

Understanding the Impact of Decarbonisation on Seafarers' Wellbeing: Findings of an ISWAN survey

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Decarbonisation is one of the key drivers of transformation in the maritime sector. There is widespread acknowledgement of the significant training challenges that the maritime sector faces to safely operate technologically complex low-carbon ships. There has, however, been little attention paid to the impact that the drive to decarbonise is having on seafarers' wellbeing. In order to shed light on this issue, in 2023, ISWAN carried out a survey of 400 seafarers to better understand how the rapid adoption of new technologies and regulatory regimes is affecting their wellbeing and job satisfaction. The findings indicate that, whilst many seafarers are broadly supportive of journey to zero carbon, the pressures of decarbonisation are having a negative impact on many in terms of workload, stress, fatigue, mental health and fear of criminalisation. The paper builds on the survey findings to provide recommendations for how maritime employers can better support the wellbeing of seafarers through the zero-carbon transition, including by proactively mitigating against the health and wellbeing impacts of technostress, enhancing

psychological safety through inclusive leadership cultures and taking steps to improve job security. Keywords: Communication; fatigue; just cultures; mental health; psychological safety; technostress.

INTRODUCTION

Decarbonisation is one of the key drivers of transformation in the maritime sector.¹ To address shipping's contribution to the climate emergency, maritime companies are mandated to take rapid steps to meet mandatory carbon emission regulations.² At an institutional level, there is widespread acknowledgement that seafarers are central to meeting the maritime sector's decarbonisation obligations. The stated aim of the Maritime Just Transition Task Force, established following the 2021 UN Climate Change Conference in Glasgow (COP26), is to ensure that shipping's response to the climate emergency puts seafarers at the heart of the solution [3]. To date, however, the majority of discussions of what a "Just Transition" might look like in a maritime context focus on the pressing need to ensure that seafarers have the training and skills that they need to operate more complex technologies

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¹ A report by DNV [1] provides in-depth analysis of the impact of the drive to decarbonisation on the sector.

² A survey by the Global Centre for Maritime Decarbonisation (GCMD) and Boston Consulting Group (BCG) [2] demonstrates the wide spectrum of responses of shipowners and operators to the challenges of decarbonisation.

and handle potentially more hazardous alternative fuels.³

Comparatively little attention has been paid to the impact that the rapid pace of technological change is having on seafarers’ wellbeing and job satisfaction. For this reason, between July and September 2023, ISWAN conducted a survey to ask seafarers about the impact that decarbonisation is having on their work. It is hoped that the insights will contribute to understanding what it will take to achieve the International Maritime Organization (IMO)’s goal to “ensure a just transition for seafarers and other maritime workforce that leaves no one behind” [4].

DEMOGRAPHICS

The survey received 400 valid responses from seafarers of 29 nationalities, with the majority from India (42.8% of responses) and the Philippines (15.6%). This reflects ISWAN’s physical presence and extensive networks in these two major seafarer-supplying nations. Almost 90% of respondents were working in officer roles and 97% identified as men. The largest number of seafarer respondents were aged between 35 and 44 (34.3%), whilst just under 90% were aged between 25 and 54. The majority of respondents (83.4%) worked on oil tankers (37.9%), chemical tankers (25.3%) or cargo ships, including general or bulk carriers (20.2%). Just over half (54.8%) worked on vessels without a fixed trading pattern.

Characteristic	% respondents
Country	
India	42.8%
Philippines	15.6%
Russia	7.7%
Egypt	5.1%
Croatia	3.6%
Bulgaria	3.6%
Georgia	3.3%
Ukraine	3.1%
Pakistan	2.1%
United Kingdom	1.3%
Poland	1.3%
Saudi Arabia	1.3%
Montenegro	1.3%
Bangladesh	1.0%
Latvia	1.0%
Other	5.9%
Age	
18-24	1.8%
25-34	32.8%
35-44	34.3%
45-54	21.8%
55-64	8.0%
65+	0.5%
Prefer not to say	0.8%
Gender identity	
Male	97.2%
Female	2.0%
Prefer not to say	0.5%
Non-binary	0.3%
Role	
Engineer/Chief/Second/Third/Fourth/Junior	42.5%
Master/Chief/Second/Third/Fourth/Junior	39.4%
Electrical officer	7.5%
Deck Rating - Bosun / AB / OS / Pumpman	2.0%

³³ The Task Force’s commissioned report on this issue [3], as well as [1] identify very substantial skills gaps that require rapid and significant investment in infrastructure.

