Thetius

OneOcean

# COMPETENT OR COMPLIANT?

## Seafarer readiness in modern maritime operations

Matt Stevens

# Acknowledgement

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# Executive summary

**The maritime industry is experiencing a growing gap between what qualifications prepare seafarers for and the everyday reality of vessel operations. Training and certification frameworks provide an important baseline for qualifications, but they struggle to keep pace with the realities crews face on modern vessels.**

The research conducted for this report identified a concern among shipboard and shore-based personnel that competence is increasingly viewed as the ability to apply judgement, maintain situational awareness, communicate effectively, and operate safely under pressure while managing complex digital systems and operational demands, rather than as a function of someone's certification status.

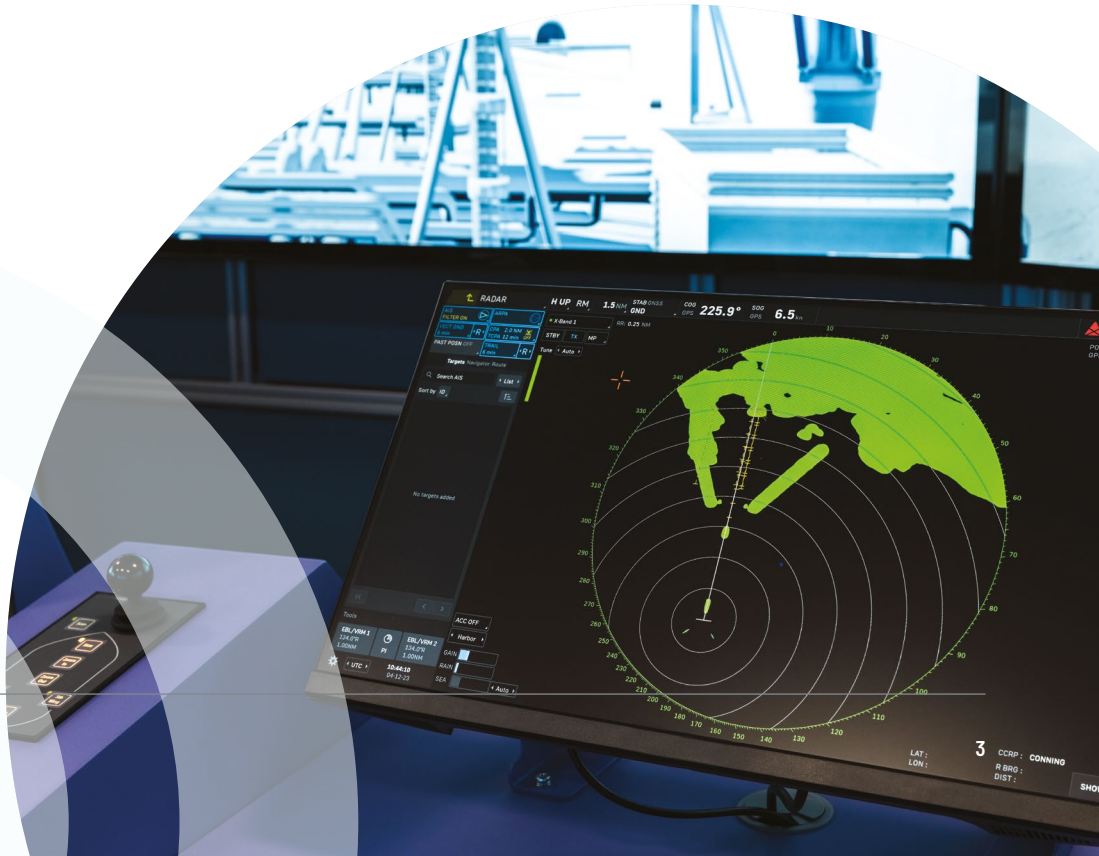
Survey respondents most frequently identified high-pressure operations, abnormal situations, familiarisation, vessel changes, digital system use, and inconsistent working practices between vessels as areas where crews struggle most.

A common theme from the survey and interviews was that training and certification are overly focused on course completion, with current approaches described as 'tick-box exercises' that do not fully prepare crews for actual seafaring.

As vessels have become more digitalised, crews are increasingly expected to interpret and validate information from multiple systems while maintaining safe operations in evolving environments.

Evidence suggests that advancing operational readiness will require more than additional training alone. Shipping companies will need to reconsider how competence is developed and assessed through daily operations if they are to close the gap between certification and readiness.

Reducing the skill gap will depend on how well shipping companies support crews in adjusting to modern seafaring demands, with the industry's key training challenge being whether seafarers are fully prepared for the conditions they actually face in their roles.



# Foreword

**John Hissey**
Senior Product Manager at OneOcean

**Starting a career at sea at the turn of the century has gifted me the experience of witnessing firsthand an incredible amount of change in the maritime industry for the better. Yet, I have a sense of unease when I speak with mentees starting out now in the industry. I realise the workplace they are now entering is in many ways unrecognisable.**

The core training regimes have not changed, but the role and what is expected of seafarers is now very different. A much more connected and fast-paced world where information is king and everyone needs an update now.

If we take the role of the Officer of the Watch (OOW) as an example, thinking back to my first watches at sea the one thing that stands out is the quietness of watchkeeping. I was lucky enough to have had a decent amount of experience before the full rollout of AIS. We had all received training on AIS, received bits of paper attesting our skills to IMO Model Course 1.34. We knew its limitations; it's no replacement for ARPA – which sees everything regardless of whether a vessel is transmitting. Remember it's just an 'aid to navigation'.

We completed the simulator exercises to prove we were qualified but what the training didn't prepare us for was the behavioural change AIS introduced. Before AIS, a vessel uncertain about another ship would hesitate before picking up the VHF, as you didn't know who you were calling or whether they'd respond. AIS changed that. Those predisposed to making a 'ship on my starboard bow' call now had a name to hail and the confidence of a likely response. For the seasoned watchkeeper, unnecessary VHF traffic was an irritation. For the newly qualified officer already weighing whether to call the master, it was a critical distraction at exactly the wrong moment.

The 2010s brought an even clearer disruption by way of mandatory carriage of ECDIS. Again, we all got the training, the simulator exercises and the certificates to prove we were safe. It covered setting depth contours, route checking, alarm management, limitations, dangers of overreliance and equipment failures. This time though, not even years of experience could prepare you for the new reality that the manual verification of multiple sources was now many awkward clicks and a few menus away.

A more subtle loss was the visual reminder built into older charts. Soundings in fathoms and greyscale indicated that the base data might not be reliable. ECDIS has its own measure of chart data quality, the CATZOC, but it is a layer within the system that is not always displayed. Even the most seasoned mariner could forget to check it, or simply not have it switched on.

