

future<sup>e</sup> nautics  
maritime

# Crew Connectivity 2018 Survey Report

In association with

KVHI<sup>®</sup>





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# Contents

04| Foreword

06| Introduction

09| A Matter of Mindset

10 | Key Findings & Market Value

14 | Crew Connectivity Survey Report 2018

46| Our partners

# Foreword



**W**hen I first developed the questionnaire for the original Crew Communications survey back in 2012 I was optimistic that the responses were going to provide data of real value. However, I never envisaged that by 2018 it would become the definitive source of information and analysis for the industry.

In 2012 the overwhelming interest was in communications in the context of crew welfare, but since then—as the digital revolution has gathered pace and the industry has acknowledged the pivotal enabling role connectivity plays in every aspect of their operations—the question-set has expanded.

As the scope of the survey has broadened we are now collecting unique data around cyber security and resilience and in addition this year also data about crew's attitudes to a range of technologies from artificial intelligence to unmanned ships, and their likely impact on their prospects in the future.

It isn't just the question-set which has expanded, but the sample size too. This year we have had a massive 6,000 serving seafarers take the time to complete the survey. That has provided a truly significant amount of data, which has taken a significant amount of time and energy to interrogate and interpret. But its depth and breadth makes the resulting analysis all the more valuable.

It's our belief that collaborating and sharing information can accelerate the pace of transformation in shipping and

maritime, and begin to understand and solve big problems. The Crew Connectivity survey is a clear demonstration of that process in action.

I hope that this year's report continues to deliver real benefit to all kinds of industry stakeholders, and I am always happy to help companies and organisations to engage with the analysis and data as deeply as possible. If you'd like to discuss any of these findings in more detail then please feel free to contact me directly.

In closing I'd like to personally thank our partners, BIM-CO, Alpha Navigation, PTC, ISWAN and InterManager for their invaluable assistance. I'm also very grateful to Intelsat and KVH Industries for their support and sponsorship which I know they view as an investment in the future of the industry, and without which we would not be able to make this data freely available. Finally, of course, my thanks go to the thousands and thousands of seafarers who continue to believe the time they spend filling in our questionnaire is worthwhile.

The Crew Connectivity Survey is a wonderful example of something created for the industry, by the industry, and we are extremely proud to be part of it. It may have Future-nautics Maritime on the cover, but it belongs to you.

**Roger Adamson. CEO, Future-nautics Maritime**

# Introduction

In absolute terms the number of seafarers who can now use the Internet at sea has increased by over half a million . That's a hugely significant achievement. It's easy to look at these numbers and forget that each represents a human being. We mustn't.

Way back in 2013 I wrote a piece about the future of the shipping and maritime industry. Many of the terms I used, and the predictions I made were considered the stuff of fantasy by the majority of the industry at that time. I warned that if the industry didn't get its collective act together then when it said 'shipped by Amazon' on the label they really wouldn't be joking.

Fast forward less than five years and the climate is entirely different. The emergence of new, powerful competitors and technology moving at a breakneck pace has come in the face of relentless pressure on margins across the board. As a result the digital transformation of the shipping and maritime industry is well underway, and that transformation is being powered by information flows. Data is the new oil and accurate information that can be turned into actionable insight is king.

For decades this industry—in common with most others—hoarded its data and charged big money to those who wanted to access it. So it was unusual for the very first sponsor of what was then the Crew Communications Survey back in 2013 to agree to allow us to make the key findings and analysis available in a free whitepaper. The reaction of industry stakeholders to such a large and reliable dataset provided by serving seafarers was so overwhelmingly positive that we at Futureonautics were clear it had to continue.



**K D Adamson. Futurist & CEO Futureonautics Group**

Since then the survey has grown and its question-set expanded. Changing its name to the Crew Connectivity Survey in 2015 reflected the shift in understanding that connecting vessels was becoming less about just crew welfare, and more about opening the door to cross-business benefits. In 2015 it gave the industry groundbreaking statistics about fleet-wide cyber attacks and crew cyber awareness and training. It has also tracked the quantity and range of technology carried aboard vessels—anticipating the BYOD and ATAWAD trends way before they became buzzwords. And most importantly of all, it has shared all this data and insight—thanks to sponsors and partners—completely freely.

When it comes to surveys there's a lot of 'mine's-bigger-than-yours' around these days, but at close to 6,000 serving seafarer respondents the 2018 Crew Connectivity Survey really is 'the Daddy'. That's due to a range of supporting organisations whose people spend their time and energy helping us to get the questionnaire out to our seafarers around the globe. We remain indebted to them and their efforts, without which the survey would be far less robust.

Then of course there are the seafarers themselves, each of whom took the time to share their views and experiences. And what they told us has once more proved controversial, uplifting, frustrating but ultimately in my own view, immensely positive as we look towards the fast developing future.

Let's start with the basics. More seafarers than ever before have access to connectivity and communications. Delve further into the data and the availability of that access shifts around, but despite that in absolute terms the number of seafarers who can now use the Internet at sea has increased by over half a million (527,000) since the last survey, and those who can access it for free has increased by over 200,000. That's a hugely significant achievement. It's easy to look at these numbers and forget that each represents a human being. We mustn't.

It's clear that connectivity is improving, and more seafarers can access it. So perhaps one of the most controversial findings of this survey is that the market for crew connectivity has contracted.

Since the last survey the value of the market has decreased by nearly \$1bn, but lack of appetite for services doesn't fully explain the drop. What's more likely are the twin trends of falling cost of services and a shift in the way services are being accessed. As these play out what we're seeing could well be a maturation of the market and the emergence of real underlying demand.

What has been clear for several years now is the demand amongst seafarers for a global roaming SIM card, a cheap satellite phone and free in-port WiFi. It remains a source of frustration for seafarers that these requests—which they've been making repeatedly since the survey began—appear still to be falling on deaf ears.

As our analysis has often pointed out, it's an area where seafarer welfare charities have a huge opportunity to get in-

Individuals are ready to share their data to improve their employment prospects. There appears to be a real opportunity to revisit some of the traditional safeguards which may no longer be in the best interests of either seafarers or the industry.

involved, and perhaps need to do so quickly. Access to communications has consistently been the number one reason for seafarers using welfare facilities in port, so the continuing trend towards increased connectivity at sea was always likely to impact usage of these welfare facilities. However, the figures we're now seeing are stark. The numbers of crew accessing welfare facilities has fallen to 20%, and the number of ratings using welfare services has dropped from 28% to just 15%.

But where one need may be decreasing others are emerging. Welfare organisations—many of which lend valuable support to this survey—can learn much from this data about what those new needs are and how to work with new partners and in new ways to meet them for seafarers in the future.

Those new needs are driven by technology and by attitudes, each impacting the other in an ongoing feedback loop. For example, in this era of hyper-connectivity and radical transparency individuals are ready to share personal and employment data that can improve their prospects for employment and advancement. Yet today ship operators aren't permitted to have access to anything other than the most basic information about a seafarer's performance and health.

In the past this might have been considered a protection from unscrupulous employers, but seafarers today make clear that they are more than ready to share this type of data. 71% of seafarers are willing to share personal data to further their career prospects and 50% of seafarers are willing to share their employment reviews, whilst 44% are prepared to share their medical history with prospective employers. There appears to be a real opportunity to revisit some of the traditional safeguards which may no longer be in the seafarer's—or the industry's—best interests.

Seafarer's attitudes to sharing data may surprise some in the industry, but what will probably prove more of an

eye-opener are their attitudes to technology and automation. More than half of respondents had seen at least one element of their role automated in the last two years and of those 98% reported that it had had a positive impact. In fact across a wide range of technologies seafarers were universally positive about their introduction—with one exception. Unmanned ships was the only technology about which a majority were not positive, although it was far from a consensus. 38% of seafarers still viewed unmanned ships as an opportunity.

With opportunities come new threats too and the data around cyber security, attacks and resilience are sobering ones. Just under half of respondents reported having sailed on a vessel which had been compromised by a cyber attack. When one considers that up to 70% of attacks go unnoticed, the real picture could be far worse. Thankfully this issue is rising up the agenda, but the industry still hasn't got a handle on it—as the woeful stats on cyber training indicate.

I am fond of pointing out though, that cyber resilience presents a very positive opportunity for organisations. Understanding what data you have, how your systems operate, where and with what and whom you are connected and how that impacts your business, revenues and operations is very shortly going to be table-stakes. Ship operators and others need to look at cyber as a good reason to invest time and money in those things—not just out of fear, but out of a desire to equip the business with an infrastructure fit for the future.

The shift in mindset in the industry—from connectivity as an enabler of crew communications and welfare alone, to one where connectivity is an enabler of new digital operation—has happened comparatively fast, and it continues to evolve.

With 53% of seafarers now reporting that crew communications has led to a decline in social interaction on board we're beginning to see a more nuanced approach by some operators. Whilst connecting crew is unquestionably a good and smart thing to do, offering unlimited Internet access is not a panacea.

I'm aware of at least one operator who is reviving the idea of the 'Internet Cafe'—an initiative which is designed

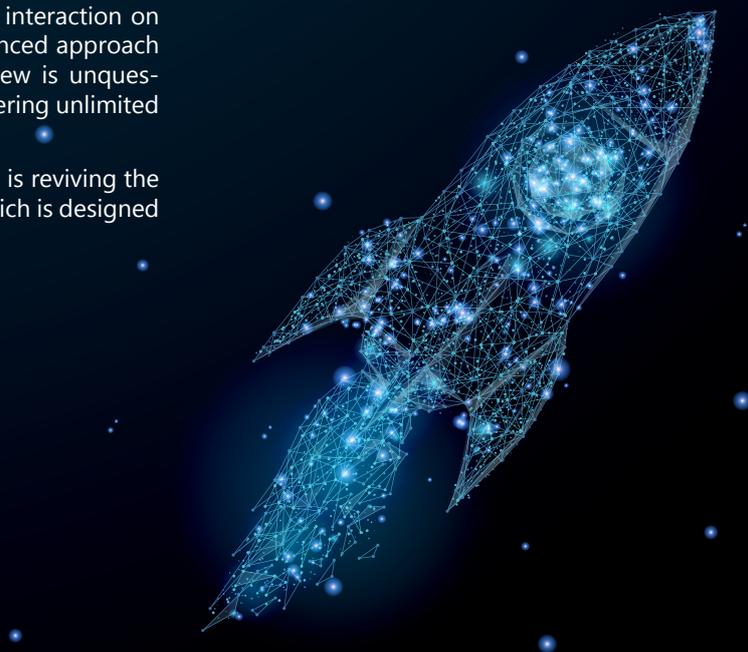
to address the very real issues around camaraderie, interaction and teamwork on board. It's a positive sign that operators are beginning to realise that the real value of technology comes when you deploy it intelligently.

The objective is not to have every seafarer connected to the Internet. The objective is for individual seafarers to lead happy, safe, productive and fulfilling lives at sea. I'm fairly sure that's the attitude of most seafarers. And if you'd like evidence of that just take a look at where they rank Internet access in their list of important services a ship operator can provide. It's number five out of six.

Since I warned about competitors like Amazon in 2013 shipping really has upped its game, but it—like every other industry—is still at the start of an incredible journey. The future has no guarantees and a set of constantly shifting parameters, but there is something we can learn from the behemoth that is Amazon.

It's often referred to as the 'everything store' but that's to fundamentally misunderstand why it's successful. Amazon isn't the everything store, it's *the everyone store*. It has almost perfected that art of listening to and learning from both its customers and its own people. That enables it to deliver services and experiences which make people happy. If we want to compete with the Amazons of this world then we have to listen to our people and focus relentlessly on helping them to be the best they can be.

Because those who win won't be the ones with the best technology, it will be the ones with the best people. And I think that the 2018 Crew Connectivity Survey shows we have all the raw material we need, if we're prepared to listen to them.



# A Matter of Mindset

**M**indset change" is a term we hear frequently in the maritime world, and the information expertly presented by Futureonautics in this report – gathered from an impressive 6,000 seafarers – certainly confirms that there is a tremendous shift underway in the industry today. KVH has always been keenly interested in what connectivity can do for a seafarer, knowing firsthand the benefits of providing a connection to home, a way to receive onboard training, and a means for increasing the overall level of crew welfare.

We were, therefore, particularly interested in the picture of an extremely technology literate seafaring workforce that emerges in this report. For example, 88% of respondents described themselves not only as users of technology but sufficiently well-versed in it that they could assist others with technology. And 90% of the respondents – a combination of officers and ratings – reported that the technology they use onboard is easier to use than technology in their non-working lives.

Connectivity is undeniably part of life at sea now: The average availability of Internet access is reported at 75%, a more than 30% increase since the last survey. Some 61% of seafarers report having Internet access "always or most of the time." And only 2% report "never" having access. Seafarers today take an average of three devices onboard, with smartphones the most popular device, as well as laptops and even smart watches and fitness trackers.

Indeed, staying connected is so important that 75% of seafarers say Internet access influences their decisions about where to work, a sentiment shared by officers and ratings alike. Interestingly, there was a significant increase in the degree to which it influenced their decision, with seafarers who said Internet access has a "strong or very strong influence on who they worked for" going from 78% in prior years to an impressive 92% in this report.

There are more signs of the mindset change in the fact that 95% of seafarers view connectivity as having a positive effect on onboard safety. It is interesting to note the generational change that came across in the fact that expenditure on crew communications was highest among seafarers ages 18-24. Although this fact is not surprising given digital natives' ease with technology, it is remarkable in that it is a reversal of the results in prior years; this switch may have more to do with the affordability of connectivity today versus prior years, when a more senior person onboard had more money to spend than a younger crew member.

Training remains an area where seafarers view connectivity as more than just a requirement but truly an enabler for behavioral change, with 77% of survey respondents



**Martin Kits Van Heyningen. CEO, KVH Industries**

viewing a ship as a good place to engage in training, a percentage consistent with prior years. A point to note was the willingness of seafarers today to share personal data – albeit in a career scenario: Some 50% of seafarers reported being willing to share their employment reviews and health history with a prospective employer, and only 13% reported being unwilling to share any data at all.

The effect of the mindset shift regarding technology throughout the maritime industry appears to be well understood by seafarers: Some 69% view big data and analytics, for example, as an opportunity for their jobs in the next five years versus only 17% who view it as a threat. Likewise, 75% of seafarers reported seeing predictive maintenance as an opportunity versus 15% seeing it as a threat. Some 68% of seafarers see automation as an opportunity versus 21% who see it as a threat, which illustrates the massive shift to connected data to inform real-time decision making.

This is an extremely exciting time for the maritime industry, as digitalization begins to transform ship operations and open up many opportunities to keep this industry vital. We are delighted to support this report, which reinforces the importance of connectivity and how it is changing the life of the individual seafarer. By better understanding their needs, and by giving voice to their experience, the entire industry is poised to grow for the future.

# Key findings



- The value of the crew connectivity market has decreased by nearly \$1bn since the last survey thanks to a fall in crew spending on connectivity services due to falling costs and a change in the way in which crew access these services.
- The numbers of crew accessing welfare facilities has fallen to 20%. The number of ratings using welfare services dropped from 28% to just 15%.
- Once again, the survey found evidence of a highly IT literate workforce with 88% reporting that they understand technology or are very knowledgeable and help others with technology.
- 90% of seafarers reported that shipboard technology was easier or far easier to use than the technology they encountered in their daily lives. Of those that found on board technology more challenging twice as many were officers.
- More than half of all seafarers had seen at least one element of their role automated in the last two years. 98% said this had had a positive impact on their role.
- Seafarers saw automation, Big Data & analytics and predictive maintenance as the biggest technology opportunities for the industry in the next 5 years.
- Unmanned ships, robotics and Artificial Intelligence (AI) are seen as the biggest technology threats facing the industry in the next 5 years— although 38% of seafarers viewed unmanned ships as an opportunity.
- The most important service a ship operator can provide crew is accurate and timely payment of salary. Internet access was ranked the fifth most important service a ship operator could provide out of a list of six.
- 75% of seafarers said the level of connectivity provided on board did influence which ship operator they worked for. 92% said it had a strong or very strong influence on who they worked for—a rise of 14%.
- 61% of seafarers have access to crew communications services ‘most of the time’ or ‘always’—representing an increase of 3%. 38% or 650,000 seafarers get access to crew communications only ‘sometimes’. Just 2% or 80,000 seafarers ‘never’ get access to crew communications.
- 92% of seafarers believe that there has been an improvement in provision/access to crew communications since the introduction of the MLC.
- Although improved since the last survey the General Cargo and Bulk sectors remain those with the least crew communications provision.
- Internet access across all sectors has increased by 32% since the 2015 survey with 75% of seafarers now having some form of access whilst at sea. In absolute terms the number of seafarers that can now use the Internet at sea has increased by over half a million (520,000) and those that can access it free by over 200,000.
- For over half of crew, the most common place from which they can access communication services is their cabin. This was equally true for ratings as for officers. Only in the Bulk and General Cargo sectors is the bridge still the most common place for accessing services.
- Despite the growth in access there is no evidence of corresponding growth in usage—in fact the opposite as average numbers using services on a daily basis has fallen by 3%.
- There has been a fall of 21% in the number of seafarers quoting cost as the factor that most limits their use of crew communications.
- 53% of seafarers believed that crew communications had led to a decline in social interaction on board.
- 55% of seafarers believed that crew communications had affected safety on board ship but 95% believed the effect was positive.
- 47% of seafarers said that they had sailed on a vessel that had been the target of a cyber-attack.
- Only 15% of seafarers had received any form of cyber security training. The majority of training currently provided to seafarers is by crewing and manning agencies before the seafarer leaves on his/her next contract.
- Only 33% of seafarers said the company they last worked for had a policy to regularly change passwords on board.

- Only 18% of seafarers said the company they last worked for had a policy to change default equipment passwords on board.
- 71% of seafarers are willing to share personal data to further their career prospects. 52% are willing to share personal data in return for free Internet access.
- 50% of seafarers are willing to share their employment reviews, whilst 44% are prepared to share their medical history, with prospective employers.
- The number of seafarers undertaking some form of computer-based training on board fell by 3% to 43% since the last survey. The majority of CB training undertaken was safety related.
- Equipment refresher training was cited by 65% of crew as missing from the current training solutions provided. Only 20% cited cyber security training.
- Crew expenditure on connectivity services at sea has fallen by 33% and by 34% ashore/in coastal waters since the last survey. This has been driven by falling costs and more cost-effective ways in which crew can access some services.
- The gap between expenditure levels of ratings and officers has narrowed to 10%
- EMEA nationality seafarers spent least on crew communications whilst those from countries in South Central Asia and Rest of the World spent the most.
- Seafarers take on average 3 personal technology devices on board. Smartphones, ordinary feature phones and laptops/netbooks are the most popular items.
- Smart watches and fitness trackers are growing in popularity amongst seafarers as part of a wider 'quantified self' trend and together represent some of the most planned technology purchases for seafarers in the coming 12 months.
- Facebook remains the most popular social media site/app for seafarers. ABS-CBN is the most popular news site/app, NBA the most popular sports site/app and Lazada the most popular shopping site/app.
- The crew communications services most wanted by seafarers, and not currently provided, were free in-port WiFi, a global low cost roaming SIM card and a low cost satellite phone.

