 of the ISM Code states,

"Safety management objectives of the company should, inter alia:

1. *provide for safe practices in ship operation and a safe working environment;*
2. *assess all identified risks to its ships, personnel and the environment and establish appropriate safeguards; and*
3. *continuously improve safety-management skills of personnel ashore and aboard ships, including preparing for emergencies related both to safety and environmental protection."*

Thus, it is absolutely clear that the company must identify all risks and establish safeguards. The International Maritime Organization builds on this basic premise with countless other references to risk assessment such as Assembly Resolution 1050(27) (https://www.imo.org/en/KnowledgeCentre/IndexofIMOResolutions/Pages/A-2011-13.aspx) related to enclosed spaces.

Flag administrations similarly highlight the issues, an example being Safety Advisory 23-20 issued by the Marshall Islands (https://www.register-iri.com/wp-content/uploads/MSA-2020-23.pdf), and again related to enclosed spaces. Other organisations, too many to mention, highlight risk assessments covering the full spectrum of maritime related activities. Many of these articles are in response to an incident and mention that generic risk assessments were in place – they also frequently highlight that the risk assessment should be ship or job specific since a generic assessment is only a guide and cannot cover all aspects of a specific job in a specific place.

So, is a risk assessment actually fit for purpose?

In one sense yes – risk assessment can be an excellent tool to highlight dangers in the workplace, but only if it is used correctly, and as an integral part of a number of tools to assist with incident and accident prevention. The International Maritime Organization and other organisations would almost certainly not promote the use of risk assessment in so many areas of their work if it were not fit for purpose.

In another sense no – risk assessment can only be fit for purpose if it is used correctly and that, all too often, is the inherent problem. In many cases it is being used simply as a tick box exercise because it has to be done. This extends from the lowly seafarer not doing it, through companies not implementing it, to flag states or their recognised organisations which audit companies for a Document of Compliance (DOC), not ensuring that risk assessments are used properly. As an example, the auditor asks the company if they have risk assessment in their Safety Management System (SMS). Of course, the answer is "Yes", the SMS is full of it. Great stuff - tick the box, onto the next question and issue the DOC. This simple example does not tell the whole story – sometimes it is indeed recognised that the risk assessments are generic in the SMS and the auditor will ask for further (random) proof that ship specific risk assessments are in place and that they being used. Equally there are many cases where this is not done.

There are many excuses as to why risk assessment is either not conducted at all, or not completed properly. Not enough personnel or not enough time are two of the favourites - which brings into question the whole topic of safe manning and hours of rest. Whilst partly relevant, a full discussion on these aspects would divert from the purpose of this article. Other reasons why risk assessment has not been conducted properly can be summed up by human factors such as complacency, culture, local practices, situational awareness and a basic lack of communication in some cases. In other words, the whole issue of a failure to properly conduct a risk assessment comes down to failings in the company safety culture.

The main objective of any risk assessment is of course to reduce any inherent risk to make it as low as reasonably practicable (ALARP). To use a well-known analogy, the idea is to fill in as many holes in the Swiss Cheese model (see figure 2 below) as possible in order to prevent an incident from occurring. It should be highlighted that risk assessment will not do this by itself – in order to be effective, it has to be used with other

RISK ASSESSMENT MATRIX								
CONSEQUENCES				INCREASING LIKELIHOOD				
PEOPLE (P) (Health & Safety)	ASSETS (A) (Financial, Commercial & Asset Integrity)	ENVIRONMENT (E) (Level of Spill response)	SEVERITY	A Never heard of in the industry	B Heard of in the industry	C Incident has occurred at same location/ company	D Happens several times within 5 years at same location/ company	E Happens several times p.a. at same location/ company
NO INJURY or health effect	NO DAMAGE	NO EFFECT	0					
SLIGHT INJURY or health effect	SLIGHT DAMAGE costs less than US$10,000	SLIGHT EFFECT Slight environmental damage contained within premises (Tier 1)	1					
MINOR INJURY or health effect (<5 days to recover)	MINOR DAMAGE costs between US$10,000 and US$100,000	MINOR EFFECT Minor environmental damage, but no lasting effect (Tier 1)	2					
MAJOR INJURY or health effect (=> 5 days absence from work)	MODERATE DAMAGE costs between US$100,000 and US$1,000,000	MODERATE EFFECT Limited environmental damage that will require cleaning up (Tier 2)	3					
PERMANENT TOTAL DISABILITY (PTD) or up to three fatalities	MAJOR DAMAGE costs between US$1,000,000 and US$10,000,000	MAJOR EFFECT Severe environmental damage that will require extensive restoration (Tier 3)	4					
MORE THAN 3 FATALITIES reulting from injury or occupational illness	MASSIVE DAMAGE costs in excess of US$10,000,000	MASSIVE EFFECT Persistent environmental damage leading to recreational loss or loss of resources over a wide area (Tier 3)	5					
				LOW RISK	MEDIUM RISK	HIGH RISK		

Figure 1 – A typical risk assessment matrix

tools such as a robust permit to work system, a heathy company safety culture from top to bottom, toolbox talks etc. The assessment should also be thorough and not drawn up by a single entity.

Some risk assessments are so comprehensive that for every identified hazard, the risk to **P**ersonnel, the **A**sset (vessel, specific machinery etc.), the **E**nvironment, and the **R**eputation of the company are all considered. This is known as the PEAR concept.

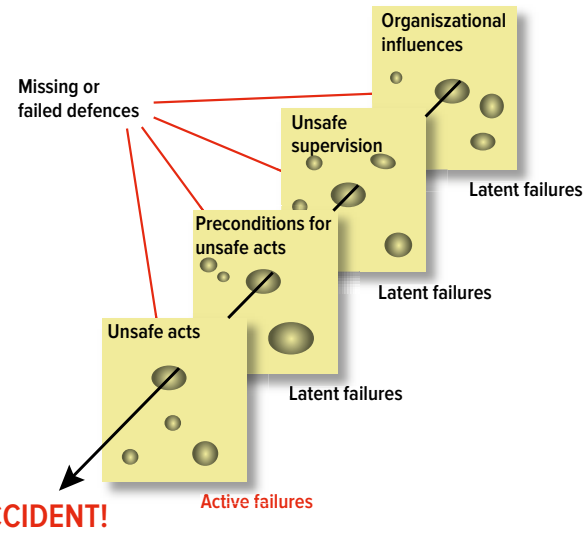


Figure 2 – 'Swiss Cheese' model

An example of good practice

Whilst discussing risk assessments recently, it was commented that there was a lot of work to do in order to make them truly effective for all cases. The following story, told by a company superintendent, seems to be an excellent method of ensuring that risk assessment is used as it was always intended to be used.

The superintendent was sailing with the vessel for a short voyage and on this particular day attended a work planning meeting. At the meeting it had been decided to review one of the ship's risk assessments as required by the company. To expand, this particular company was fairly sizeable, and with many different types of vessels within its fleet it had a full chapter of its SMS devoted to risk assessment. These were all generic, but the company required that each vessel make up its own ship specific assessment. Furthermore, the company required that all of these specific risk assessments were regularly reviewed and the results of the review were to be transmitted to the company, (so that they could show the ISM Auditor at DOC review time!).

What the superintendent witnessed next horrified him. The review consisted of the shipboard safety officer reading off the contents of the risk assessment in a dull monotone, pretty much guaranteed to send you to sleep. The audience was disinterested at best and it became obvious that this was simply a tick-box exercise being conducted because the SMS stated that it must be done. There was no attempt to actually improve upon the contents.

A couple of days later the superintendent had the opportunity to conduct some training with the whole vessel's complement (apart from watchkeepers) and so he decided to review a risk assessment. Mooring operations was the subject of choice, and, quite simply, he asked all deck officers to go to another room and identify all the hazards of mooring operations that they could. The same was done for engineer officers and the crew. Some twenty minutes later the three groups returned, and a whiteboard exercise was used to identify the hazards. Firstly, the deck

officers were asked to list all of the hazards that they had identified. These were all drawn up on the whiteboard, occasionally with a little prompting to make the exact hazard more specific. On more than one occasion this ended up being two or more specific hazards. Next up were the engineer officers who were asked if they had anything that was not on the list. They did and several more hazards were identified. Finally, the superintendent turned to the crew and asked them what had been missed. To the surprise of the deck and engineer officers the crew had quite a few hazards that had not be identified. The initial risk assessment before the training session had identified twelve hazards. After the risk assessment no less than twenty three specific risks had been identified.

The learnings were clear. The more people that get involved then the more hazards you are likely to identify. In addition, listen to your crew – they can contribute a great deal if they are given the opportunity.

Although the training session stopped there, the compiling of the risk assessment was by no means complete. For each of the identified hazards specific actions need to be put in place to mitigate the risk. Too often the measures put in place have been seen to be non-specific such as "wear PPE". If the hazard is something such as snagging your hand on a wire, then the more specific measure would be sturdy gloves – possibly even Kevlar type gloves. In addition, the focus of any mitigating measures should be those with a high consequence should something go wrong, particularly if there is a considered to be a high probability of the event occurring. All too often you can concentrate on measures which are too trivial – low consequence and low probability. Whilst these do indeed deserve some attention they detract from the main purpose of the assessment.

Conclusion

Risk assessment is part of the SMS and as such should be regarded as a 'living document'. In other words, the SMS and constituent parts should be under constant review to reflect the specific changing requirements of individual vessels. Generic risk assessments are exactly that – generic. As such they are only provided to give guidance to vessels and certain associated tasks. Even when a generic risk assessment for a task has been compiled and then adapted to fit a specific vessel for a specific task, each and every time that task is repeated, the risk assessment requires to be re-visited and modified to suit the current working scenario. This is because the circumstances of a repeated task may have changed since the last occurrence i.e., different crew, different location, different weather conditions, different human element, etc. Only the nature of the task is the same. Thus, it is only when a new revision has been conducted and previously unseen latent risks have been identified that the risk assessment can be signed off and delivered as a tool-box talk.

In addition, risk assessment is the determining factor of all permits to work, isolations, lock outs, enclosed space entry, and jobs involving working over the side and at heights. It is vital that due consideration through revision for a specific task is inclusive and comprehensive. It is all too easy to manipulate a risk assessment to procced with an inherently dangerous task when the risk assessment should actually produce a 'stop work' decision. As an example, using a crane for personnel ship to ship transfer, perhaps for transferring a surveyor or superintendent, when the crane does not have certification for man-riding and the crane operator has not received accredited training. It is all too easy to say, "We've always done it like this", "We've never had an accident", and the old chestnut, "There's no alternative". However, this particular task is fraught with inherent safety issues such as the crane potentially not having a secondary braking system, the crane operator not being experienced with that specific crane or in personnel transfer operations, just to mention a few.