It's not that the introduction of ECDIS restricts the mariner. After all, the ECDIS performance standards mandate: 'It should enable the mariner to execute in a convenient and timely manner all route planning, route monitoring, and positioning'. In practice, convenient and timely depends entirely on how well you know the system.

I chose these two examples deliberately. We are all compliant with the training AIS and ECDIS required of us. But compliance is not the same as the healthy scepticism that only builds with exposure and experience, and that scepticism is now more important than ever.

But are we all provided with the time and support to become confident enough to question what our systems are telling us, react to the situation and consistently apply sound judgement? In other words, to develop true competence. In a modern, automated and data-rich maritime world, we really need to consider whether we are allowing our professionals to adapt to all this new 'help'.

# Introduction

**The demands placed on seafarers are outpacing the training and certification models that measure seafarer readiness. Digitalisation has not happened overnight. Over years, each new system, reporting requirement, and regulatory framework has added incrementally to what crews are expected to manage. Individually, each change seemed manageable. Collectively, they have profoundly altered what onboard roles demand, and the pace of that change is not slowing.**

Modern maritime operations require more from crews than ever before. Deck officers and engineers in particular now carry a significantly wider set of responsibilities than traditional navigational and engineering tasks alone.

They are expected to manage complex digital systems, comply with regulatory reporting requirements, interpret operational data, and maintain robust safety and environmental standards, amongst other demands.

This has created a recognisable gap between compliance and real-world readiness, which is often most visible in high-pressure moments when judgement and operational experience are most required. In the survey conducted for this report, 52% of respondents reported that qualified crew struggle in real operations 'often' or 'very often'.

The importance of competence in maritime operations goes beyond the ability to perform routine tasks, as poor decisions at sea can have serious consequences.

Masters and senior officers may also carry legal liability for their decisions. This is pressure that few industries place on frontline personnel. In an industry where the consequences of poor decisions can be severe, competence means ensuring people can perform safely when it matters most.

While certification frameworks such as the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers (STCW) continue to set a global minimum standard for seafarer qualifications and training, they do not necessarily ensure operational readiness.

Many shipping companies already look beyond certification when assessing crew readiness through vessel-specific familiarisation, onboard assessments, mentoring programmes, and frameworks such as OCIMF and INTERTANKO's Behavioural Competency Assessment and Verification (BCAV), which takes a more extensive view of competence than certification alone can.

This reflects an industry that understands that competence is not a given. It varies from individual to individual, and while training provides the foundation, real competence is built through experience and demonstrated in practice. In an industry where the stakes are as high as they are, responsibility has to be earned, not assumed.

A crew member may hold the correct qualifications for a role while still lacking experience with the operational realities onboard a vessel. As maritime operations become increasingly digitalised and interconnected, the impact of this gap becomes more significant.

This report explores how the competence gap is developing across modern maritime operations and why the industry needs to rethink how readiness is recognised and maintained. It considers the impact of digitalisation, workload, familiarisation, system design, and operational pressure on crew performance.

It also outlines what applied competence looks like and how operators can move beyond a purely compliance-based approach towards a model focused on readiness.

# The competence gap in modern operations

**The maritime industry, much like other industries, tends to rely on training and certification to demonstrate that seafarers are qualified to perform their roles. International shipping requires common standards, structured learning, transferable qualifications, and a common understanding of what is expected of seafarers.**

Under the STCW, seafarers who pass the required training and examinations can obtain certificates of competency, which legally qualify them to serve onboard vessels globally. That training covers essential foundations: basic safety, firefighting, personal survival, medical first aid, navigation, watchkeeping, and bridge or engine resource management.

For officers progressing through the ranks, this includes simulator-based navigation training, GMDSS certification, and, in some cases, type-specific endorsements for tankers or passenger vessels. These qualifications are internationally recognised and act as the foundation of the industry's approach to seafarer standards.

Yet readiness is more complex than qualification status alone suggests. A tanker master and a cruise ship master can both hold senior certificates of competency, but the operational realities of each role are quite different.

A tanker master's work centres on cargo compatibility, inert gas management, loading and discharging procedures, single point mooring operations, and handling a vessel whose characteristics change considerably between loaded and ballast conditions. A cruise ship master manages the safety of thousands of passengers, complex port-intensive itineraries, large multinational crew teams, and a distinct set of regulatory and operational demands.

Transitioning between these roles would require additional type-specific certification and time to develop the operational knowledge each role demands. The certification piece is the more straightforward part. The judgement, the familiarity with how a particular vessel type behaves, the instinct for when something is wrong, that comes from time in the role.

This is the broader pattern the report examines. Vessels differ significantly in their systems, equipment, cargo types, trade routes, and operating environments. A certificate confirms a seafarer has met a defined standard. Whether they are ready for a particular vessel, route, or set of conditions is a separate question.

Digitalisation has widened the space between those two things. Watch officers now work with integrated bridge systems that combine ECDIS, radar, AIS, and alert management into a single operational environment. Engineers monitor machinery through automation platforms and planned maintenance systems that feed performance data directly to shore teams.

Emissions performance is tracked against regulatory targets in real time. Voyage decisions are shaped by fleet management tools operated from shore. Each of these developments has expanded what deck officers and engineers are expected to understand and manage, and the pace of that change has not slowed.

Regulations have also become more stringent as reporting and compliance requirements have been introduced into everyday operations. This has resulted in a gap between demonstrating compliance and readiness.

> **We were in a world where competency was taken for granted through mentoring the younger generation, and that has slowly died because the turnaround of ships is faster.**
>
> **Pradeep Chawla**
> *GlobalMET Chairman*

Certification is still an essential part of seafarer training, providing the industry with a common baseline for qualifications and competence.[1]

Despite the value of certification frameworks, baseline qualifications do not prove all aspects of everyday readiness. A seafarer could be fully qualified to perform a role, but still not be ready for the demands of a vessel, company, route, cargo type, digital system setup, or operating environment.

This concern is shown in the Seafarers Happiness Index Q2 2025 report, where respondents raised concerns about training integrity, workload pressures, and the growing use of e-learning approaches that prioritise completion over competence.[2]

Pradeep Chawla, GlobalMET Chairman, discussed how "we were in a world where competency was taken for granted through mentoring the younger generation, and that has slowly died because the turnaround of ships is faster."

Seafarer readiness has become a central issue in the IMO's comprehensive review of the STCW Convention and Code.[3] The review identified how advances in digitalisation, automation, AI, and emerging technologies are changing vessel operations and the competencies required of seafarers.[4]

Barry Hooper, Head of Maritime Strategy at OneOcean, explained that "the industry has always produced seafarers who are qualified for ships that were in service when the courses were designed; there's always going to be a lag behind innovation."