# Market Value

FutureNautics estimates the market value for crew communications at sea across the major sectors at \$1.3bn USD per annum—a decrease of over \$500m (*Table 1*) This estimate is based on the expenditure by officers and ratings in each sector.

With the exception of the Passenger and Offshore sectors it is based on 20 crew members per vessel with a split of 8 officers to 12 ratings. It also takes into account those that do not have access to any form of crew communications services, and those that choose not to use them, as well as those that are provided the services free of charge by the ship operator.

The decrease in market size is primarily accounted for by significant falls in expenditure by crew in a number of sectors.

The Passenger and Tanker sectors remain the most significant markets for crew communications. The Passenger market is important because of the disproportionate number of crew in this sector in comparison to other commercial sectors.

We have seen a very dramatic decrease in expenditure—of more than 50%—by both officers and ratings in this sector. The significant variation between officer and rating expenditure previously observed in the passenger sector seems also now to have largely disappeared.

The Tanker market (in which we include crude, product and chemical tankers) is the second largest sector by vessel numbers, and the combined expenditure by both ratings and officers is the highest of any sector. The General Cargo sector is the third most valuable market.

Futureautics estimates the shore-based crew communications market at \$1.1bn per annum—a decrease of \$0.34bn. (Table 2)

This estimate is based on expenditure by officers and crew from each sector whilst ashore or in coastal waters where terrestrial (non-satellite) communications solutions are available. The estimate accounts for those crew members who do not go ashore during port calls.

The Passenger and General Cargo sectors are the most significant markets, in terms of value, for the shore-based crew communications markets.

The gap between officer and rating expenditure ashore continues to narrow and in half of sectors expenditure by ratings in port/coastal waters is now higher than that of officers. Expenditure whilst ashore or in coastal waters has fallen in all sectors apart from the smallest (Car Carriers).

Combined, the shore-based and sea-based crew communications market is worth in excess of \$2.4bn per annum—a decrease of \$0.9bn.

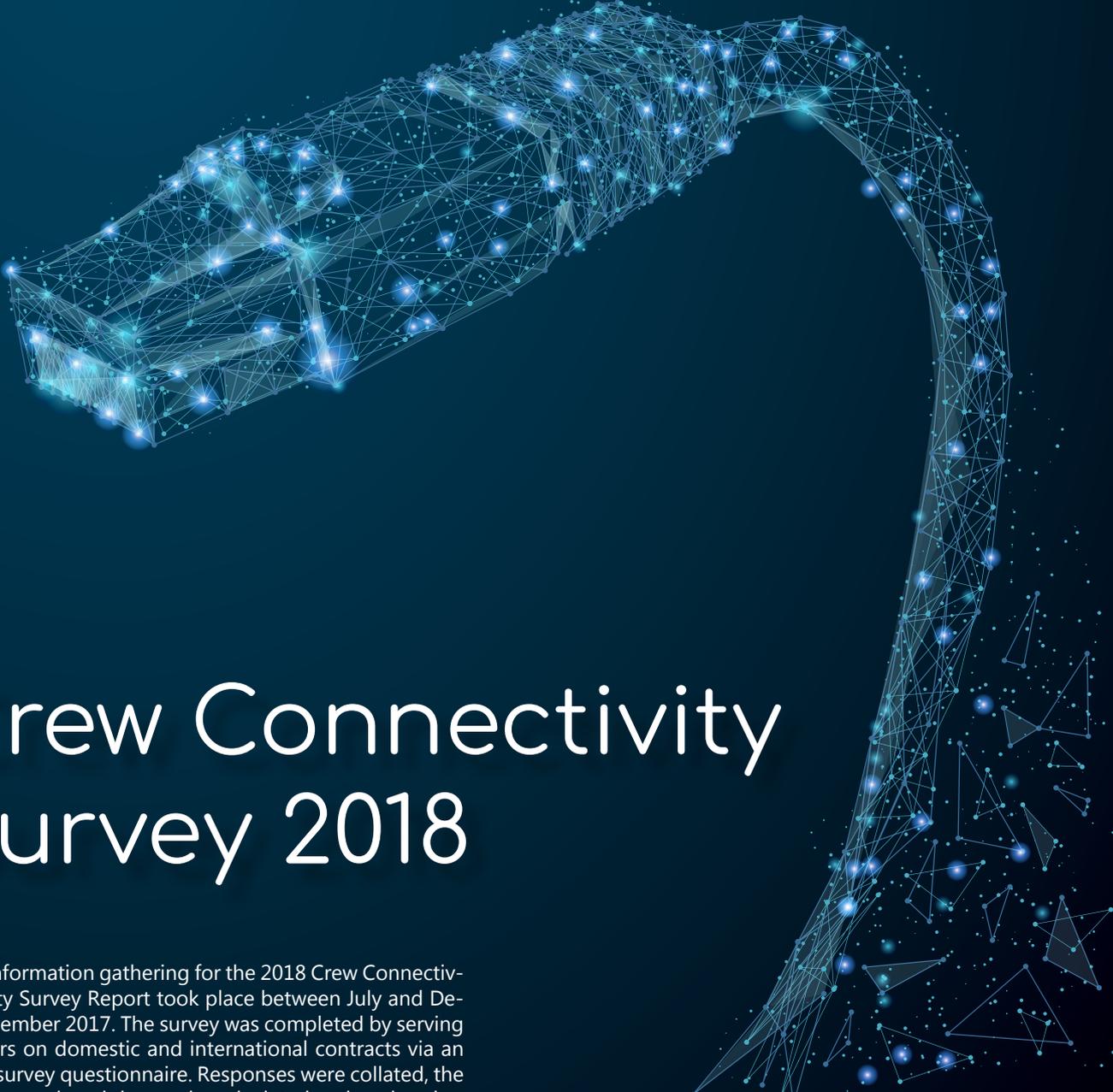
Table 1 | Expenditure at Sea

Sector	No. Vessels*	No. of Crew	Ratings	Officers	Market Value \$m
Tanker	13,222	264,440	\$113.05	\$120.85	\$282
Gas Carrier	1,921	38,420	\$101.31	\$89.35	\$35
Car Carrier	780	15,600	\$58.67	\$79.64	\$10
Bulk Carrier	11,614	232,280	\$88.56	\$114.63	\$221
General Cargo	16,433	328,660	\$93.86	\$68.48	\$234
Container	5,107	102,140	\$101.36	\$108.94	\$94
Offshore	8,408	100,896	\$88.68	\$134.83	\$101
Passenger	7,011	427,400	\$85.70	\$91.14	\$337
Other	5,830	116,600			
<b>Total</b>	<b>70,326</b>	<b>1,626,436</b>			<b>\$1,314</b>

\* Clarksons Research

Table 2 | Expenditure Ashore

Sector	No. Vessels	No. of Crew	Ratings	Officers	Market Value \$m
Tanker	13,222	264,440	\$90.07	\$85.89	\$227
Gas Carrier	1,921	38,420	\$94.72	\$71.77	\$23
Car Carrier	780	15,600	\$52.37	\$70.97	\$10
Bulk Carrier	11,614	232,280	\$68.88	\$89.68	\$181
General Cargo	16,433	328,660	\$74.69	\$59.91	\$233
Container	5,107	102,140	\$71.57	\$99.26	\$80
Offshore	8,408	100,896	\$69.76	\$29.27	\$44
Passenger	7,011	427,400	\$74.59	\$87.89	\$318
Other	5,830	116,600			
<b>Total</b>	<b>70,326</b>	<b>1,626,436</b>			<b>\$1,116</b>



# Crew Connectivity Survey 2018

Information gathering for the 2018 Crew Connectivity Survey Report took place between July and December 2017. The survey was completed by serving seafarers on domestic and international contracts via an online survey questionnaire. Responses were collated, the data cleansed, and the results calculated and analysed.

As in previous years, we are indebted to a range of organisations for assisting in the dissemination of the survey link. Philippine Transmarine Carriers, a leader in the Philippine maritime industry deploying over 35,000 Filipino global maritime professionals on board close to 700 vessels, and offering an integrated value chain of services, continued their support in 2017 by making the survey available to all crew passing through their facilities.

InterManager, the International ship management organisation known as 'the voice of ship management', Alpha Navigation, ISWAN—the International Seafarers Welfare and Assistance Network—and BIMCO were also instrumental in lending their support to the survey and promoting the completion of surveys by the crews of their memberships.

Particular gratitude is of course due to each of the nearly six thousand serving seafarers of all nationalities who gave up their time to tell us about their experience of connectivity today, its availability, cost and impacts. Without them this survey would not be possible.

Special thanks are also extended to KVH Industries and Intelsat whose support and sponsorship of this global survey has enabled us once again to make the whole report and dataset available free of any charge to all industry stakeholders and beyond.

As a major network operator Intelsat's operations are integral to delivering services that seafarers and ship operators rely on, and given KVH's close relationship with both crews and connectivity via its various maritime businesses it has always been aware of the importance of giving crew a voice. We are grateful to them both for enabling that voice to be heard, something which is essential to drive the industry forward.

# Respondents

The 2018 Crew Connectivity Survey Report collected responses from 5,889 seafarers—an increase of over 2,800 responses compared to the 2015 survey.

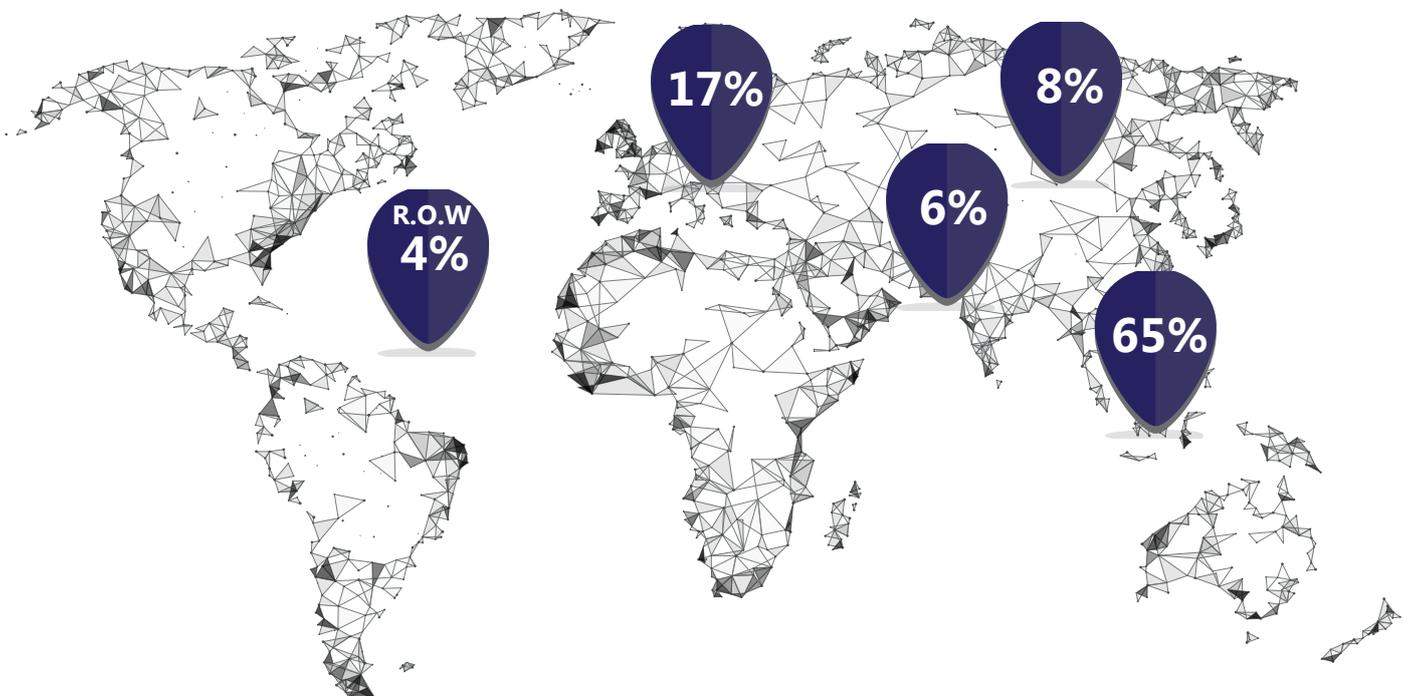
30 nationalities were represented in the survey with the top ten nationalities representing 90% of all respondents. 17% of respondents were from EMEA countries (primarily Ukraine and Poland), 8% of respondents were from North East Asia (primarily China and the Russian Federation), 65% were from South East Asia (primarily the Philippines and Indonesia). South Central Asia (primarily India and Pakistan) accounted for 6% of respondents and the Rest of the World made up the remaining 4%.

Of the total respondent base 36% were officers whilst 64% were ratings. The ratio of officers to ratings in this year's survey more accurately reflects the typical balance on an average commercial vessel than in previous years. It also reflects the increasing access to crew connectivity enjoyed by many ratings today.

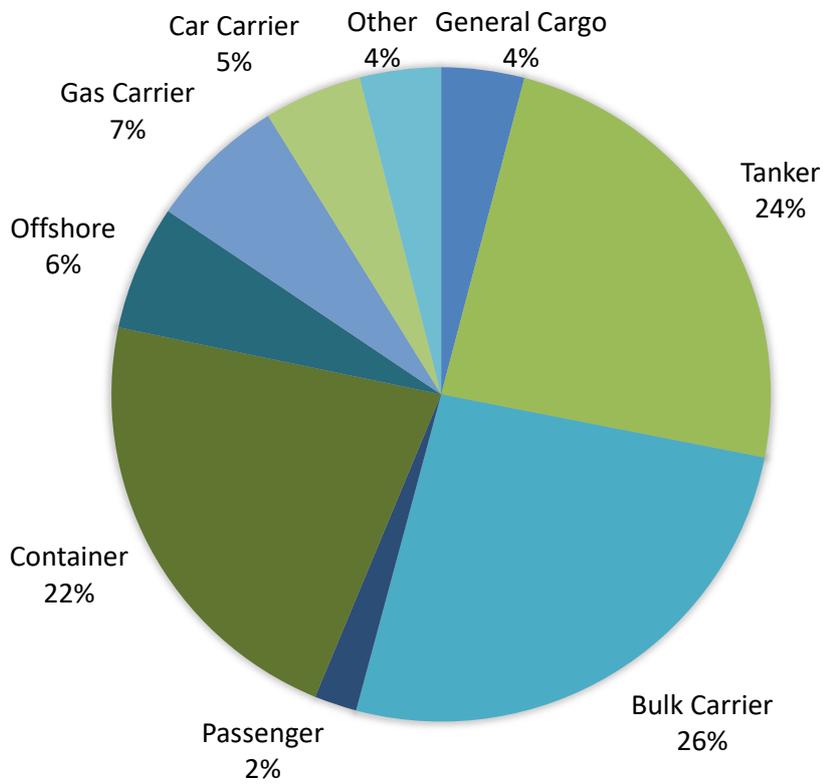
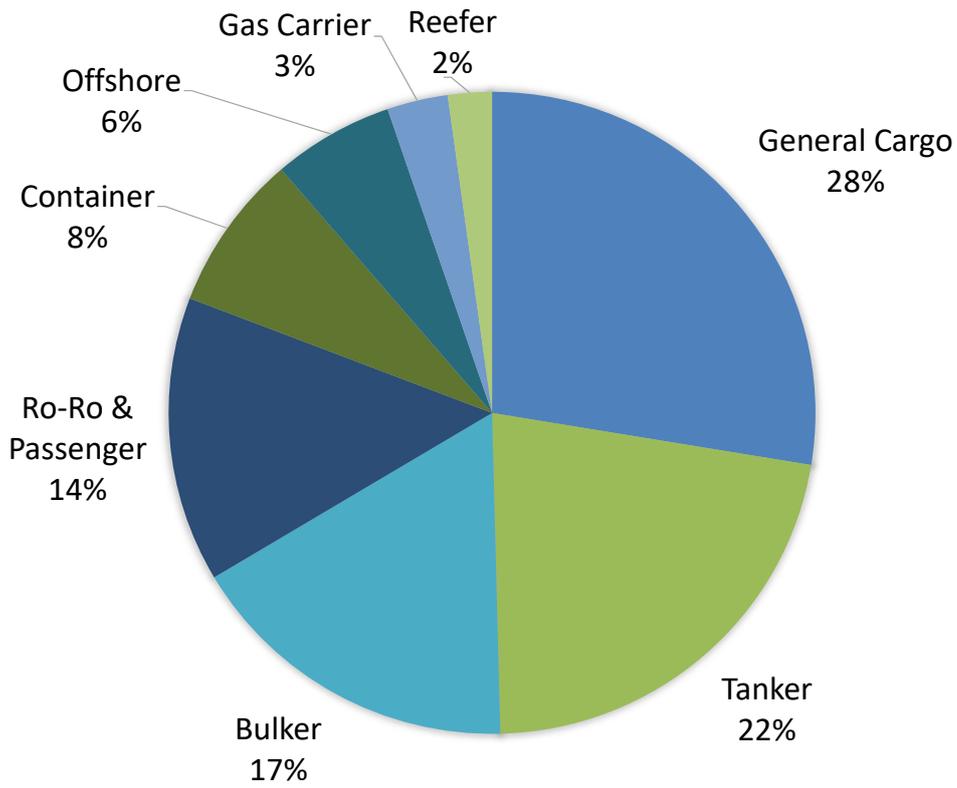
Of the officer group 40% were from the Philippines, 21% from Ukraine, 12% from India and 7% from India. The rating group was dominated by Filipino, Indonesian and Chinese seafarers—between them accounting for nearly 80% of ratings. We have broken out the officer/rating groups in order to provide a more meaningful analysis.

We asked all respondents to provide us some information about themselves including to which age group they belonged. As in previous years the smallest number were those in the youngest age group of 18-24 years at 11%. The largest number (36%) were in the 25-34 year group, again as witnessed in previous years. 32% were aged between 35 and 44 and 23% were 45 or over.

Officers were evenly spread across all age ranges except for the youngest age group (18-24 years) which accounted for just 4% of officers. 70% of ratings were aged between 25 and 44 years with 11% and 18% in the youngest and oldest age groups respectively.