To simplify:

- Risk assessments should be reviewed before repetition of that specific task in order to identify any change of circumstance
- Risk assessment is an excellent tool that, if used properly, can reduce risk to a lower (and acceptable) level of risk
- A risk assessment is only as good as the personnel involved in managing it
- The correct participants should be present at a risk assessment in order to arrive at the correct conclusion
- Risk assessments are vulnerable to manipulation in order to conduct a task that should otherwise not take place

FINALLY – A risk assessment is a 'living document' that MUST be correctly managed and implemented in order to mitigate any latent risk. Going back to the introduction, if the risk assessments had been given the full attention that they deserve in the first place, then the tragic incidents referred to may well have been avoided.

A risk assessment is only as good as the personnel involved in managing it both on board and ashore

Section eight

Pilot boarding and pilotage

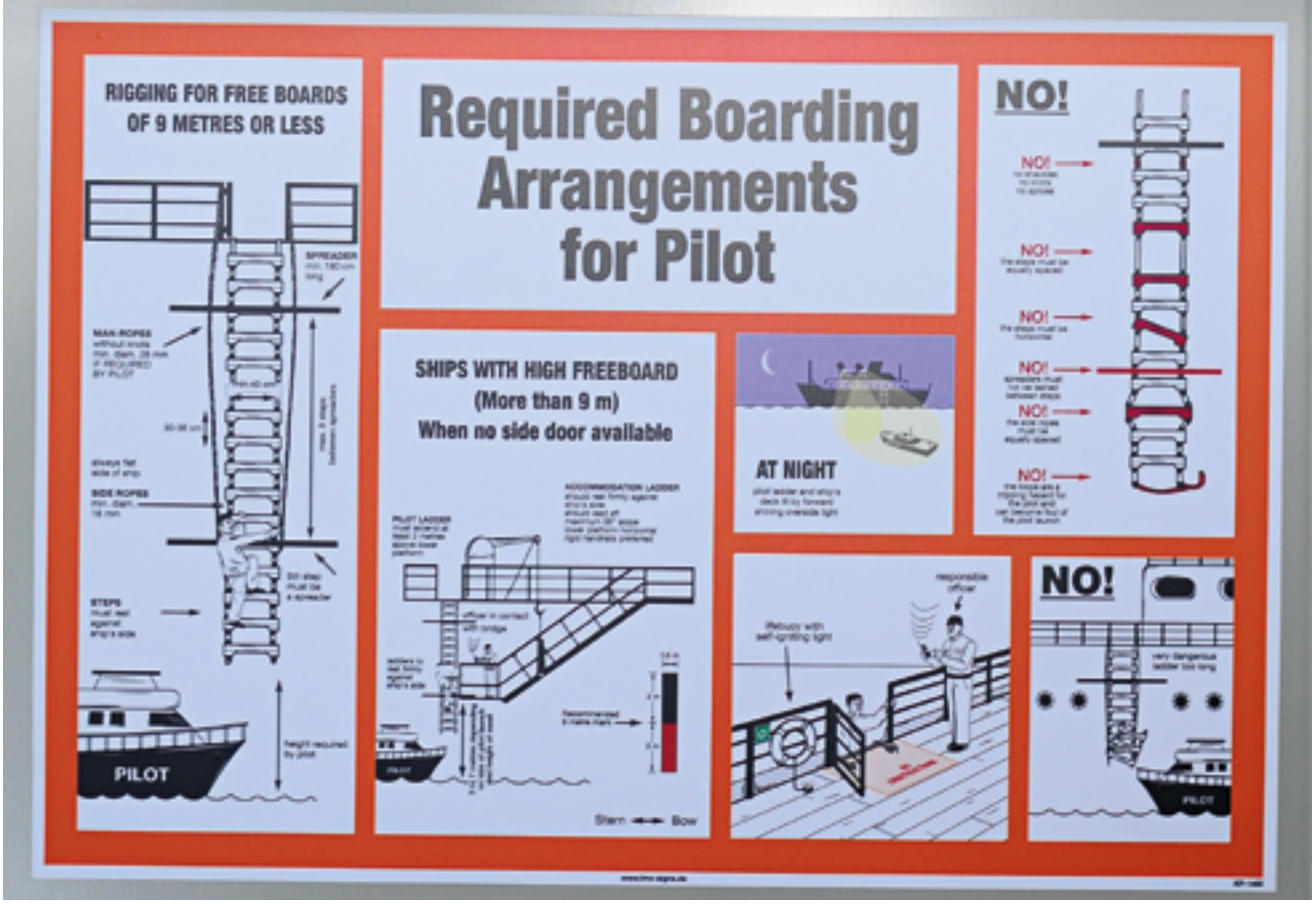
As normal this is one of the largest sections of the Annual Digest, partly because we have so many dedicated reporters in the pilotage sector, but also because so many crews seem to be incapable of rigging the pilot boarding arrangements correctly. As we have stated in the past, we will continue to highlight problems surrounding safe access until there is a noticeable improvement.

We start with perhaps the most egregious mistake – a pilot ladder which was not even secured to the ship! This is followed by a report about a pilot ladder which had never been tested, and an insightful piece about some mistakes in the pilot ladder poster which is found aboard most ships.

We then turn to the reports and papers which have featured in our 'Pilots Corner' section. These excellent and wide-ranging submissions are all written by experienced pilots and are worthy of careful study by everyone involved in shipping.

Our Insight articles contain an examination of the way to rig pilot boarding arrangements properly, and our analysis of pilot ladder failings which have been brought to our attention. These speak for themselves, but are a sad indication of how far we have to go to solve the problems.

On a brighter note, pilots in several ports are now refusing to berth or sail ships where the access arrangements are not compliant. If more ports did the same, we suspect the problems would soon start to disappear.



Article 44

Unsecured ladder

Outline: This is not what you want to find after climbing the pilot ladder.

What the reporter told us:

I boarded the vessel and noticed that the ladder had been put under a steel platform. I asked the crew to lift the platform because I wanted to know how this ladder was secured to the deck. After they lifted the platform, I found out that **the ladder hadn't been secured at all**. It ran under the platform, and this platform alone held it down. The ladder came from an electrically powered winch reel, which also wasn't mechanically secured.

Lessons Learned:

Check exactly how the ladder is secured before boarding the vessel. This example shows a complete neglect of pilot safety.

CHIRP Comment:

- The above isn't a shipboard modification, the ship came out of the builders' yard like that
- Shipyards don't do things randomly, ships are built according to the plans the yard are given, so this ladder arrangement was designed that way. **Non-compliant by design *again***.
- Possibly it has never been inspected by a class surveyor - whilst pilot ladders are not a class item, they are a specific part of the Safety Certificate. Every 5 years they are supposed to be looked at, but they rarely are
- With more surveyors having an engineering background rather than a seafaring one, they may not be trained in what to look for or what the requirements are
- The issue of pilot ladders and boarding arrangements being non-compliant by design is a flag state issue and *CHIRP* has raised the issue with more than one flag state administration

They say a picture paints a thousand words – this clearly demonstrates the appalling lengths that some mariners will go to with respect to endangering life.

The above article was published in MFB 58

Article 45

Correspondence received – **Discrepancies in the pilot ladder poster**

CHIRP's attention has been drawn to a number of discrepancies between the regulations concerning pilot ladders and pilot boarding arrangements as stated in SOLAS (Chapter V Regulation 23) and IMO Res A.1045 (27) and the depiction of the arrangements on the IMO accredited IMPA poster "Required Boarding Arrangements for Pilot". All seafarers are advised that while the poster is a good starting point it remains only an illustration to draw attention to the contents of the written regulations which should always be referred to as the definitive requirement for pilot ladders and pilot boarding arrangements.

The above article was published in MFB 60

Article 46

Pilot's corner

This inaugural article in our new section has been written by a senior pilot

Pilot ladder incorrectly secured to the deck using D-shackles to choke the side ropes.

For pilots one of the hot problem topics is pilot ladders and access. How do we tackle this? Locally my own port authority has a robust system for reporting and investigating non-compliant arrangements and are very supportive of pilots who refuse to board when they observe a non-compliant arrangement that cannot be rectified in a timely manner.

Last year a pilot boarded an inbound vessel at night and, on climbing, felt that something appeared to be out of place with the step spacing of the pilot ladder. On inspection, the steps were too far apart at over 40cm. The port would not allow the vessel to sail until a new ladder was sourced, which involved a delay of over 24 hours.

Last year I initially refused to board an inbound cruise ship as there were no stanchions at the head of the

pilot ladder. Returning 10 minutes later after dropping a colleague at another ship, the stanchions had magically appeared. On another vessel, I observed a dangerous practice – whilst rigging a combination ladder only one of the crew was wearing the correct PPE out of the three crew members involved in the task. When I pointed this out to the captain, he was reluctant to stop the task until I insisted.

Unfortunately, we are still seeing accidents and in 2019 a number of pilots were killed whilst boarding or disembarking from vessels. Clearly, we need to continue working harder in trying to eradicate non- compliant boarding arrangements. Internationally, IMPA is working hard at the IMO and each year report the findings of the annual global "Pilot Ladder Safety Survey".

Going forward we need to continue educating masters, crews and ship owners on how the ladder should be rigged. I personally carry a supply of laminated cards that I can leave with the master illustrating how the ladder side ropes should be secured with rope using a rolling hitch which is then secured to an approved strong point with another hitch. No choke shackles over the side ropes, and no wedging a step behind a piece of angle iron. These practices have been outlawed by the MCA, AMSA and the New Zealand marine authorities. Surveyors, both port state and classification society, must also play a greater part in assisting with this ongoing problem. We are still frequently seeing new ships, built and certificated with non-compliant access areas and boarding arrangements.

The above article was published in MFB 58

Article 47

Learning opportunities from non-compliance reports (2)

Outline: Two reports were received recently that contained references to unusual recommendations, rules and regulations. Following the adage 'take every opportunity to learn', *CHIRP* is publishing details in the belief that they need to be promulgated more widely to prevent ships' crews falling foul of them. Remember that other legal truism 'ignorance of the law is no defence'. Two separate subjects – the other report may be found in Section 6.

What the reporter told us (2):

After boarding the vessel, which had a well-worn pilot ladder, the master was asked for the certificates for his ladder. He produced a surveyor's certificate dated 6 days after the vessel's launch date (9 years earlier). The captain was asked if he had any test certificates as required by ISO799, but he was unable to provide these. Without any available verification, it had to be assumed that the pilot ladder had not been load tested for over 9 years rather than "at not more than 30 months intervals" as required by ISO799.