1. International Maritime Organization (Accessed April, 2026) International Convention on Standards of Training, Certification and Watchkeeping for Seafarers, 1978
2. Seafarers Happiness Index (2025) Seafarers Happiness Index Quarter 2
3. International Maritime Organization (Accessed April, 2026) Comprehensive review of the STCW Convention and Code - FAQ
4. International Maritime Organization (Accessed April, 2026) Comprehensive review of the STCW Convention and Code - FAQ

# Survey Analysis

## Thetius surveyed maritime professionals from across the industry for this report, with most having more than 10 years of industry experience.

The findings reflect perspectives from masters, officers, engineers, superintendents, training personnel, crewing staff, and shore-based operators working within the realities of modern vessel operations.

18% of respondents believe current training and certification models prepare crews "well" for modern operations. The remaining 82% describe them as either "neutral" (41%), "poorly" aligned (38%), or "very poorly" aligned (3%) with realities.

One phrase recurs throughout the responses: "tick box exercise". More than half of respondents (56%) identify compliance-focused training as a contributor to competence gaps, arguing that course completion is often prioritised over practical readiness.

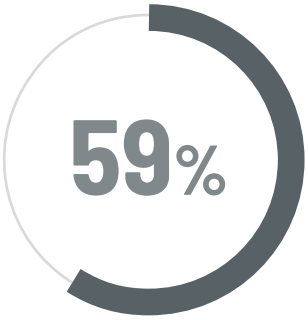
When asked where crews most commonly experience competence gaps, transition-related responses were most common. Working across different vessel setups was identified by 36% of respondents, familiarisation by 31%, joining a new vessel by 26%, and poor familiarisation by a further 8%.

Digitalisation is a central theme in the responses, with 31% of respondents identifying digital systems, ECDIS, and reporting tools as areas where crews increasingly struggle, while a further 31% say training is not aligned with real operational conditions onboard.

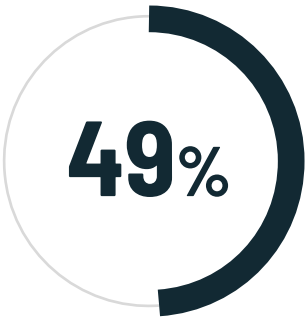
The findings point to a consistent gap between controlled training environments and everyday working conditions, as situational awareness and decision-making under pressure are jointly identified as the largest skills gaps at 59%, followed by systems literacy and communication and teamwork, both at 49%.

38% of respondents identify workload and administrative burden as the biggest barrier to performance on board. Fatigue ranks at 23%, followed by poor system integration at 15% and insufficient familiarisation time at 13%. When asked what matters most when things go wrong, poor leadership onboard was identified by 33%, followed by lack of experience at 28%.

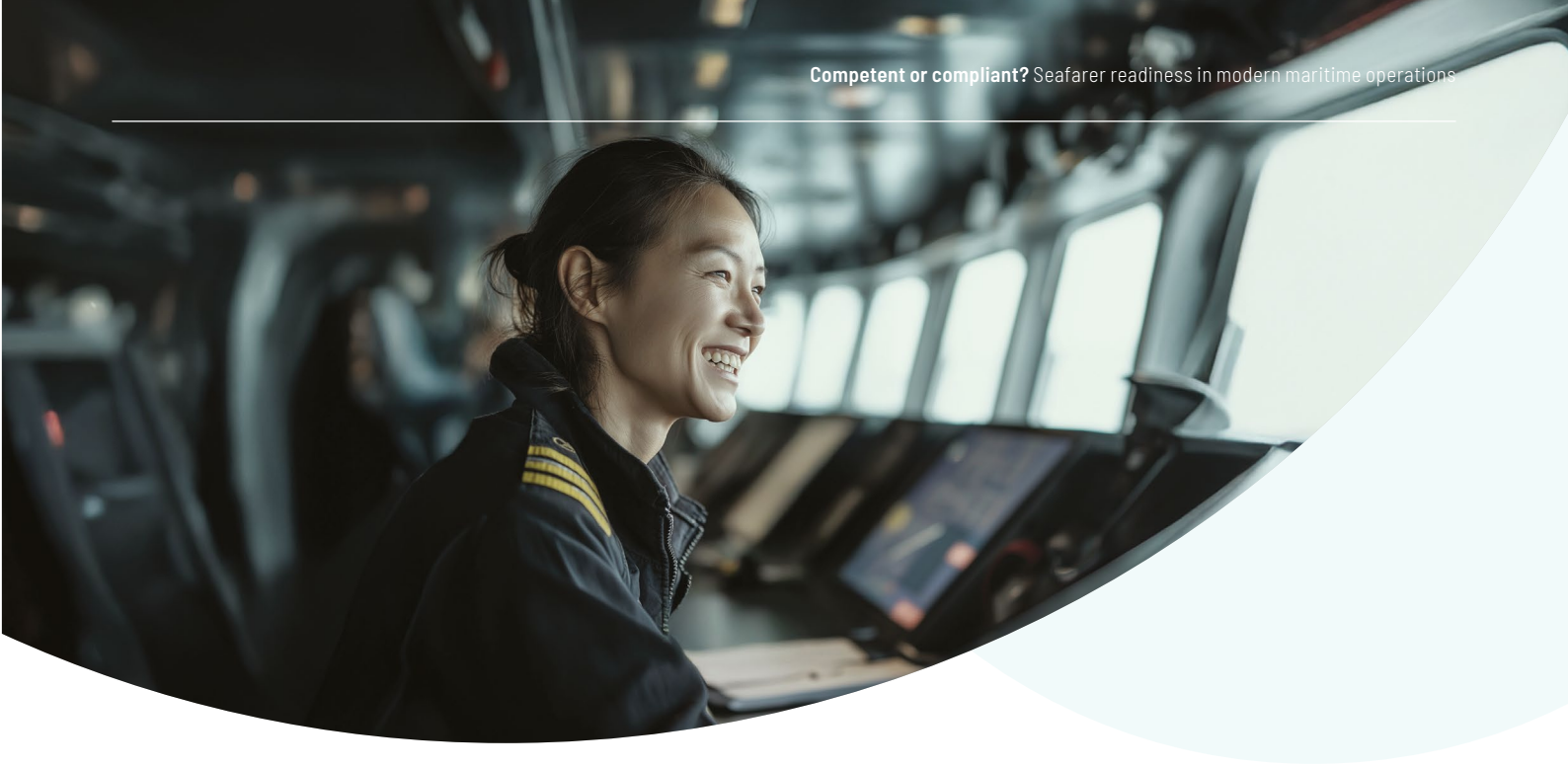
Taken together, the findings describe an industry where the difference between qualified and being ready is widely felt but inconsistently addressed. The barriers go beyond training quality; workload, system design, familiarisation, and leadership all shape whether a certified seafarer can actually perform when it matters.