Deck cadet	1.8%
Engine room Rating	1.8%
Galley : Cook / steward / messman	1.8%
Prefer not to say	1.5%
TME / Engine cadet	0.3%
Other	1.5%
Vessel type	
Tanker – oil	37.9%
Tanker – chemical	25.3%
Cargo, including general and bulk carriers	20.2%
Tanker Gas/LPG/LNG	3.8%
Ferry/Ro-Ro ferry	3.0%
Container ship	2.0%
Prefer not to say	1.8%
Supply ship	0.8%
Cruise ship	0.8%
Tug	0.3%
Other	4.3%
Trading pattern	
Unfixed	54.8%
Fixed	25.1%
Partially fixed	20.1%

SURVEY FINDINGS

The survey indicates significant support in principle from seafarers as regards the decarbonisation agenda. For some seafarers, concern about the climate emergency is part of their motivation to support the transition to zero carbon. For example, one seafarer commented that: “I get more motivated knowing that the reason for all these carbon regulations is for the planet”.

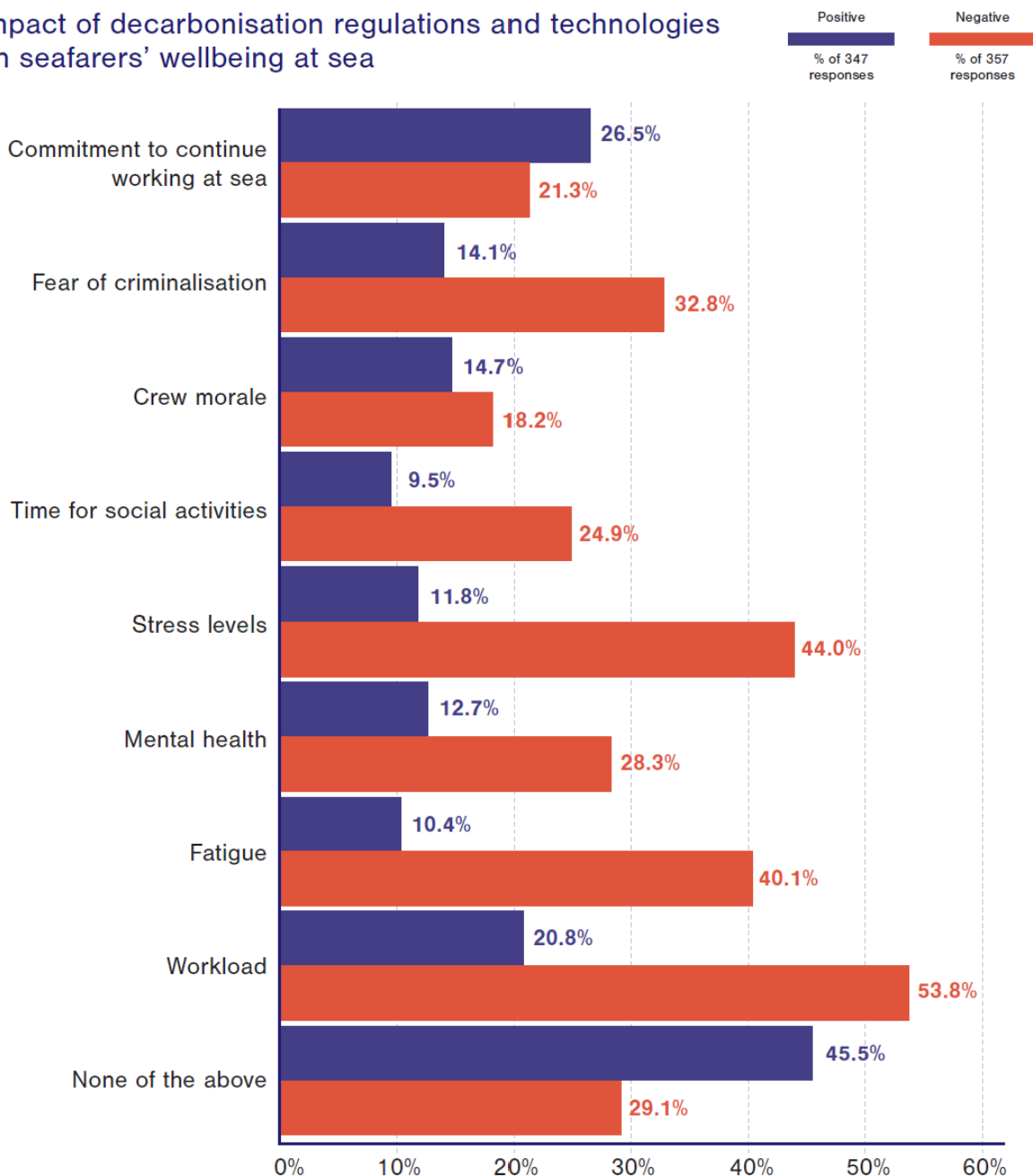
The findings indicate that there is, however, considerable disquiet about the realities of seafaring during the transition to zero carbon. For many seafarers, the potential benefits of technological modernisation and environmental sustainability are countered by the impact of rapid change on their psychological wellbeing.

