

THE REPORT



SEP 2026 | ISSUE 117

The Magazine of the International Institute of Marine Surveying

THE MARINE SURVEYOR AND THE GUT FEELING

**THE
HARMONISED
FUTURE
OF ELECTRIC
BOATING**

**HOW ARE
MOTORBOATS
MADE?**

JUSTIFYING SUSTAINABLE SUPERYACHT REFITS

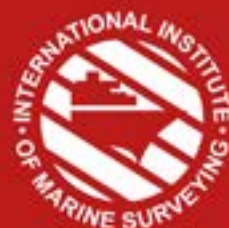
Container ship fires are pushing salvors to the limit

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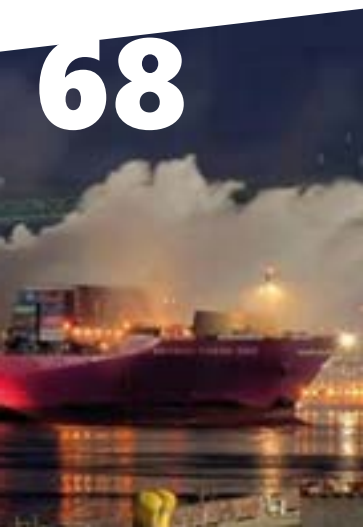
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EDITOR'S LETTER

Dear Member and Fellow Maritime Professionals

I am pleased to welcome you to the September 2026 edition of The Report Magazine.

The onslaught of AI technology has taken the world by storm in recent years, and its effects are being profoundly witnessed in every area of the shipping and boating industries. It is clear that what we are seeing is a series of seismic events that are challenging and reshaping the way the maritime industry thinks and operates. I believe personally this will be the biggest shift we have seen in our lifetimes.

With AI firmly in mind, I have authored an article entitled '*Spotlight on emerging AI technology in the maritime sector*' (page 54). I have drawn together a series of stories into one article, each of which demonstrates the impact AI is having. In a similar vein, I am grateful to Venkat Krishna Soundarraja who has penned a fascinating article - '*AI at Sea: From Maritime Hype to Operational Readiness*' (page 74).

In truth, whatever we think about AI, it is here to stay, and these two articles provide a valuable insight into the challenges and changes we can expect to see as it emerges.

Sticking with new technologies, electric vehicle lithium-ion battery fires on ships continue to exercise minds. The Cargo Incident Notification System (CINS) has released its latest guidance for shipping lithium-ion cells and batteries in containers. This essential guidance and advice carry great authority – see page 64.

I read many articles about the importance and value of Port State Control inspections. The author of the article entitled, '*Seven pillars for improved PSC performance*' (page 128) argues that the fundamentals of strong PSC performance remain unchanged. It details seven key areas that need careful thinking about and understanding to ensure a successful outcome.

'*How are motorboats made?*' (page 98) is written by the team at Fjord boats. It is a deep dive into how modern-day motorboats are constructed from concept to blueprint to manufacture. It lifts the lid and gives a fascinating insight into twenty first century boatbuilding techniques.

End of life boats are abandoned and can be found everywhere. There are literally millions of GRP boats in Europe alone that are past their sell by date and no longer fit for use. This is a subject I have championed before and, although it remains an

immense problem, there is movement developing in this area. In the article '*Large scale required to improve boat recycling efficiency*', the author takes a long hard look at how things are scaling up to meet this challenge in what is, let's face it, a global issue.

The article entitled '*The Marine Surveyor and the Gut Feeling*' by Hans de Koning, MBA MIIMS on page 137 certainly grabbed my attention when it was submitted for publication. Hans argues that these days marine surveyors can be led by gut feeling at times and he is rightly concerned what happens when objective evidence is avoided, overlooked or ignored. He has a valid point!

In her feature '*The Future of Sustainable Marine Manufacturing*', (see page 105), journalist Krystina Skibo admits that while "going green" is the phrase of the day, the path to true sustainability on the water is proving to be less of a sprint and more of a difficult upstream row.

As always, I am immensely grateful to all those who have contributed to this edition of The Report Magazine and hope you will find articles and content to inspire and educate you further.

Survey well,

Mike Schwarz
Chief Executive Officer



PRESIDENT'S COLUMN

Dear IIMS members and fellow maritime professionals

The Human Element

The tragic and avoidable accident involving *Peaky Blinder* highlights the responsibility the master has to their passengers and crew - be that a small, high-speed, pleasure boat or a cruise liner. As well as the impact on friends, family or colleagues, a serious marine casualty can also cause enormous environmental damage. Clearly, human factors are a significant or root cause in many accidents on the water and as such, they must be addressed - but by whom? In the UK, the Department of Transport must surely act now to enable a law that has been kicked down the road for far too long. But it is not

just alcohol that causes accidents. The International Safety Management Code (ISM) was born out of several tragic accidents that were largely caused by human factors, most notably the *Herald of Free Enterprise* incident.