Situational awareness and decision-making under pressure are jointly identified as the largest skills gaps




Systems literacy and communication and teamwork jointly identified as the second largest skills gaps



# The changing operational reality

**The operational reality onboard vessels has changed over the past decade. Digital tools have developed to support seafarers by providing improved visibility, lessening manual tasks, enabling better access to operational information, and enabling regulatory compliance.**

Capt. Abhijit Arvind Mohite, HSSE Manager at a tanker operator and former Master Mariner, noted that gathering data is no longer the biggest challenge. "There is enough data available, but it is up to the user how to interpret it. The interpretation is a challenge," he said.

Crews work with digital systems, update electronic records, interpret system outputs, monitor performance data, manage alerts, complete compliance workflows and share information with shore teams.

The IMO first introduced its e-navigation concept in 2006, approved its e-navigation strategy at MSC 85 in 2008, and began implementation planning in 2009.[5] What was then a novel strategic direction has since become the operational baseline. Integrated bridge systems, electronic charts, digital reporting, and shore connectivity that were considered emerging developments are now standard features of vessel operations.

> **There is enough data available, but it is up to the user how to interpret it. The interpretation is a challenge.**
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> **Capt. Abhijit Arvind Mohite**
> *HSSE Manager at a tanker operator and former Master Mariner*

Watch officers are now expected to understand ECDIS, radar, AIS, bridge alert management, voyage planning software, GNSS vulnerabilities, company reporting tools, and route-specific procedures.

Engineers may be expected to work with control systems, planned maintenance platforms, diagnostics, automation, emissions data, and increasingly complex fuel systems.

Crews are increasingly expected to interpret systems and validate outputs, and regulation is reinforcing this shift. For example, the IMO Data Collection System requires ships of 5,000 gross tonnage and above to collect fuel oil consumption data, which feeds into the Carbon Intensity Indicator (CII) framework.

5. The Nautical Institute (2009) IMO adopts e-navigation

In Europe, the EU Emissions Trading System (EU ETS) has applied to maritime transport emissions since 2024, while FuelEU Maritime has applied from 2025. These requirements bring emissions, fuel use, reporting, and voyage decisions closer together.[6] Compliance is now more embedded into daily operations, increasing the importance of data quality and the crew's ability to interpret information in context.

This has added to the pressure on crews. Capt. Abhijit Arvind Mohite explained: "The same crew has to manage multiple jobs. They have to ensure safe operation, they have to move cargo, they have to navigate, and in addition to that, they have the burden of paperwork."

The BIMCO/ICS Seafarer Workforce Report 2025 warned that the industry would need an additional 89,510 officers by 2026 to operate the global merchant fleet, underlining the need for more training and recruitment.[7]

Crew readiness is therefore a very different issue from what it was ten or fifteen years ago, as crews now need to understand unfamiliar software, different equipment layouts, local procedures, port procedures, cargo requirements, reporting platforms, and company expectations.

This makes familiarisation one of the clearest readiness challenges. "You've got someone that probably hasn't worked for two or three months, and they're chucked onboard a ship and said go," said Robert Pogson, Deputy Harbour Master/VTS Manager at Belfast Harbour.

Building on this sentiment, John Hissey, Master Mariner and Senior Product Manager at OneOcean, said that crews need time to settle into unfamiliar vessels and systems. "You shouldn't be expected to go and take over after a gangway handover," he said. "It's giving people a chance to settle in."

**Compliance is now more embedded into daily operations, increasing the importance of data quality and the crew's ability to interpret information in context.**

6. International Maritime Organization (July, 2025) IMO targets seafarer fatigue, work and rest hours, and harassment at sea
7. International Maritime Organization (July, 2021) New BIMCO/ICS Seafarer Workforce Report warns of serious potential officer shortage

# Certification, compliance training, and competence

## Certification, compliance training, and competence are closely linked, but they are not the same.

Certification confirms that a seafarer has met the defined standards required of them, compliance training demonstrates that a person has completed mandatory training, and competence concerns whether a person can perform safely in actual conditions.

Alexander McDonald, a Coastal Tanker Master at a shipping company, explained that certification does not always prove readiness, comparing certification to a driving test. "You learn to pass your test, and then you learn how to actually drive afterwards," he said. "People learn to pass exams, and then when they're on board, that's when we try to teach them how it actually works in practicality."

Competence is more nuanced than being qualified because it is difficult to measure accurately. It is shown through performance rather than on paper. Interviewees repeatedly described competence as the ability to operate safely and respond to changing conditions.

According to Hissey, one of the biggest gaps is not technical knowledge, but the confidence and communication needed to act on it. "Soft skills are the biggest gap," he said, referring to the ability to lead a team, communicate clearly under pressure, exercise discernment, and make decisions with confidence when the situation demands it.

A fully qualified seafarer might understand formal procedures but not know how they work within specific vessel operations. During training, tasks are usually clear, and scenarios are often designed around specific outcomes.

> **Simulation is good because you can simulate scenarios which happen very rarely, but it doesn't replace the experience of living and working onboard a ship**
>
> **Matt Bland**
> *Marine Consultant at Alton Marine Consulting Limited*

However, onboard operations are less controlled than in simulation tools. Tasks overlap, interruptions often occur at the worst moments, equipment varies from vessel to vessel, and crews are expected to operate under pressure while dealing with multiple demands simultaneously.

Matt Bland, Marine Consultant at Alton Marine Consulting Limited, noted that "simulation is good because you can simulate scenarios which happen very rarely, but it doesn't replace the experience of living and working onboard a ship". This is where experience and time in rank are important, as competence develops through repeated operational exposure rather than only through formal learning.

If crews are progressing faster through the ranks while the demands placed on them are increasing, the industry needs an understanding of the impact of this compressed timeline and how to compensate for it.

The competence gap is most likely to appear under high-pressure, time-sensitive situations. This includes bridge watchkeeping in congested waters, use of vessel-specific ECDIS settings, cargo operations, machinery troubleshooting, alarm handling, emergency response, handovers, inspections and the use of company-specific reporting systems.

At such moments, competence means knowing what to do when a situation does not fit the standard operating procedure.

For McDonald, competence is built through experience as much as formal training. "You can know how to avoid collisions from scenarios, but when you're actually in those situations, and you've got to make those decisions, that's another thing," he said.

# Where the competence gap shows

**The competence gap is often evident at transition points. The first transition point is when a seafarer joins a vessel. New crew members need to familiarise themselves with the vessel, route, ship-specific equipment, company safety management system, emergency procedures, reporting tools, and working culture onboard while the vessel continues to operate.**

This makes familiarisation critical. Amitvikram Chitnis, Head of Product at Inchcape Shipping Services, discussed how, "if you're not familiarised in the right way and if you don't have that experience or confidence, the chances of getting into an accident or a tight spot are very high".

