ISWAN

Taking a seafarer-centred approach to decarbonisation:

Guidance for seafarers and maritime stakeholders

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About the author

After 17 years as a Deck Officer in the Merchant Navy, Chris came ashore in 1988 to teach maritime studies. He set up his own maritime education consultancy in 2001 and now coaches serving seafarers, supervises on Masters' degrees, delivers bespoke L&D programmes; is a college External Examiner, and writes regularly on issues relevant to seafarers. He strives to inspire others to embrace life-long, reflective learning, to maximise potential and extend personal boundaries.

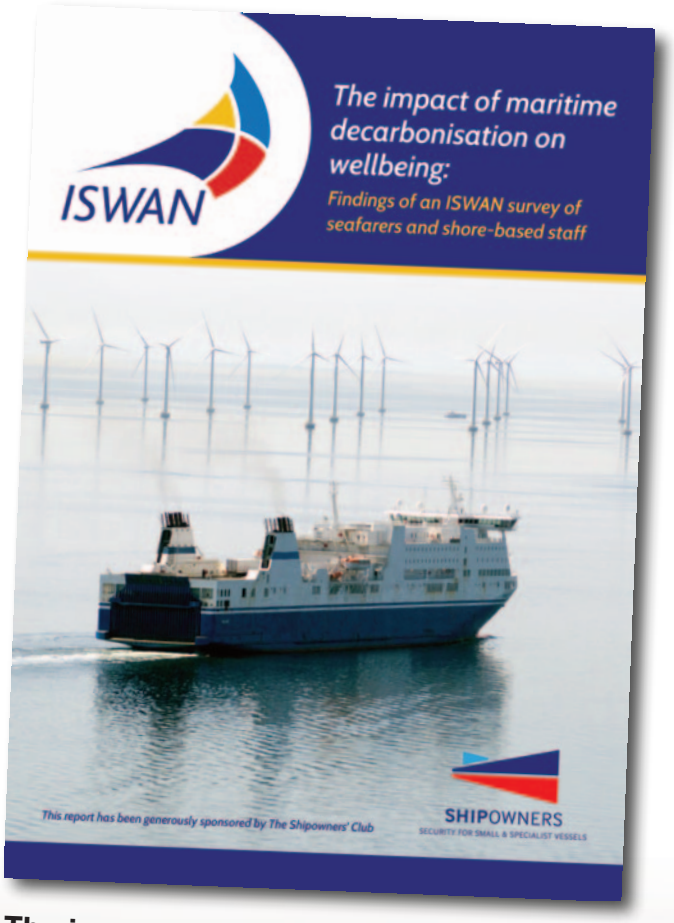
Introduction

The maritime sector is decarbonising. In 2023, the International Maritime Organization (IMO) announced its GHG Strategy to halve greenhouse gas (GHG) emissions from ships by 2050. Supported widely by the maritime community, with some stakeholders aiming for a nearer target date, it is a subject matter that remains influenced by sociopolitical, commercial, and technological drivers.

To enable industry to achieve this goal, new or revised operating procedures help enormously – for example, slow-steaming, 'just-in-time' arrivals, and 'cold-ironing' – but by far the most important contributor is the acceleration in the adoption of cleaner fuels to reduce ships' GHG emissions.

In this rapid pursuit of decarbonisation and technical change, the fundamental burden for implementation of new technologies falls squarely on the seafarer. However, while there is much literature, advice and training focused on the engineering, hardware, and technical aspects of decarbonisation, there is far less on the mental health and psychological impacts that may be encountered.

In response to this perceived gap, in 2024, the International Seafarers' Welfare and Assistance Network (ISWAN) carried out a survey to better understand the impact that the rapid pace of technological change was having on seafarers' wellbeing and job satisfaction.



The impact of maritime decarbonisation on wellbeing: Findings of an ISWAN survey of seafarers and shore-based staff

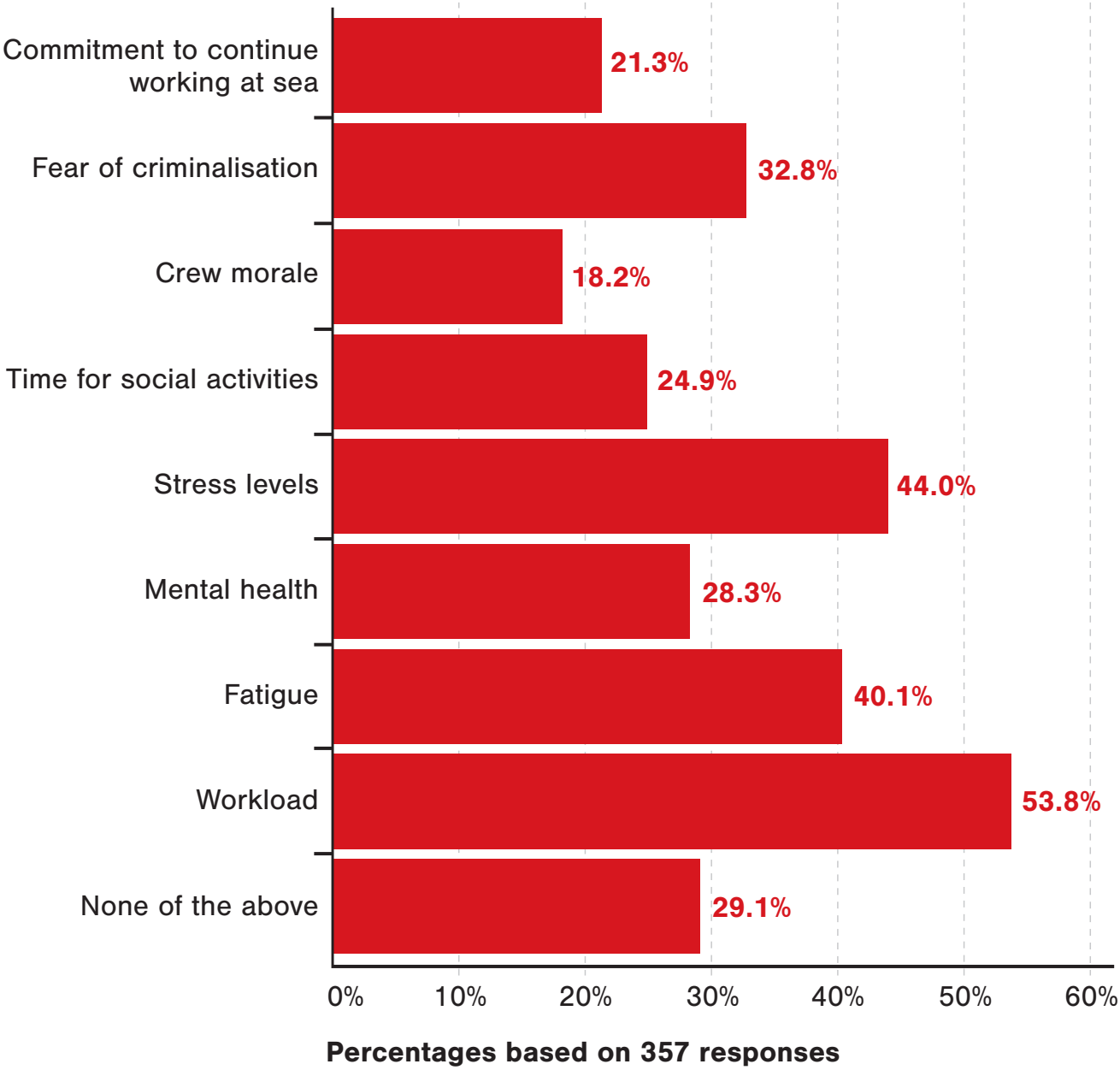
The high-level survey results found that many seafarers are broadly supportive of the aims of decarbonisation, with respondents citing the following positive factors:

- The provision of modern ships
- The adoption of clean fuel and its effect on the environment
- The learning of new skills and adoption of new technology
- New training
- Taking on more responsibility and challenge
- An altruistic feeling of satisfaction that they were contributing towards a better environment

> “I get more motivated knowing that the reason for all these carbon regulations is for the planet”
>
> **– ISWAN survey respondent**

However, the survey indicates that the pressures of rapid technological change along with a complex regulatory and reporting environment are having a negative impact on many seafarers' wellbeing, particularly as regards workload, stress and fatigue. Furthermore, 40% of respondents were concerned about their potential criminalisation in the event of alleged breaches of new rules and regulations.

Negative effects of decarbonisation regulations and technologies on seafarers' wellbeing at sea



Percentages based on 357 responses

The fundamental change that decarbonisation dictates may incur additional, hidden costs beyond the obvious monetary ones. ISWAN's survey suggests that the impact on seafarers' wellbeing is one such hidden cost that, to date, has received little attention in the maritime sector. However, failing to proactively plan for a seafarer-centred approach to the zero-carbon transition represents a substantial risk as, if these extra costs become too high, they could ultimately see seafarers leaving the sector, thus contributing to the maritime sector's growing recruitment and retention crisis. As research commissioned by the Maritime Just Transition Task Force (2022) makes clear, the sector will be unable to meet its environmental obligations without sufficient numbers of seafarers with appropriate skills and training to ensure a safe transition. In order to retain the skilled professionals upon which the sector depends, the transition from fossil fuels to cleaner forms of energy must be underpinned by fair and equitable policies that are perceived by seafarers as 'just'.

This guide builds on the findings of the ISWAN survey by providing practical ways in which:

- Seafarers can support their own wellbeing and that of their crew during the zero-carbon transition
- The maritime sector can foster environments that are supportive of seafarers' wellbeing and are protective against the risks posed by rapid technological and regulatory change

Action 1: Value seafarers as experts and partners

> “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.” **– ISWAN survey respondent**

The centrality of highly trained, competent seafarers to a decarbonised maritime sector is clear. At sea, the responsibility for implementing onboard decarbonisation technologies falls predominantly on individual seafarers. However, one of the most powerful findings of ISWAN’s survey is that many seafarers report that, despite their fundamental importance in achieving a decarbonised maritime sector, their role and expertise is rarely acknowledged.

What is more, whilst in many ways the technological changes brought about by decarbonisation have increased techno-complexity and technostress, technologically sophisticated onboard environments are leading to a loss of autonomy and decrease in job satisfaction and self-esteem for many seafarers, as even relatively low-level decisions may now be referred ashore (Samson, 2024:4).

As ISWAN’s survey made clear, many seafarers understand all too well the need to take steps to safeguard the environment. They have undoubted expertise and are proud to play their part as drivers of change. There is ample opportunity for maritime organisations to build on this substantial reservoir of positive belief and goodwill to create stronger foundations for the sector’s transition to zero carbon.

Valorising seafarers’ importance to decarbonisation is only possible within a wider context of addressing the multiple factors that are driving the maritime sector’s deepening recruitment and retention crisis, including widespread dissatisfaction about pay and conditions, and changing priorities amongst younger generations. However, implementing the changes that would see seafarers truly respected and valued as integral to achieving environmental goals could represent a major step forwards in terms of enhancing the maritime sector’s sustainability in human terms.

The overriding principle that underpins this guide is that treating seafarers as crucial partners in the decarbonisation transition and proactively valorising their expertise and motivation will enable the maritime sector to chart a safer and more sustainable path towards achieving its climate obligations.

Questions to consider

For seafarers:

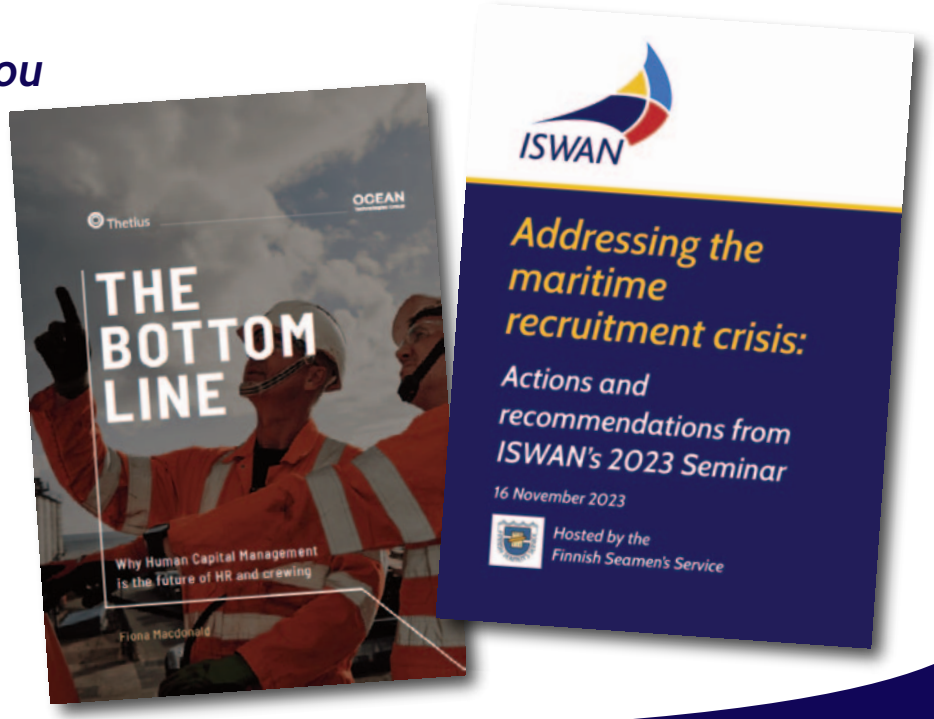
- How well do you and your onboard colleagues feel that you understand the bigger picture in relation to the maritime sector's path to decarbonisation and the role that seafarers play?
- How do you feel that your expertise can be best utilised in the journey to zero carbon? What are your hopes and fears about decarbonisation?
- What onboard initiatives could help to acknowledge and recognise the vital role that your crew is playing in the efforts to decarbonise the maritime sector?