The most significant impact related to the increase in workload associated with adapting to new technologies and reporting requirements, with over half (53.8%) of respondents stating that the impact on their workload had been negative.⁴ For 44.0% of respondents, this was associated with increased stress, whilst 40.1% reported increased fatigue. A quarter (24.9%) of respondents felt that the additional pressures of decarbonisation were negatively impacting on the time available for social activities,⁵ whilst just under a fifth (18.2%) believed that the impact on crew morale was detrimental. Just under 30% of survey respondents (28.3%) felt that change associated with decarbonisation was negatively affecting their mental health. Almost half (45.5%) of respondents reported that the introduction of decarbonisation regulations and technologies had not had a positive impact on any of the wellbeing areas included in the survey.

⁴ Based on feedback from seafarers during the testing phase of the survey, respondents were asked about broadly positive or negative impacts, rather than using a five-point scale, due to limitations in using matrix question layouts on mobile phone technology.

⁵ ISWAN's Social Interaction Matters (SIM) project [5] explores the crucial importance to seafarers' health and wellbeing of having quality social interaction and rest time.

Impact of decarbonisation regulations and technologies on seafarers' wellbeing at sea



In free text comments, some respondents emphasised that the complexity of the regulatory environment is having the greatest impact on stress levels and workloads, as this requires constant adaptation to meet reporting requirements in different parts of the world. Frequently, this additional work is not reflected in crew size. For example, one seafarer

stated that: “A lot of complicated rules and regulations set by the shipping committee resulting [in] an extra load, thus extra stress and fatigue to the crew onboard.” Some respondents raised concerns that excessive workloads are compromising safety at sea, with one stating that: “extra paper work and adherence to varying rules leads to fatigue and