World map showing spread of respondents globally

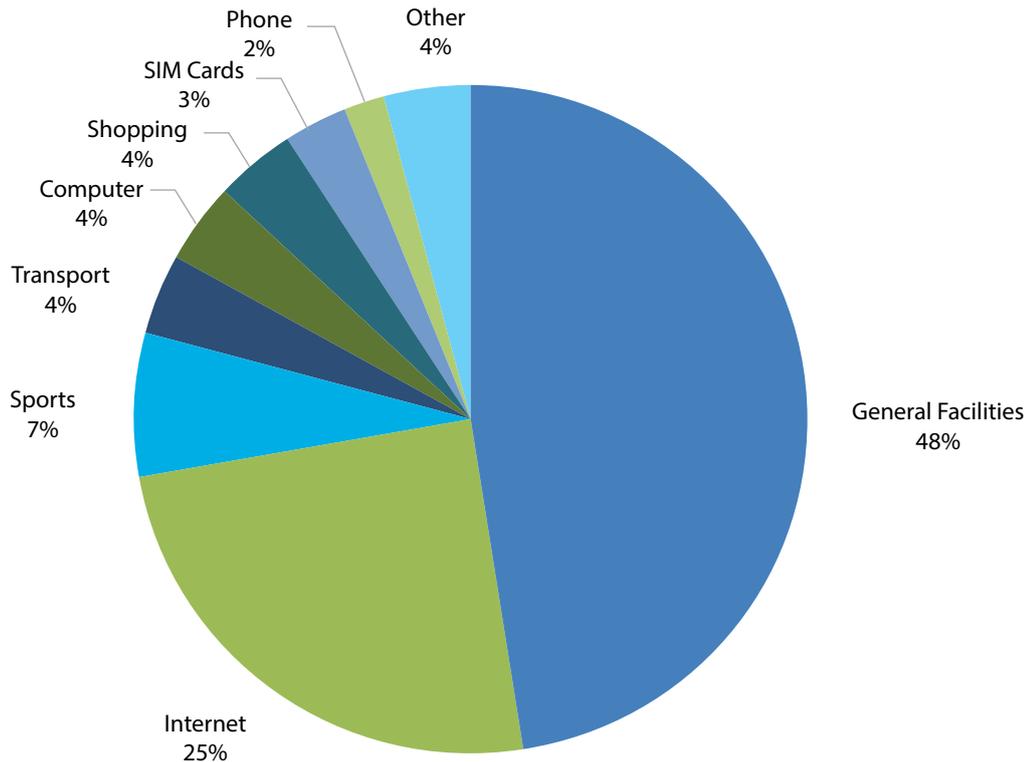


Figures 1a & 1b. World Fleet 2018 & Vessel type by respondent

# Sectors

Of our respondents, 96% worked on vessels in the major sectors; namely, Tanker, Bulk, Gas, Car/Truck (PCTC), Off-shore, General Cargo, Container and Passenger. Although a further 10 sectors were represented—everything from heavy lift ships to super yachts—analysis centres around the key sectors for the commercial maritime market. (Figures 1a & 1b)

In this year's survey there is higher respondent representation in the bulk carrier and container sectors and lower representation in the general cargo and Ro-Ro/passenger sectors than is representative of the current world fleet. These discrepancies should be taken into account when interpreting the overall figures provided within this survey.



**Figure 2. Crew welfare facilities used in port**

## Use of Crew Welfare Facilities when in port

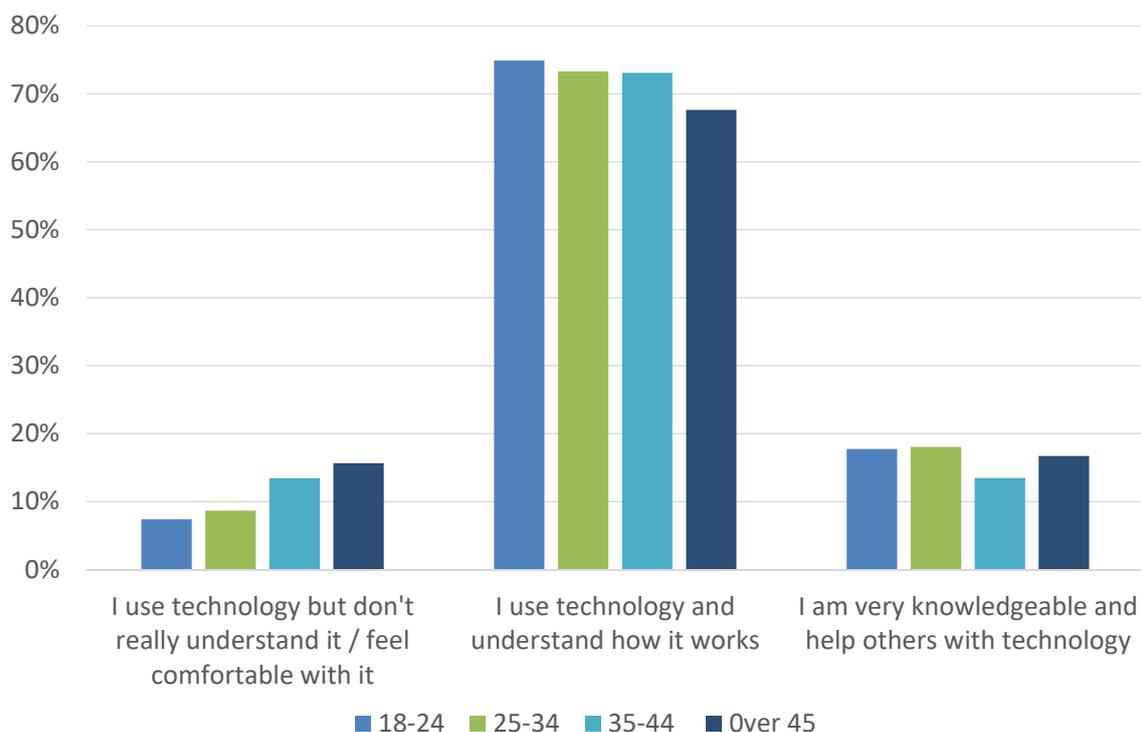
Overall the number of respondents who used crew welfare facilities in port has dropped from 28% in 2015 to 20% in this year's survey. The number of officers using these facilities was static, hence the drop was in the number of ratings using these facilities—falling from nearly 28% in 2015 to just 15% in 2018.

Of the 20% of respondents that did get time to use crew welfare facilities in port the majority (48%) used the general facilities provided by the seaman's centres (Figure 2). Although the second most popular service, the figures for Internet usage have continued to fall. In the 2014 survey 41% of seafarers went to seaman's centres to use the Internet; that fell to 34% in 2015 and has dropped again in this year's survey to 25%. This is likely the consequence of increasing levels of access to the Internet now being enjoyed by seafarers whilst at sea - see Provision of Free Services.

Other communications services offered by seaman's centres remain in demand, such as access to a telephone and the purchase of local SIM cards for making low cost voice and data calls. Sports, shopping and transport services additionally provided at these centres also proved popular with crew.

## Skills, Technology and Automation

Given the increased levels of technology and automation that seafarers encounter both at work and at home, respondents were asked to rate their perception of their own IT skills and literacy. The results show a technology literate work force with 88% of respondents reporting that they used technology, understood how it worked and could help others with technology. At 12% the number who felt uncomfortable with technology has changed little since the last survey.



**Figure 3. Seafarers technology skills by age.**

Analysing the responses by age we can clearly see again that those in the millennial cohort are most comfortable with and knowledgeable about technology. It is also clear that knowledge and comfort reduces with age. (Figure 3). This is even more stark when taking into account rank. Nearly twice as many ratings as officers feel uncomfortable with technology.

For the first time this year's survey asked seafarers to compare the ease of use of technology they encountered onboard with the technology they used in their daily lives. 90% of the combined group told us that ship-board technology was far easier, easier or the same to use as technology they encountered in their non-working lives.

Significantly, the 10% of respondents that felt shipboard technology was more difficult to use consisted of twice as many officers as ratings. It was much higher at 24% in the seafarer group from South Central Asia (India, Pakistan and Sri Lanka). This group consisted of 75% officers and

25% ratings and was highest in the passenger and tanker sectors. Other groups with higher percentages of officers showed similar but less dramatic results.

Although the majority of seafarers appear to be at ease with technology on board there is a significant group predominantly officers, who struggle with the technology they are expected to use. This is also the group exposed to the highest levels of technology on board the ship. Technology providers and training suppliers should take note of this—especially in light of the training that seafarers indicate they are lacking – see Training.

Over half of seafarers (53%) reported that they had seen at least one element of their role automated in the last two years. This figure was higher in the Car Carrier, Container and Gas Carrier sectors.

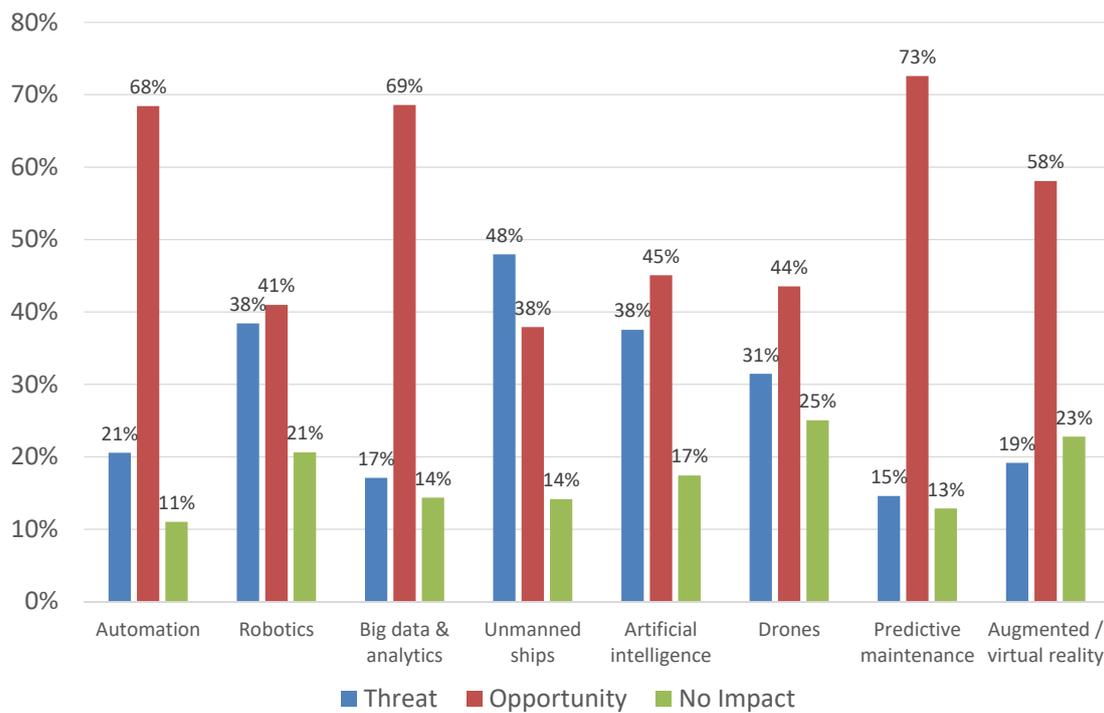
The figure rises to 72% for officers whilst the figure for ratings was 30% lower—evidence if it were needed of the changing role of deck and engineering officers as new technologies are deployed. Overwhelmingly seafar-

ers agreed on the nature of the impact of this automation on their lives at sea with 98% saying that automation they'd experienced had had a positive effect.

The survey also asked seafarers whether they viewed a number of emerging technologies—popular buzz-words in the maritime industry—as an opportunity or a threat to their jobs in 5 years time. These technologies ranged from Robotics, AI and big data to unmanned ships and predictive maintenance.

Seafarers in general thought these technologies presented far more opportunity than threat to their roles in future (Figure 4.). The three technologies that seafarers felt presented the greatest opportunities were predictive maintenance, automation and big data & analytics.

Unsurprisingly the only technology viewed as more of a threat than an opportunity was unmanned ships and the impact that this would have on their future employment prospects. However, 52% believed that unmanned ships would either have no impact or

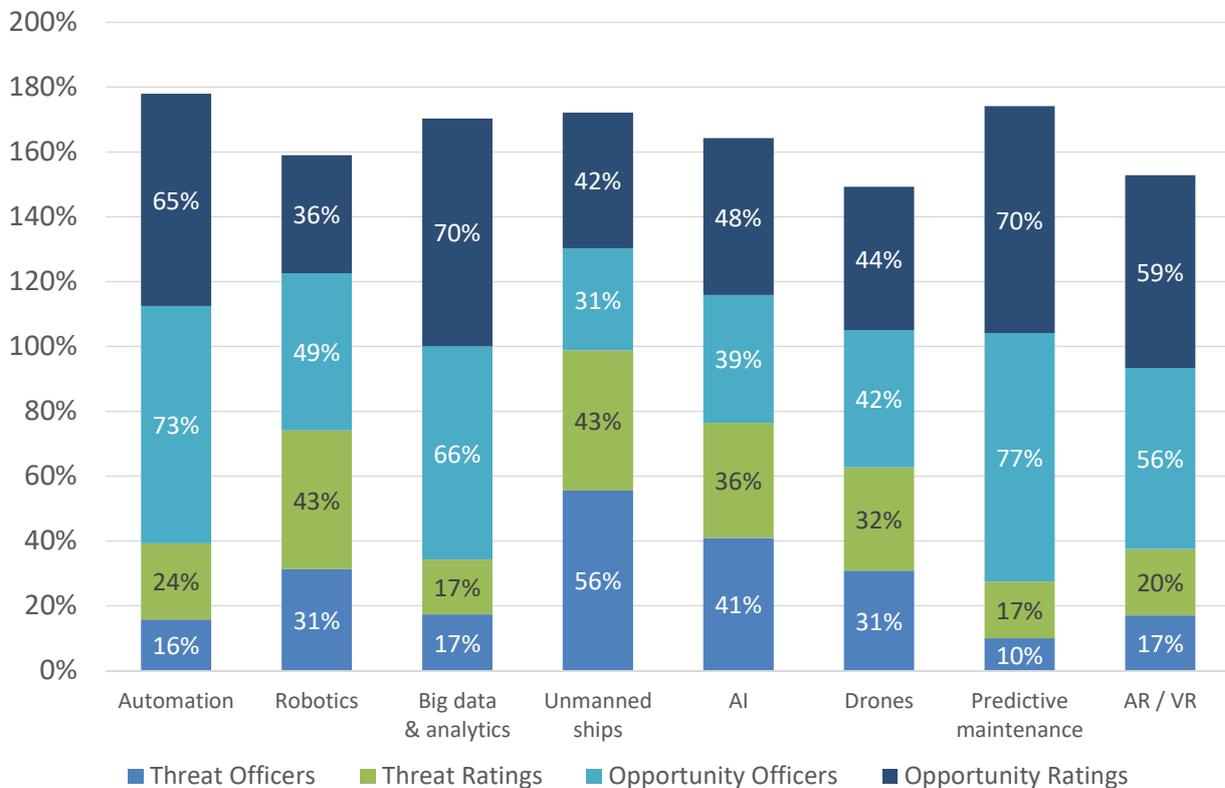


**Figure 4. Technologies viewed as threat or opportunity by seafarers**

presented an opportunity for their role in 5 years time. Officers viewed unmanned ships as a far greater threat than ratings, who were divided equally over whether unmanned ships presented a threat or opportunity (Figure

5). What these statistics demonstrate clearly is that seafarers in general are very engaged with new technologies, and broadly do not view them with suspicion or as a threat to their livelihoods. It also highlights a discon-

nect between shore-based operations, where many view much of this technology with suspicion, and those who will feel the greatest impact of the introduction of this technology.



**Figure 5. Officer & Rating's views on technology threats & opportunities**

## No magic bullet

Whilst Internet access is very important it is by no means the only criteria by which seafarers choose which operator they work for.



### Importance of Crew Connectivity

In order to understand the relative importance of crew connectivity for seafarers we asked them to rank a number of services that a ship operator could provide them in order of importance. These services consisted of a range of connectivity and non-connectivity related services, from accurate and timely payment of salary to crew entertainment services such as TV and News services. (Figure 6.).

Accurate and timely payment of salary at sea and ashore was rated as most important by seafarers, and crew entertainment as least important. Both crew connectivity related services scored poorly with seafarers who rated training and career development more important services than Internet access. This was consistent across officers and ratings, age, and regional groups.

The survey tested again this year if the crew connectivity services provided on board influenced which shipping company seafarers worked for. 75% of respondents said that it did influence which company they choose to work for—a small but steady increase over prior years. This result was consistent

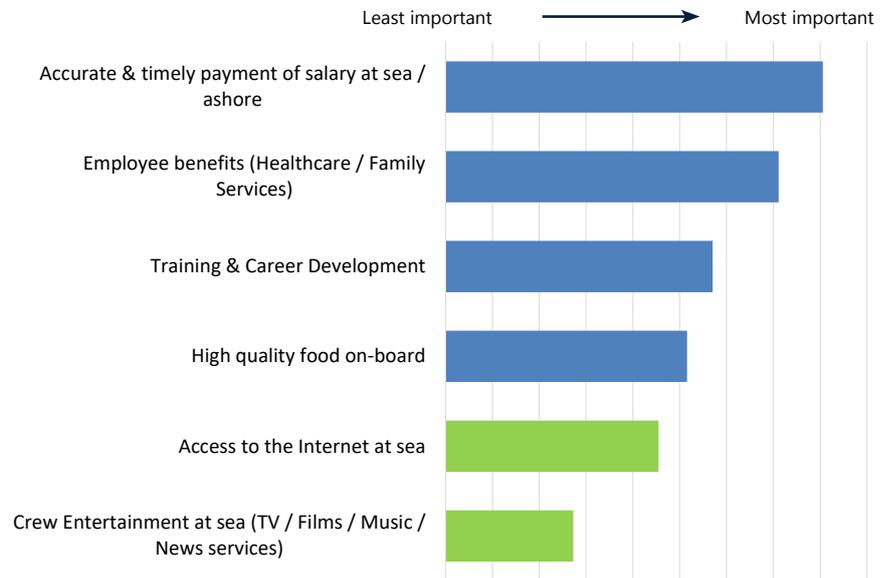


Figure 6. The most important services ship operators can provide to seafarers

However, there was a marked increase over prior years in those saying that it had a strong or very strong influence on who they worked for—rising from 78% to 92%. (Figure 7.)

What these findings demonstrate is that the importance of crew connectivity is a matter of context. Whilst Internet access—as has been shown elsewhere in this survey—is very important, it is by no means the only criteria by which seafarers choose which operator they work for.

In fact, as has been shown here, it is somewhat down the list. These figures should also be viewed against a backdrop of rapidly improving Internet access at sea which may make it less of an issue for seafarers

Does the provision of crew connectivity influence which shipping company you work for?

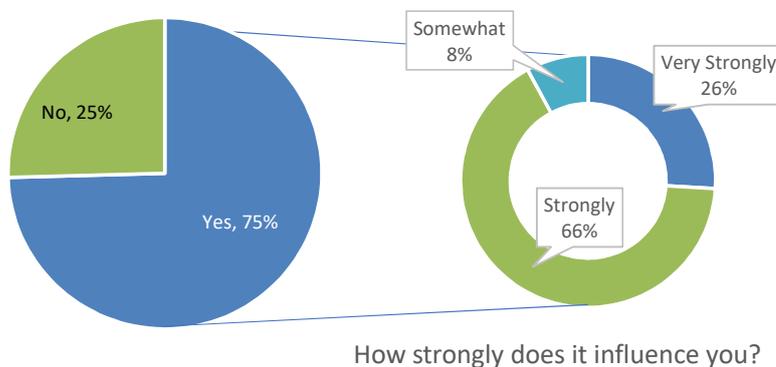


Figure 7. The influence of crew connectivity on recruitment

### Access to Crew Communications

When asked about their access to crew communications services 61% of respondents reported that they had access to some form of crew communications either 'always' or 'most' of the time. This shows another modest increase of 3% since the last survey. Generally speaking officers enjoyed better access than crew, but this should be seen in the context of officers often having access within their cabins, and using communications systems for operational business as part of their duties.