For maritime stakeholders:

- What mechanisms do you have in place to valorise the pivotal role that seafarers are playing in efforts to decarbonise maritime operations?
- How could your organisation better harness seafarers' expertise and willingness to contribute to a cleaner maritime sector?

Resources to support you

1. The Bottom Line: Why Human Capital Management is the future of HR and crewing - *Thetius*
2. Addressing the maritime recruitment crisis: Actions and recommendations from ISWAN's 2023 Seminar - *ISWAN*



Action 2: Understand the impact of technostress on safety at sea

Although this guidance focuses particularly on the impacts of decarbonisation on seafarers, this is just one aspect of a maritime world that is increasingly dominated by technology. In addition to decarbonisation, the processes of automation are introducing new technological complexities for many. At the same time, there is an increase in observation and monitoring, both in terms of reporting work activities to shore and in the use of onboard CCTV. Furthermore, wearable technology is seeing many aspects of seafarers' health and wellbeing increasingly reported and monitored by their employers.

Whilst there may be many positive aspects to these technological developments, it is vital to take account of the potential risks to seafarers' health and wellbeing of 24/7 monitoring and the sensory overload it potentially brings.

The potential impact of the challenges of adapting to rapid technological change was first recognised in the 1980s by Craig Brod, who coined the word 'technostress'.

> "Technostress is anxiety, tension, or distress caused when a person is overwhelmed by new technology. It occurs when they are unable to adapt and learn to use technology in a healthy, productive way." **– Craig Brod (1984)**

As Brod's definition makes clear, technostress can have very significant impacts on mental health, wellbeing, performance and productivity. In complex and dangerous maritime working environments, the anxiety and uncertainty associated with technostress can ultimately have a detrimental impact on onboard safety. It is, therefore, vital that maritime stakeholders are proactive in recognising the potential significance of technostress for seafarers, vessels and businesses.

Seafarers are particularly vulnerable to the effects of technostress, due to the very rapid pace of technological change and the unique stressors of life at sea, in particular the inherent reality that the ship is, for the duration of a contract, their place of work and their home.[1]

The more detailed sub-categories developed by Ragu-Nathan et al (2008) help to demonstrate the range of impacts that technostress can have on seafarers' health, wellbeing and sense of safety:

Techno-overload

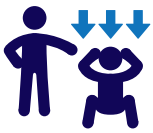
The pressure to work harder and more, due to the unrelenting introduction of new technology, bureaucracy, and the feeling of being overwhelmed by excessive information. This has implications for the way in which we communicate, particularly in a highly pressurised onboard environment in which many seafarers are already struggling with workload.

Techno-invasion

The inability to escape work. A ship is a seafarer's temporary home as well as workplace, so the potential impacts of techno-invasion risk being magnified.

Techno-complexity

Techno-complexity leads to much time being wasted while individuals struggle to learn about and understand the new technology. This can be a particular challenge in the context of fluid crewing models.



Techno-insecurity

Relates to anxieties about being replaced by more technologically competent individuals or by automated systems. As a result, some people may feel under pressure to continually upgrade their skills in order to remain competitive in the industry.

Techno-uncertainty

Constant upgrades to machinery and bugs in computer software may lead to techno-uncertainty. This is exacerbated by the isolation at sea and possible lack of IT support.

1. For a detailed case study of technostress at sea, see the World Maritime University's report, Transport 2040: Impact of Technology on Seafarers - The Future of Work. The report looks at the health and wellbeing impacts of rapid technological change on seafarers onboard a Danish-flagged vessel and also points to potential technostress inhibitors that can help to mitigate against the impacts of rapidly evolving technologies, including training, new skills acquisition, culture change and raising awareness.

Maritime decarbonisation

Figure 1: Decarbonisation and Technostress (Haughton (2025) after Brod (1984) and Ragu-Nathan et al. (2008))

Questions to consider

For seafarers:

- How is technological change affecting your work and wellbeing at sea?
- Can you identify any ways in which aspects of technostress affects your life and work?

For maritime stakeholders:

- To what extent has your organisation taken account of the potential impact on technostress in planning for decarbonisation?
- What risks relating to technostress can you identify in your current operations?

Action 3: Adopt a 'whole organisation' approach

The key challenges relating to decarbonisation and technostress concern human factors and, at their core, are closely linked to challenges relating to communication. Indeed, technostress is a phenomenon that is both caused by and exacerbates a sense of isolation from others.

Therefore, a crucial step that maritime organisations can take to prepare positively for further technological change is to ensure that they strengthen communication relating to technological change by committing to **'whole organisation'** thinking. Decarbonisation impacts all aspects of maritime operations, from engineering to ship design to logistics. Clearly, there will be differences in organisational structures between ship and shore, but ships within the fleet are part of the wider company and therefore it is important to recognise the whole organisation, not divide them up. Thinking in wide terms of the organisational 'team', avoiding processes that separate 'them' and 'us' (sea and shore) and designing initiatives with the whole organisation in mind is crucial to decreasing techno-insecurity and enhancing onboard safety.

However, as ISWAN's survey makes clear, the impacts are not being experienced in the same ways by ship and shore staff or, onboard, by engineer and deck officers (see page 28 of ISWAN's survey report). Decarbonisation will inevitably bring differing degrees of workload (and potential stress) depending on an individual's job role. Engineering officers reported more overall negative impact than personnel performing other job roles. This is understandable since the responsibility for the storage and use of new fuels, and maintenance of equipment and machinery, falls mainly on their shoulders. Elsewhere, deck officers reported more negative impacts, particularly in their work complying with inspection regimes and training.