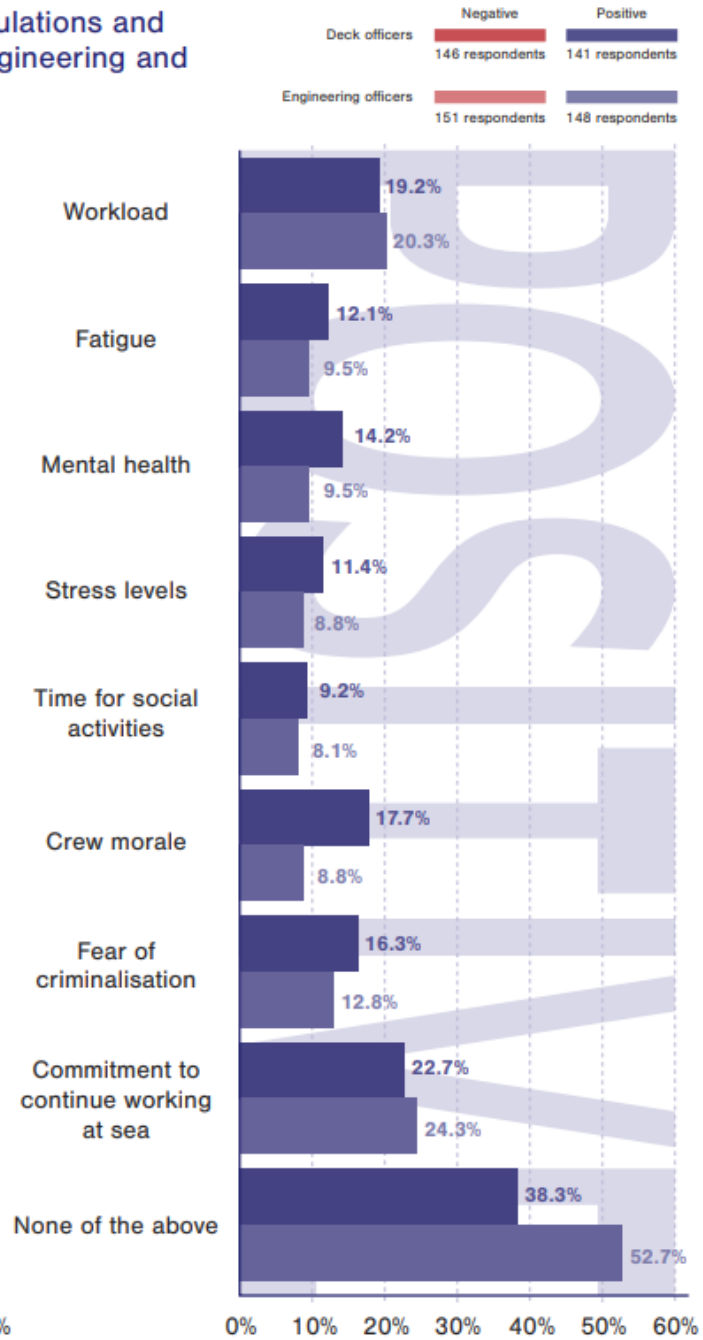
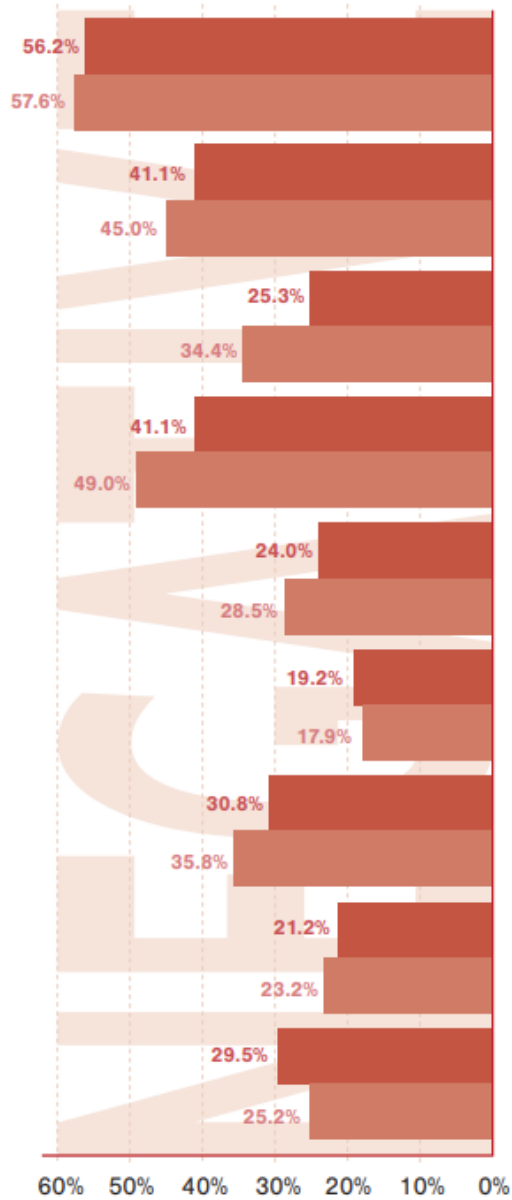
increases [the] probability of accidents and poor health due to fatigue.” Another expressed concerns that the safety and wellbeing of seafarers is being overlooked in the rush to adopt new technologies that may not, in the seafarers' view, have been sufficiently tested: “The ships are brand new, but nobody knows what they’re dealing with. Even the manufacturers have themselves designed it for the first time. So, it’s like a pilot project with testing being done on live sailing ships. The crew is having [an] extreme[ly] hard time with no shore assistance.”