The number of seafarers reporting that they never had access to crew communications services fell significantly from 7% to below 2% meaning that an extra 80,000 seafarers now have some access to some form of crew communications. Despite this positive news the number that only get access 'sometimes' has increased to 38% since the last survey. Therefore, when taken together these two figures mean that more than a third of all seafarers (650,000) still struggle to stay connected whilst at sea.

Given that the Maritime Labour Convention 2006 (MLC) has been widely interpreted as recommending ship operators should offer crew reasonable access to communications at a reasonable cost, it seems clear that meeting this objective continues to prove a challenge for operators.

The survey again asked seafarers if they had seen an improvement in the level of access to connectivity since

the introduction of the MLC and the answer was an emphatic yes. 60% now say that access has improved a lot up from 22% in the 2015 survey. Taken together with those that say access has improved a little, 92% believe there has been an improvement since the introduction of MLC—up 32% on 2015. No seafarers believed that MLC had had a detrimental effect on access.

### Access within different sectors

Access to crew communications varied between sectors but less significantly than has been witnessed in previous surveys. The general cargo and bulk sectors continued to be the worst sectors in terms of seafarer access to communications although the picture has improved since 2015.

The offshore, car carrier and passenger sectors provided the greatest levels of access with 81%, 76%, and 72% of crew in those sectors respectively having access always or most of the time.

The difference between the best and worst performing sectors widened in this year's survey—crew in the offshore sector now have nearly twice the level of access to connectivity than those in the general cargo sector (*Figure 8*).

We asked those respondents who reported having access to crew communications what services they were provided access to, and which were provided to them free of charge by the ship operator.

**Telephone** – in all previous surveys satellite phone calls

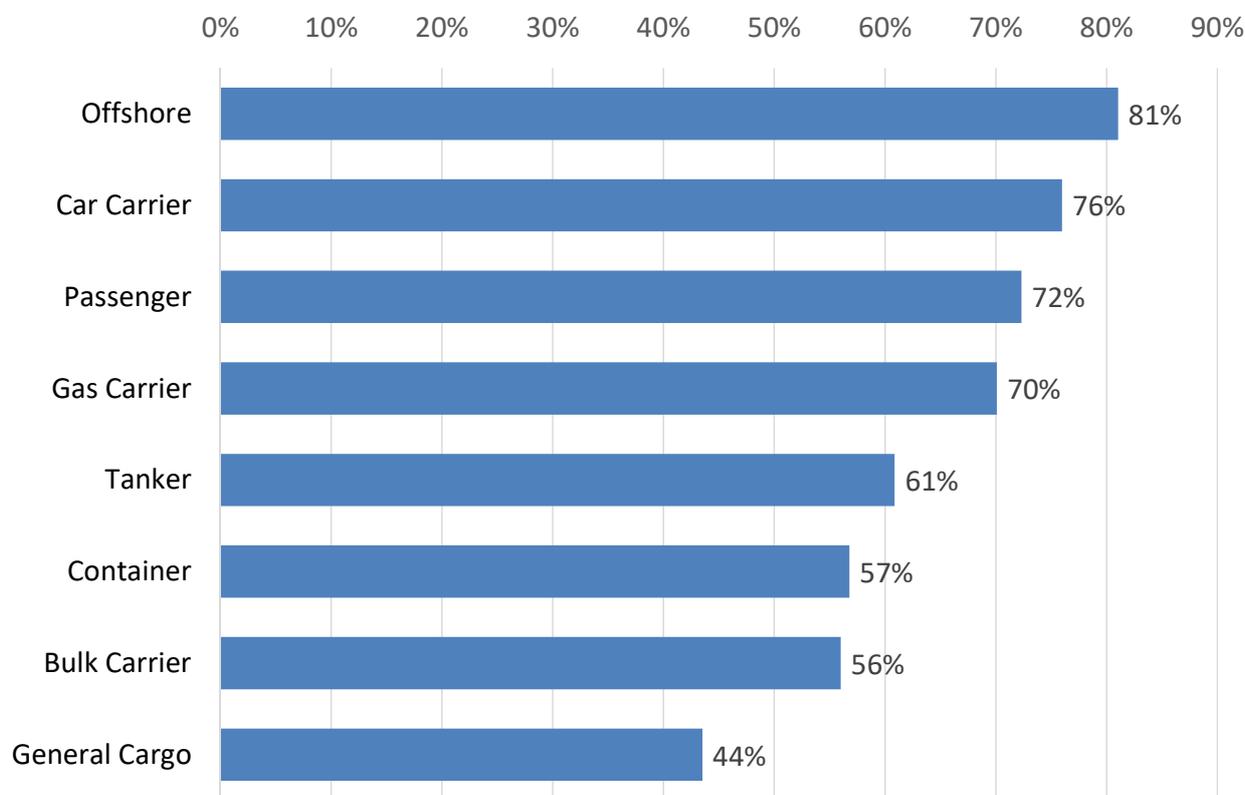
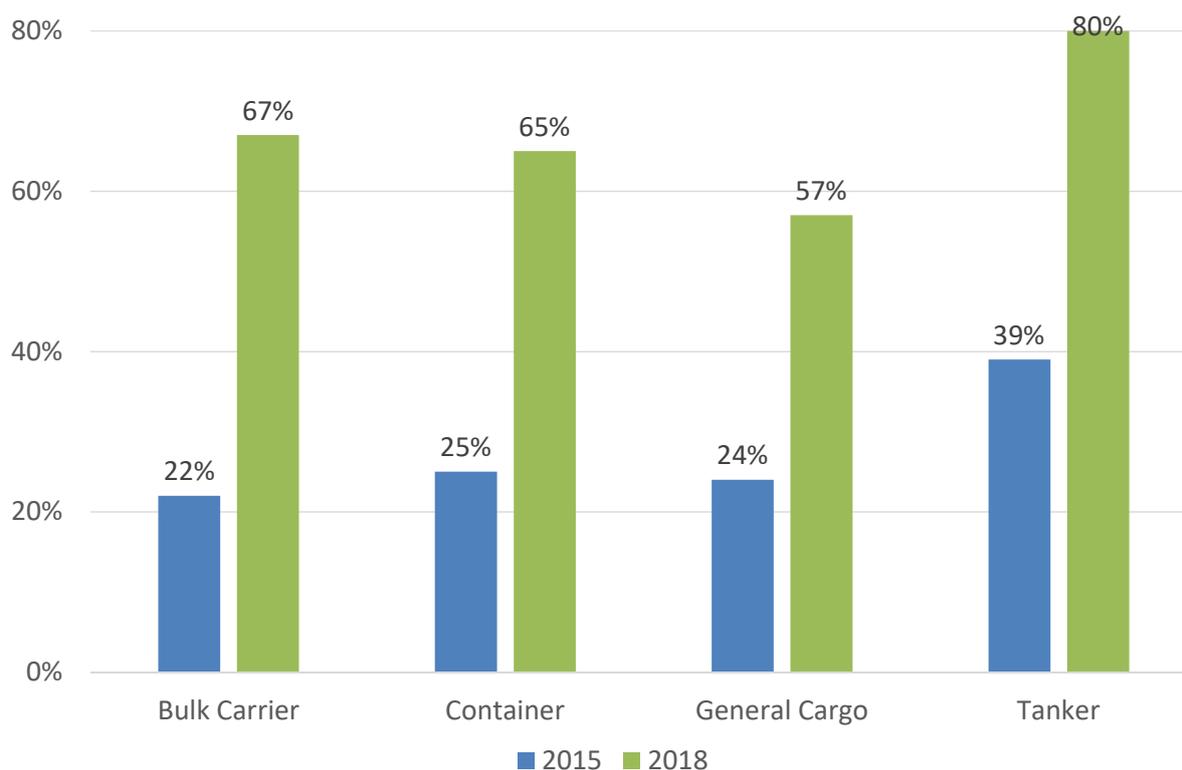


Figure 8. Access to crew communications by sector



**Figure 9. Growth in the provision of internet access in selected sectors**

have been the most common form of communications to which seafarers have access. However, in this year's survey it is relegated to second place behind Internet access. On average across all sectors 65% of seafarers with access to crew communications have access to a satellite phone. This is a fall of nearly 15% since the 2015 survey and indicates that ship operators have concentrated on the provision of Internet access where crew can utilise VoIP and video applications.

**Text only email** – provided on average by 53% of vessels across all sectors, it remains the most common non-Internet related form of crew communications. Its availability increased by more than 10% in this year's survey to 53%. The highest levels were seen in the general cargo and container sectors where provision levels were in excess of 60%.

**Email with attachments** – seafarers reported a significant increase in the provision of email with attachments since the 2015 survey. Provision grew 14% to an average of 45% across all sectors. This reflects the growth in 'always-on' satellite solutions such as VSAT where data volume is less of an issue than with volume-based services such as Inmarsat FleetBroadband. Levels of provision were relatively constant across all sectors, with lower levels in sectors with higher provision of Internet access.

**SMS Messaging** – generally provided via a PC except

for the passenger sector where it is provided via a distributed GSM solution. The provision of these services, reflecting the availability of free online web-based SMS services, has increased from 24% to 43% on average across all sectors. Provision of these services is very consistent across all sectors.

**Internet Access** – with the average availability of Internet access across all sectors now at 75%—an increase of 32% since the last survey—it now represents the most common form of crew connectivity available at sea today.

The passenger and offshore sectors continue to provide the highest levels of access with over 90% of respondents in these sectors reporting it was provided on board. This reflects the high levels of broadband satellite installations in both of these sectors.

However, it is in the other major commercial sectors that we have seen truly noteworthy increases in provision of Internet access. Provision levels in these sectors have doubled and in the case of the bulk carrier sector tripled since the 2015 survey (*Figure 9*).

These growth rates demonstrate two factors: firstly the growth in broadband VSAT solutions; and, secondly, a commitment from ship operators to provide Internet access to their crews.

### Provision of Free Services

Additionally, respondents were asked to identify which of the services provided on board were available to use free of charge (Figure 10.)

Despite the very significant growth in Internet provision across all sectors text only email solutions are still the most commonly provided free crew communications service.

Surprisingly there was a decrease in the levels of free Internet access provision falling from 49% in 2015 to 45%. Therefore, despite the much-improved levels of provision there has not been a corresponding increase in the provision of free access.

This could indicate that these solutions are in part being funded by those that use them the most—the crew. Of course, it should be noted that whilst this service is not free to use it may well be subsidised to a lesser or greater extent by the ship operator.

However, despite this fall, in absolute terms the number of seafarers that can now use the internet at sea has increased by over half a million (520,000) and those that can access it free by over 200,000—a very significant achievement by any measure.

Those services which saw the most substantial increases in free provision were satellite phone calls, rising from 7% to 16%, and emails with attachments, rising from 28% to 42%.

The low level of free satellite phone calls reflects their cost of use—another reason why crew are so keen on communications alternatives such as video chat/VOIP, free port WiFi and Global roaming data SIM cards, all of which can be used to leverage IP technology to reduce the cost of voice calling.

The rise in free email with attachments would appear to be in part explained by the increased levels of VSAT broadband installation and relaxing of restrictions around the size of email attachments.

Officers continued to enjoy bet-

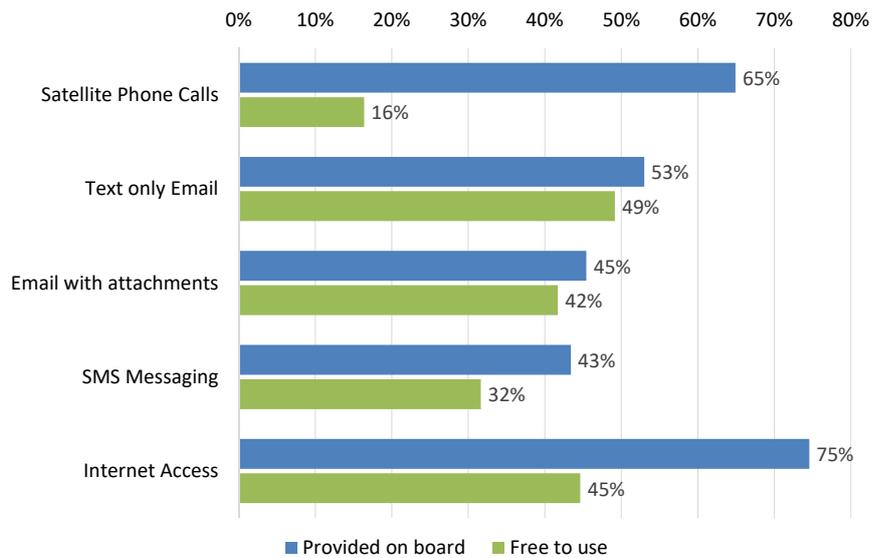


Figure 10. Provision of free services

ter levels of access to free communications. Only when it came to satellite telephone calls did ratings have a higher level of free access—25% compared to 10% for officers.

#### Where is access provided?

The most common place for crew to be able to access communications services is now their cabin. Traditionally, the ship's bridge—with its attendant privacy issues—has been where crew have had to go to access communications.

With more than half of seafarers (52%) now able to access communications services in their cabins this marks a profound change in the way seafarers are able to communicate with friends and family. However, in two sectors—bulk and general cargo—the bridge remains the most common place to access communications. As in previous surveys there are notable differences between sectors.

Sectors such as passenger and offshore provide the highest levels of in-cabin access, reflecting the high levels of broadband infrastructure.

Where we find less investment in infrastructure such as in the bulk and

general cargo sectors, access is more traditional. Other main zones where seafarers can access services are communal areas such as the crew mess etc., and the ship's office.

#### How often do crew use communications services at sea?

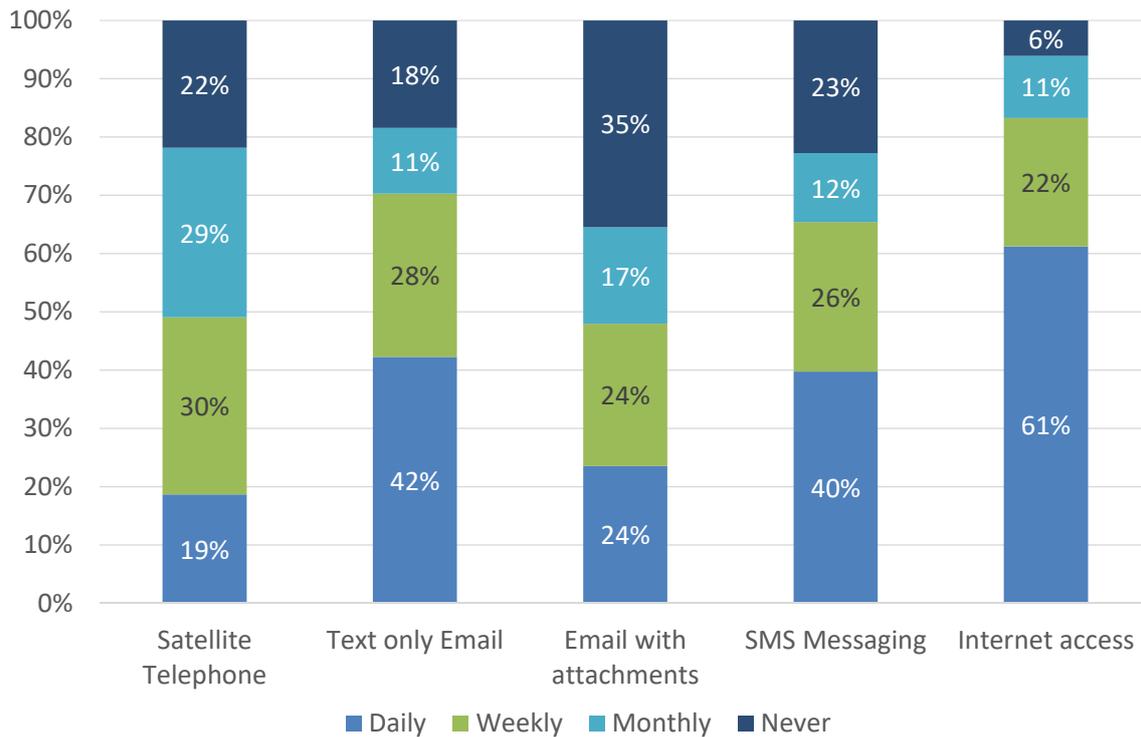
The greater availability of crew communications has only given rise to a modest increase in the frequency of use of these services. (Figure 11).

In the last survey we found that the majority of services were being accessed on a daily basis and whilst that still holds true there has not been the significant rise in usage that might be expected with greater access.

In fact the average number of those accessing services on a daily basis has fallen by 3%. In areas such as email we have seen a fall in daily usage and only modest increases of 2% in the use of the Internet and satellite phone calls.

The increased availability of communication services does not seem to have seen a corresponding increase in the frequency of their use—in fact in some areas quite the opposite.

Whilst it is true these services are



**Figure 11. Frequency of service use**

still viewed as expensive by seafarers this pattern of usage seems to be more reflective of the underlying demand for these services given the constraints placed on seafarers' time when at sea.

What these figures do not show, of course, is the volume and scale of consumption of these services—which have significant implications for ship operators and satellite service providers alike.

Those in the older age groups tended to use more services more frequently and may be more reflective of seniority and disposable income than a desire to use.

The youngest age group (18-24 years) tended to use more services on a weekly or monthly basis than other age groups. This age group was also, by far, the largest group that never used the crew communications services on board.

This appears to be reflective of the high levels of crew respondents from the bulk and general cargo sectors rather than the high level of ratings within this year group.

There was little overall difference between ratings and officers in how

frequently they chose to access services. Internet access was the most commonly used service by both groups.

#### Limitation on Use

Although it is no surprise that once again seafarers chose cost as the factor that most limits their use of communications services, this figure has fallen since the 2015 survey.

The number quoting cost has fallen from 59% in the 2015 survey to 38% in this year's survey. Also noteworthy is a fall of 11% in those quoting lack of privacy as a factor limiting use as well as an increase of 11% in those reporting that nothing now limits their use.

There were however increases in those seafarers whose use was limited as a result of not getting regular access and too many others also trying to use the service.

Officers and ratings were very evenly matched in their responses to this question, a reflection of how much easier access to communications has become for many crew.

Cost was a more significant issue for the two younger age groups, but all had similar experiences when it came

to how regularly they got access and the number of other crew trying to use the service.

#### How do crew want to access communication?

The preference towards using a smartphone to access communications services continues to grow, with the number of respondents indicating this as their preferred mean of access growing from 34% in 2015 to 58% this year.

Although in second place accessing services on a laptop via WiFi is some way behind the smartphone. As in prior years accessing services using shared PCs or their own laptops connected to the ship's LAN fared poorly.

Perhaps surprisingly so did access via tablets—a device which has not really found favour with seafarers—which was the preferred means of access by only 7% of respondents.

These figures highlight the trend towards the growing importance of smartphones as personal devices as they continue to provide a much broader range of services and applications.

### Influence of Crew Communications on life and operations at sea

The increased levels of connectivity within the shipping industry as a whole and its impact upon life and operations at sea continue to be the subject of speculation. This year, as in previous years, we asked respondents a range of questions to establish how they themselves believe improved communications had impacted their lives and jobs at sea.