James Shaw, Master at a major ferry operator, supported this, explaining that newly qualified officers need time to settle into the vessel before they are expected to take full responsibility.

He said: "Rather than someone passing out of college with a nice new certificate and then being sent on a ship straight away, they need some time as a supernumerary. If you have got the guys there for a couple of weeks just shadowing and getting their heads around everything first, then that's a big step, rather than just them plunging in."

Multiple interviewees noted the value of additional supernumerary time to build confidence before taking on full responsibility.

The effects of inadequate familiarisation procedures are documented in the MAIB Safety Digest. A delivery crew joining a fishing vessel failed to recognise an engine room bilge alarm they were unfamiliar with, and the vessel sank. The investigation found the crew had not been given sufficient time to become familiar with the vessel's systems before departure.[8]

The second transition involves moving from vessel to vessel. This was identified by 36% of survey respondents as a common source of competence gaps. Even within the same company, vessels will have different equipment, software versions, bridge layouts, cargo systems and working procedures. If the company does not properly standardise critical procedures as much as practicable, crew members will have to relearn working methods each time they move to a new ship.

The third transition is moving between different conditions, as a crew member might perform well in everyday operations yet struggle when something unexpected happens. For example, this could include an unexpected machinery fault, abrupt weather changes, a late change to a port instruction, or a sudden change in traffic.

> **If the company does not properly standardise critical procedures as much as practicable, crew members will have to relearn working methods each time they move to a new ship.**

Abnormal and unexpected situations were identified by 67% of survey respondents as an area where crews commonly struggle, which was the highest single response in the survey.

Drawing on his experience in LNG operations, Mohit Mehrotra, COO, Oil and Tanker Management at Kmarin, noted that accidents and incidents most often occur "wherever there's a human interface", especially during connection and disconnection activities.

He argued that these events are "predominantly due to the people mishandling" rather than equipment failure, pointing to procedurally intensive, high-risk operations as the moments where gaps in competence are most likely to surface.

8. MAIB (February, 2022) SAFETY DIGEST Lessons from Marine Accident Reports

These situations are a test of more than just classroom knowledge. They test prioritisation, judgement, communication, confidence, and situational awareness, as well as whether crews understand the systems they are using well enough to recognise when something is wrong.

High-pressure situations were identified by 56% of survey respondents as a common source of competence gaps. McDonald said: "The digital systems are so good in many ways that they can mask a lack of competence until a point where it becomes critical."

This dynamic is further complicated when workarounds become the norm on a vessel. If tools do not fit the task, or if systems do not integrate properly, crews can develop informal ways of working. While these workarounds are often practical, they can hide problems in the design process.

Chitnis explained that technology needs to be built around how work actually happens onboard. "Any system which is designed without keeping the people at the centre never works, because systems are often designed around assumptions rather than operational reality," he said.

This aligns with findings from CHIRP Maritime, which has repeatedly highlighted procedural deviations, informal practices, and reporting culture issues as contributing factors in maritime incidents and near misses.[9]

Over time, the gap between documented procedures and actual practice can become difficult for shore teams to see. It is in these circumstances that the relationship between competence and system design is most obvious. If a process relies on individual experience, the vessel's performance can be compromised. A highly experienced crew member might know how to manage a difficult system, but someone new will not be aware of the workaround, the risks, or when support is needed.

This can cause inconsistencies that turn small gaps into real-world risks at a fleet level. A missed handover point, an unclear alarm, an incomplete familiarisation process, or a misunderstood system output might not cause an isolated incident, but if these recur across vessels and voyages, they create the conditions in which serious incidents become more likely.

> **The digital systems are so good in many ways that they can mask a lack of competence until a point where it becomes critical.**

9 Chirp (Accessed May, 2026) Improving safety at sea worldwide

# Greater demands on crew

**The cognitive strain on crews has grown in recent years as modern operations require them to manage digital systems, reporting, compliance, inspections, commercial schedules, and rest-hour requirements simultaneously. How well a seafarer performs is not only a function of their training. It is also shaped by the conditions they are asked to work in.**

Manning levels and working conditions shape performance as directly as training does. IMO principles on safe manning refer to the number of qualified and experienced seafarers needed for ship safety, security, protection of the marine environment, and seafarer welfare. They also recognise that factors such as training, hours of work and rest, occupational safety, and health affect seafarers' ability to maintain safe operations.

Maritime human factors guidance from the UK Maritime and Coastguard Agency (MCA) underlines the importance of "people's ability and capability to deal effectively and safely with the complexity, difficulty, pressures and workload of their daily tasks."[10]

In practical terms, this means that as the complexity and amount of tasks increase, the margin for error narrows. A crew operating at the limit of their cognitive capacity has less room to respond to the unexpected.

Fatigue is a clear example of how competent performance can deteriorate under operational pressure. These concerns continue to receive attention at the IMO level, including ongoing work related to fatigue, rest hours, workload, and seafarer wellbeing.[11]

Research commissioned by the UK Department for Transport into ferry operations examined fatigue among ferry crews and its consequences for safety-critical roles, noting the need to understand how fatigue is assessed and monitored in actual operating environments.[12]

The findings suggest that even in a closely regulated operating environment, the way fatigue is managed in practice does not always reflect what rest-hour requirements set out on paper.

Fatigue affects attention, judgement, and decision-making. These are precisely the capabilities that matter most when conditions are difficult, and the pressure to perform is highest. Even the most capable crews are not immune to erosion of their faculties when fatigued.

The decisions that most directly shape what crews face onboard are largely made ashore. Where a vessel goes, what it carries, how it is manned, and how long it spends in port are determined under commercial constraints, largely by people who are not operating the vessel. Investment in training and crewing follows the same logic. As Pogson observed, "why would a ship owner want to invest any more money than something that meets the bare minimum?"

The crew bears the consequences at sea of decisions made on shore. Hurried familiarisation, compressed promotion timelines, and tight manning are unfortunately common features of an industry that operates under sustained commercial pressure and significant market volatility.

When rates fall, training budgets and crewing levels are among the first things to be cut. When the market recovers, vessels return to service and crews are expected to perform, but the experience gaps created in the downturn do not close as quickly. Training alone cannot bridge that.