For decarbonisation to be navigated safely, it is vital that those involved in the safe and efficient operation of the ship – whether at sea or on shore – have an integrated understanding of how technological change impacts not only their own work, but that of their colleagues.

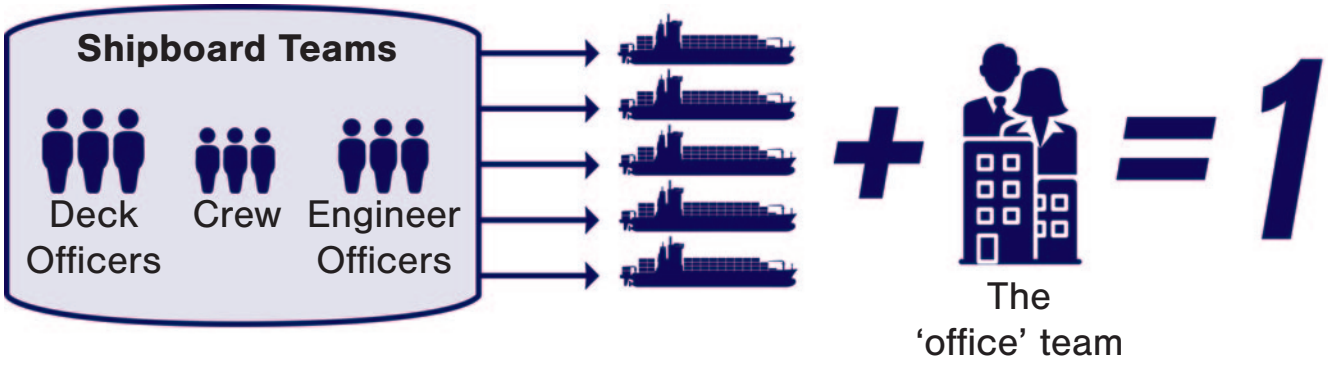
“As [an] Engineer, I say this impacts us the most. Whether you install new Ballast Treatment, or scrubber system, or develop new technology engines to adhere with new regulations, you still add and change equipments which will be additional work to engineers.”

“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. [...] [The] final blow is ongoing with compliance checks from Port and Flag states plus third-parties.”

– ISWAN survey respondents (both engineers)

ACTION

Maritime companies can mitigate against the risks of technostress by building organisation-wide understanding and addressing silo working. In order to achieve this, it is recommended that decarbonisation policies are championed by a senior manager at Executive or Board level and led by a specially formed committee of technical and HR experts. They should meet regularly, keep the human-centred policies under review at the highest level in the company, and provide the essential impetus for change.



Work to bring everyone together

Figure 2: A Whole Team Approach (Haughton, 2025)

Simultaneously, it is recommended that ‘ambassadors’ are trained and appointed on every ship. On successful completion of training, their role would be to:

- Familiarise themselves with the concept of technostress and the issues in this guide
- Provide information on decarbonisation (in particular) and technostress (in general)
- Offer support (mentoring) to their shipmates
- Run focus groups to encourage discussion, in particular amongst those working in different departments onboard
- Facilitate communication about the impact of the introduction of new technologies and ensure that any negative impacts on health and wellbeing are signalled

Ambassadors would not be qualified, or act, as counsellors or coaches.

ACTION

Consider carefully the selection of the appropriate person to fulfil this function. The person should not be determined by rank. Instead, volunteers who are interested in this type of work, and would bring energy and enthusiasm to it, should be invited to apply. It’s their personal skill sets that are relevant rather than their job role. To this end, the position should be open to all. An additional payment should be considered for this work.

The ambassador would report, in the first instance, to the Master, but only to confirm activity. The content of discussions with individuals onboard would be confidential, with the caveat that if the ambassador learns that individuals are **(i)** working against the interests of the company, **(ii)** breaking the law, or **(iii)** feel that there is the potential of harm to themselves or others, they would be obliged to inform an appropriate person.

Questions to consider

For seafarers:

- How well do you understand the impacts of decarbonisation technologies and regulations on your colleagues in other departments?
- How effective do you find the relationship between ship and shore in ensuring that the journey to zero carbon is implemented safely and effectively?

For maritime stakeholders:

- To what extent is whole organisational thinking informing your plans for decarbonising?
- How effective are the relationships between ship and shore in ensuring effective roll-out of new technologies and regulations connected with decarbonisation?
- What mechanisms are available for deepening whole organisational understanding of the impact of decarbonisation?

Action 4: Prioritise psychological safety as central to safety culture

Safety is paramount in discussions about maritime decarbonisation, most prominently when it comes to the transition from conventional to alternative and potentially more hazardous fuels, including hydrogen, methanol and, most notably, ammonia.[2]

It is, of course, crucial that seafarers have access to appropriate training to provide them with the competencies to safely handle the inherent risks of working with hazardous fuels. However, the crucial importance of psychological safety to mitigating against the risks of alternative fuels is frequently overlooked.

Psychological safety in the workplace means building a safe space in which people feel able to speak up and raise concerns without fear of criticism or recrimination. It has been demonstrated to play a vital role in building safe and effective teams and thus improving organisational performance in a number of ways:

- Team members feel more engaged and motivated as they feel their contributions matter and they can speak up without fear of retribution
- It can lead to better decision making as people feel more comfortable voicing their opinions and concerns, which often leads to a more diverse range of perspectives being heard and considered
- It can foster a culture of continuous learning and improvement, as team members feel comfortable sharing their mistakes and learning from them

Gallo (2023)

2. Most notably, a recent report by the Maritime Just Transition Task Force (2024) considers the training aspects for seafarers on ships powered by alternative fuels.

Building psychological safety is a fundamental pillar to establishing an effective **Safety Culture** at sea. Safety Culture was defined by the EU-funded SAFEMODE project as 'the motivation for safety at all levels in an organisation, encapsulating "the way we do things safely around here", even when no one is looking.' Within this framework, Safety Culture comprises:

Just Culture, in which people are not punished for honest mistakes, is seen in many industries as a driver and enabler for honest reporting in accidents, incidents and near misses, and hence underpinning a healthy **Reporting Culture**.