In the last survey we reported a decrease in the numbers of seafarers that felt greater connectivity led to a reduction in social interaction onboard. This year that trend has been reversed.

There was a 13% increase to 53% in the numbers believing that social interaction had declined—perhaps reflecting the number of crew that can now access services in their cabins. Once again those in the oldest age group felt this loss of social interaction most keenly.

In this year’s survey we asked seafarers for the first time to give some insight into how easy it is to communi-

cate with others, given the connectivity they have onboard. We asked them to tell us how easy it was to communicate with shore-based staff, seagoing staff on other vessels and also people in different organisations.

The vast majority of respondents told us that it was easy to communicate with shore-based staff and those within their organisation based on other ships (*Figure 12*). Communicating with people in another organisation was marginally more difficult. Only 6% reported that it was difficult or impossible to communicate with these groups.

Of perennial interest is the potential impact of crew communications upon safe operations. 55% of seafarers believe that access to communications has affected safety onboard—an increase of 37% since the 2015 survey. However, 95% reported that it had had a positive impact on safety—an increase of 72%.

The previous split between officers and ratings on the safety merits of connectivity have disappeared in this year’s survey with 95% of both groups reporting that connectivity had a positive effect.

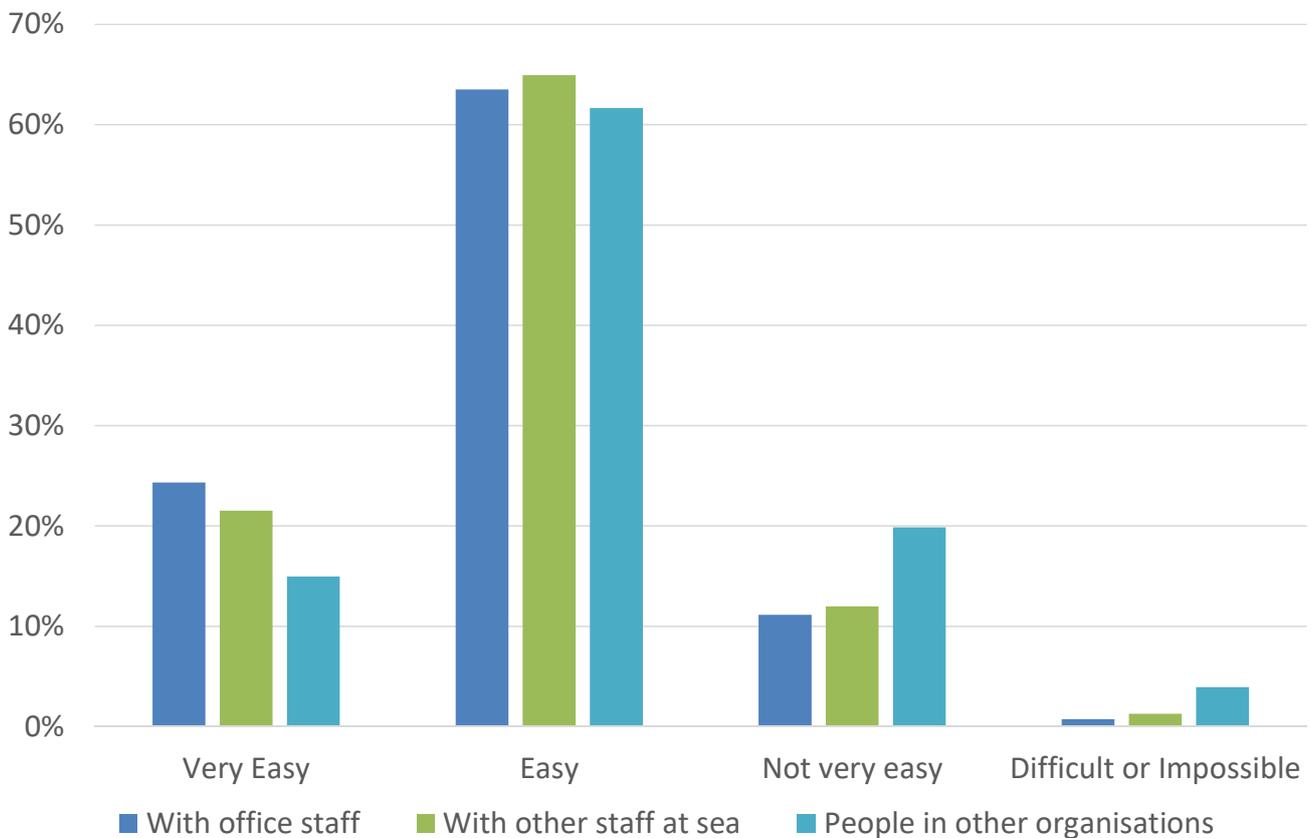


Figure 12. Collaborating at sea

# Safer, but more isolated

Crew communications has made operations safer, but increased social isolation—especially for older seafarers.



## Cyber Security

The issue of cyber security has moved up the maritime agenda since our 2015 survey highlighted a number of issues around training and lack of on board policies. With several high profile cyber breaches in 2017 causing operators financial and reputational damage we revisited the issue again in the 2018 survey to see if the industry had tightened its policies and provided much-needed training to its staff.

In this year's survey 47% of respondents reported that they had sailed on a vessel that had become the target of a cyber-attack—an increase of 4% since the 2015 survey.

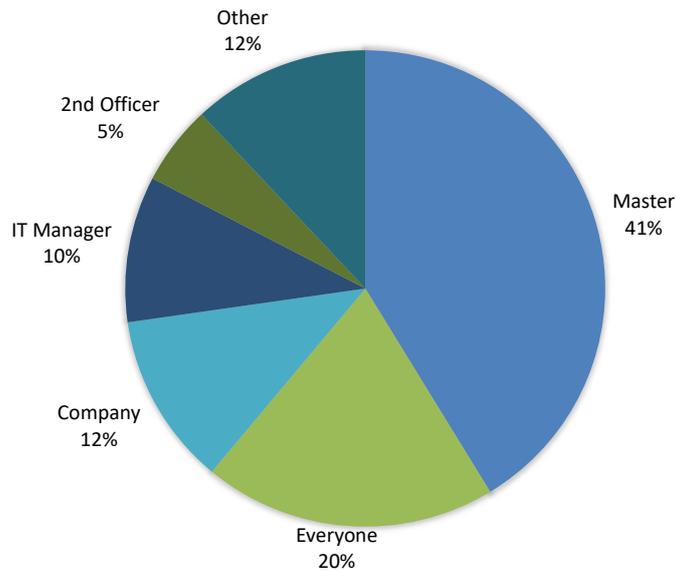
The cyber resilience of the vessel was mainly seen as the responsibility of the master of the vessel (*Figure 13*). 41% of respondents believed that ultimate responsibility for the e-worthiness of a vessel rested with the master—an increase of 20% since 2015.

On top of the other duties required of the master it would also appear he is perceived by the crew to be primary defence against cyber-attack, despite receiving little or no training. Interestingly only 22% of respondents felt it was the responsibility of the ship operator or its IT department.

Data from a variety of reports and studies indicate that employees are responsible for more than 80% of cyber breaches—either maliciously or unintentionally. Providing training and guidance for crew is one of the most important ways in which an operator can reduce its risk.

The level of cyber training provided to crew is still pitifully low, only 15% of crew reported receiving any form of training in this year's survey—representing an increase of only 3% since 2015. This figure was the same for officers and ratings.

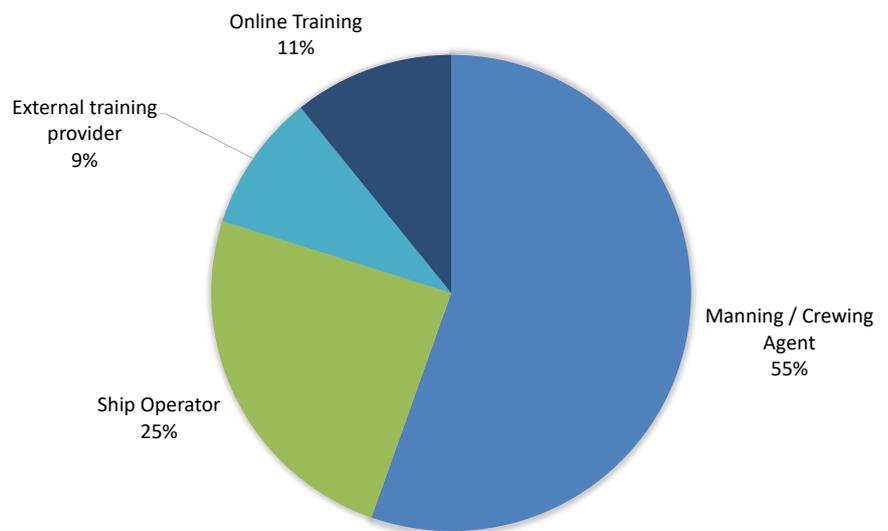
With over 50% of all seafarers reporting that they used a PC on a regular basis to fulfil their duties this figure should be a continued cause of concern for all stakeholders in the



**Figure 13. Who is responsible for cyber security?**

shipping and logistics industry. Where training was provided it was provided mainly by manning and crewing agencies (55%) before crew left on their next contract. Ship operators provided 25% of the training, and online and external training companies the remaining 20% (*Figure 14*.) In effort to

understand the importance placed on this training we asked seafarers in addition how often they were expected to complete cyber awareness training. Encouragingly, 59% were expected to complete this training quarterly, or prior to starting each new contract—typically 2-3 times every year. However-



**Figure 14. Who provides cyber security training?**

er, 24% reported that they were only expected to complete this training once, and a further 11% only annually.

We asked the 51% of crew who used a PC on a regular basis about the cyber safe policies adopted on board. These related specifically to whether they were aware of any cyber safe policies, how software and operating system updates were handled, and password policies.

51% of all respondents said they were aware of the company having a cyber-safe policy relating to the use of personal devices, removable media (e.g. USB memory sticks) and personal web browsing on board. This varied dramatically between sectors from a low of 29% of respondents in the general cargo sector to 65% in the passenger sector.

29% said their company did not have such a policy and 20% said that they were unaware of whether a cyber-safe policy existed within the organisation they worked for.

40% reported that software updates and patches were implemented on board as soon as they become available on board. 12% reported that updates were undertaken on a daily basis, 11% weekly and 15% monthly. A further 24%

said updates were made either infrequently, never, or they did not know (Figure 15a). The majority of software updates and patches (41%) were received on board by satellite. 26% arrived on board by DVD or on a memory stick and 29% by both satellite and DVD/memory stick. Only 4% were installed by shore-based IT staff or suppliers.

Over 42% of respondents indicated that their company regularly reviewed passwords for strength and 33% had a policy to regularly change passwords.

Despite the importance of control systems on board the average vessel only 18% reported that their company had a policy to change the default passwords. 25% of respondents reported their company had no password policy at all (Figure 15b).

Since we first drew attention to the data on cyber vulnerability in 2015 concerns amongst flag states, authorities, suppliers and customers about the risks of cyber-attack have only increased. However, judging by this latest data it seems clear that the industry still has a very significant competence gap where cyber security and resilience is concerned.

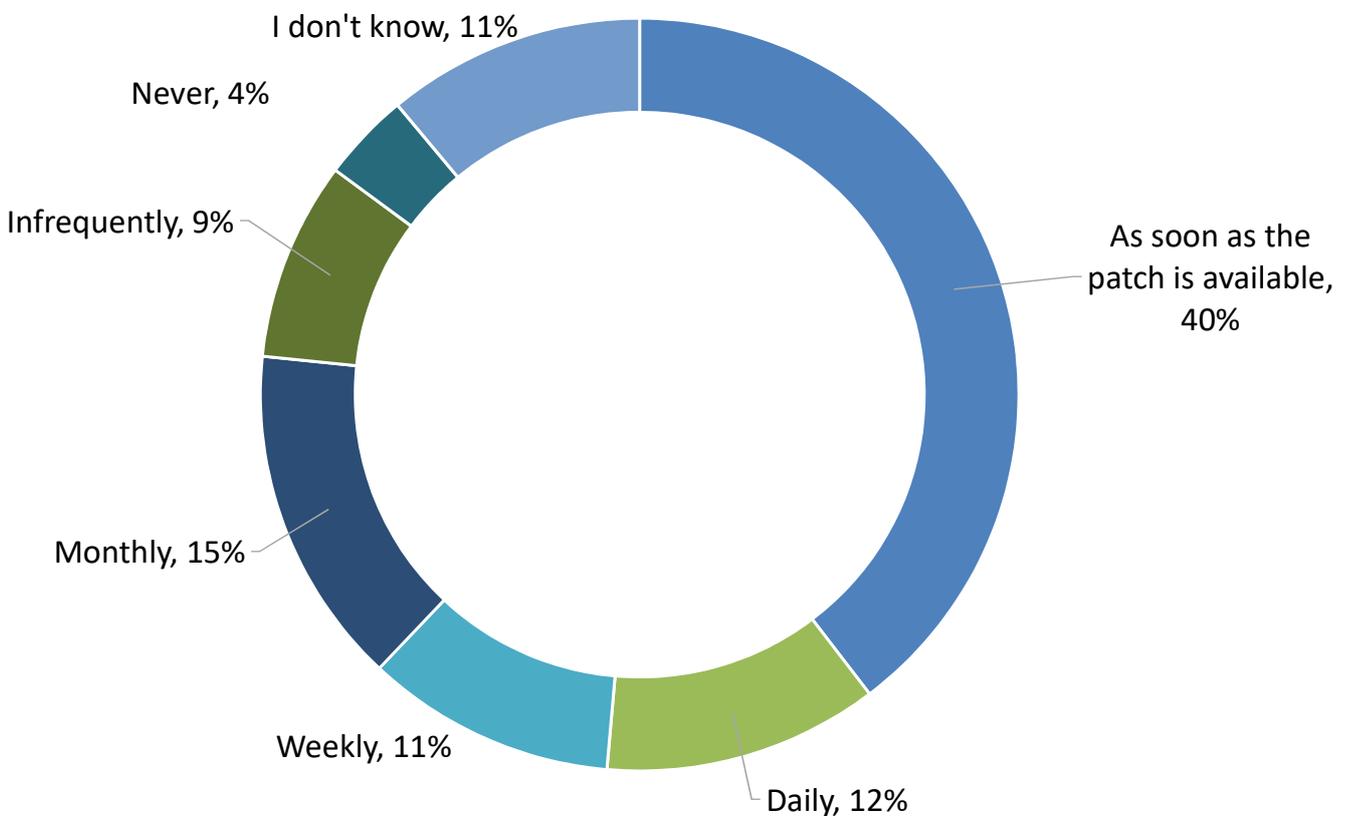
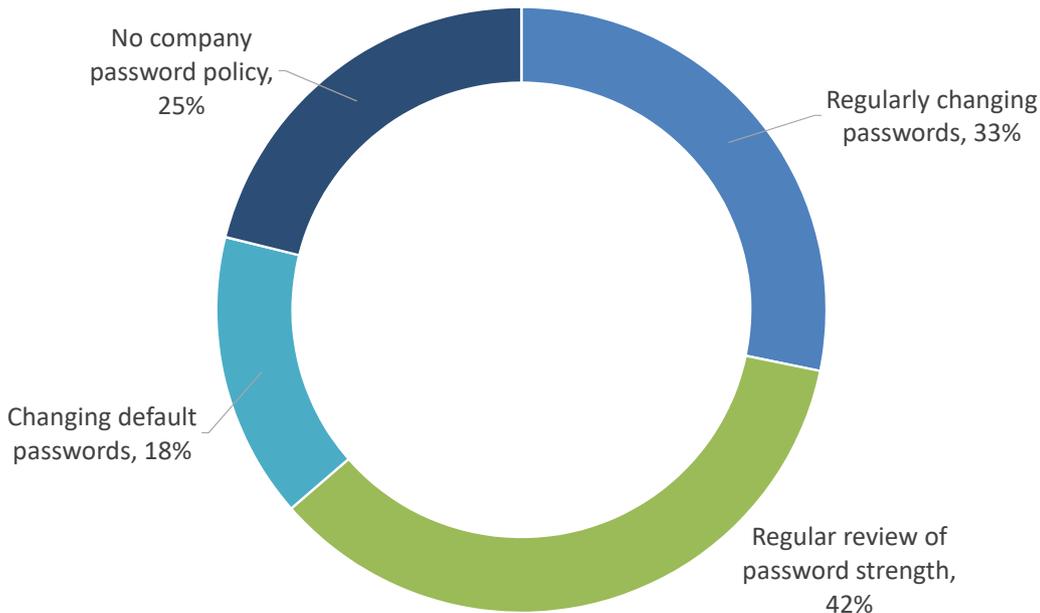


Figure 15a. Frequency of on board system patching.



## Online Lifeline

Cyber training for crew reduces risk, but the provision is still pitifully low, whilst 25% of respondents' companies have no password policy at all.



**Figure 15b. Password policies.**

**Personal data and data sharing**

Over 95% of seafarers felt it was important or very important that companies they worked for stored their personal data securely and 72% felt that ship operators had the necessary measures in place to ensure the security of their data.

Considering the lack of policies and training currently in place this may be a somewhat naive sentiment, as many cyber breaches exploit weaknesses in remote locations to infiltrate corporate networks.

With the imminent entry into force of the General Data Protection Regulations (GDPR) in Europe in May which extends to protection of personal data of EU citizens and any data transfer outside of Europe, ship operators with EU nationals working on board need to ensure they have the relevant policies and procedures in place. Fines of €20million or 4% of global turnover are possible for the most serious violations of the GDPR.

There is a perception in the maritime industry that companies and individuals are reluctant to share their data with other entities even if sharing that data would yield some form of benefit.

We asked seafarers if they would be prepared to allow others to have access to their personal data in order to improve career prospects, get free Internet access onboard, or have access to discounted or tailored products and services.

Nearly three quarters of seafarers were prepared to share their data if it would improve their career prospects,

and over half would share data in return for free Internet access whilst at sea (*Figure 16.*) Seafarers were less likely to share their data in return for tailored training solutions or access to free or discounted products and services, but still approximately one fifth of seafarers indicated they were prepared to do this.

We delved a little deeper, asking seafarers what data they would be willing to share with a prospective employer (*Figure 17.*)

There has been much debate about whether training in the industry is centred more around compliance than competence, so we asked seafarers whether in addition to sharing their training certificates they would also be willing to share their employment reviews.

50% of seafarers said that they would be willing to share these reviews with a prospective employer. 44% also said that they would be willing to share their medical/health history—the younger age groups being the more likely to share this data.

Significantly, only 13% of seafarers were unprepared to share any data at all with a prospective employer.