The survey indicates that the complexity of the regulatory environment is also substantially increasing fears of being criminalised as a result of administrative errors or inadvertently contravening one of the overlapping environmental regimes. Almost a third of respondents (32.8%) reported increased fears of criminalisation, with one seafarer commenting that: “One is always scared of getting into trouble with the authorities or company due to an oversight or mistake by self or staff. This is mainly due to varying rules and limits in different parts of the world. Also interpretations are also different in different countries and the seafarer is always wrong!” The only area of wellbeing in which respondents deemed the positive impacts of decarbonisation to outweigh the negative related to their commitment to continue working at sea. Just over a quarter (26.5%)

responded that decarbonisation was having a positive impact on their commitment to remaining in the maritime sector, whilst for just over a fifth (21.3%) the impact was negative. Again, this could reflect the two sides of seafarers’ experiences of the journey to zero carbon: many find it motivating to be part of finding solutions to the climate emergency; however, for a significant minority, the day-to-day impact on their workload and stress levels are so substantial that they are undermining their commitment to working at sea.

There was substantial variation between deck officers and engineering officers in terms of the impact of the decarbonisation transition on their wellbeing. A greater proportion of engineering officers, who are tasked with the complexities of adopting multiple fuels, evaluated the impact on their wellbeing as negative across all wellbeing categories, with the exception of crew morale. Indeed, over half of engineers (52.7%) responded that there had not been a positive impact on any of the wellbeing areas surveyed, in comparison with 38.3% of deck officers. The differential was most striking in terms of impacts on mental health, with 34.4% of engineers stating that decarbonisation was having a negative impact on their mental health, in comparison with 25.3% of deck officers.

Impacts of decarbonisation regulations and technologies on wellbeing – Engineering and Deck Officers



Amongst engineers with no fixed trading pattern, the impact appears to be even more stark: 59.2% reported a negative impact on their workload, whilst 52.4% reported increased stress levels. Just over 40% (40.5%) reported increased concerns about criminalisation.