CHIRP Comment:

Like many seafarers, *CHIRP* is aware of the requirements of IMO and SOLAS concerning pilot ladders and refers to the appropriate publications. For those who are not

10.4 Each ladder shall be subjected to the ladder and step attachment strength test in Table 2 at not more than 30-month intervals. Each ladder which fails the test shall be rebuilt according to 10.3 or scrapped. The ladder shall be marked with the date of the test and the identification of the person or company performing the test. This marking shall be placed on the same steps as marking required by 8.1 of this document

The appropriate section of Table 2

Test	Item to be tested	Test Procedure	Acceptance Criteria
Ladder and step attachment strength	Fully assembled ladder of longest length to be approved	Suspend the ladder vertically hanging to its full length or extend the ladder to its full length on a horizontal surface, with the top end of the ladder secured using its own attachments. Apply a static load of 8,8kN widely distributed over the bottom step for a period of at least 1 min, so that the load is applied evenly between the side ropes through the step attachment fittings. Repeat the procedure at five different steps, except that the ladder is not required to be hanging at full length and only the step under test, its side rope attachments, and the side ropes immediately above the step attachment fittings are required to be subjected to the load.	Steps shall not break or crack. Attachments between any step and a side rope shall not loosen or break. Side ropes shall not sustain any observable damage, elongation, or deformation that remains after the test load is removed.

familiar with the requirements of ISO799 (2019/2020) the appropriate section 10.4 is reproduced below.

Final thought:
It is quite possible that the cost of load testing a pilot ladder every 30 months is going to exceed the price of a new ladder. A simple notation in the planned maintenance schedule to renew each pilot ladder every 30 months would be simple and probably cost-effective.

The above article was published in MFB 59

Article 48

Pilots Corner – **A perspective from New Zealand**

This article has been written by a senior member of the New Zealand Maritime Pilots Association (NZMPA). Whilst some parts are specific to New Zealand, the vast majority of the issues and points raised are applicable on a global basis. Equally, a large portion of the initiatives introduced by the NZMPA for implementation within their sphere of influence have been introduced by other maritime pilot associations around the world.

In recent years, the NZMPA has undertaken to implement a number of steps and initiatives in relation to pilot boarding safety. In following this process, we have identified two areas of concern – these being non-compliance by design (cases such as trapdoor arrangements or other shipboard design deficiencies not necessarily related to the crew), and non-compliance by ignorance (cases where the crew show a complete disregard to pilot safety, regulations and the condition of their boarding arrangements).

The initiatives developed are designed to cope with both areas of concern, and in NZ we are now starting to see positive results. In addition to regular engagement with members and industry stakeholders we are doing the following:

- Pro-active engagement with our regulator. Here we are engaging in high level discussions around policy, regulation and education.
- A successfully implemented online event reporting system. To date, pilot ladder related issues are the most common report type, with container vessels being the most common vessel type reported.
- A published NZMPA Safe Pilot Transfer Good Practice Guide
- Design and publication of the 2020 Pilot Pete's Pilot Ladder Tips calendar
- Development of descriptive guidance notes designed to educate and clarify rule requirements and be an aid to masters & pilots in demonstrating compliance vs non-compliance. A trapdoor PBA advisory notice is about to be published here.

To give weight to our campaign, in November last year Maritime New Zealand presented the results of a pilot ladder focus campaign. What was discovered raised concern and highlighted the extent of the issue, with:

- 8% of all pilot boarding arrangements not properly inspected by crew
- 9% were of non-compliant construction
- 30% without mandatory records, and
- 40% of all pilot boarding arrangements improperly rigged or unsafe for use.

The next step for NZMPA is to issue a set of regulator-endorsed guidance notes. The first version will focus on accommodation ladders used in conjunction with pilot ladders.

The intention of the guidance notes are to be a useful tool for ship owners, operators, agents, ship masters, ports and pilots to determine compliance vs non-compliance within the framework of NZ pilot ladder regulations (Maritime Rule Part 53).

As the first set of notes focuses on accommodation ladders used in conjunction with pilot ladders, they relate primarily to combination and trapdoor arrangements. As an association we have been formally challenging trapdoor arrangements since early 2018 based on our local regulatory framework, which states ladders must be secured directly to the ship's structure and not to the accommodation ladder.

We are now seeing positive changes in NZ where previously non-compliant ships are now presenting modified boarding arrangements to ensure compliance within the NZ rule framework. This drive ultimately culminated, last December, in the first ship being refused pilotage services by NZ ports for repeatedly presenting a non-compliant and unsafe boarding arrangement.

Example of a compliant combination PBA with trap door.

Compliant combination PBA with trap door – pilot ladder and man ropes extend up to and are made fast on vessel's deck

The above article was published in MFB 59

Article 49

Pilots Corner – **Non-compliant trap door pilot boarding arrangements**

Outline: Non-compliant by design, known about by port state authorities, owners, and flag state administrations – yet still these vessels are allowed to sail the world endangering pilots.

What the reporter told us (1)

A vessel was identified by the port authority as having a non-compliant pilot ladder arrangement on 17.03.2020. The vessel has a trap-door platform, but the pilot ladder does not extend 1.5 m above the platform. A report was submitted to the national regulator who visited the vessel and confirmed that the arrangement is non-compliant. Pilots are told not to use non-compliant arrangements and can be penalised should they do so or report such ladders and then use them despite the known defects. However, this ship, and others are still making calls to the port. If inspected, non-compliant ships are simply issued with a letter from the regulator, but this does not stop them sailing and pilots are put in an impossible position because management and port authorities tacitly condone these arrangements and simply tell pilots not to board if it is unsafe.

Further dialogue

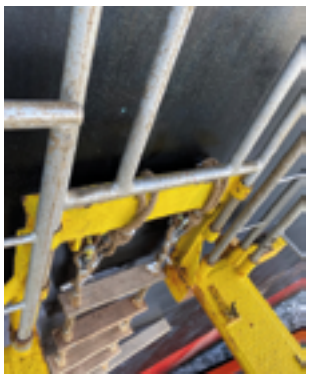
There was a lot of dialogue arising from this report and the salient details are as follows.

CHIRP contacted the DPA of the company in question, the harbour master of the port, and the port authority.

The DPA confirmed that the issue was known to them and that the vessel's flag state, and classification society had already been contacted.

The view of the harbour master was that the issue was a Port State Control issue whilst adding that liaison with the port authority on all marine safety issues would continue and is paramount.

The port authority was very helpful and highlighted their support for pilots who refused to board vessels which they believed to be dangerous. They requested that pilots inform them of any deficiencies in order to enable effective follow-up. A comprehensive system for investigating incidents and reports is maintained, including dynamic risk assessment. It was also highlighted that there is close liaison with the national regulator.



2 examples of non-compliant 'trapdoor' pilot boarding arrangements

There was a lot more correspondence about procedural issues in order to overcome the problems raised, but in summary there is no easy solution for a problem that has been 20 years in the making! *CHIRP* can however proactively engage with all parties and apply appropriate pressure to highlight any potential issues and the need for resolution.

CHIRP comment

The second report included in this "pilots' corner" is about the same issue at the same port, only the name of the ship was different. This brings the total of named vessels mentioned in reports to *CHIRP* with this defect, to four.

The response from all parties was refreshing, nevertheless the vessel remains non-compliant. Potentially the letter from the regulator did its job, since the company, flag, and class are all aware of the issue. However, since the vessel was built to pre-2012 regulations, there is "wriggle room" in the wording of the regulations and the argument of **must** and **should** comes into play. So, the vessel continues trading and remains non-compliant. The port authority knows of other vessels on a fairly regular trade which also fall into this category. All are well run and have reputable managers – they were just built with non-compliant pilot boarding arrangements.

Members of the MAB noted that quite a lot of improvement on trap door pilot boarding arrangements has been seen in Europe. Some companies have carried out modifications with class approval. *CHIRP* is also aware of at least one flag state administration that is in consultation with class to resolve the issue. This is encouraging, although more needs to be done.

Tragically it was one of these non-compliant trap door pilot boarding arrangements that resulted in the death of a pilot in New York earlier this year. This has led to a renewed focus on the safety of these trap door arrangements and pilot boarding arrangements in general. Tragically just prior to publishing this edition of FEEDBACK we learned of a second fatal accident involving a pilot boarding arrangement at the New York, Sandy Hook boarding ground on 5th August.

The whole point of compliance is that it makes the equipment safe to use. Non-compliance means that it is not safe to use. While a port state regulator does not have the power to tell the ship what to do, the pilot does have the power not to move the ship.

A pilot about to sail a ship can insist on sighting a compliant pilot boarding arrangement before letting go any lines. Upon arrival at a pilot boarding station, if a non-compliant arrangement is presented the pilot should refuse to board the ship.

It is time to say Enough is Enough.

The above article was published in MFB 60

Article 50

Pilots Corner – **a lucky escape, consequences, and design issues**

Three reports illustrating different aspects of an ongoing problem.

Outline (1): A report received detailing a lucky escape

What the reporter told us

Parted ladder

While boarding the vessel at the pilot exchange station, one of the side ropes snapped. No other pilot ladders were available.

Further dialogue:

Luckily, the pilot had only climbed two steps when the side rope parted, and he was able to jump back onto the pilot boat without sustaining any injury.

The vessel did not have a suitable replacement ladder.

The local agent arranged for a new pilot ladder to be delivered to the vessel before sailing.

CHIRP contacted the DPA who advised the following:

The company already had maintenance routines dealing with pilot ladders, but immediately following this accident the procedures had been modified and increased to include monthly testing where the weight of several crew was added to the ladder in a safe way, while the ladder was suspended down the wheelhouse front.

A new pilot ladder was already on order for the vessel but unfortunately missed the ship by a couple of days when it sailed from its home port on the most recent voyage. The new ladder is waiting at the home port for the vessel to return.

In addition, the information about the incident was made available to all company vessels and crew. The company was not satisfied with using manila ropes in pilot ladders due to the quality of rope available and weaknesses being difficult to spot. They had started a replacement programme using better quality rope.

CHIRP comment

CHIRP asked about the alternative rope to be used in place of manila and requested details of the product and manufacturers but there was no further correspondence from the DPA.

The company's engagement with *CHIRP* was encouraging and their response was comprehensive but perhaps they need to look more closely at the procedure adopted when a new vessel is taken into their fleet to ensure that the existing equipment on board is fit for purpose.

The reporter was indeed lucky, but so was the sea pilot who had boarded the ship earlier in the night using the same pilot ladder.

Outline (2): There are consequences for non-compliance

What the reporter told us

There were several ships in the anchorage awaiting berths. The first vessel to berth was instructed to prepare its engine and rig a pilot ladder. As the pilot boat approached it was clear that the pilot ladder steps were not level and for that reason it was rejected. Upon request, the vessel rigged an alternative ladder but when the pilot boat was alongside the whippings on each step were found to be very loose – it was possible to turn each step nearly vertical by hand. The pilot refused to board and pilotage was refused until a new pilot ladder was procured and delivered to the vessel at anchor. The next vessel in the anchorage was asked to prepare its engine etc. and the pilot boarded this vessel instead.