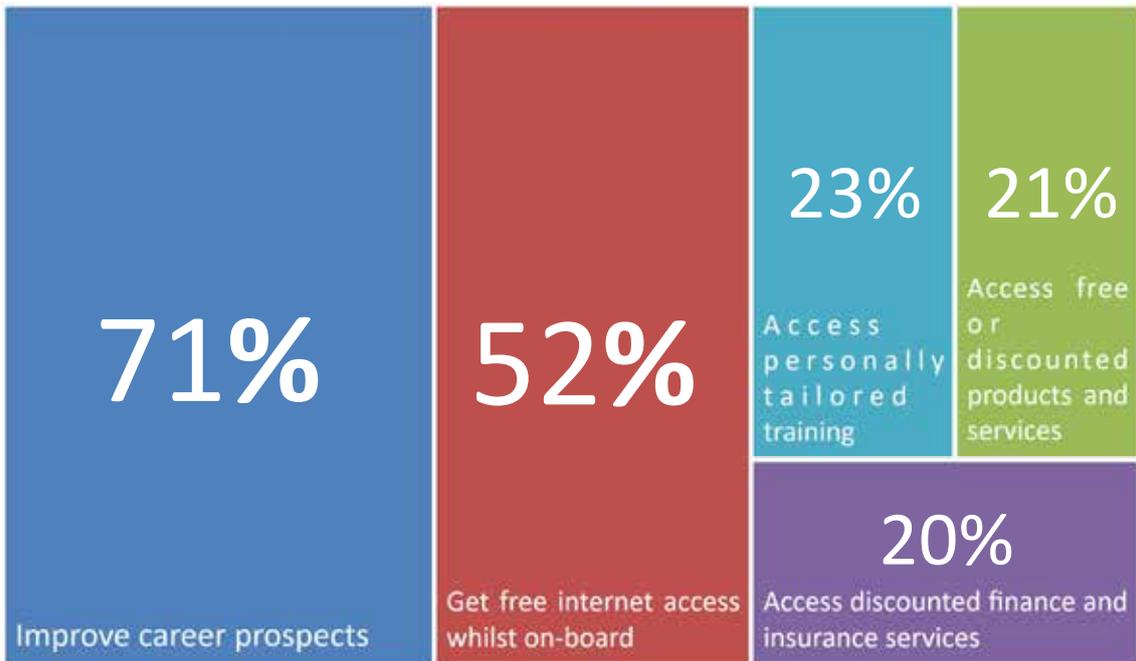


Figure 16. Sharing of personal data



Figure 17. Sharing data with prospective employers

## Training

The number of respondents that undertook some form of Computer Based Training onboard during their last contract fell by 3% to 43% in this year's survey. As in previous surveys the training was primarily safety related and highly fragmented, with at least 25 categories of training covered. 33% of all training was safety related, 15% environmental / MARPOL and 9% related to electronic charts (*Figure 18.*)

The majority of respondents—77%—unchanged from last year, said that the ship was a good place to undertake training. As observed in previous surveys however, when given the choice as to where they would like to learn the majority of seafarers preferred to undertake training ashore in a training centre—the number increasing to 53% in this year's survey.

The number wanting to undertake training at sea fell for the first time this year from 41% to 34%. The results in this year's survey were noticeably more consistent across the age range with a strong preference for onshore training from all age groups. There was also far more consistency when comparing ratings and officers.

For the first time we asked seafarers what training was missing and could be provided to them whilst at sea. Equipment refresher training was their first choice with 65% of respondents indicating that this was currently lacking on board.

In the same vein technology and digital technology training also scored very highly (60%) as did leadership and management training (*Figure 19.*) Leadership and management training scored far more highly amongst officers but

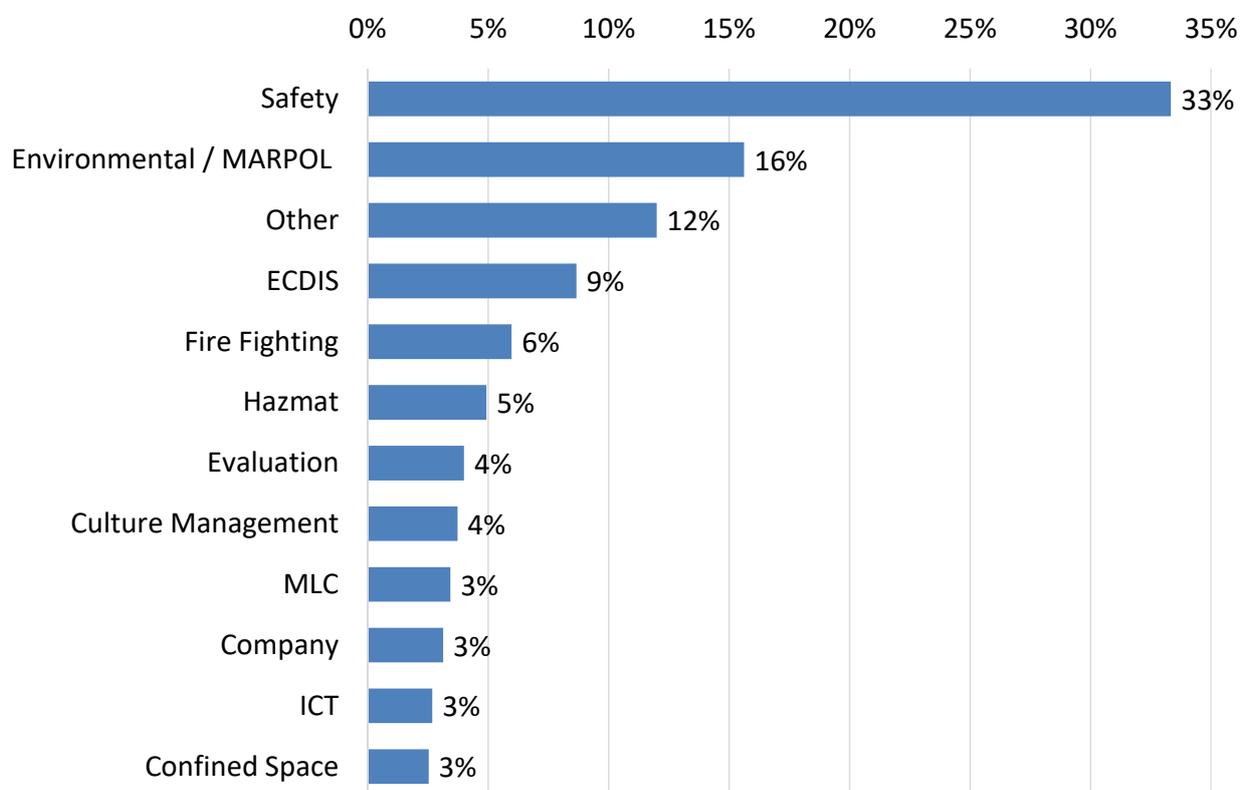


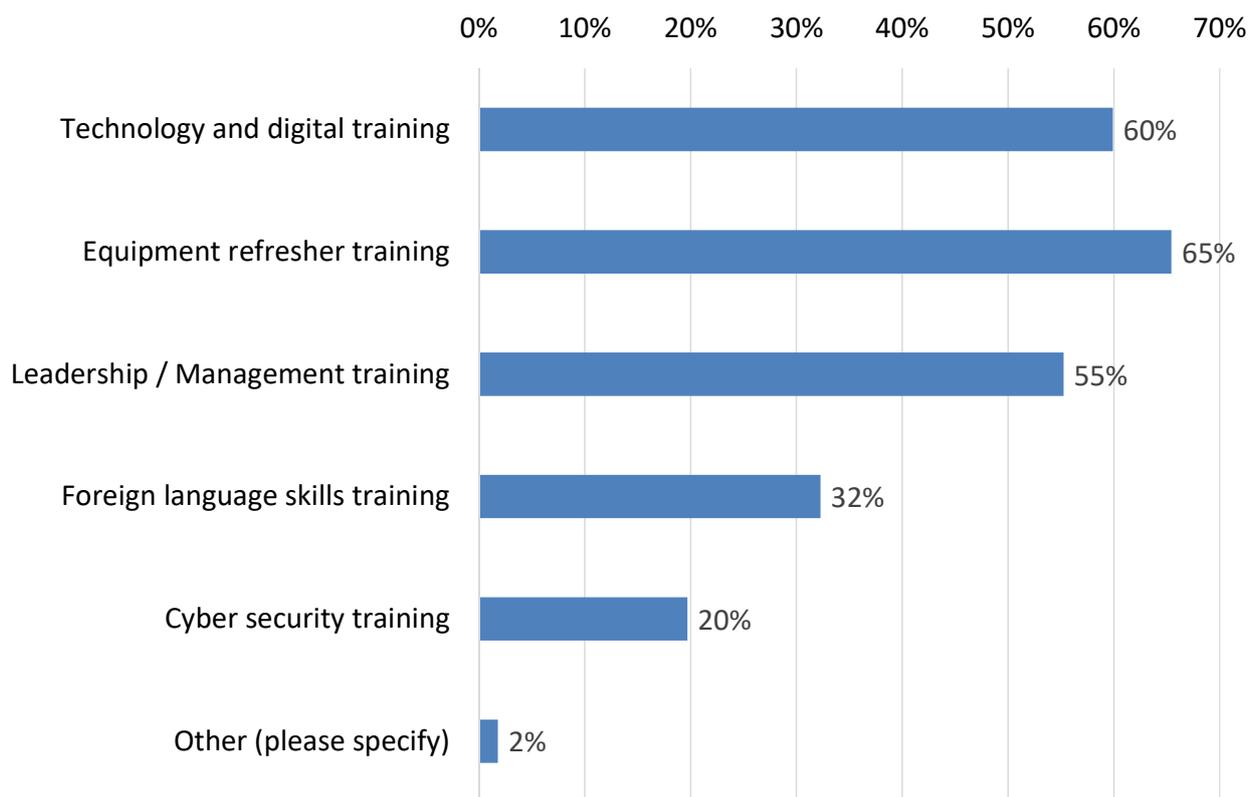
Figure 18. Computer Based Training

it was still ranked as third most important for both groups. Foreign language and cyber security training were also in the top five, but some way below technology and leadership training.

The low score for cyber-security training, given that it is seldom provided, probably indicates that education around the nature and magnitude of threat posed is required—and quickly. However, the emphasis on equipment refresher training may also point to a potentially just as significant issue—that seafarers currently don't fully understand how to

operate the equipment on board. Unfortunately, it is unlikely that cyber security awareness and training can wait until the problems associated with equipment refresher training are resolved.

Somewhat surprising given the above was the finding that over 90% of respondents felt the training they received equipped them for the job expected of them today, in the future and for career progression/promotion within the industry. However, they felt less certain that the training equipped them for a shore-based role.



**Figure 19. Additional Training Requirements**

### Crew Communication Expenditure

On average respondents spend \$101/month on crew communications whilst at sea, representing a decrease of \$51/month (33%) and spent \$80/month whilst ashore or in coastal waters, representing a decrease of \$41/month (34%) - (Figure 20).

The largest expenditure at sea is still on voice calling but spending on this has fallen by exactly \$22/month. Internet expenditure at sea has also fallen by nearly \$20/month. Expenditure on email saw a modest increase of \$4/month.

Expenditure ashore and in coastal waters has seen a fall of \$6/month in expenditure on voice calling which is now no longer the service on which seafarers spend the most.

There was also a significant fall in expenditure on Internet services from \$61/month in 2015 to \$33/month in this year's survey. Email expenditure increased by \$5/month.

It should be noted that in the 2018 survey we did not ask seafarers about their expenditure on SMS messaging whilst at sea or in port/coastal waters.

The figures for SMS Messaging expenditure at sea would likely add less than \$10/month to expenditure at sea and ashore.

It is unclear from the data exactly why the levels of expenditure by crew have fallen so significantly. This year's dataset is significantly larger than in previous years so should provide a truer picture of spending habits by crew.

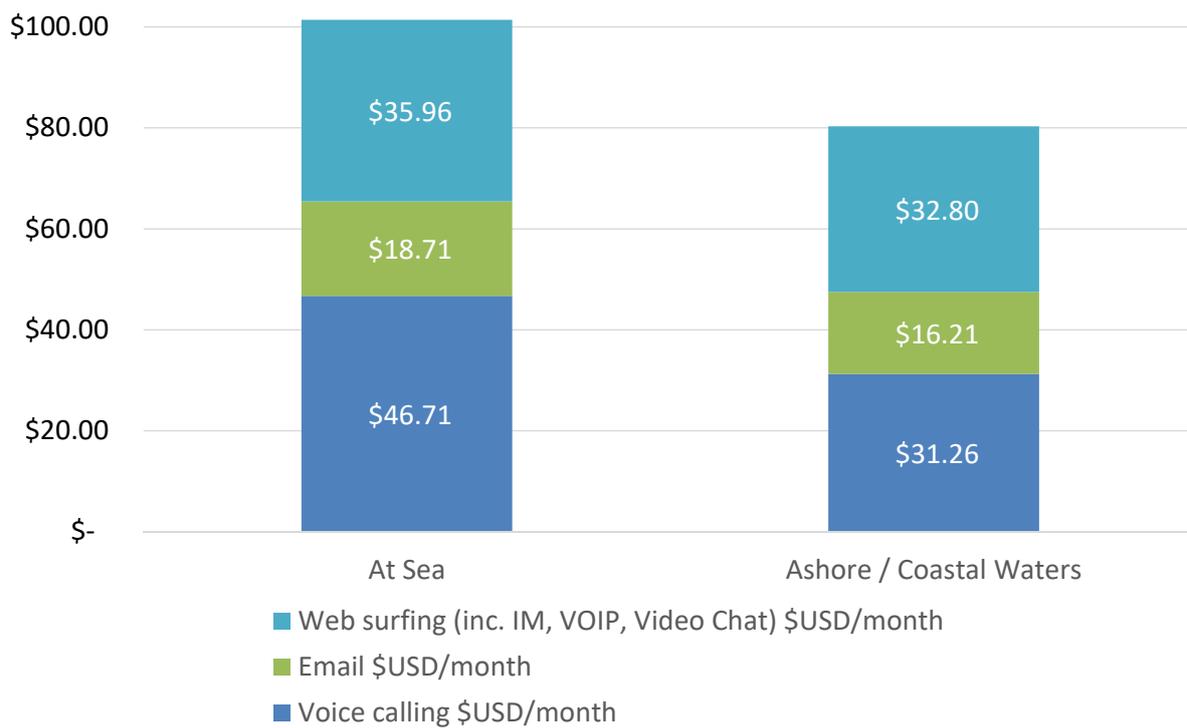
There has been no material decline in usage levels of many of these services (see 'How Often do Crew Use Communications Services at Sea') with only a few percentage points difference in average usage figures over the prior survey.

However, approximately 3% less crew, on average, use services on a daily basis, and there has been an increase (5%) in those using services on a weekly/monthly basis.

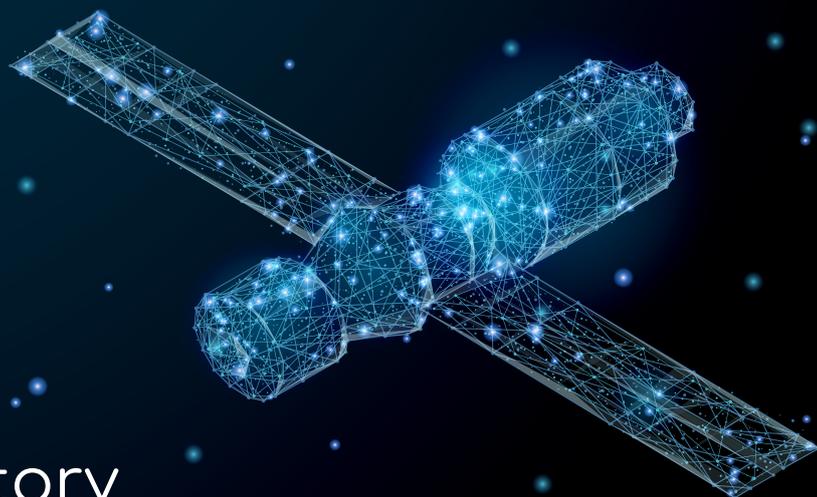
We have seen an increase in the provision of some free services, such as satellite calls (7%-16%) and SMS, and this will account for some but not all of the reduction in expenditure.

In light of this it appears the most likely explanation for the reduction in expenditure is the falling cost of services being passed on to the seafarer as ship operators migrate to broadband VSAT technologies.

This is linked to the changing/more cost-effective way in which seafarers can access some services. Widespread Internet access is seeing increasing numbers of seafarers, for example, using VoIP services instead of dedicated voice solutions.



**Figure 20. Average Crew Expenditure on crew communications**



## Downward Trajectory

Expenditure on crew communications has fallen, alongside the cost of broadband VSAT services.

### Expenditure by age group

Expenditure on crew communications was highest in the youngest age group (18-24) and dropped as respondents aged—a reversal of the results seen in previous surveys (Figure 21).

The youngest group spent \$197/month on communication (at sea and ashore) whilst the oldest age group spent \$174/month. Expenditure by the youngest group was higher both at sea and ashore.

However, they spent less than other groups on voice

expenditure whilst at sea. Whilst ashore they spent the most on voice calls indicating that they perceived this to be better value. They were also the biggest spenders on email at sea and ashore by some margin.

These levels of expenditure underline two factors identified in this report—increased levels of access and the falling cost of communications both on board and ashore.

The combination of these two factors mean that we are beginning to see the emergence of the real underlying usage patterns, and by extension real demand for services.

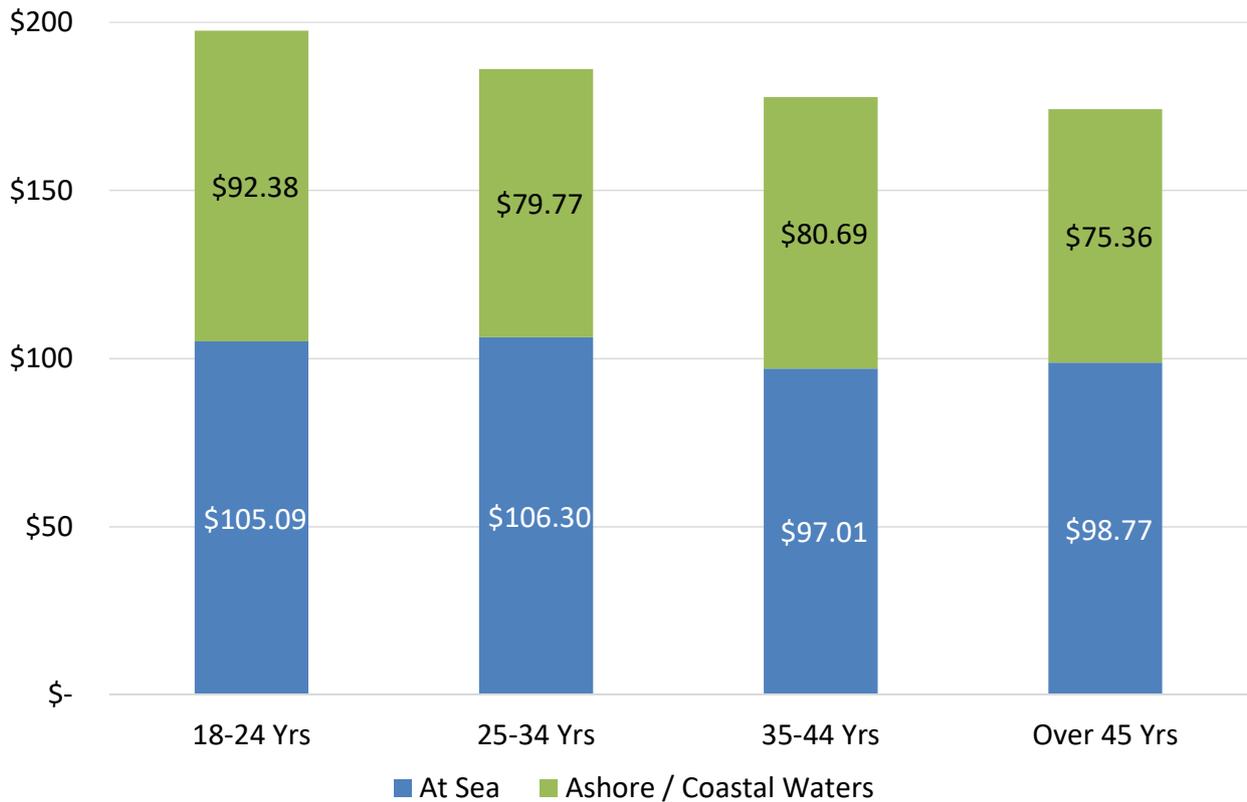


Figure 21. Crew Expenditure on communications by age.