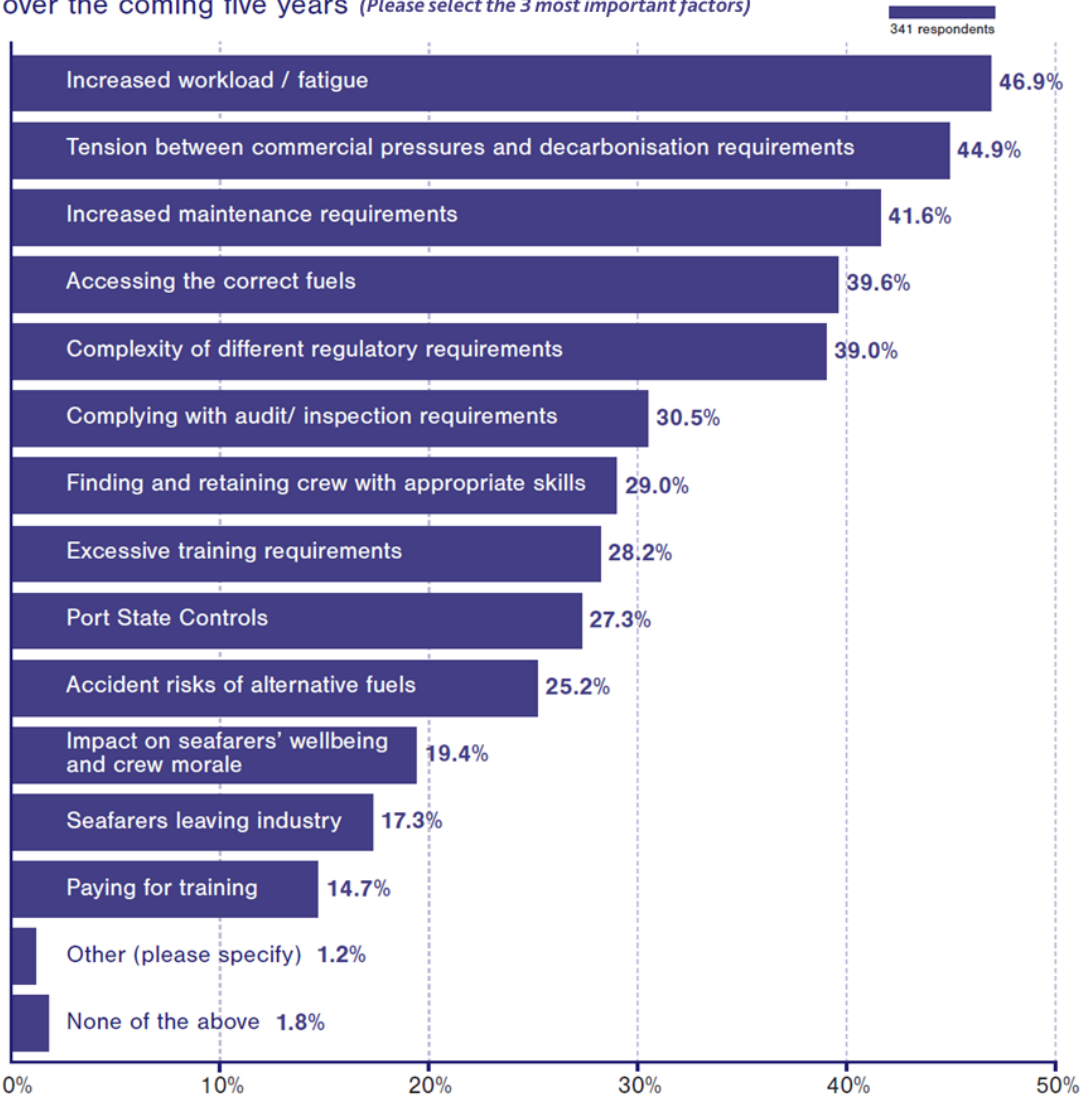
Engineers who took part in the survey commented on the strain that the requirement to undertake additional tasks with the same, or fewer, crew was placing on their health and wellbeing. One stated that: “[The] negative effects are both physical and mental. Understanding the scope of change was a challenge because shore staff were also not clear how the change was going to take shape. Then cleaning and preparing the bunker tanks were a physical challenge. Use of different fuels required a lot of training and understanding. Maintaining machinery has added burden to already stressed crew. [The] final blow is

ongoing with compliance checks from Port and Flag states plus third-parties.”

FUTURE IMPACTS OF DECARBONISATION ON SEAFARERS’ WELLBEING

Survey respondents were asked to select the top three challenges that decarbonisation was likely to pose for their work over the coming five years. Increased workload and fatigue was viewed as the most significant challenge, selected by almost half (46.9%) of seafarer respondents. The practical and technical challenges of the journey to zero carbon were also apparent, with substantial numbers highlighting the tensions between commercial pressures and regulatory requirements (44.9%), increased maintenance requirements (41.6%), difficulties accessing the correct fuels (39.6%) and the complexity of regulatory requirements (39.0%) as key concerns.

Key challenges for seafarers posed by decarbonisation over the coming five years (Please select the 3 most important factors)