▲ Second ladder rejected due to very loose whippings

◀ First ladder rejected due to uneven steps

Further dialogue

CHIRP contacted the reporter to enquire about the outcome of this report and learned that the ship's agent was able to source a new pilot ladder and deliver it on board the next day. Unfortunately, as the port only had a single suitable berth on which the vessel could load its cargo, the ship lost 3 days waiting for the alternate vessel to complete loading and vacate the berth.

CHIRP comment

We do not know what charter rate the vessel was on but are quite certain that three days of lost hire is greater than the cost of a new pilot ladder.

Outline (3): Non-compliant by design. The following report was received from the area manager of a national pilotage authority.

What the reporter told us

I have read your publication on pilot ladder failings and am seeking your advice. We have several vessels in our area that are constructed in a way unsuitable for boarding by pilot ladder. Most of them have a railing (rubbing strake) without a gap to allow safe access for the pilot boat. The rubbing strake will also press down and damage the pilot boat in the case of rough seas. In some cases, the railing (rubbing strake) is so wide that the pilot ladder swings freely underneath it when rigged above the railing.

SOLAS stipulates that the pilot ladder must lay against the ships side, but we have had a hard time finding rules for railings (rubbing strakes) without gaps. Do you have any useful information on this matter?

Examples of ship side features that render the vessels non-compliant by design

Further dialogue

CHIRP highlighted the relevant sections of both SOLAS Chapter V Regulation 23 (section 3) and IMO Res 1045(27) to the reporter. Unfortunately, as with so many SOLAS and IMO regulations both include the ubiquitous get-out clause to the effect that the rule does not apply if it is deemed to be impractical by the 'administration' or providing an alternative arrangement is deemed acceptable to the 'administration'.

CHIRP comment

To repeat a previous mantra "if a pilot boarding arrangement is not compliant it is not safe" and anything that is not safe is dangerous, pilots have the right to refuse to use a dangerous PBA. The inevitable delays and costs incurred as a result of such refusals would very quickly focus the attention of the operators and owners of these vessels to solve the problem.

The SOLAS and IMO rules and regulations are about safety. The safety of ships and the safety of the seafarers who use, live and work on them. Naval architects and flag administrations should address and resolve these identified problems at the design and building stage of a vessel and not abuse clauses in the regulation that are intended for exceptional circumstances.

The pictures above both show what appear to be ferries with relatively low pilot access doors. It may be possible to modify a pilot boat with one or two raised platforms that would present the pilot at the level of the access door or certainly above the obstructing rubbing strake. The advantage of this would be that the pilot authority would be taking control of the issue rather than trying to influence multiple vessel operators to modify their ships. At the end of the day it is the safety of the pilots that is the main concern.

The above article was published in MFB 61

Article 51

Insight – **1000 ways to secure a pilot ladder, and only one way is correct**

The following article was written by Captain Arie Palmers and it highlights many of the issues which *CHIRP* Maritime has been promulgating over the last few years.

Content

2 metres of ladder with at least 4 non compliances.

1. Introduction

Dear reader...

My name is Arie Palmers, and I am working as a pilot in the Scheldemonden area since 2009. After I got involved in two incidents with minor injuries in one week in the spring of 2018, I started wondering whatever might have caused these incidents and therefore I started developing an interest in pilot ladders and the way they are secured.

From that moment on I have been keeping a tally of the non-compliant boarding arrangements I see in front of me on a daily basis, and of course I participate in the annual safety campaign, conducted by IMPA each October. The outcome of the campaign is that about 18-20% of the boarding arrangements are non-compliant in accordance with:

- SOLAS Regulation V/23
- IMO Resolution A.1045(27)
- NEN ISO 799-1(2019)

In my own tally the outcome is even more staggering: 47% of the pilot boarding arrangements I have to encounter are non-compliant. What does this difference mean??? That will be work enough ahead for another article. On a daily basis we see numerous of different ways a pilot ladder is secured, the vast majority of them are non-compliant and therefore dangerous for the user. Insurance companies might even deny liability after an incident because you could have known or should have known the arrangement was dangerous. If you still use it, it's on your own behalf...

In the next few chapter's I will discuss the arrangements we see a lot and explain why they are non-compliant. As the title already suggests, "1000 ways to rig a ladder, only one of them is right". Names of the vessels involved, will not be displayed in the article, just out of politeness. The Facebook page "dangerousladders" often displays names and destinations of the vessels involved, mainly to warn our colleagues in the port of destination that a present is underway.

I wish you all good readings and please feel free to comment and share. Please keep coming back home vertically and not horizontally!!

Also check Facebook: dangerousladders

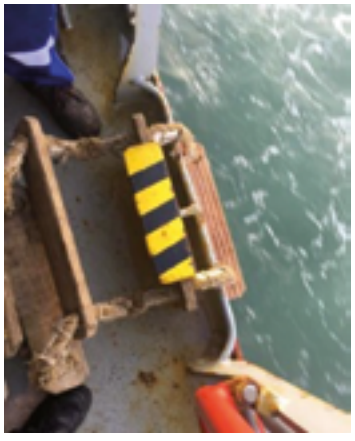
Broken combination with 3 more non compliances

2. Deck Tongue.

A photo explains more than a 1000 words – here we see an example of a so-called deck tongue, installed on one of our regular visitors. Seems like a great and simple solution to install and adjust a pilot ladder, ingenious invention! Unfortunately, this system is non-compliant and therefore downright dangerous for anyone who might have to use it (pilots, agents, surveyors, crew changes etc. etc.).

Notorious offender...

Here we see the deck tongue in use holding the ladder, or to put it better, holding one step. Besides all this, the ladder seems rather old and worn. Let's have a look at the regulations to explain why this setup is dangerous.



Deck tongue supporting the ladder.

IMO A.1045(27) states: The side ropes of the pilot ladder should consist of two uncovered ropes not less than 18mm in diameter on each side and should be continuous, with no joints and have a breaking strength of 24 Kilo Newtons per side rope (2.2.1).

ISO799-1(2019) states that each step shall have a strength of at least 8.8 kN (table A.1 production test).

IMO1045(27) 2.1.1 the securing points etc. shall be at least as strong as the sideropes.

After reading this, we find out that each siderope can handle 2400 kilos (4800 together) and that

each step can handle a weight of 880 kilos. The strength of the deck tongue? Don't have the slightest idea. Is it tested and certified?

So, we buy a tested ladder that can handle about 5 tonnes on the sideropes, and then we put a step that can carry 880 kilos behind a steel plate. One heavy touch of the pilot launch and the pilot ladder is destroyed which is rather inconvenient for the poor guy standing on the ladder at that moment.

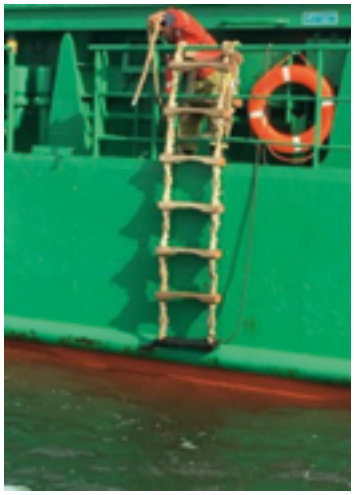
Swell, swinging of the ship or the launch lifting the ladder can also have the dangerous result that the ladder comes loose out of this deck tongue and goes overboard.

Besides that, SECURING a ladder is something totally different than putting it behind a piece of welded steel. We all climb ladders without being secured in any way... SOLAS and IMO provide the minimum safety rules concerning the ladders, less is absolutely not more in this case.

Notorious offender, and it's not even a pilot ladder. As we say: non-compliant as hell.

3. Bulwark setup

Another easy way to prepare a ladder - throw it over the railing, tie the sideropes together with a piece of rope you found on deck and you have the ladder ready in a jiffy!! The ladder itself is not a pilot ladder, something to get into in another article.



Notorious offender with bulwark setup. It's not even a pilot ladder (at least 6 non compliances).

We have already seen that the ladder has to be secured to strongpoints on deck, but a railing is not a deck, seems easy and yet it goes wrong time after time - why? Maybe it looks easier to rig it this way.

This setup means you have to stumble sideways to reach the entrance.

We have already seen that the ropes of the ladder can handle almost 5 tonnes on each side, just a question for the reader: are you sure the railing can handle 5 tonnes? We have all seen beaten up and damaged railings in our career, who of you hasn't stepped on a railing piece of steel, and it gave way? We'll never be able to find out who spotwelded the railing in a far away shipyard many years ago. For sure a railing can't handle 2 times 5 tonnes.

Conclusion: 'securing' a ladder on a piece of railing is non-compliant and therefore dangerous - don't use it! Have the crew secure the ladder to strongpoints on deck and don't forget to report them.

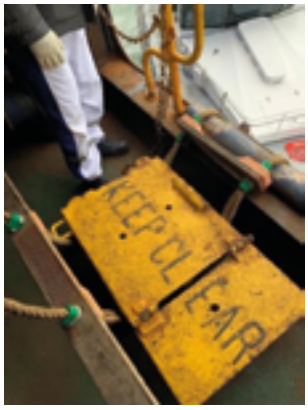
Sideway shuffle again – how strong is the railing?

4. Platform placed over the securing area of the ladder

Always a surprise when you lift the lid.

Having a platform built over the securing area of the pilot ladder is absolutely not illegal, it can even improve the access – no debris or other tripping hazards.

BUT 99 out of 100 times, when you lift the lid, there's a surprise underneath: a steel bar, (which we'll discuss later), a deck tongue or just nothing to hold the arrangement in place.



Looks like a safe access but the 3cm piece of steel is the only thing between life or death.

Basically, whenever you encounter a platform over the ladder, just ask them to lift it because you want to check the way of securing. As we have seen in the last photo, there was no securing at all!

A nice and swift way for the crew to install, and it can be a swift way for you to get down to the deck level of the pilot boat. Secured to strongpoints on deck? No. Secured to ANY strongpoints? No. Secured AT ALL? No.

Again it's non-compliant and therefore dangerous, don't use it. Have the crew secure it to strongpoints on deck and don't forget to report the vessel. Instead of getting down the ladder you'll be walking the plank.

5. Spreader

A spreader used for securing the ladder behind a very thin piece of railing.

A spreader is a great invention to prevent a pilot ladder from twisting. Without a spreader you might look at the horizon instead of the ship's side all of a sudden. How would you get back in a safe position if something like that happened? Therefore, every ladder with more than 5 steps must have a spreader (IMO A.1045(27) – Rule 2.1.4).