### Expenditure by rank (Figure 22)

Overall expenditure by officers was 10% higher than that by ratings. It was higher both in expenditure at sea (9%) as well as ashore (11%).

In this year's survey expenditure between the two groups was far more closely aligned than in previous surveys.

Both groups spent most on voice calling whilst at sea and most on Internet access whilst ashore/ coastal waters.

Officers spent 25% more when at sea than when ashore and ratings spent 20% more at sea than when ashore.

### Expenditure by region (Figure 23)

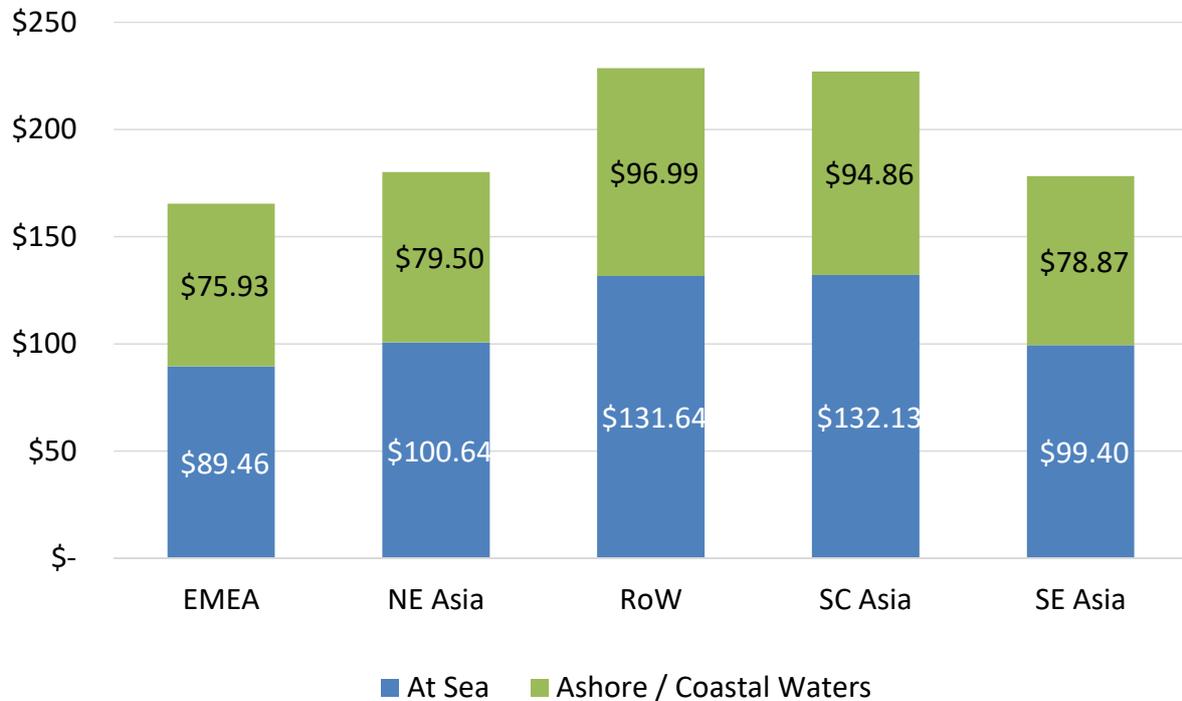
The most dramatic difference in expenditure is seen in the regional breakdown. Those seafarers from the Rest of the World group were the largest spenders on crew communications at \$229/month for communications at sea and ashore, followed by seafarers from South Central Asia (India and Pakistan) at \$227/month.

The lowest expenditure levels were by EMEA seafarers who spent just \$165/month on communications at sea and ashore. The difference between the regions can be accounted for primarily by the level of expenditure on voice communications.

Seafarers from SC Asia and ROW spent nearly double (84%) on voice communications at sea than seafarers from other regions.



**Figure 22. Crew communications expenditure by rank**



**Figure 23. Expenditure by seafarer region**

## Future Spend

When questioned about their likely expenditure on crew communications services over the next 12 months, 61% of respondents believed that their expenditure would remain the same—an increase of 14% since 2015.

The number of seafarers who thought their expenditure would increase dropped from 41% to 27%. The number who expected their expenditure to decrease remained unchanged at 12%.

This suggests once again the emergence of a more settled picture of expenditure and usage as costs fall and access increases.

These results were consistent across both officers and ratings, and also largely across age range. Seafarers from the highest spending regions (SC Asia & RoW) were amongst those that expected to see levels of increased

expenditure on communications.

Those from EMEA who currently spend least also expected their level of expenditure to increase the least in future—only 19% percent anticipated an increase in future expenditure.

## Technology taken onboard

We once again asked crew about the technology /communications devices taken on board, in order to gain an understanding of the affect this has on the services they use; what they wanted in future; and, how they would like to access these services.

As with the last two surveys seafarers take on average three personal technology/communications devices on board with them.



There are significant differences in the devices taken on board by officers and ratings (*Figure 24.*) When comparing these figures with those of the last survey it should be borne in mind that the ratio of officers to ratings in this year's survey (1:2) is the reverse of the last survey.

The smartphone continues to be the most common device and is taken on board by 72% of seafarers—although this number has fallen by 5% since the 2015 survey. 80% of officers had a smartphone compared with 68% of ratings.

Conversely, 52% of ratings carried an ordinary feature phone compared to just 39% of officers. The combined group shows an increase of 20% in the number of seafarers carrying an ordinary feature phone on board, at 47%.

It is unclear why there is such a difference in these numbers but it may indicate that a significant number of seafarers now carry a second phone on board.

Although representing the second most popular device taken on board on average the number of laptops/netbooks have fallen from 69% in the 2015 survey to 58% in this year's survey.

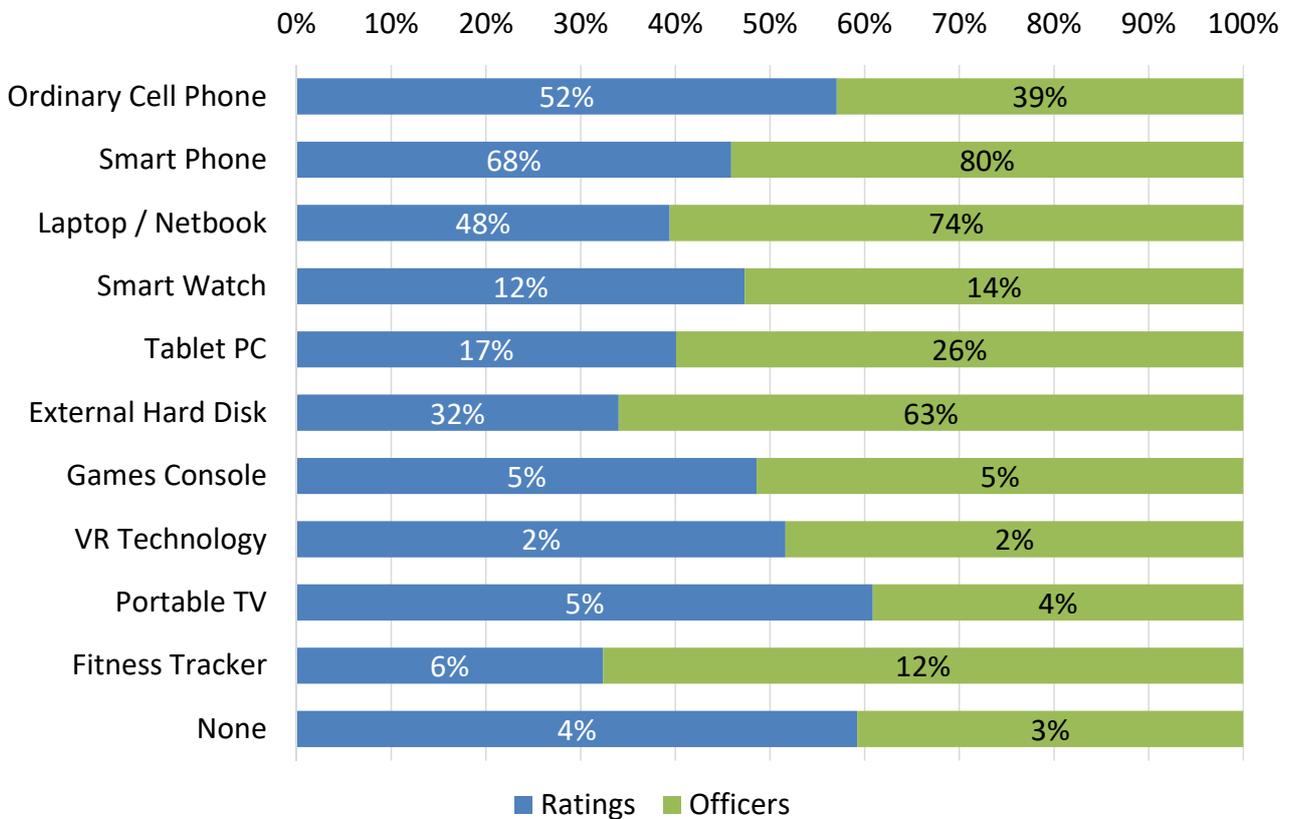
74% of officers took a laptop on board compared to 48% of ratings. Following the same trend is a reduction in the numbers carrying external hard disks on board. This has fallen from 57% to 43%. 63% of officers took an external hard disk on board compare to just 32% of officers.

Tablet PC usage on board has also fallen from 28% to 21%. Once again officers carried more tablets than did ratings.

The 2018 survey has certainly confirmed the arrival of smart watches and fitness trackers. Smart watches are now worn by 13% of seafarers, and fitness trackers by 8%.

These technologies were only emerging in 2015 but now seem to have found favour with seafarers both as another means of communication and as a health/well-being monitor reflecting wider societal changes. Twice as many officers carried fitness trackers as ratings.

The Container and Gas Carrier sectors reported the highest levels of technology/communications devices and general cargo sector had the lowest numbers of technology devices taken on board of any sector.



**Figure 24. Technology currently taken on board by rank.**



## Wearables have arrived

According to the 2018 survey smart watches are now worn by 13% of seafarers, and fitness trackers by 8%.

### Planned purchases

In order to identify future personal technology trends on board we asked seafarers about their planned technology purchases for the next 12 months (*Figure 25*). As in the last two surveys, and at almost exactly the same level, 39% of the combined group of respondents planned to purchase a laptop/netbook.

This figure was driven more by ratings—45% of whom anticipated purchase of a laptop—than officers, of whom only 12% anticipated a purchase.

Fitness trackers were the second most common planned purchase by the combined group at 29%. 34% of officers and 27% of ratings planned to purchase such a device reflecting a wider societal trend of growth in personal health monitoring devices. Although second in the combined group this was the number one planned purchase for officers.

Tablet PCs were the third most common planned purchase by the combined group at 27%. A quarter of officers and 29% of ratings planned to purchase such a device. Tablet PCs were the number one planned purchase in the last two crew connectivity surveys but this intention to buy has not led to an increase in the numbers taken on board.

Hence whilst crew may certainly be purchasing these devices they are not then taking them on board. We believe that this may be because these are primarily devices for

surfing the web and consuming on-demand content. They offer little over smartphones in terms of functionality and don't offer the storage capacity of laptop PCs.

Smart phones, smart watches and games consoles were the next most common planned purchases by the combined groups—tied at 25% each. Smartphones were second in last year's survey and this fall in importance is likely due to the numbers of seafarers who already own these devices.

Smart watch purchases are planned by 27% of officers and 24% of ratings which reflects the adoption of this technology ashore. As well as providing wireless connectivity and communication these devices are now increasingly moving in the wireless health monitoring space which is seen by many as the long-term growth market for these devices.

The level of technology currently carried onboard, and that which is likely to be carried on board in the near future, provides significant opportunities for service providers and ship operators alike.

With smartphones now commonplace, new ways to disseminate services, training and other information and content utilising wireless networks to personal devices are now possible—as is the ability to positively influence support and monitor crew health with the widespread adoption of smart watches and fitness trackers amongst crew.

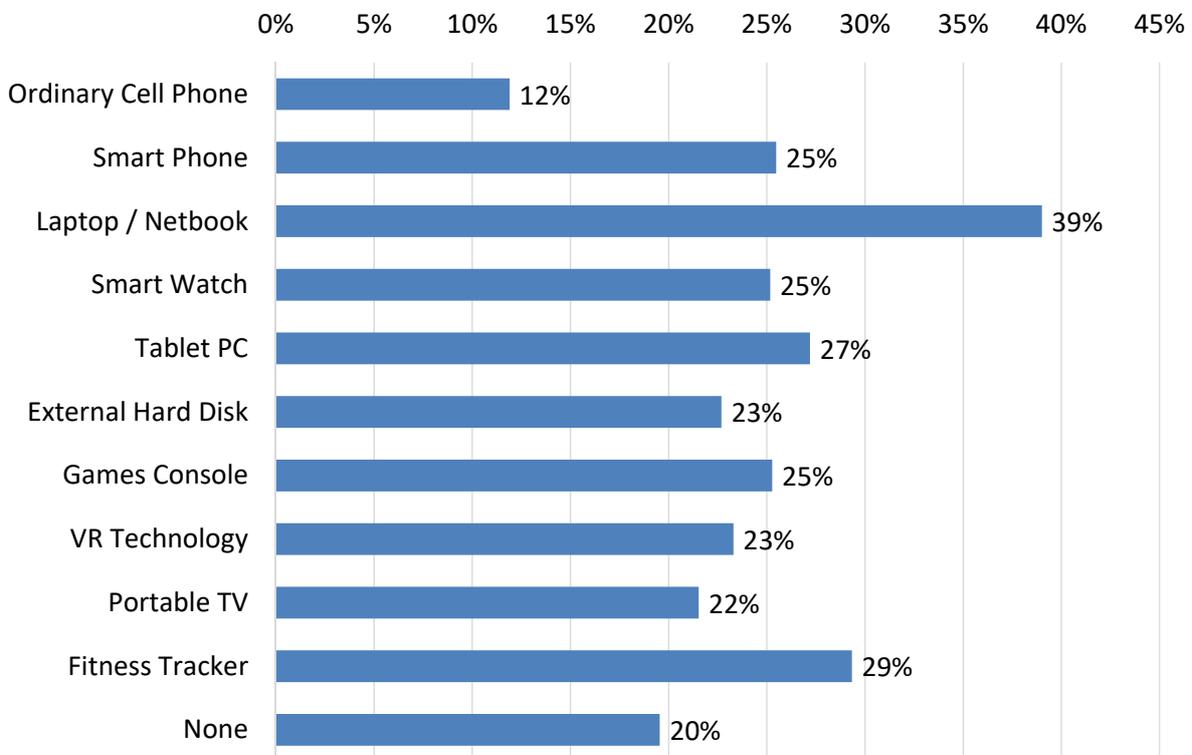


Figure 25. Planned technology purchases in the next 12 months

### Popular Apps and Websites

In previous surveys we have asked seafarers to identify their favourite websites. However, this year we asked them to identify their favourite website or App in the following categories—social, news, sport and shopping.

Facebook was the most important social media website/app with 66% of crew identifying this as their preferred site. Messenger at 17% was the second most important social media site/app followed by WhatsApp at 5%.

Facebook was the number one social media site for all regions except NE Asia where WhatsApp was the number one—at 56% compared to Facebook at 36%. For seafarers from the EMEA region where there were a significant number of Ukrainian and Polish seafarers Viber was the second most important site at 15% (Figure 26).

The top news site was ABS-CBN with 32% of seafarers identifying this as their preferred site, which reflects the large number of SE Asian seafarers in the survey. Google, CNN and the GMA Network were the next most popular sites/apps with 19%, 16% and 11% respectively.

As would be expected there was significant variation by region. In the EMEA, ukr.net, Google and the BBC were the three most popular websites. In NE Asia and the RoW ABS-CBN, Google and CNN were the most important sites. Seafarers from NE Asia primarily got their news from Google, NDTV and the India Times sites and apps. (Figure 27.)

ABS-CBN did score highly in most regions suggesting that there may be a number of naturalised Filipinos living in these other regions.

Of the combined group, 46% of seafarers got their sports information from the NBA site/app. 17% got sports information from ESPN. For seafarers from the EMEA region Eurosports was the most popular site/app followed by the NBA and ESPN. The NBA was also dominant in NE Asia with 50% of seafarers indicating this was their primary source of sports content.

Eurosport and the BBC were joint second with 10%. Cric Info, Star sports and ESPN were the most important sites/apps for seafarers from NE Asia with each site collecting around 25% share. The NBA had more than 50% share of the SE Asian seafarers with ESPN and Solar sports in second and third place respectively (Figure 28).

The most popular seafarer shopping site was Lazada (42%) followed by Amazon (18%), Walmart (17%), and eBay (9%). The most popular shopping site for EMEA seafarers was Rozetka (24%), Amazon (23%) and eBay (19%). Seafarers from NE Asia shopped most often from Lazada (43%) Walmart (23%) and eBay (19%). Amazon fared particularly poorly in this region with only 4% of seafarers choosing it as their preferred site/app.

However, Amazon was chosen by 73% of seafarers from NE Asia with FlipKart in second place with 23%. Walmart, Amazon and Lazada were the top sites for seafarers from the RoW with nearly 86% of seafarers choosing them. Lazada scored highest—unsurprisingly—with seafarers from SE Asia followed by Walmart (21%) and Amazon (12%) (Figure 29.)