10. Gov.UK (Accessed May, 2026) MGN 520 (M) Amendment 2 Human element guidance - part 2 The Deadly Dozen - 12 Significant People Factors in Maritime Safety
11. International Maritime Organization (July, 2025) IMO targets seafarer fatigue, work and rest hours, and harassment at sea
12. Gov.UK (December, 2024) Understanding seafarer fatigue in ferry operations

# What competence looks like in modern operations

Competence in modern maritime operations is defined as the ability to perform safely and consistently in the real conditions that crews face onboard. It is also the ability to apply knowledge and judgement in changing operational environments.

Competence is dynamic; a seafarer may be competent for one vessel type, system setup, trading pattern, or operating condition, but less ready for another.

## Defining applied competence

Applied competence refers to a seafarer's ability to operate safely under real-world conditions. This is role-specific. For example, a watchkeeper, chief officer, engineer, master, or superintendent each requires a different set of skills and level of readiness because each role has a different function and carries different decisions, risks, and responsibilities.

It is also vessel-specific, as a person may understand the general principles of navigation, cargo handling, engineering, or compliance, but still needs to understand the vessel's equipment, procedures, limitations, and working culture. Even vessels built to the same design standards may still require different ways of working onboard.

As Cristian Cioban, Founder of AICC Maritime Consulting and Brokerage and Master Mariner, explained, "every vessel you go to has different systems, different programmes you need to learn, and crews need time to adapt even when operating similar vessel types."

It is also affected by how recently skills have been practised. A seafarer returning from an extended period of leave, moving to a vessel type they have not worked on recently, or operating with qualifications earned before a significant system or regulatory change, faces a readiness gap that their certification does not reflect. Familiarity erodes when not practised, and the role continues to evolve in the meantime.

# Competence as a crew function

## Competence is assessed at an individual level through certification, training records, and competence assessments. However, safe and proficient performance on board is the function of a crew.

A technically competent seafarer operating within a poorly functioning team may still struggle to perform adequately. Unclear procedures, ineffective delegation, and an imbalance of experience are liable to undermine the value of individual competence and jeopardise operations.

The behaviours that underpin crew competence are central to safe operations, but difficult to measure through certification alone.

Certification assesses individuals in controlled conditions against defined standards, but collaboration, reliability, adaptability, and judgement under pressure are not things that can be confirmed by a certificate. They vary from person to person, develop differently depending on experience and character, and can only really be seen in how someone performs their role.

When something goes wrong at sea, onboard crews are usually the first and most important line of response. Shore teams can advise, but they cannot usually intervene directly. This makes crew competence a safety-critical function, not just a measure of individual capability.

The collective competence of the crew is the primary safety mechanism onboard. Their ability to communicate clearly, share information, and act together under pressure is what determines the outcome.

> **The behaviours that underpin crew competence are central to safe operations, but difficult to measure through certification alone.**

That is what makes communication and teamwork safety-critical capabilities rather than general professional skills. Nearly half of survey respondents identified them as a major gap. The Seafarers Happiness Index Q2 2025 found that interaction scores improved modestly from 7.68 in Q1 2025 to 7.93 in Q2 2025, pointing to the value of strong crew relationships in managing the challenges of life at sea.[13]

Crew competence also depends on a joint understanding and a culture that supports proactivity and raising issues regardless of rank. These qualities develop over time through experience and working together, which is precisely what high crew rotation makes difficult.

The stakes are highest during high-pressure operations, where safe performance depends on how effectively information is shared and acted upon. Many operational failures arise not because an individual lacks technical competence, but because the team around them fails to function effectively at the moment a decision is needed. The right information exists but does not reach the right person. A concern is identified but not raised. Two crew members operate from different understandings of the same situation without realising it.

How well a crew functions together is also affected by experience levels within a team and the time crew have to develop judgement within their roles. Cioban explained how "there is a big need for crew nowadays, and that's why, to keep them, they promote quickly. However, rapid promotion does not always allow sufficient time for competence and judgement to develop at the same pace as rank."

13. Seafarers Happiness Index (Q2, 2025) Seafarers Happiness Index Quarter 2

# The modern skills crews need in digitised operations

The skill set required of modern crews has expanded alongside the digitalisation of vessel operations. Traditional seamanship skills remain vital, but systems literacy, data awareness, and the ability to interpret and interrogate digital information have become equally central to safe performance.

Pogson said: "You're almost getting to the stage now where they are going to have to think about deck officers having a level of systems knowledge leading into the training."

Systems literacy is central to a modern seafarer's success. For Hooper, systems literacy increasingly means understanding the quality of the data behind digital tools. "Seafarers should be educated on the risks and limitations of digital tools, and how data quality affects those risks," he said, adding that trust in a system should depend on "how much you trust the data underneath."

> **You're almost getting to the stage now where they are going to have to think about deck officers having a level of systems knowledge leading into the training.**

Systems literacy also means knowing the limits of what a system can tell you. Crews need to understand system limits and recognise when outputs do not reflect real conditions. One concern for James Shaw is that newer officers can become too focused on screens rather than the world outside the bridge. "They don't seem to be able to relate what's on the radar screen or on the ECDIS screen to what they're looking at out of the window," he said.

This also applies in the engine room, where machinery spaces now rely heavily on automation, sensors, diagnostics, and digital reporting systems. When something goes wrong, it could be due to software, system settings, poor-quality data, or the crew's interpretation of the information.

While digital systems can support decision-making, safe operations still come down to people, their judgement, their experience, and their willingness to question what a system is telling them when something does not feel right.

# What good looks like across a fleet

**The strongest operators treat competence as something that has to be actively maintained across a fleet, not confirmed once at the point of certification. While some flexibility is necessary, given that every vessel is unique, fleet-wide standards create consistency in key vessel operations without removing professional judgement.**

Effective handovers should help the next crew member on duty to better understand an operational picture: what is developing, what has been deferred, what decisions may be needed on the next watch. Done well, they are one of the most effective ways of preserving operational knowledge across crew changes.

Near misses, repeated errors, audit findings, and everyday workarounds are signs of where something is not working properly, whether that is unclear expectations, weak training, poor process design, or systems that are difficult to use.

Shore teams play an important role in influencing the conditions under which crews operate. Interviewees described shore teams as active participants in daily operations, influencing crewing decisions, procedures, technology adoption, and operating priorities, and in doing so shaping the conditions in which competence either develops or erodes.

Trusting the seafarer requires establishing a culture where crews can report concerns, raise uncertainty, challenge decisions and explain operational problems without fear that the issue will automatically be treated as a failure. This is especially important when the problem is not a lack of effort, but a mismatch between the procedure and the work itself.

Effective competence programmes define what readiness means for key roles and identify the procedures in which poor performance poses the greatest risk. They check whether these procedures are being followed in practice and use feedback from seafarers to keep improving them.