That is what a spreader is made for and not for keeping a ladder secured to strongpoints on deck. As we know from an earlier statement in the article, steps can handle 880kilos and sideropes 2400 kilos each. That is the main reason you must not secure it this way. One touch of the pilot boat and the ladder will be damaged beyond repair, as will be the poor soul standing on the ladder.

Another spreader used as a securing method.

6. Human force

I feel very lucky I've never run into this method, but at least two of my colleagues have. Let's just assume you have to board a vessel, the ladder has to be lowered a bit, which goes rather rapidly and before you know it you look up, see a smiling face and thumbs up "ready Mr. Pilot!!"

Then you start climbing, what might be a real Jacob's ladder, you reach the top and 2 quite overweight guys stand on the sideropes on deck – horrible.

They must have read the instructions wrong. The instructions clearly state: the ladder has to be secured to strongpoints on deck and not to strong men on deck. After this case the vessel was reported, captain was angry, not with the guys on deck but with the pilot for reporting his vessel!

7. Combination Ladders

A non-compliant combination arrangement.

SOLAS V.23 clearly states (3.3.1): a pilot ladder requiring a climb of not less than 1.5m and not more than 9m above the surface of the water etc. etc.

Why 1.5m? Well wait and see where you want to grab with a pilot ladder on a low freeboard of the vessel you have to climb onto... 3 steps over the side and nothing to hold on to.

Why 9m? To make something clear: this has nothing to do with the length of the ladder, but only with the distance from the water surface to the deck entry point. If you drop down from distances over 9 m there is a significant risk of severe injuries or even death when you fall down. It's all about the acceleration. If more than 9m then use a combination.

We have seen that I wrote in the above picture the set up was non-compliant, but why? Looks alright or not?

To start with, the ladder is tied to the gangway. Both the ladder and gangway have to be secured to the

hull independently, and not together. You see the ladder is not attached to the hull this way.

OK – Suppose they have sorted this issue and you start climbing. You reach the platform and there's nothing to hold on to. On both sides of the platform there have to be hand hold stanchions (and horizontal ropes) so you can safely transfer from the ladder to the platform.

IMO A.1045(27)

7.2. angle of the gangway under 45 degrees
7.3. lower platform horizontal and secured to the ship's side. At least 5m above the water
7.5. stanchions and rigid handrails
7.6. ladder adjacent to the platform, maximum distance 0,2m, secured to the ships side

8. Embarkation platforms

Non-compliant trapdoor arrangement.

Another name often used for this platform is "trapdoor system". Another wonderful invention to rig a ladder, at least a number of people must have thought it would be a great system. The problem is however that it introduces more risk and more non-compliances. (Keep It Simple Stupid!).

Ok, let's go to the "rulebook" to see what's wrong with this setup.

IMO A.1045(27) 3.7 is the most important one in this case. It tells us the ladder has to "extend above the lower platform tot he height of the handrail and remain in alignment with and against the ship's side.

We have already seen that the ladder has to be secured to strongpoints on deck – not the case here Also we saw that the ladder and platform have to be secured to the ship's hull – again, not the case here.

More often than not the platform has to be adjusted in height to make a safe approach of the pilot boat possible. This always happens in a jiffy which means, the winch is not mechanically secured and the system is not secured to the ships' hull – all that is keeping you alive are the steel wires.

The ladder is attached under the platform, and we know now this is not correct. Whenever you reach the top of the ladder, you have to lean back, grab some pieces of steel and drag yourself through the gap (750x750mm) in the platform - during rain this system works as a nice shower as well. Water collected on the platform and gangway will find its way down through the gap.

Here are a lot of reasons why someone climbing this setup can fall back down into the water or onto the pilot boat. And yes it happens every year again, with severe injuries or worse. It's inconvenient, slippery and dangerous – reject and abort.

So, the ladder has to run through the platform, must be secured to the already mentioned strongpoints, and had to rest firmly against the ship's hull as well, all not the case here.

I would love to show a compliant embarkation platform system, but in over 10 years of pilotage I have come across the most sickening fantasies in construction but never ever a compliant one - sorry dear reader.

Pilot ladder winch reel

Non-compliant (by design) pilot ladder winch.

First the "IMO-rulebook" again.

7.1.1 Position of the winch must provide unobstructed access to the ship.

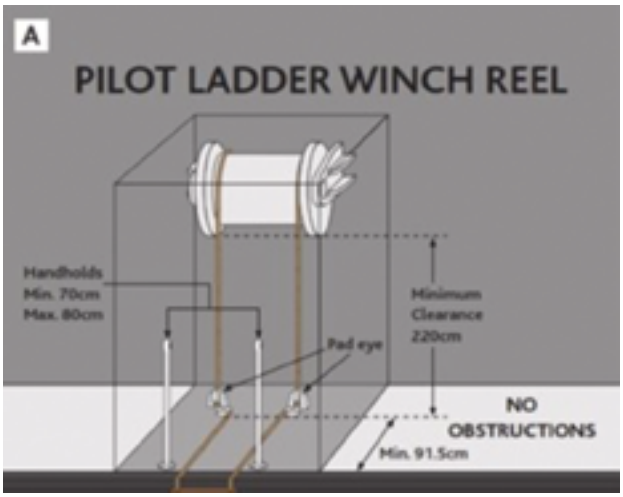
Here we see it's not the case: if you keep climbing, you'll end up on top of the winch.

7.1.2 Point of access may be a ship's side opening, accommodation ladder or a single section of pilot ladder.

In this set up you have to step sideways to the deck and in another section of this article we have already seen this is not allowed. What if your unobstructed access is restricted, due to the freeboard a spreader?

7.1.3 The access position and area should be clear of obstructions. Therefore, the winch has to be placed basically out of your way

And the most important rule I want to stress on in this part is rule 7.4.2: the pilot ladder should be secured to a strong point independent of the pilot ladder winch reel AND 7.4.3: the ladder should be secured at deck level inside the ship's opening or, when located on the ship's upper deck, at a distance of not less then 915mm horizontally from the ship's side inwards.



Section of the pilot ladder poster.

Here we see a part of the well-known pilot ladder poster, it makes the rule clear. Suppose the ladder is secured to the deck at the opening? This is a risk for someone climbing – when he reaches in, he can grab hold of a part of the ladder on the other side of the securing and fall down. It has happened to one of my colleagues over here, he wasn't able to work for over 6 months and gained a few kilos in weight due to the nuts and bolts keeping his foot together. You'll understand the 915mm rule makes sense – haven't met anyone yet with arms longer than 915mm.

Also, the system is secured in more ways – the ladder is secured to strongpoints, the winch is on the brake and a mechanical device or locking pin should also be utilized to lock powered winch reels (7.5.6).

Again, we see the more difficult, the more non-compliances.

Non-compliant (by design) pilot ladder winch reel, spreader obstructing entrance after the sideways dive.

In this final picture in this section we can clearly see the spreader is obstructing your safe access to the ship, and again you have to stumble sideways. Conclusion in this section: Read the manual or look at the poster.

Non-compliant: not secured on deck and deck level

9. Shackles (why and why not)

Check the condition of the sideropes.

On the photo we see that the shackles have been used often to keep the ladder in place. The photo shows really well what effect the steel shackles have on the manilla ropes - twisted and beaten up. Just wonder if this ladder will pass the 30-month compulsory strength test (ISO799-1/2019 10.4, for ISO certified vessels).

Shackles are an easy way for the crew to keep a ladder in place, but is it actually securing the sideropes??? No, it's not - when weight is put on the ladder, the ladder will move freely under the shackles until the next chocks and step has reached the shackles.

Basically, the ladder will be held in place solely by step and chocks. Let's think back a moment, we have seen that each siderope can handle 2400 kilos and that a step can handle 880 kilos. If or when the pilot lauch hits the ladder, it will be ripped to pieces. 880 kilos instead of 4,800 kilos.

So, we see that the shackles ruin the sideropes and that the force is put to the steps and not the sideropes. Why still use this setup would be an genuine question - the answer is simple: IMO allows it:

IMO A.1045(27): 2.1.1 the securing strong points, shackles, and securing ropes should be at least as strong as the sideropes specified etc. etc. This sentence is the only permission in the IMO regulations for using shackles over ropes, with the result we have seen on the photo. Different countries (New Zealand, UK etc) have already declared shackles non-compliant. Have you rigged a ladder with shackles? Ok no pilot for you!

A lot of stress on the chocks and steps.

10. Correct way of rigging a ladder

After all the do nots, finally a do. What is the best practice to secure the ladder to strongpoints on deck?

How to secure the pilot ladder correctly at deck level.

This is it... nothing to it, simple and safe!

We saw in the previous section that the securing ropes must at least have the same strength as the sideropes and that makes sense doesn't it? 4,800 kilos secured by a rope of 4,800 kilos strength (IMO A.1045(27) 2.1.1: securing ropes should be at least as strong as the side ropes >>24kN).

The rolling hitch knot.

The better ladder manufacturers supply securing ropes with every ladder they provide. Use these ropes. Don't use some random piece of rope you have found in the bosun's shop or strops or what else.

- It's an easy to do knot, every able seaman knows how to tie this knot
- No stress on the steps No stress on the chocks
- Sideropes will not be destroyed by the shackles
- The ladder will last longer and therefore save money to the shipping company.

11. Epilogue

I hope you have enjoyed reading this article and maybe you've seen some practices used on your own ship. Don't hesitate to step forward and change it to a compliant system.

You want to be safe, so does the pilot boarding your vessel. You can be sure I don't want to die climbing a ladder as unfortunately happens again and again. People get hurt or die. I have promised my loved ones to come back home vertically and not horizontally.

But be aware, there are of course more non-compliant ways to secure a pilot ladder – brackets, steel wires, etc.

For now, stay safe and godspeed!!!!
Arie Palmers Registered pilot.

Article 52

Insight – *CHIRP* Maritime 2019 Analysis of Pilot Ladder Failings

Introduction

CHIRP Maritime has often mentioned that by far the greatest number of reports we receive relate to pilot ladders. Some of the more specific reports have been discussed in various editions of Maritime FEEDBACK, or have been the subject of Insight Articles, all of which may be found on our website www.chirpmaritime.org.

What on the face of it would appear to be the simple procedure of rigging a pilot ladder to facilitate embarkation and disembarkation has become one of the most dangerous aspects of a pilot's life. Not only do pilots have to concern themselves with the complexities of their job, from manoeuvring huge vessels under challenging conditions, to routine port arrivals and departures; coping with defective vessel equipment; language difficulties and of course the unexpected emergency, but also they have to deal with what should be the relatively easy part of getting on and off the vessel. The perennial issue of pilot ladder failings is once again the subject of intense debate. Such has been the overwhelming number of reports received on this subject, *CHIRP* Maritime has decided to analyse the reports received, which are free from corporate interference and represent the view directly from the reporter.