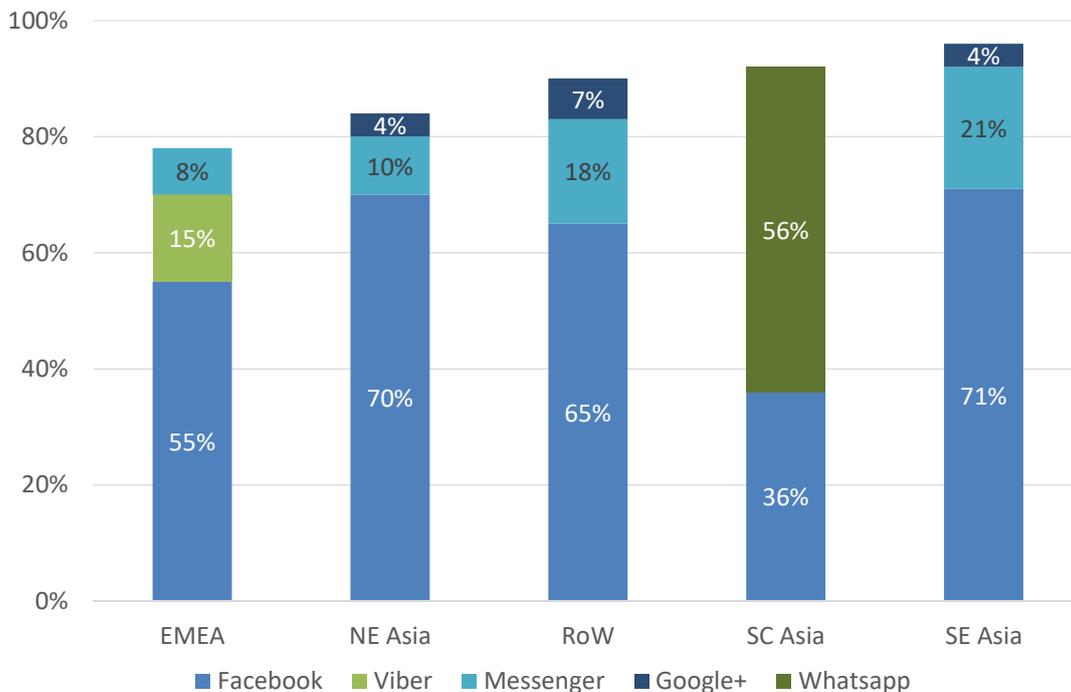
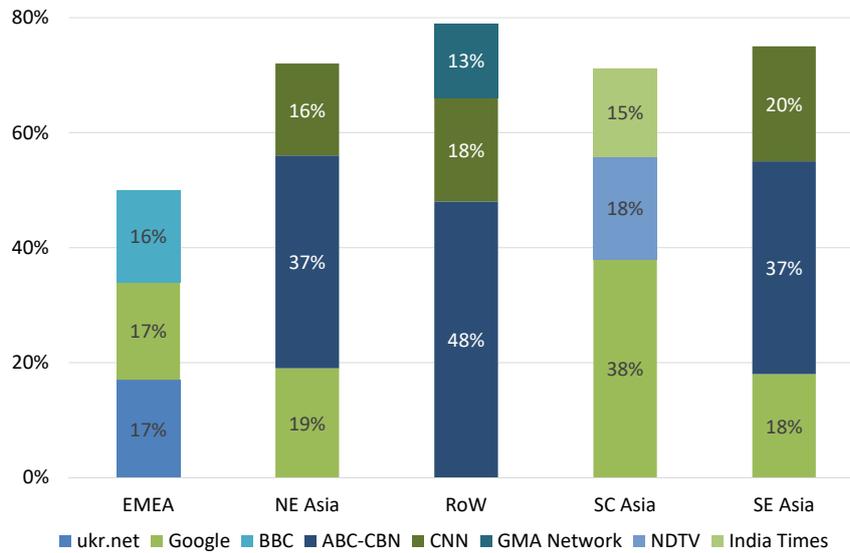
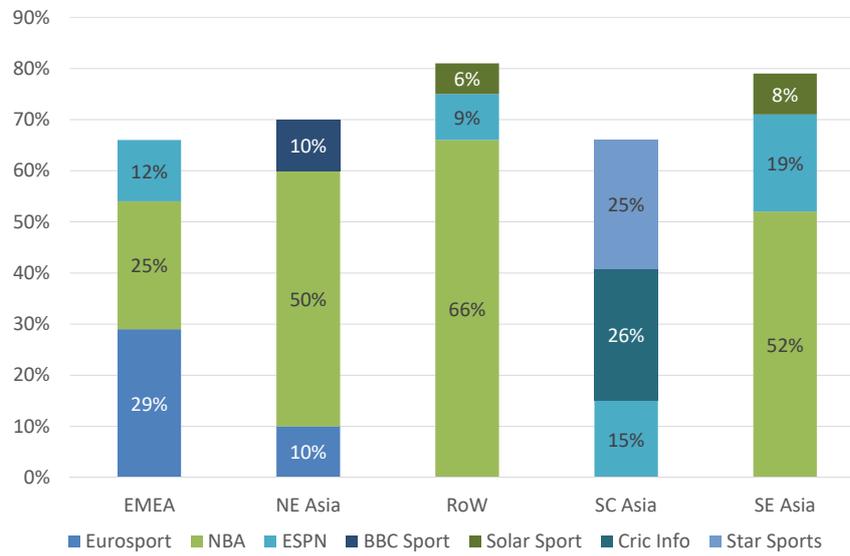


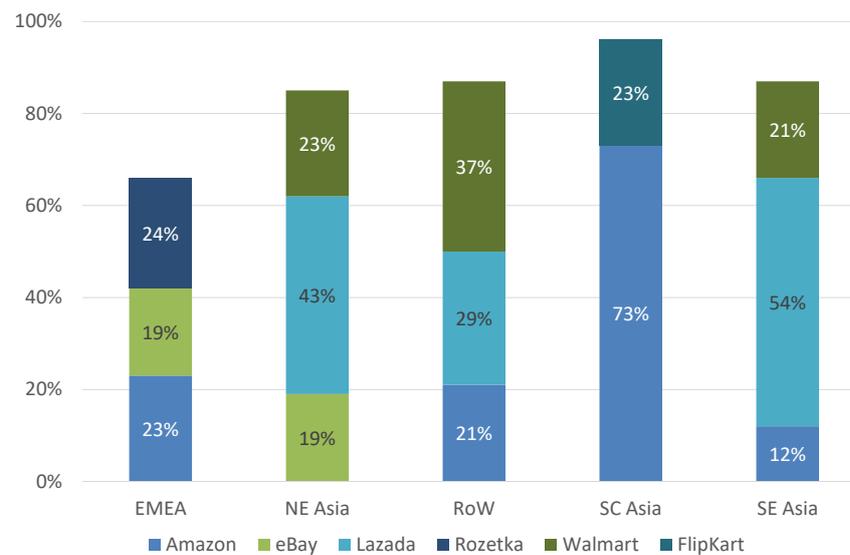
Figure 26. Most popular social media sites/apps by region



**Figure 27. Most popular news sites/apps by region**



**Figure 28. Most popular sports sites/apps by region**



**Figure 29. Most popular shopping sites / apps by region.**



### **Future Services**

We asked respondents once again to consider a list of potential future services and choose the most important to them (*Figure 30*.)

Once again free in-port WiFi services is the most important service that seafarers are currently lacking—this has consistently been top of seafarers' requirement lists in most surveys we have conducted.

There continues to be a strong appetite for a low-cost global roaming SIM card that would allow low cost calls from any country. Currently seafarers find themselves purchasing multiple SIM cards from port welfare facilities which, if not used, are worthless in another country.

There is wide availability of roaming SIMs and smartphone mobile apps but these tend to be regional and fragmented. To date none of the mainstream terrestrial providers of such services have recognised the opportunity and entered the market, and nor have any of the maritime communications suppliers partnered with operators to make this happen.

The continued interest in such SIMs would suggest that the right solution could represent the low hanging fruit of crew communications.

Technology training and a low-cost satellite phone system were the third most important services. A low-cost satellite phone service could compete with terrestrial roaming services to allow use both at sea and ashore.

The need for technology training echoes the demands for training outlined in the Training section where seafarers most wanted equipment refresher and digital technology training.

This would indicate a strong awareness on the part of seafarers of the exponential growth in technology and the desire to be trained to take advantage of the opportunities this technology will deliver.

There was also interest in a free, confidential seafarer helpline, to assist seafarers in times of hardship.

As we have seen in previous surveys there remains little appetite for onboard content services such as on-demand TV/films and music. This is likely linked to the fact that seafarers already bring a large selection of content on board

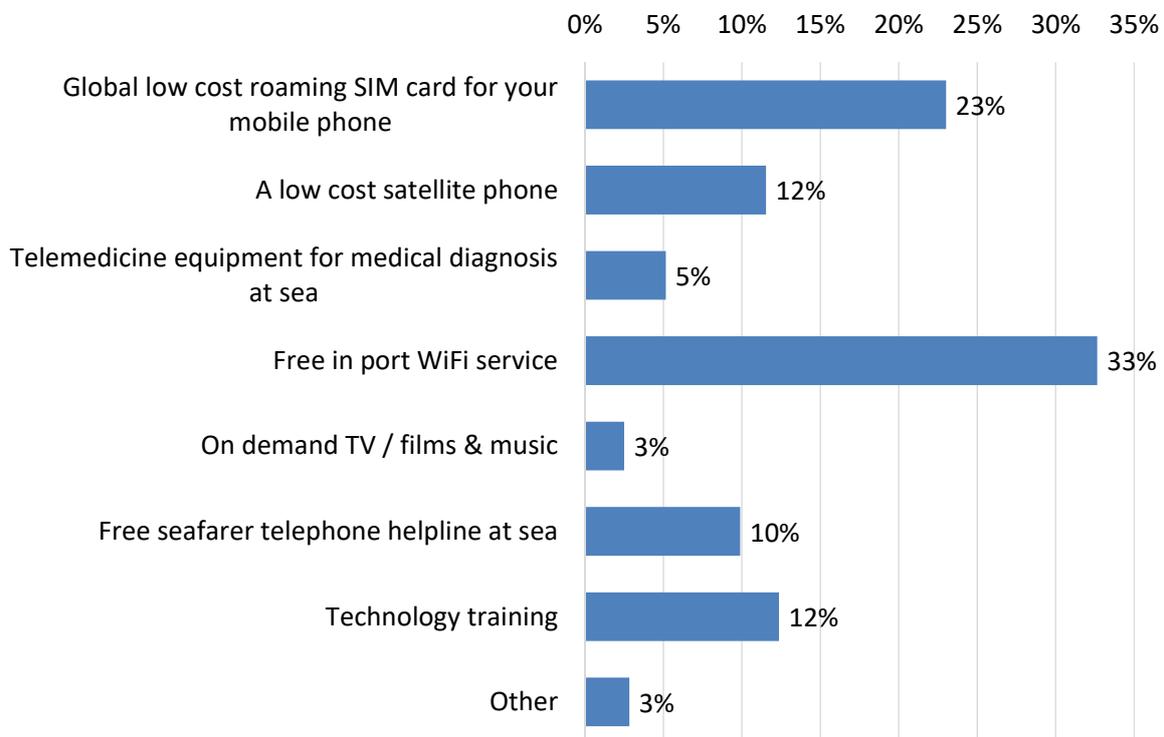
on various devices and share it with others, hence it is perceived as freely available already.

Unfortunately, the reality is that much of this content will be unlicensed and downloaded from Internet sites which are also designed to deliver malware. As the focus on cyber hygiene intensifies this is likely to be an area in which ship operators seek to tighten their procedures.

In the event that such content becomes subject to approval or scrutiny before being allowed on board, its decreasing availability may push ship operators to consider offering such on-demand services to compensate seafarers.

Likewise, there was little interest on the part of seafarers for telemedicine equipment for medical emergencies, indicating that the demand for these services will ultimately be driven by ship operators rather than the crew.

The figures for future services were consistent across officers and ratings as well as all age groups



**Figure 30. Future services most wanted by seafarers**



## Industry Heavyweights. Invaluable Partners.

We are indebted to the following organisations for their active and continued support of the Crew Connectivity Survey.

Thank you.

# PTC

Founded in 1979, PTC is one of the largest crew management and diversified maritime services companies in the Philippines. Its range of services include marine management, education and professional development, energy and logistics, healthcare, tourism, offshore processing, property development, microfinance and international professional placement.

Its pioneering initiative in crew management was the international deployment of a full-Filipino complement on three 50,000 DWT Ore Bulk Oil Carriers, a first in Philippine maritime history in 1984.

Today, PTC has grown beyond crew management. A leader in the Philippine maritime industry deploying over 45,000 Filipino global maritime professionals on board close to 1,100 vessels, PTC now offers an integrated value chain of services that spans Marine Management; Education and Professional Development; Energy and Logistics; Travel and Tourism; Healthcare; Offshore Processing; Property Development; Microfinance; Family Care Programs; International Professional Placement; and Information and Communications Technology.

Driven by a passion to make a difference and a commitment to longstanding partnerships with Principals who are themselves leaders in Europe, Asia and North America, the PTC Group continues to embrace its vision for a Filipino Global Maritime Professional to be on every vessel, in every sea, Moving the World.

[www.ptc.com.ph](http://www.ptc.com.ph)

# InterManager

InterManager is the international trade association for the shipmanagement industry. Its members are in-house or third party ship managers, crew managers or related organisations and businesses from throughout the shipping industry.

Collectively InterManager members are involved in the management of almost 5,000 ships and responsible for some 250,000 seafarers. InterManager is the only organisation exclusively dedicated to representing the shipmanagement industry. It is a recognised and well-respected organisation which represents its members at international level, lobbying on their behalf to ensure their views and needs are taken into account within the world-wide maritime industry.

In addition, InterManager is committed to improving transparency and governance in the shipping world and ensuring high standards are maintained throughout the shipmanagement sector.

The directors and senior staff of InterManager member companies hold a number of external positions. Posts include advisers to governments, technical institutes, maritime academies and maritime courts on maritime affairs, as well as senior elected positions in environmental and business promotion organisations, representation on ICS, ISF, Intertanko, BIMCO and national shipowners' association boards or committees and official positions in local branches of The Nautical Institute. InterManager is the voice of shipmanagement.

[www.intermanager.org](http://www.intermanager.org)

# ISWAN

The International Seafarers Welfare and Assistance Network promotes seafarers welfare worldwide and directly serves seafarers by providing a 24 hour helpline. ISWAN is the result of a merger between the International Committee on Seafarers' Welfare (ICSW) and the International Seafarers Assistance Network (ISAN).

ISWAN is a membership organisation with the International Shipping Federation, The International Transport Workers Federation and the International Christian Maritime Association as the core members.

ISWAN provides direct welfare services to seafarers. The 24 hour multilingual helpline, seafarer help, runs every day of the year and is free for seafarers to call from anywhere in the world. ISWAN also runs an emergency welfare fund for seafarers in dire need, produces health information for seafarers, and provides information on the location of seafarer centres.

ISWAN works to support the welfare of seafarers all over the world. It works in support of organisations and bodies that provide direct welfare services to seafarers. It works to enable the establishment of welfare facilities and services in port and on ships. ISWAN brings together and supports its members to share learning and experiences to improve seafarers' welfare both onboard and ashore.

In particular, ISWAN works for the implementation of the ILO Maritime Labour Convention 2006. ISWAN works with companies, unions, governments, welfare organisations (secular and faith based), and ports for the benefit of seafarers' welfare.

ISWAN is funded by membership subscriptions, grants from foundations, sponsorship, and earned income.

[www.seafarerswelfare.org](http://www.seafarerswelfare.org)

# BIMCO

Bimco has continuously advocated for the economic well-being of shipping, whilst promoting safety and environmental protection, and always acting in the best interests of its members.

Bimco has existed through an era of immense change in transportation and economic growth, and has built its strength upon its ability to move with the times and adapt to economic and political realities.

Bimco's mission is to provide a first class service to its membership representing all segments of the shipping industry by facilitating state-of-the-art access to quality information and advice, developing standard contracts and clauses, promoting fair business practices, free trade and open access to markets, enhancing the proficiency and qualifications within the industry through its educational programmes, pro-actively participating in all developments which serve to enhance harmonisation, and helping to maintain a level playing field within the international shipping industry.

Bimco also offers a broad range of practical knowledge and services, complemented by voluntary reporting and input from the membership.

BIMCO's website is possibly the largest single compilation of contemporary and practical shipping information, with more than 175,000 pages on all aspects of vessel operations including port and cargo databases and an array of other shipping-related data.

[www.bimco.org](http://www.bimco.org)

# Alpha Navigation

Alpha Navigation, founded in 1997, has been providing crew management services and supplying vessels with competent and professional Ukrainian and Filipino crews consistently throughout the years. It has more than 20 years of experience in placing seafarers in contracts with top tier employers from the longest ship owners list.

Its work is geared to providing its clients with professional services of the highest quality. To ensure those objectives are achieved successfully, it has masterminded a one-of-a kind process of maritime employment.

Alpha Navigation recognises the importance of providing qualified crews on both sides—at sea and on-shore—and accomplishes this by personally screening each and every prospective applicant through rigorous competence, fitness, and English language comprehension tests to bring its clients the very best people.

In accordance with the shipowner's demands, the designated Crew Superintendent selects and employs the command and crew for the vessel. Alpha Navigation ensures it complies with all internal Quality Standards, IMO, STCW, ISO requirements, and the vessel's manning stipulations.

Alpha Navigation maintains a high standard of excellence through performance appraisals and continuous upgrade training for its crews. Its clients' satisfaction and success is of the utmost importance.

[www.alncc.com](http://www.alncc.com)





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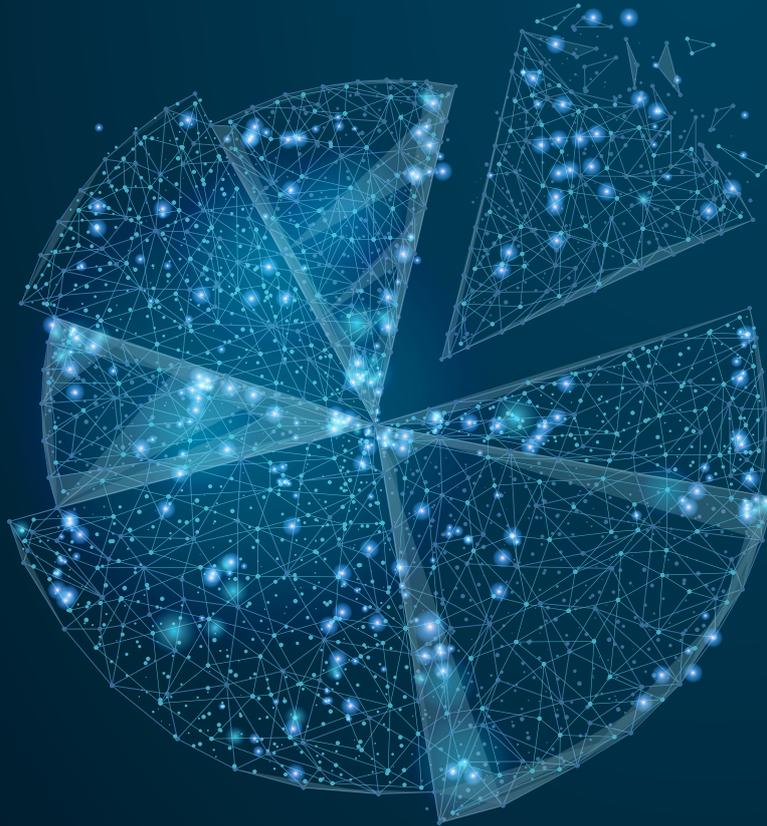
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