The industry already has established frameworks that reflect this approach, including continuous improvement models such as OCIMF's Tanker Management and Self Assessment programme, which encourages operators to assess safety management systems against key performance indicators a nd use the results to support phased improvement plans.[14]

Maran Tankers Management was one of the shipping companies that implemented BCAV, with training manager Dimitris Fokas describing the process of embedding behavioural assessment across the fleet, including the challenge of delivering it virtually during the COVID pandemic.[15]

The experience points to what fleet-wide competence management requires in practice: clear standards, consistent application, and the organisational commitment to sustain it over time.

> **Near misses, repeated errors, audit findings, and everyday workarounds are signs of where something is not working properly**

14. OCIMF (January, 2022) Management Self Assessment
15. Tanker Operator (January, 2022) OCIMF/INTERTANKO'S behavioural competency assessment

# How to move beyond certification

**The practical challenge for operators is not whether to look beyond certification as a measure of readiness, but how.**

The priority is understanding how crews perform in actual conditions, how knowledge is transferred, how skills are learned, and how critical tasks are supported across a fleet.

## Prove readiness, not attendance

**The most effective assessments focus on the safety-critical tasks that matter most for each role, including bridge watchkeeping, alarm handling, emergency response, cargo operations, and handovers, and whether crews can perform them consistently.**

Scenario-based checks can identify where further learning, familiarisation, and support are required before course completion. These checks could be integrated into simulator sessions, procedure-onboard assessments, supervised manoeuvres, and re-familiarisation periods.

> **Operators need practical evidence that crews can perform important tasks safely in high-risk conditions.**

The MCA's human element guidance stresses how factors such as capability, pressure, distractions, communication, local practices and fatigue can influence safety performance, underlining the need to assess competence in realistic operating conditions.[16]

High performing operators define competence levels for each rank and role and focus on the decisions each person is expected to make. As Cioban explained, "experience gives you the judgement to know when something is wrong before it becomes a problem."

Operators need practical evidence that crews can perform important tasks safely in high-risk conditions. Hristo Hadzhiev, Master Mariner, explained that younger officers "learn the basics in training, but are not very well trained for the critical situations."

16. Maritime and Coastguard Agency (Accessed May, 2026) The Human Element

> **If a better way to manage a procedure is identified, it needs to be reviewed and shared fleet-wide if deemed a success by a review committee.**

# Build practice into operations

## The interviews conducted for this report found that competence is mostly developed through daily work. Practice and feedback need to be integrated into normal operations, not limited only to formal courses or post-incident investigations.

According to Captain Shravan Bhagra, a Master Mariner, much of seafarer competence is still developed informally on board. He claimed that most of it is built on the job, through hands-on training, "rather than being trained properly before you go on a ship".

The strongest competence programmes incorporate routine debriefs into everyday operations, with near misses, deviations, audit findings, repeated errors, and everyday workarounds viewed as learning opportunities.

Simple learning loops should be established between vessels and shore teams. This is achievable through post-operation reviews, safety updates and bulletins shared across the fleet, or feedback sessions.

If a better way to manage a procedure is identified, it needs to be reviewed and shared fleet-wide if deemed a success by a review committee. If multiple vessels struggle with the same process, the process should be redesigned, not simply reissued.

# Fleet-wide consistency

**54% of survey respondents said competence varies widely between vessels within the same company, underlining how far fleet-wide consistency still has to go. While every vessel is different and some flexibility is necessary, this does not mean each vessel should develop its own version of safety-critical procedures.**

Excessive variation in safety-critical procedures forces crews to spend time relearning processes each time they join a different vessel rather than focusing on operations. Bland, Marine Consultant at Alton Marine Consulting Limited, also warned that inconsistent application across vessels can widen the gap between "work as imagined and work as completed", especially where systems are deployed without clear guidance.

Leading operators identify procedures where inconsistency poses the greatest risk, and standardise them where possible, adapting them only when vessel-specific conditions require it. Standard templates, shared checklists, common alarm settings, and fleet-wide bridge or engine room guidance could support these procedures.

The MCA's guidance on "local practices" makes this point clearly, noting that local practices can differ from documented procedures and, if left unaddressed, can become established as the new norm, with a lower safety and quality threshold.

Operators should approach workarounds as experienced crew intelligence and seek to understand their causes, rather than just instructing crews to follow their procedures. Crews often need to "distinguish the real alarm, the real danger, from the potential one and prioritise the most dangerous ones," said Hadzhiev.

Shore teams play a key role by supporting readiness, clarifying expectations, reviewing recurring issues, sharing lessons across vessels, and removing unnecessary friction from work processes. Their role extends beyond post-incident compliance audits.

This aligns with the logic of the ISM Code, which aims to provide an international standard for the safe management and operation of ships and pollution prevention, while recognising the need for management structures that support those onboard.[17]

> **Excessive variation in safety-critical procedures forces crews to spend time relearning processes each time they join a different vessel rather than focusing on operations.**

17. International Maritime Organization (Accessed May, 2026) The International Safety Management (ISM) Code

# Maturity roadmap

## Operators do not need to overhaul their entire competence model at once. A practical approach begins with areas where skill gaps pose the greatest operational risk.

A good starting point is defining the critical procedures and decisions that matter most for each role. Identifying where performance issues most often occur and focusing improvement efforts there first allows companies to test whether clearer expectations and coaching improve outcomes before expanding the approach across the fleet.

Structured familiarisation is where the readiness process begins in practice. Cioban explained that, based on his experience, crews were often given "more time for handover in Chinese ports," whereas in other regions operational pressures left far less time for officers to transfer knowledge before leaving the vessel.

> **Whenever there's a new officer on board, or whether you're new on board, the first weeks you're following people quite closely,if they're not ready, then we've got to bridge the gap on board.**

While some preparation can be done before joining the vessel, onboard familiarisation is required under the IMO's International Convention on Standards of Training, Certification and Watchkeeping for Seafarers (STCW), as crews still need time to understand how work is carried out on that vessel.[18]

McDonald explained this: "whenever there's a new officer on board, or whether you're new on board, the first weeks you're following people quite closely," he said. "If they're not ready, then we've got to bridge the gap on board."

The STCW framework already recognises the importance of familiarisation in specific contexts, including company responsibilities for familiarisation training for certain passenger ship personnel.

This could include protected onboarding time for shadowing, supervised task completion, equipment walkthroughs, and mentoring during a crew member's initial period.

From there, competence checks focused on critical procedures can be introduced, linked to coaching and regular reviews with senior officers and shore teams. The results identify where mentoring and additional support are needed.

The approach does not need to be introduced across the entire fleet at once. Starting with the highest-risk roles and procedures, demonstrating the value, and building from there is how a practical competence programme develops traction.