The perennial issue of pilot ladder failings is once again the subject of intense debate.

Many of the pilot ladder and combination ladder reports that *CHIRP* Maritime receives have recurrent themes, with the same latent failings appearing time and time again. It was therefore decided to produce an analysis of the reports in order to determine the areas in which deficiencies are occurring. The analysis is based upon 124 reports that *CHIRP* received in 2019. The reports were broken down into the main areas of concern with keywords being utilised to build up the picture of areas which required remedial action.

The following graphs show the results of the analysis, along with discussion points to supplement the findings. Each section of the pie graph shows the number of reports received for each deficient category, (shown in brackets), and the percentage of the sum total of the topic in question. As always, any feedback is appreciated, simply email *CHIRP* at mail@chirp.co.uk.

Non-conforming ships by age and flag registry

The first pie chart shows the vessels with ladder deficiencies that were constructed before the current SOLAS Chapter V Regulations in 2012, and those constructed since. The second chart highlights the vessels by flag state registration. Both charts equate to the sum total of the 124 reports that *CHIRP* received.

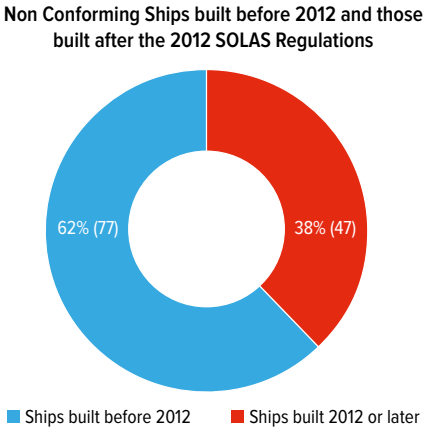


Figure 1 – Non-conforming ships by age.

It is perhaps no surprise that the greater number of non-conforming vessels were constructed prior to the advent of the current Regulations. Neither will there be any raised eyebrows with respect to the second chart – after all the larger sections of the pie chart are the larger ship registries. However, this is not the point. All vessels will have undergone a statutory five-year refit since the 2012 regulations came into force and have had ample opportunity to modify their arrangements in order to comply with SOLAS Chapter V. Yet this has not been done. *CHIRP* would query why this is so and refuses to accept that "We comply with pre-existing older regulations" is a satisfactory answer. The lives of maritime pilots are being endangered day in and day out, so it is incumbent upon shipping companies, classification societies, flag state administrations and indeed vessels' crews to ensure that the arrangements are one hundred percent compliant.

CHIRP refuses to accept that "We comply with pre-existing older regulations" is a satisfactory answer

Note: "Other" consists of 12 Flag States with only 1 or 2 non-conformities

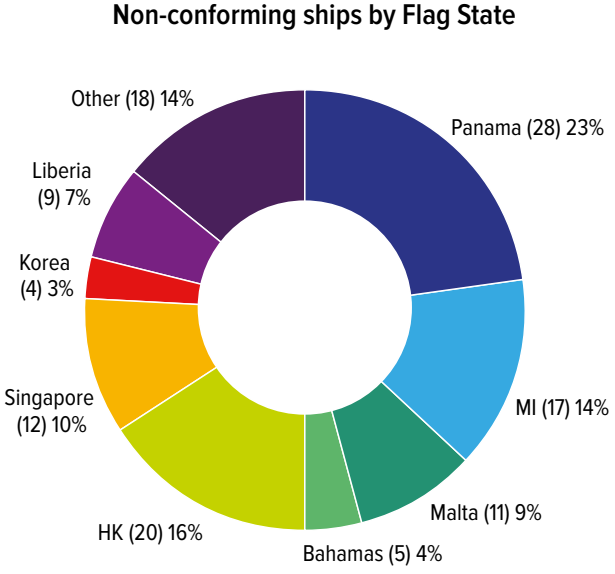


Figure 2 – Non-conforming ships by Flag State.

Reports specific to pilot ladders

The chart in Figure 3 shows deficiencies of pilot ladders, where a single ladder was utilised for pilot embarkation or disembarkation. *CHIRP* received 66 reports in this category, which detailed 99 specific deficiencies.

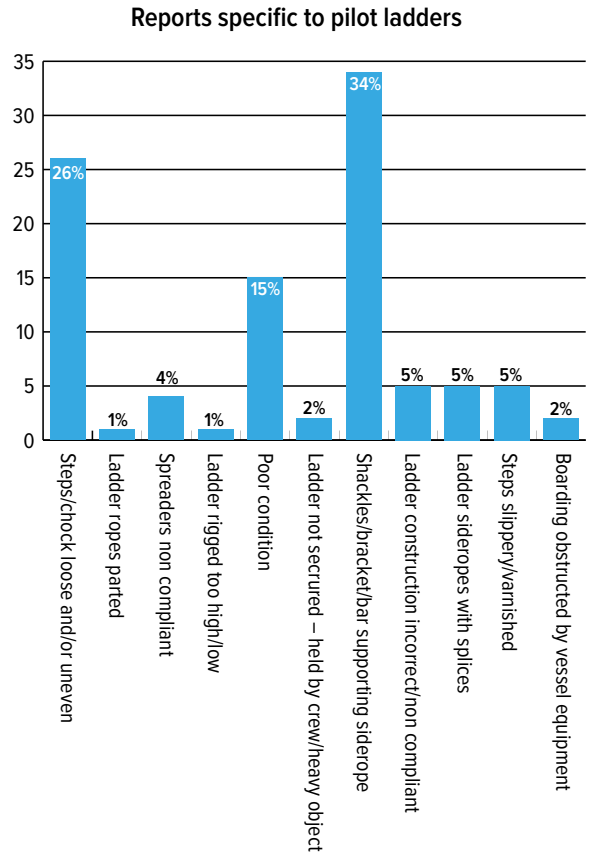


Figure 3 – Reports specific to pilot ladders.

It is a damning indictment that 42% of the reports received highlight uneven steps, loose chocks, a ladder in poor condition or, in one case, the side ropes parting completely when weight was placed upon them prior to disembarkation. This highlights a deficient safety culture and woefully poor quality of seamanship as well as indicating a complete disregard for the safety of the pilot who has to use the ladder. It should be noted that a small percentage of the uneven steps/chocks were in fact ladders that were relatively new and manufactured ashore. *CHIRP* is aware that in some cases this has been followed up by the port or national administration who have contacted the manufacturer(s) in question. The same applies to some of the pilot ladders which have been manufactured ashore and have arrived varnished.

Regarding the pie chart, one third of the reports highlight that side ropes are supported by shackles, a bar, or a bracket. SOLAS does not state how the side ropes are to be secured, but only mentions that the arrangement must be the same or greater strength than the side rope. Brackets or the equivalent may well be stronger than side ropes, but the load usually impacts upon the steps, seizings, or widgets. Thus, the weight of the ladder is now not supported by the side ropes and the arrangement becomes non-compliant. *CHIRP* notes that some classification societies and flag administrations have issued notifications that these arrangements are illegal on board their vessels.

A recurring theme in reports received is the lack of understanding as to how to properly rig a pilot ladder. Some

pilots have reported to *CHIRP* that they see the bracket, bar or shackle arrangement as the lesser of two evils compared with the standard of seamanship observed where the pilot ladder side ropes are being "correctly" lashed to the vessels deck. The hitches used have been observed to be completely unsafe and the associated ropework sub-standard (Note that SOLAS 2012 is vague with respect to the actual securing).

CHIRP strongly believes that pilots should not be faced with "the lesser of two evils", and that one hundred percent compliance with any pilot ladder rig should be the only acceptable expectation

Thus, much of the foregoing comes down to safety culture, seamanship, training and supervision, both on board and ashore – there appears to be a long way to go in this respect. *CHIRP* strongly believes that pilots should not be faced with "the lesser of two evils", and that one hundred percent compliance with any pilot ladder rig should be the only acceptable expectation.

Reports specific to accommodation ladders

Figure 4 shows deficiencies related to accommodation ladders with 17 reports received and 29 separate deficiencies highlighted. Almost fifty percent of the reports relate to either the accommodation ladder itself and/or the pilot ladder, not being secured to the ships side as required by the 2012 SOLAS V regulations. Another significant slice of the pie describes the accommodation ladder itself being less than five metres above the waterline. Anything other than a light swell could cause damage to either the attending pilot vessel and/or the accommodation ladder itself.

The apparently repeated report of defective steps and chocks is explained by the fact that the reports highlighted this issue along with other deficiencies specific to accommodation ladders.

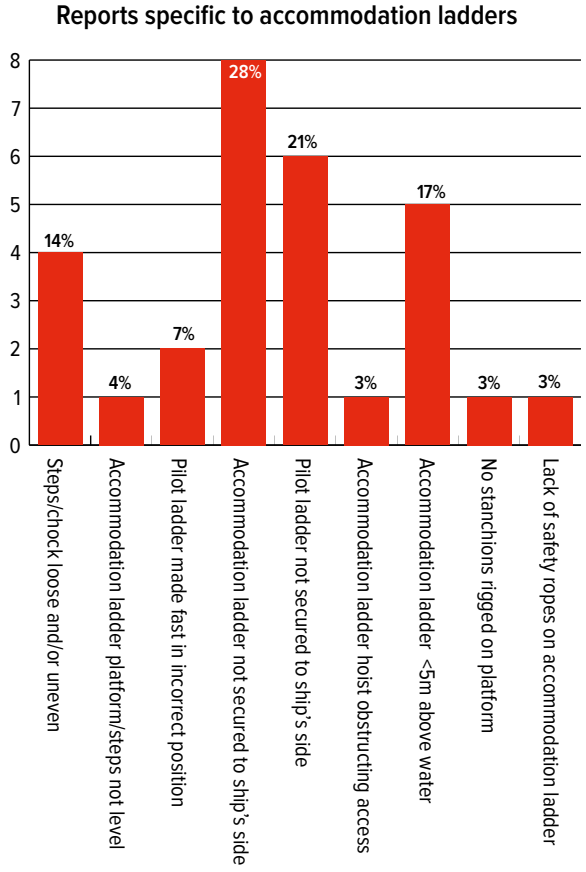


Figure 4 – Reports specific to accommodation ladders.

The smaller sections of the diagram deserve a mention since they are extremely dangerous – accommodation ladder steps not being level, a lack of safety ropes on the accommodation ladder and no stanchions rigged at the bottom of the ladder at the pilot access are all extremely dangerous. *CHIRP* Maritime would argue that there is no excuse for this – in dialogue with the reporters, we discovered the vessels concerned had confirmed that the arrangements were ready in all respects to effect a safe pilot transfer. Clearly this is not the case, and in no situation was the vessel being rushed to prepare the arrangement. This is safety culture and supervision in its poorest form.