Learning Culture arises from Reporting Culture, and focuses on how people, organisations and entire industries learn from past incidents, accidents and near misses, as well as successes, to become safer. The simple argument is that if you have Just Culture you get good reporting, and if you have good reporting you can learn to be safer, thus leading to a better Safety Culture.

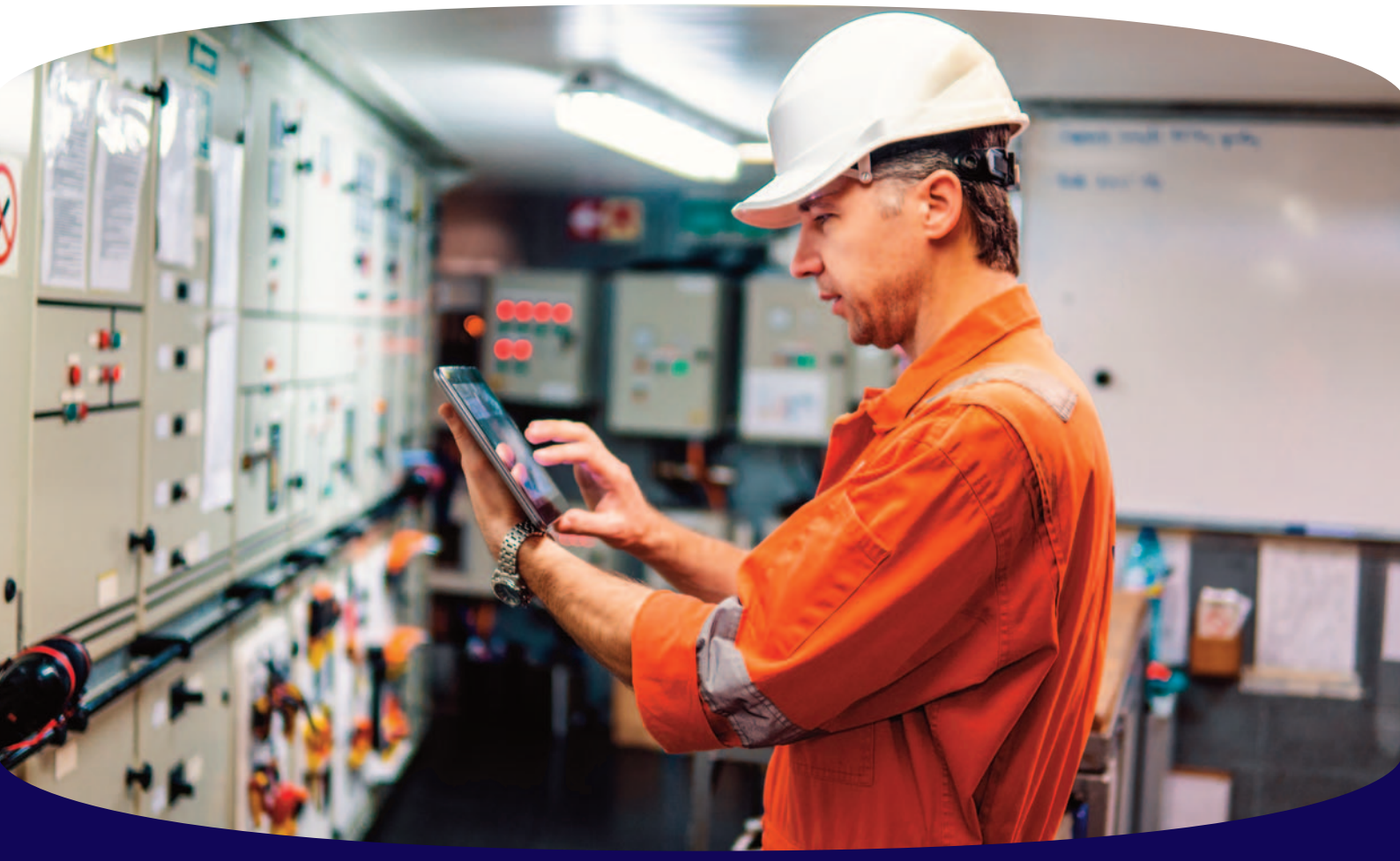
Culture of Care concerns looking after the wellbeing of seafarers and all who work in the industry, founded on respect and empathy for one's colleagues, and again can be a major enabler for safety and Safety Culture, and reflects the growing global trend in focus on wellbeing of people at work in all industries.

Kirwan, Bettignies-Thiebaux, Cocchion et al (2022)

Given the very real risks of the alternative fuels that seafarers will increasingly be asked to embrace, it is more important than ever that they have the confidence to speak up about any uncertainties, concerns, or potential hazards that they become aware of, even if they involve senior ranks.

ISWAN's survey highlighted that many seafarers are not currently working in environments in which they feel psychologically safe. For some seafarers, their sense of psychological safety at sea is being eroded by anxieties around the speed of the decarbonisation process and the safety of the technologies that they are being asked to implement. Furthermore, ISWAN's helpline officers report hearing from seafarers who share concerns that they don't have the right training or level of understanding to confidently carry out their work, but are unable to raise this with senior officers onboard.

In addition, the survey highlighted that, whilst anxieties about the implementation of new technologies has the greatest impact on engineers, many deck officers also reported concerns relating to the proliferation of regulatory regimes that underpin environmental legislation. This is a particular risk when ships travel between jurisdictions in which different laws apply. Decarbonisation is resulting in a spate of new rules and fear has been expressed by many seafarers for the consequences of these inadvertent mistakes. Almost a third of all respondents reported increased fears of criminalisation relating to making inadvertent mistakes in their efforts to conform with what is perceived by many to be a confusing regulatory landscape.



33% of seafarers who responded to ISWAN's survey reported **increased fears of criminalisation** as a result of the introduction of **decarbonisation** technologies and regulations

"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 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."

– ISWAN survey respondents

It will only be possible to implement alternative fuels in a truly safe way if seafarers believe that the technologies that they are being asked to implement are deemed to be safe and if their working environment provides enough psychological safety for seafarers to raise concerns, either about potential hazards or about their own lack of training or understanding. However, achieving true psychological safety in a maritime context carries particular challenges and will take sustained investment and commitment. The sector is historically underpinned by a hierarchical leadership and management culture, which mitigates against those in more junior ranks sharing their concerns freely. Furthermore, many seafarers come from cultures which place a high value on respect and deference to those in positions of authority, which may present additional barriers to raising concerns without clear mechanisms and explicit support.