18. International Maritime Organization (Accessed May, 2026) International Convention on Standards of Training, Certification and Watchkeeping for Seafarers, 1978

# What to measure

**Shipping companies need to measure readiness improvement without creating unnecessary reporting. Where possible, the starting point is existing operational data, audit findings, near misses, simulator observations, and onboard assessments rather than creating entirely new reporting systems.**

The goal is to identify a small set of indicators that help leaders assess whether crews are genuinely ready. Tracking recurring deviations, repeated workarounds, reactive safety reports, incident reports, near misses linked to procedure gaps gives a more complete picture of operational strain than certification records alone.

There is value in more real-time analytics to understand how crews perform in their daily work. Knowing whether tasks are being completed in the right sequence, and where crews consistently deprioritise certain procedures, can reveal competence gaps before they surface in incidents.

Competency checks would provide valuable leading indicators when focused on critical procedures. Effective operators assess whether crews can apply judgement in practical situations.

> **The goal is not a perfect measurement system, but to give shipping companies a clearer picture of readiness before small gaps lead to incidents.**

These situations might include whether a watchkeeper can demonstrate how they would respond if GNSS became unreliable, whether an engineer can distinguish which alarms require escalation, whether a crew can carry out an effective handover and whether a chief officer understands how compliance and security requirements intersect during operations.

The goal is not a perfect measurement system, but to give shipping companies a clearer picture of readiness before small gaps lead to incidents.

Sustaining improvement is as important as achieving it. Crew rotation can cause good practice to fade, and effective procedures or lessons may not transfer across the fleet. Regular review points tied to crew changes and fleet audits help ensure that what works on one vessel reaches the others.

If a readiness measurement does not lead to better practice, procedures, system design, or support, it becomes a compliance burden. Better measurements enable leaders to take action and be practical, linked to operational improvement.

# Conclusion and recommendations

**The competence gap identified in this report arises because the demands placed on crews have evolved faster than the systems designed to prepare and support them.**

While certification frameworks remain useful for providing an international baseline for qualification and safety standards, certification alone cannot fully demonstrate a seafarer's readiness for real-world operations.

Modern maritime operations are shaped by digitalisation, regulations, crewing shortages, and greater operational complexity. Crews now need to work across multiple systems while making more performance-related decisions in real time than before the widespread introduction of digital tools.

Simultaneously, growing workloads and fragmented workflows have placed additional pressure on operational performance. Competence is not a one-off achievement demonstrated by a certificate. It is a capability that has to be developed through experience, maintained through practice, and supported by the conditions crews are given to work in.

More training alone will not close the skills gap. The evidence in this report shows that closing the gap requires attention to how competence develops at an individual level, how crews function as teams, and how decisions made ashore about manning, investment, and operational design shape the conditions in which crews are expected to perform.

## 01 Operational readiness in addition to course completion

Operational readiness depends on whether crews can perform safely in real-world operating conditions. Formal qualifications remain a necessity, but competence assessments must focus on practical performance.

Scenario-based exercises, simulator sessions, supervised operations, and onboard coaching provide better insight into readiness than attendance records. The aim is to identify where additional support or familiarisation is needed before small gaps become larger operational risks.

## 02 Vessel familiarisation as a core learning component

Vessel familiarisation is one of the most important parts of the crew readiness process.

New crew members need time to understand how operations are carried out in practice before taking full operational responsibility. If handovers between teams or individuals are rushed, then uncertainty can increase and place additional pressure on crews.

Vessel owners and operators need to provide structured familiarisation periods that include full equipment walkthroughs and mentoring from experienced crew members.

A crew member given time to understand a vessel before taking full responsibility is less likely to rely on workarounds, less likely to miss something critical during a handover, and more likely to remain with the company that invested in them.

## 03 Build competence into everyday operations

The most effective shipping companies integrate feedback into routine vessel operations rather than over-relying on post-incident learning.

Mistakes should be treated as opportunities to improve procedures and strengthen crew performance. Regular debriefs build the habit of reflection and create space for crews to share what is actually happening onboard.

Given how shorter promotion timelines and crewing shortages are reducing the experience many officers gain before moving into senior positions, the importance of mentoring and coaching in skills transfer is growing.

## 04 Reduce complexity in system designs

Many of the challenges identified throughout this report stem from fragmented systems and operational processes that do not align with seafaring realities. Technology and procedures that add to workload rather than reduce it are part of the competence problem, not separate from it.

Improving usability and reducing operational friction are central to supporting competent performance. Systems work best when tested in real operational environments and designed around how crews actually work onboard, rather than solely around technical capability.

## 05 Establish standardisation across fleets

While each vessel will have operational differences, unnecessary variation within safety-critical procedures can create confusion and increase operational risk.

Crews rotating between vessels within the same fleet should be able to rely on consistent core procedures. Identifying where variation creates the greatest risk and standardising accordingly is a practical starting point.

Recurring workarounds and repeated operational issues deserve careful review, as they often suggest that procedures do not accurately reflect operational reality on board.

# References


1. International Maritime Organization (Accessed April, 2026) International Convention on Standards of Training, Certification and Watchkeeping for Seafarers, 1978
2. Seafarers Happiness Index (2025) Seafarers Happiness Index Quarter 2
3. International Maritime Organization (Accessed April, 2026) Comprehensive review of the STCW Convention and Code - FAQ
4. International Maritime Organization (Accessed April, 2026) Comprehensive review of the STCW Convention and Code - FAQ
5. The Nautical Institute (2009) IMO adopts e-navigation
6. International Maritime Organization (July, 2025) IMO targets seafarer fatigue, work and rest hours, and harassment at sea
7. International Maritime Organization (July, 2021) New BIMCO/ICS Seafarer Workforce Report warns of serious potential officer shortage
8. MAIB (February, 2022) SAFETY DIGEST Lessons from Marine Accident Reports
9. Chirp (Accessed May, 2026) Improving safety at sea worldwide
10. Gov.UK (Accessed May, 2026) MGN 520 (M) Amendment 2 Human element guidance - part 2 The Deadly Dozen - 12 Significant People Factors in Maritime Safety
11. International Maritime Organization (July, 2025) IMO targets seafarer fatigue, work and rest hours, and harassment at sea
12. Gov.UK (December, 2024) Understanding seafarer fatigue in ferry operations
13. Seafarers Happiness Index (Q2, 2025) Seafarers Happiness Index Quarter 2
14. OCIMF (January, 2022) Management Self Assessment
15. Tanker Operator (January, 2022) OCIMF/INTERTANKO'S behavioural competency assessment
16. Maritime and Coastguard Agency (Accessed May, 2026) The Human Element
17. International Maritime Organization (Accessed May, 2026) The International Safety Management (ISM) Code
18. International Maritime Organization (Accessed May, 2026) International Convention on Standards of Training, Certification and Watchkeeping for Seafarers, 1978

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