Reports specific to "trap door" type combination rigs

Figure 5 shows deficiencies with respect to "trap door" type combination rigs. *CHIRP* received 25 reports related to these arrangements and the analysis shows a high number of deficiencies, namely 58. The reason for this is not at all surprising. It is almost universally impossible to rig a trapdoor arrangement that is one hundred percent compliant with the 2012 SOLAS V regulations.

The largest areas of failing are the pilot ladder being secured to the bottom of the accommodation ladder, the pilot ladder (often another ladder) not being attached to the ships side 1.5m above the accommodation ladder platform, and access and handholds being-non compliant – this is causing repeated difficulties for the pilots to make the transition from pilot ladder to accommodation ladder.

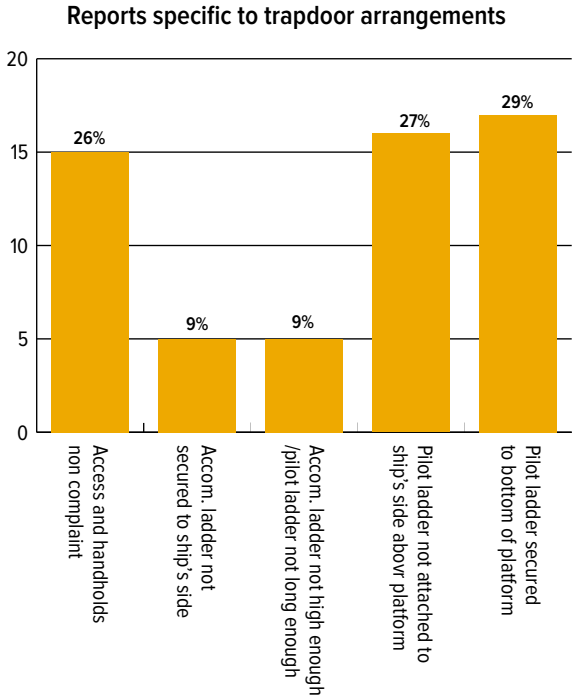


Figure 5 – Reports specific to "trap door" type combination rigs.

CHIRP queries all of the above but specifically the pilot ladder being secured to the bottom of the accommodation ladder. Photographic evidence often shows modifications having been made to accommodation ladders, and that lugs have been welded to the base of the ladder to allow a pilot ladder to be shackled on. Despite the fact that this is non-compliant with the regulations, *CHIRP* asks the question, "Who authorised these arrangements?"

The sooner these arrangements are either modified to ensure full compliance or are removed from service and banned altogether the better

Fully compliant trap door arrangements such as three-sided trap door rigs are noted to be few and far between. The general view is that the sooner these arrangements are either modified to full compliance or are removed from service and banned altogether the better. *CHIRP* fully agrees with this sentiment but assesses that such a change will need to be mandated in clear language to avoid misinterpretation.

Reports specific to manrope deficiencies

CHIRP received 37 reports where manropes were specifically mentioned, and 45 deficiencies were highlighted. Almost half of the deficiencies related to the incorrect rigging of the manropes. Notwithstanding the nature of the other deficiencies reported, all of the failings came down to a basic lack of seamanship, supervision, safety culture and training. This is one area where any change to pilot ladder regulation is unnecessary – all of the deficiencies can be addressed on board to ensure that manropes are rigged correctly.

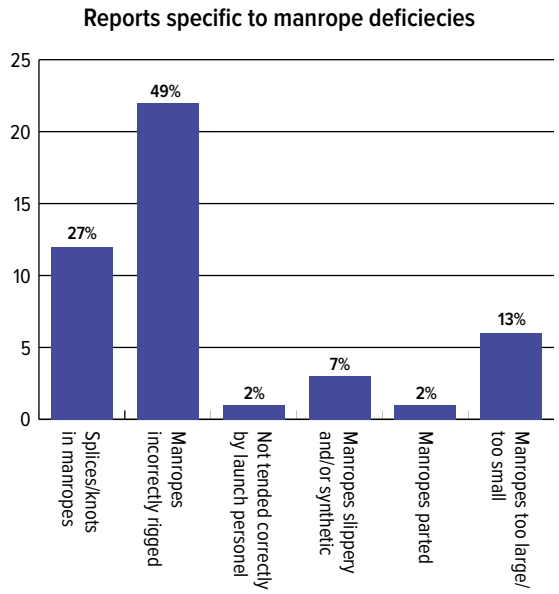


Figure 6 – Reports specific to manropes deficiencies.

The whole chart demonstrates a lack of understanding as to what the manropes are used for, and this requires the urgent attention of vessels crews and their managers ashore in order to rectify the problem.

Sundry equipment deficiencies

The final chart in Figure 7 describes sundry deficiencies with the equipment. 47 reports were received, and 53 separate deficiencies were noted.

The largest area of failing were the deck fittings (or more correctly lack of) for side ropes and manropes. The deficiencies were noted for both pre 2012 and current SOLAS vessels. As noted earlier, all vessels have had ample time since the introduction of the current regulations to rectify any failings, so the question has to be asked why they have not done so? There is much more to be done by flag administrations, their recognised inspection organisations, port state control, and shipping companies in order to rectify this area.

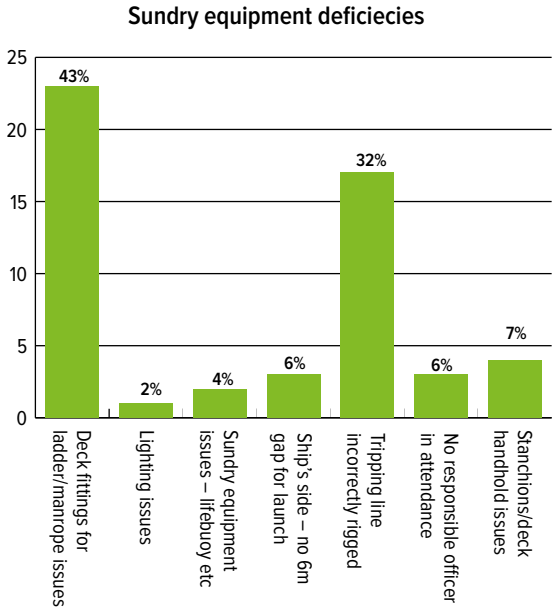


Figure 7 – Sundry equipment deficiencies.

Incorrect retrieval lines – often called tripping lines – accounted for almost one third of the reports, where the line was rigged in such a manner that it could become fouled upon the attending pilot launch or obstruct the safe access to the ladder for the pilot. The majority of failings were that the line led aft and not forward – also the line was rigged below the bottom spreader. All totally avoidable with a little care and attention.

CHIRP also highlights the ship side issue where there was no 6m gap in the rubbing bar to allow for safe access for the pilot boat. The vessels concerned were new – one on her maiden voyage – so who allowed them to be constructed in this non-compliant manner? *CHIRP* often highlights safety culture on board, but this is an example of poor safety culture ashore and a disregard for construction regulations.

Finally, the lighting issues and lifebuoy issues might charitably be attributed to carelessness, or it might be down to a poor safety culture. There is however absolutely no excuse for a responsible officer not being in attendance during the embarkation or disembarkation of a pilot. This highlights a disregard for the safety of any pilot boarding operation and/or exposes deficiencies in crew manning.

Summary

Overall, the analysis makes depressing reading for any maritime pilot who has had his or her life needlessly endangered when encountering these arrangements. The diagrams show an unacceptable disregard of the 2012 SOLAS Regulations and the accompanying IMO Assembly Resolution A27-1045. They also indicate a low level of awareness and poor seamanship standards, all of which are very much avoidable should shipping managers, port state control, classification societies and flag state administrations intervene and "walk the walk" rather than turning a blind eye to the problem.

CHIRP Maritime intends to follow up with further analyses once sufficient reports have been received in order to determine whether the deficiencies above have been addressed and where the future focus of the maritime sector should be in order to ensure maritime pilot safety.

In conclusion, a clear picture has emerged of the principal failings relating to the rigging of pilot ladders. Apart from

the questionable quality of some new ladders – *CHIRP* queries how these products are deemed acceptable at the manufacturing stage – there is also the issue of seamanship. This leads to some uncomfortable conclusions about the quality of training and supervision at the basic level of a seafarer's skill and the quality control among ship managers.

CHIRP Maritime asks whether the quality of seamanship exposed by the reports meets the minimum standard expected from a competent professional? If the answer is YES, then the accepted low standard of competency and the training process must be questioned. If the answer is NO, then there is a very poor on-board safety culture in place which the ship operator has not correctly monitored or chooses to accept. Either way, the situation is unacceptable and such poor regard and understanding of professional standards and safety culture continues to expose pilots to unacceptable and unnecessary levels of danger.

The above article was published in May 2020 on the *CHIRP* Maritime website. It was also the "safety focus" feature in the August edition of Safety at Sea.

The analysis makes depressing reading for any maritime pilot who has had his or her life needlessly endangered when encountering these arrangements