Practical steps that maritime stakeholders can take to enhance psychological safety and embed a stronger safety culture include:

- **Whole organisation leadership and management training:** There are widespread efforts to rethink the maritime sector's traditionally hierarchical leadership and management culture. In order to embed an effective safety culture that adequately meets the challenges of adapting to rapid technological change, these initiatives should take a whole organisation approach, including both engineering and deck officers as well as shore-based staff.
- **Build psychological safety into ongoing onboard safety drill:** All seafarers should feel confident in knowing how to raise any concerns or uncertainties. This capacity can be developed and consolidated through incorporating psychological safety as a routine part of onboard drills. This could include ensuring that seafarers understand the avenues that are available to raise concerns; providing practical concrete examples of language that can be used; and giving opportunities to role-play to ensure that seafarers can overcome any reticence or anxiety about raising issues.

- **Proactively demonstrate an effective Learning Culture:** Sharing how your organisation is proactive in learning from experience – both negative and positive – to continually strengthen safety culture will build seafarers' confidence to speak out without fear of recrimination.
- **Towards seafarer-centred learning:** Seafarers often report that fulfilling the volume of training that they are required to complete – particularly during their home leave – can be a burden on their energies and motivation. At the same time, some seafarers also raise concerns about inadequate levels of training for adopting alternative fuels and operating new technologies. Whilst an element of mandatory training is inescapable, organisations can help to build psychological safety and protect against the risk of burnout by moving towards a culture in which seafarers have more autonomy in directing their own learning, rather than completing 'tick box' trainings. Providing greater agency can help to foster greater engagement with learning, improved motivation and reduced anxiety and uncertainty about technological change. It is also fundamental that seafarers feel that they have sufficient opportunities to gain practical as well as theoretical knowledge.

> "New regulations are more stringent and [employers] need to keep seafarer[s] up to date with [...] development in shipping industries. Seafarers need to [be] provide[d with] proper training and open opportunities to get actual experience onboard and adopt new upcoming technology."
>
> **– ISWAN survey respondent**

In addition to building a psychologically safe organisational culture, maritime companies can, furthermore, advocate for a Just Culture to underpin the maritime sector's decarbonisation efforts more broadly to address seafarers' fears about the potential consequences of inadvertent mistakes. This could include using their influence to encourage flag states, shipowners' and trade organisations, insurance providers and other bodies to encourage equitable and 'just' treatment of seafarers, including through taking a more harmonised, coherent and seafarer-centred approach to regulatory frameworks.

Questions to consider

For seafarers:

- How confident do you feel about raising any concerns or questions that you have relating to life and work at sea?
- What mechanisms are in place for seafarers onboard your vessel – whatever their rank – to raise concerns or questions about any aspect of decarbonisation?
- What actions could help to strengthen psychological safety of your team?

For maritime stakeholders:

- To what extent has the issue of psychological safety been addressed in your plans to decarbonise?
- How can building a just culture be built into your systems and processes?
- What mechanisms do you have in place to support seafarers to navigate the complexities of the regulatory environment?

Resources to support you

1. A kinder way to lead at sea - The Maritime Professional Council of the UK

2. Towards a Safety Learning Culture for the Shipping Industry

Action 5: Good communication

For the benefits of whole organisational approaches to be felt, effective communication is essential. To ensure onboard safety, everyone involved and impacted by decarbonisation should know how to have their voice heard.

However, effective communication doesn't happen automatically; it must be worked at and sustained to ensure that information is disseminated, problems identified and shared, and solutions sought. Formal structures that facilitate information flows across the organisation – such as the combination of top-level management involvement and shipboard ambassadors outlined above – can make a huge difference in ensuring effective two-way flows of information between the different parts of the organisation. This can help to ensure that any risks and unintended consequences of rapid technological change are identified and any safety issues, including negative health and wellbeing impacts, can be addressed.

A proactive, organisation-wide communication strategy is therefore fundamental to charting a safe course towards decarbonisation.

Your organisation's communication strategy must provide an effective structure to ensure that information reaches the correct people and flows between ship and shore in clear, digestible and actionable ways. Your communication strategy should also bear in mind the importance of taking a **whole organisation approach** to build a broader base understanding of the implications of decarbonisation technologies and regulations and actively work against the risk of information silos.

Proactively considering the following questions can be helpful in building your communications strategy, particularly prior to the introduction of any major organisational changes, including new technologies:

- What needs to be communicated?
- Who needs to know and why?
- Who (job role or named individual) is responsible for initiating messages?
- Who is responsible for receiving and acknowledging messages?
- How will information be transmitted?
- What is the frequency of sending routine messages?
- How will emergency messages be sent?
- How is information disseminated throughout the ship and office?
- How will you know your messages have been received, understood, and acted upon?

Continue adding to the list to reflect your own personal circumstances and organisation's needs.

> “Prepare your ships well in advance and don’t burden [seafarers] with information and queries at the last minute.”
>
> “Avoid producing big manuals, nobody read[s] it.”
>
> **– ISWAN survey respondent**

As well as ensuring that top-down information is communicated effectively, it is equally important to consider the mechanisms that are in place for seafarers and shore-based staff to communicate upwards. Maritime companies can build healthier and safer environments by engaging with seafarers to:

- Actively listen
- Consult with them prior to major technological change to identify any unforeseen issues
- Harness their expertise
- Consult and respond to their suggestions
- Take timely and appropriate action

This can help to identify any unforeseen challenges or risks relating to technological change. It will also build psychological safety by ensuring that all seafarers, whatever their rank, know how to and feel able to raise any issues or uncertainties about new technologies so that they can be safely addressed.

To ensure this two-way flow of information, your communications strategy should address the following questions:

- What mechanisms does your organisation have in place to capture feedback from seafarers about technological change, both prior to and after changes being introduced?
- Do all sea and shore staff have access to information and know how to communicate upwards?
- How do you ensure that seafarers know their input has been heard and taken into account?

Your organisation's communications systems and processes should also be accessible to seafarers and ensure that they have the information they need, particularly in sensitive situations such as any changes to home leave. It is at times like this that deep empathy needs to be displayed by those ashore responsible for logistics and communication. Seafaring is a relentless 24/7 activity recognising no weekends or holidays, and operating across 24 time zones. This ceaseless activity must be reflected in the way the workplace is run, staffed and managed. Crews have a right to know in real time what is happening and so office rosters, staffing policies and effective communication channels must meet this need.