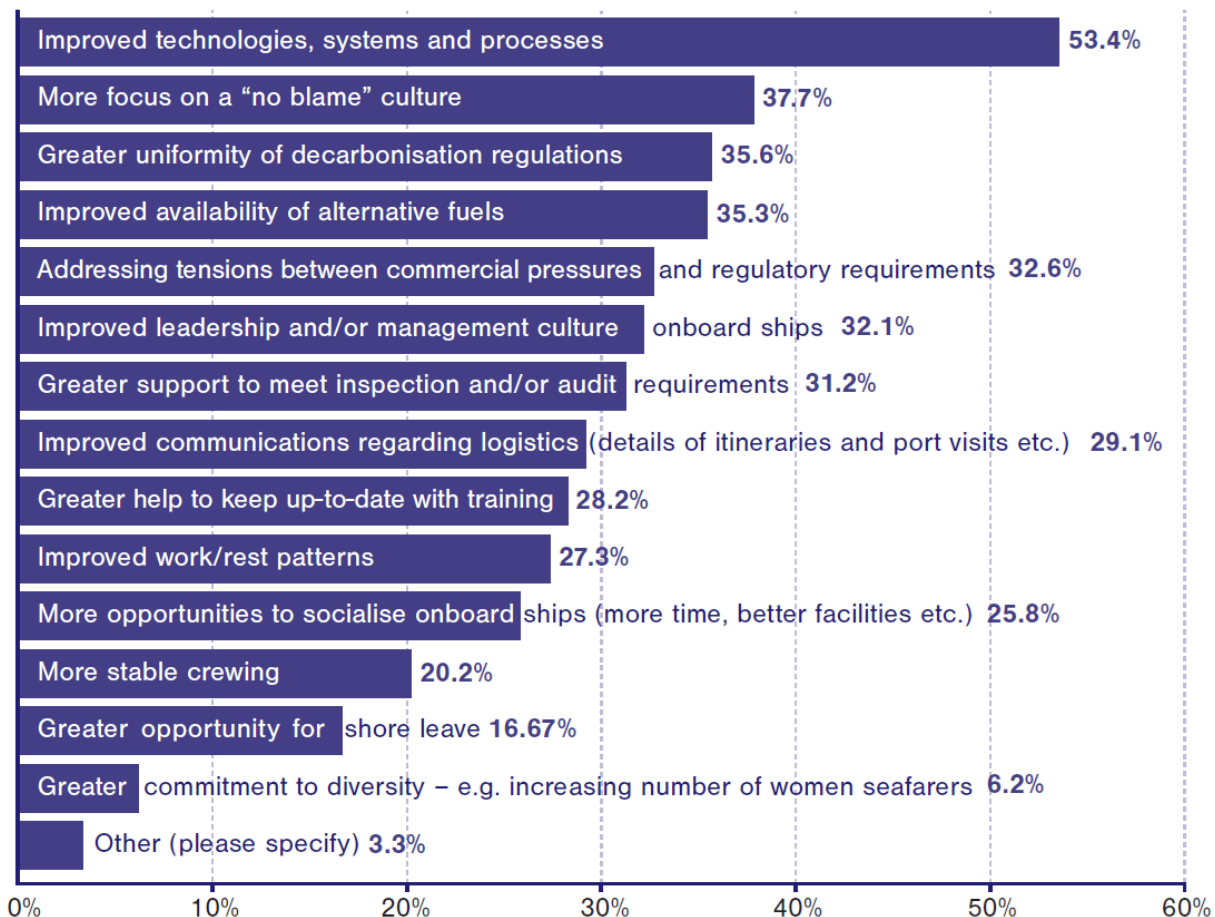
Survey respondents were asked to share their views about the most important steps that maritime employers could take to support them through the zero-carbon transition. Over half of respondents (53.4%) selected improving technologies, systems and processes key, potentially indicating a current lack of coordination, consistency and joined-up

planning in the rush to meet new regulatory requirements. For over a third of seafarers (37.7%), strengthening focus on a “no blame” culture was deemed a top priority, reflecting the increased anxieties that the decarbonisation transition has brought as regards making mistakes and potential criminalisation.

What actions could ship owners and managers take to support seafarers’ wellbeing through the transition to greener shipping?

(Please select the 3 most important factors)

337 respondents



In free text comments, several seafarers expressed the opinion that ensuring appropriate crewing levels to meet the challenges of zero carbon should be a priority for maritime employers. A number of seafarer respondents also reflected on the importance of ensuring that seafarers’ contributions to implementing rapid technological change are appropriately valorised.

Some commented that salaries should be increased to reflect the additional pressures and responsibilities that seafarers are being asked to assume. For example, one stated that there are: “so many new things to implement, but wages and care from company is still the same. Why would the crew sacrifice their mental peace for

someone else's experiments. Either increase remuneration or increase manpower.”