Section nine

APPENDICES

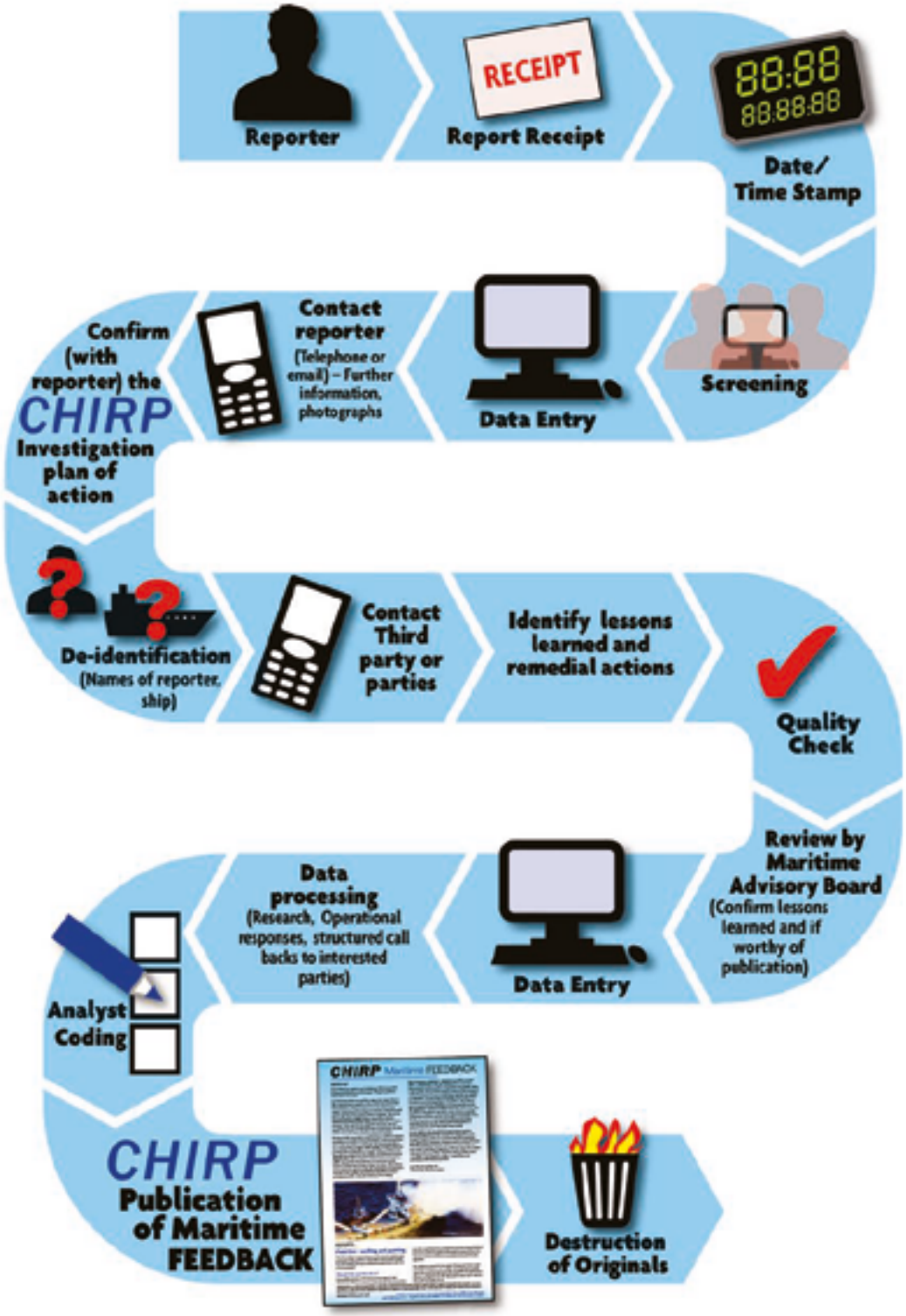
Appendix I: **Acronyms**

AB	Able Bodied Seaman
ACGIH	American Conference of Governmental Industrial Hygienists
ADA	American Disabilities Act
AIS	Automatic identification system
ARPA	Automatic Rader Plotting Aid
BA	Breathing Apparatus
BRM	Bridge Resource Management
BS	British Standards
CBM	Conventional Buoy Mooring
CD	Compact Disc
CHIRP	Confidential Human Factors and Incident Reporting Programme
CNIS	Channel Navigation Information System
COLREGS	The International Regulations for Preventing Collisions at Sea
COG	Course Over the Ground
COT	Cargo Oil Tank
CPA	Closest Point of Approach
DGPS	Differential Global Positioning System
DPA	Designated Person Ashore
ECDIS	Electronic chart data information system
EEBD	Emergency Escape Breathing Device
EMSA	European Maritime Safety Agency
ER	Engine Room
ERM	Engine Room Resource Management
EU	European Union
FRC	Fast Rescue Craft
GISIS	The International Maritime Organization's Global Information System
GPS	Global Positioning System
H_2S	Hydrogen Sulphide
HE	(The) Human Element
HELM	Human Element Leadership and Management
HRO	High Reliability Organisation(s)
HSE	Health, Safety and Environment
IG	Inert Gas
IMO	International Maritime Organization
IMCA	International Marine Contractors Association
IMPA	International Maritime Pilots Association
ISM	International Safety Management Code.
ISGOTT	International Safety Guide for Oil Tankers and Terminals
ISO	International Organization for Standardization
ISWAN	International Seafarers Welfare and Assistance Network
IT	Information Technology
ITF	International Transport Worker's Federation
LOP	Letter of Protest
MAB	*CHIRP* Maritime Advisory Board
MAIB	Marine Accident Investigation Branch
MARPOL	International Convention for the Prevention of Pollution from Ships, 1973 as modified by the Protocol of 1978
MCA	The United Kingdom Maritime and Coastguard Agency
MEPC	The Marine Environment Protection Committee – IMO
MFB	Maritime FEEDBACK
MGN	Marine Guidance Note
MLC	Maritime Labour Convention
mmwg	millimetres of water gauge
MNM	Merchant Navy Medal
MOU	Memorandum of Understanding
MPX	Master / Pilot Information Exchange
MSC	Maritime Safety Committee (IMO)
MSF	Marine Safety Forum
NB	Nota Bene
NM	Nautical Mile
NOx	Nitrous Oxides
OOW	Officer of the Watch
OS	Ordinary Seaman
PACE	Probe, Alert, Challenge, Emergency
PDF	Portable Document Format
PEC	Pilot Exemption Certificate
PM	Particulate Matter (Nox and Sox)
PM	Planned Maintenance (System)
PPE	Personal Protective Equipment
Ppm	parts per million
PPU	Portable Pilot Unit
PSC	Port State Control
QA	quality Assurance
RHIB	Rigid Hulled Inflatable Boat
RIB	Rigid Inflatable Boat
RN	Royal Navy
RPM	Revolutions per Minute
SCABA	Self-Contained Breathing Apparatus
SI	Statutory Instrument
SMS	Safety Management System
SOG	Speed Over the Ground
SOLAS	International Convention for the Safety of Life at Sea (SOLAS), 1974 as amended
SOx	Oxides of Sulphur
STCW	The International Convention on Standards of Training, Certification and Watchkeeping for Seafarers (STCW), 1978 as amended
STEL	Short Term Exposure Limit
SWL	Safe Working Load
TCPA	Time to Closest Point of Approach
TDG's	Tactical Decision Groups
TLV	Threshold Limit Value
TSS	Traffic Separation Scheme
TWA	Time Weighted Average
UCL	University College London
UK	United Kingdom
UKHO	United Kingdom Hydrographic Office
UKMPA	United Kingdom Maritime Pilots Association
US	United States
USCG	United Sates Coast Guard
VHF	Very High Frequency (radio)
VLCC	Very Large Crude oil Carrier
VTS	Vessel Traffic Services

Appendix II:

How the *CHIRP* reporting process protects your identity

Report processing flow – *CHIRP* Maritime



Guiding Principles:
Confidentiality Protection / Non-Punitive/ No "Whistle Blowing"

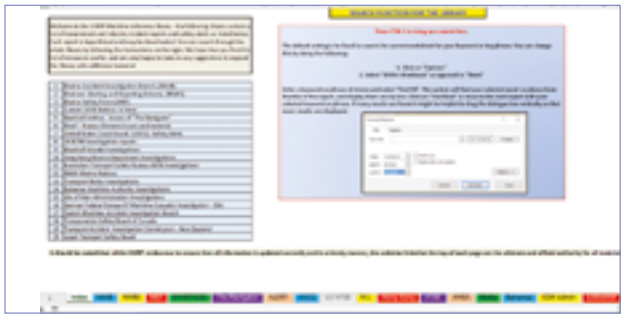
Appendix III: **The Maritime Programme – How it works**

- Reports can be generated either online (through our secure website www.chirpmaritime.org, by email (reports@chirp.co.uk) or by telephone to the *CHIRP* Charitable Trust (+44 1252 378947 ext 3).
- *CHIRP* currently receives confidential incident reports from professional and amateur participants in the maritime sector, throughout the world and across all disciplines. For all potential reporters, they can be reassured the identification of all reporters is always protected even if their reports are, ultimately, not used.
- Every report that is received is acknowledged and investigated, with feedback provided to the reporter before closure of the report.
- On being received, reports are screened then validated as far as is possible and reviewed with the objective of making the information as widely available as possible whilst maintaining the confidentiality of the source.
- Anonymous reports are not acted upon, as they cannot be validated.
- *CHIRP* is not a "whistle blowing" organisation.
- Each report is allocated its own unique reference identification. Data is entered into the internal network computer system.
- When appropriate, report information is discussed with relevant agencies with the aim of finding a resolution.
- Only depersonalised data is used in discussions with third party organisations and the confidentiality of the reporter is assured in any contact with an external organisation.
- The report in a disidentified format will be presented to the Maritime Advisory Board (MAB). The MAB meets every quarter January, April, July and October. The MAB discuss the content of each report, they then provide advice and recommendations for inclusion in Maritime FEEDBACK. All reports are analysed for casual factors and potential risk.
- No personal details are retained from any reports received, including those not acted upon. After ensuring that the report contains all relevant information, all personal details of the reporter are removed with an acknowledgement email sent to close the report.
- After the deletion of personal details, *CHIRP* is subsequently unable to contact the reporter. The reporter may, if he/she wishes, contact the *CHIRP* office for additional information by using the report reference identification.
- The Maritime FEEDBACK publication is written by the Maritime Advisors with the assistance of volunteers from the MAB who are experts in the written article to be published. All published "Lessons Learned" are disidentified and therefore the possibility of identifying the Company, Ship or Seafarer reporting or involved shall be almost impossible.
- All our published material is freely available for use by other safety systems and professional bodies.

Director (Maritime)
December 2020

Appendix IV: **Our Publications**

Reference Library



The link below will take you to the reference library page on the *CHIRP* website. From there you can download an Excel workbook which contains links to a comprehensive list of incident investigations, near miss reports and safety alerts issued by a selection of government maritime agencies and shipping industry sources around the world.

The library has been written in Microsoft Excel on a Windows 10 operating system – the browser used for links was Google Chrome. With these in place, all links should open automatically. It has been found that when viewing the files on an Apple Macintosh, that links to the internet tend to open correctly, but links to a specific PDF file do not open. If this is the case, then copy and paste the link into your browser – the requested file should then open.

We should emphasise that that the official source of information is the actual web sites of the Agencies included in the workbook. The links to these sites may be found at the top of each sheet of the workbook and should be consulted for the most current data.

The library is updated on a regular basis – any suggestions for further enhancements of the library will be very much welcomed.

www.chirpmaritime.org/reference-library

Appendix V: **Our Sponsors**

We are grateful to the following sponsors for funding the publication and distribution of this *CHIRP* Annual Digest 2020. They are:

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The Seafarers' Charity

CHIRP MARITIME

The *CHIRP* Charitable Trust, One Kingdom Street,
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Please add as much detail as possible about the incident/safety issue, including date, time and location. Please note that *CHIRP* does not recommend the use of unencrypted email for reports and the preferred method of reporting should be online at www.chirpmaritime.org.

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