Crucially, your communications strategy should be kept under review to ensure that it is effective in facilitating two-way flows of information throughout your organisation:

- How will you monitor and review the effectiveness of your communication strategy?

Action 6: Think holistically about health, wellbeing and safety

In a maritime context, the need to adapt to rapid technological and regulatory change comes on top of the many factors that already make maintaining good health and mental wellbeing at sea exceptionally challenging. Common challenges faced by many seafarers include:

Working conditions

- Extended or indeterminate contract lengths
- Employment insecurity
- Shore-based micro-management leading to loss of shipboard autonomy and self-esteem

Fatigue

- Reduced crew numbers and increased workload
- Increased bureaucratic and regulatory burdens
- Violations of work-rest hours
- Disrupted sleep cycles

Lack of social connection

- Isolation
- Separation from home and loved ones
- Poor (or no) online connectivity
- Loneliness
- Little or no shore-leave

Onboard culture

- Poor management and leadership
- Experiences of abuse, harassment, discrimination or violence
- Fluid crewing models eroding a sense of team
- Poor recreational facilities
- Lack of social interaction with colleagues
- Sense of isolation driven by aspects such as nationality, culture, religion, language, gender identity, etc.
- Hazardous working conditions
- Potentially hostile weather conditions
- Workplace hazards
- Dangerous cargo
- War and piracy in some regions

Physical health

- Illness and injuries
- Poor quality or lack of variation in food

> “The benefit of social interaction would have been that the ship’s staff can identify the early signs of depression. You get to know if a person is not talkative anymore or goes into a shell... even the chief cook can come and say [he] used to get a second helping now he’s stopped coming down for dinner, that should give an indication that maybe someone needs to talk to him and sit down ask him about it and see if he is okay”
>
> **– Interview from ISWAN’s Social Interaction Matters (SIM) Project**

The wholesale changes brought about by decarbonisation are being introduced into this already exceptionally challenging landscape, which already places unique strains on seafarers’ mental and physical health.

If seafarers are to have the capacity to respond positively to the accelerating pace of decarbonisation, it is crucial to ensure that conditions onboard are supportive of their physical and mental health, including attention to mitigating against fatigue. This will help to provide the foundations to ensure that seafarers have the resources and the resilience to adapt to the additional pressures of rapid technological change.

In addition to measures to support seafarers’ individual physical and mental health, taking a proactive approach to providing **increased good quality social interaction and rest time** onboard is an important step that maritime companies can take to support seafarers’ wellbeing through the decarbonisation transition. As well as the mental and physical health benefits of relaxation and social connection, good quality and varied opportunities to interact socially can help seafarers to build trust and a sense of psychological safety at a team level, thus helping to protect against the risks of technostress. ISWAN’s Social Interaction Matters (SIM) Project has a wealth of resources and guidance.

Questions to consider

For seafarers:

- Which aspects of life at sea have the greatest effect on your health and wellbeing?
- What steps would you like to take to improve your own health and wellbeing?
- What opportunities for social interaction with colleagues are available to you onboard? Are there ways that this could be improved?

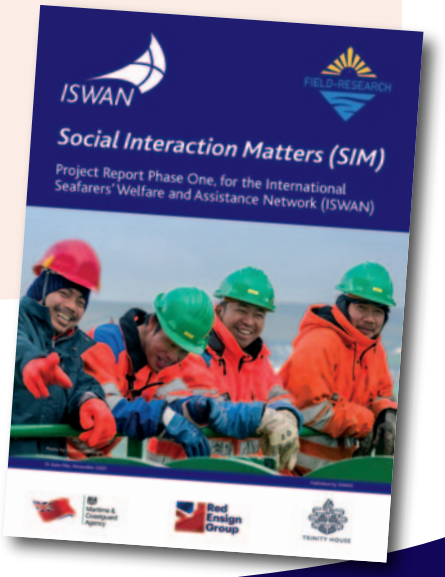
Resources to support you

1. Managing Stress and Sleeping Well at Sea – ISWAN
2. Steps to Positive Mental Health – ISWAN
3. Psychological Wellbeing at Sea – ISWAN

Questions to consider

For maritime stakeholders:

- What broader improvements might you need to make to support seafarers' health and wellbeing at sea and proactively mitigate against the risks of technostress?
- Is the impact of rapid technological change included in existing trainings about stress management?
- What mechanisms do you have in place to gauge the impact on seafarers' health and wellbeing as the pace of decarbonisation accelerates?
- How proactive is your organisation in advocating and facilitating social interaction at sea?



Resources to support you

1. Social Interaction Matters (SIM) Project – ISWAN

Action 7: Invest in seafarer-centred working practices

Many respondents to ISWAN's survey reported feeling subject to the competing stresses of commercial pressures and fulfilling environmental requirements. These twin demands of complying with decarbonisation regulations in a financially highly competitive sector can often contribute to creating stressful working environments in which seafarers feel undervalued and unrecognised.

However, as the pace of technological change accelerates, it will become increasingly important for companies to take steps to invest in nurturing and retaining the skills of the seafarers who are responsible for implementing new decarbonisation technologies on a day-to-day basis.

There are number of practical steps that maritime companies can take to ensure that working practices contribute to an effective safety culture, thus supporting seafarers to adapt to the challenges of decarbonisation.

Seafarer-centred systems and processes

A crucial dimension of implementing whole organisation thinking is ensuring that systems and processes work in coherent and joined-up ways. In ISWAN's survey, when asked what actions ship owners and managers could take to better support seafarers' wellbeing through the transition to greener shipping, 'improving technologies, systems and processes' was the top response, cited by 54% of respondents.

Seafarers sometimes report that they work for the 'system' rather than it working for them. A common complaint is that the lack of consistency in what's required from port to port and even ship to ship leads to time-wasting, frustration and, ultimately, anger. This is a clear symptom of techno-overload.

As the pace of decarbonisation and the adoption of potentially hazardous alternative fuels accelerates, it will be more important than ever that systems and processes are based on human-centred design principles that genuinely take into account the lived realities of the seafarers who will be responsible for implementing them. Clearly, in seeking solutions, it behoves organisations to listen more effectively to their staff and those who are actually doing the job. Practical steps could include ensuring adequate consultation before making any significant organisational changes, in order to identify and address any unforeseen negative consequences, including duplication or lack of coherence in systems and processes. Ensuring that procedures are as streamlined as possible and that policies are standardised across the fleet can also help to reduce the impact of technostress.