Other seafarers stressed the need for effective information flows to help to ease information overload and to make transitions between different regulatory requirements as smooth as possible. One seafarer called for companies to: “prepare your ships well in advance and don't burden [seafarers] with information and queries at the last minute.”

CONCLUSION AND RECOMMENDATIONS

ISWAN's survey suggests that many seafarers understand and support the urgent need to decarbonise shipping. However, the findings also suggest that the potential for the rapid adoption of new technologies and regulations to have a detrimental impact on those tasked with implementing them is currently being overlooked. As one seafarer commented: “I am a big supporter of decarbonisation and taking steps to reduce our negative impact on the planet and our surroundings. I just wish it was done in a much better way.”

The survey points to a number of concrete steps that maritime employers can take to better support seafarers through the zero-carbon transition.

A proactive approach to seafarer welfare:

- Acknowledge and address the impact on workloads, particularly amongst engineers, and proactively factor in the impact of decarbonisation into crew sizes.
- Recognise the psychological impacts of rapid change and technostress and include these in stress management and mental health trainings.
- Consider both physical and psychological safety. Seafarers must feel confident that the technology that they are being asked to adopt is safe; that they and their colleagues have appropriate training and support to implement

it; and that they can speak out about any concerns without fear of recrimination.

- Commit to inclusive, supportive leadership cultures. The challenges of rapid adaptation to change should be proactively built into the development of good practice as regards leadership at sea.
- Improve terms and conditions. Many seafarers feel that the additional effort that the zero-carbon transformation demands of them is not appropriately remunerated. The short-term nature of many maritime contracts can also act as a disincentive for employers to invest in providing seafarers with the training that they need to carry out increasingly complex and technical work.

A human-centred approach to systems and processes:

- Protect against technostress in system design. Attention should be given to ensuring that new technologies, systems and processes function in cohesive, joined-up and accessible ways in order to reduce duplication and mitigate against the negative impacts of technostress. Employers should also proactively seek input from those tasked with implementing new technologies to better understand the impacts on their work and wellbeing.
- Build strong communication channels. Ensuring that seafarers understand the rationale for new technologies and reporting requirements will help to ensure that they feel fully engaged in the decarbonisation journey. It is, furthermore, important to ensure that engineering and deck officers understand the differing impacts of decarbonisation on their

work, to build a culture of safe and effective team work and shared responsibility.

- Investigate benefits of fixed trading patterns. ISWAN's survey findings indicate that adopting fixed trading patterns may help to mitigate against the negative effects of decarbonisation on wellbeing. As the adoption of alternative fuels accelerates, maritime employers should factor in potential impacts on seafarer wellbeing when making decisions about trading patterns.
- Consider crewing models that best meet the challenges of decarbonisation. The proliferation of new technologies can lead to a steeper learning curve for seafarers joining a new ship. Additional research should be carried out into the crewing models that will best support seafarers through the zero-carbon transition.

Just and coherent regulatory regimes:

- Harmonise reporting regimes and requirements. ISWAN fully supports the commitment on behalf of individual ports, nations or regions to go beyond the requirements of international legislation in tackling carbon emissions. However, regulatory and reporting requirements should be simplified and harmonised to limit the bureaucratic and administrative burden this poses.
- Proactively build collaborative, just cultures. Despite considerable support for decarbonisation, it has heightened fear about inadvertent errors and criminalisation. Particularly in light of the current complexity of reporting regimes, it is vital to build a

culture that supports joined-up, collaborative action to achieve zero-carbon goals.

Above all, ISWAN's survey points to the need to valorise seafarers as crucial partners in the decarbonisation journey. Many working in the maritime industry understand only too well the vital importance of taking rapid action to address the climate emergency and are strongly motivated to play their part. The industry can benefit from their expertise and continue to build a sense of partnership by proactively consulting seafarers in decision-making about the development and implementation of new technologies. ISWAN's helpline data and insights from our projects tell us that too often seafarers feel overlooked and undervalued. Having their concerns about decarbonisation acknowledged and acting on their suggestions for change would be an important step in empowering seafarers to be proponents and drivers of the journey towards zero carbon, rather than becoming another factor that risks driving many out of the industry.

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