Review crewing models

Recent decades have seen a growing trend towards smaller crew sizes, as logistics have become more efficient and operating models have been honed to improve financial competitivity. However, this trend has created a climate in which many seafarers are routinely exceeding mandated work-rest regulations, leading to increased fatigue (Bhatia et al, 2024). In addition to negative impacts on the seafarers' individual health, wellbeing, stress levels and job satisfaction, particularly in increasingly sophisticated technological environments, routine violations of work-rest regulations also pose a substantial threat to the vessel's safety.

> "Every port had [a] different set of rules in terms of fuel usage"
>
> "Too much pressure for compliance and reporting with no increase of manpower"
>
> "Mentally one is under immense pressure with so much or regular checks"
>
> **– ISWAN survey respondents**

Beyond ensuring adequate crew sizes meet the additional demands of decarbonisation – including the additional reporting requirements – maritime companies should also review how their crewing model can contribute to achieving a safe transition to zero carbon.

One practical step could be to ensure that robust processes are in place to manage instances when risks of technostress are increased; for example, crew changes. Due to the proliferation of new technologies, when new personnel join a ship, they could well be faced with unfamiliar, technical equipment. There may also be added commercial and time pressures (turnaround time) and insufficient time for the off-going crew to give a proper or effective handover. The potential repercussions are catastrophic if seafarers are not totally confident in understanding, as well as being safe and competent in, the technical and operational requirements of new decarbonisation and fuel-handling systems (for instance).

One way to solve this at an instant is by taking proactive steps to ensure efficient, effective and safe handovers. Harmonising systems, processes and procedures as much as possible across the fleet would substantially reduce the risk of technostress, both for new crew and for the existing crew who are tasked with onboarding. Further measures could include having standardised protocols for assuring safe transitions and, as far as possible, overlapping reliefs, to allow sufficient time for a new officer to understudy their predecessor before assuming their duties.

Consider the impact of trading patterns

ISWAN's survey suggests that technostress is reduced when ships follow regular trading patterns. On a practical level, officers and crew on regular runs become familiar with the operational, technical and regulatory requirements and tie-ups of the various port calls. They may even develop personal relationships with pilots and port officials: all steps that reduce the unknown, and therefore tension and stress.

Spot market and tramp shipping companies are subject to the vagaries of commercial markets and so have limited influence in the voyage patterns of their vessels. One thing they can do, however, is to lobby through their administrations, trade association bodies, and insurers for standardisation in bureaucracy, paperwork, port clearance and customs declarations, form filling and general administrative requirements in ports worldwide. This reduces the burden on masters and officers and will boost their psychological wellbeing and safety.

Invest in fair pay and contracts

A key finding from ISWAN's survey is that seafarers feel that the contributions that they are making to decarbonisation are not being appropriately recognised. This guidance contains a series of practical steps that maritime companies can take to build cultures that acknowledge and valorise the central role that seafarers play in achieving the sector's decarbonisation goals. This is not, however, to overlook the importance of the sector also investing in appropriately remunerating seafarers for the increased responsibilities that they are being asked to assume. This includes providing contracts that work for seafarers, both in terms of length and stability of employment, enabling them to maintain good psychological health, cope with the many stressors of life at sea and balance their working and family lives.

Questions to consider

For seafarers:

- How well do the systems and processes that are in place on your vessel support you to adapt to the challenges of new decarbonisation technologies and regulations? Can you identify ways in which this could be improved?

For maritime stakeholders:

- What measures does your organisation have in place to ensure that systems and processes operate in joined-up, seafarer-centred ways? What feedback mechanisms are in place and how are any issues addressed?
- Does your organisation's strategic approach to crewing models or trading patterns reflect the evolving needs of a decarbonising maritime sector?
- How can you ensure that building the kinds of working cultures and practices that will retain technologically skilled seafarers is adequately valued and factored into your organisation's operating practices?

Conclusion

The aim of this guide was to raise awareness of the deeper effects and potential implications of decarbonisation in the maritime sector.

It has endeavoured to:

- Set the decarbonisation context and highlight potential repercussions for seafarers and others working in the sector
- Define the problem, decipher some of the jargon, and highlight how decarbonisation may lead to ‘technostress’
- Offer support and guidance to seafarers, ship owners and managers, crewing agents, and flag and port state administrations tasked with implementing policy
- Offer some practical suggestions on how to mitigate against the risks to health and wellbeing posed by decarbonisation and, in particular, technostress

A central theme of the guide has been to emphasise the need to place seafarers at the centre of the sector’s decarbonisation plans. This requires thinking holistically what a just transition means in terms of building the working cultures and practices that will enable the sector to successfully recruit and retain the skilled professionals it needs to ensure a safe, equitable and sustainable transition to zero carbon.

A seafarer-centred approach to decarbonisation: Action checklist

Joint actions – we're this together

- [ ] Understand the impact of technostress
- [ ] Prioritise mental and physical health
- [ ] Promote psychological safety
- [ ] Foster ongoing dialogue and feedback
- [ ] Build a 'just' culture
- [ ] Harness motivation
- [ ] Celebrate success
- [ ] _____
- [ ] _____
- [ ] _____

Seafarers

- [ ] Reflect on leadership styles in use
- [ ] Recognise the problem and communicate this onwards
- [ ] Appoint Decarbonisation Ambassadors to facilitate focus groups
- [ ] Embrace training
- [ ] Stay healthy and active
- [ ] Eat well and get sleep/rest
- [ ] Know when, how, and where to seek help
- [ ] Invest in building resilience
- [ ] Communicate effectively to all stakeholders any concerns, ideas, etc.
- [ ] _____
- [ ] _____
- [ ] _____

Management

- [ ] Allocate leadership responsibility for policy at Board level
- [ ] Facilitate appropriate leadership models
- [ ] Commission fact-based research
- [ ] Observe the law
- [ ] Recognise, state, and 'own' the problem
- [ ] Value, invest in, and support seafarers
- [ ] Proactively seek feedback
- [ ] Listen
- [ ] Foster an effective Safety Learning culture
- [ ] Demonstrate duty of care
- [ ] Advocate for seafarer-centred systems and processes
- [ ] Devise comms plan
- [ ] Review crewing models and contracts
- [ ] Review trading patterns
- [ ] Review and align systems and processes
- [ ] Lobby external actors
- [ ] _____
- [ ] _____
- [ ] _____

This checklist can be used as a quick and dynamic reference document. The items highlighted in the checklist have been taken from the findings of the ISWAN survey. However, to ensure full buy-in, tasks bespoke to your company should be included.

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