The public, or someone new to marine surveying, could be forgiven for thinking that the role of the surveyor is to assess the physical nature and condition of a vessel or cargo. Indeed, draught surveys, pre-purchase surveys and surveys for insurance focus on the fundamental dimensions, structure or condition of a vessel or its cargo. However, if we look deeper into the role of the earliest surveying organisations, such as Lloyd's Register, the role of the surveying organisation was also to regulate human behaviour by, for example, requiring a

load line. While the position of the load line is determined by physical measurement and calculation, its role is very much to control human behaviour. In the UK Merchant Shipping Regulations the original wording was, '*The centre of this disc shall indicate the maximum load line in salt water to which the owner intends to load the ship for that voyage.*' That wording could clearly be interpreted in different ways and is now, '*A ship shall not be so loaded that if the ship is in salt water and has no list the appropriate load line on each side of the ship is submerged.*' Even the latest vessel technology involving unmanned and autonomous vessels is still controlled directly or indirectly by humans and therefore the vessel's performance and



safety is at the mercy of human factors. These human factors are best controlled via a structured, safety management system (SMS).

For surveyors new to safety management systems on small vessels, there is a concise introduction in UK MGN710 which provides guidance on how to assess an SMS on a UK Workboat, operating under Edition 3 of the Code. This approach is largely objective and via document sampling. This assessment is to confirm that the SMS is implemented and operational, as opposed to the more subjective requirements that many commercial operators and surveyors encounter when working with large energy companies.

As I wrote in the last Report, the value and adoption of the IMCA eCMID

programme for vessels under 500gt could be under threat through a lack of trust in the process by stakeholders, particularly in the offshore renewables sector. As well as some concerns around content, which I believe can be easily addressed via Annexes, other stakeholder concerns relate to the rigorous assessment of the SMS and how the SMS both influences and controls the behaviour of the vessel crew. This may be something as simple as ensuring that a procedure for entering a 500m exclusion zone is available, or something more subjective, such as, *'is a comprehensive passage plan available for the current voyage and does it cover the full voyage from berth to berth?'* If you review stakeholders' own suitability and fit-for-purpose surveys or audits, the terms can become far more subjective, for

example, *'do all crew show positive and safe behaviour?'* How does a surveyor assess the latter, or indeed the quality of a passage plan, within the timescale of a typical vessel inspection. Are surveyors competent to assess these topics, or does the question-set need to be re-written? I think both probably require our attention.

Surveyors are an integral part of a vessel and crew's life and to ensure the surveyor's role is both effective and successful I believe we should embrace and attempt to influence the quality of safety management systems and their assessment. Through this continuous improvement we will improve safety on the water.

Mike Proudlove
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ACR Electronics calls for global recognition of electronic flares

Marine safety equipment manufacturer ACR Electronics is calling for international standards to recognise electronic flares as an approved distress signal for commercial and leisure vessels.

The company, alongside its sister brand Ocean Signal, says electronic visual distress signalling devices (eVDSs) are emerging as an alternative to traditional pyrotechnic flares, following a transition by the US Coast Guard.

"In today's age, with a formidable array of reliable electronic safety tools and advanced modern alerting and locating systems available, ACR Electronics believes eVDSs are the logical alternative to pyrotechnic flares," says Mikele D'Arcangelo, vice president of global marketing and product management at ACR Electronics and Ocean Signal.

"Commercial operators and recreational boaters should no longer have to accept the drawbacks and risks associated with pyrotechnic flares, which raise issues for user safety and the environment, and create problems on land with disposal, transportation, and storage."

The US Coast Guard completed the removal of pyrotechnic flares from its cutters in June 2026, replacing them with eVDSs.



Photo credit: Carteret Fire Department & EMS Division

Turkish shipbuilding exports on course for record 2026

The Turkish yacht and shipbuilding industry is on course for a record 2026, having generated some US\$1.5bn in exports during the first half of the year and projecting year-end totals of between US\$2.5bn and US\$3bn.

Mustafa Talha Pepe, chairperson of the board of the Ship, Yacht and Services Exporters' Association (GYHIB), told Anadolu Agency the increase was driven largely by deliveries of fishing vessels, special-purpose ships and tugboats ordered by Northern European customers two to three years ago. He said the sector continues to strengthen its competitiveness in international markets and has made significant progress in recent years.

GYHIB has taken its message abroad, actively participating in shipbuilding and yacht exhibitions across Europe and organising one-to-one business meetings. Pepe added that ship and yacht building is one of Turkey's highest value-added export industries, generating an average export value of around US\$25 per kilogram, and that export growth has a positive ripple effect on employment, domestic suppliers and local manufacturing.



Mustafa Talha Pepe (pictured)

Firefighters rescued after whale sinks New Jersey emergency response boat

A New Jersey fire department has described the extraordinary moment one of its rescue boats was sunk by a surfacing humpback whale during a routine return from a marine security deployment. The collision left the vessel with catastrophic damage and underwater within minutes, but all three firefighters escaped unharmed thanks to nearby boaters, fellow emergency crews and the fact they were wearing lifejackets.

'While the Carteret Fire Department Marine Unit regularly trains to rescue civilians from the water and respond to marine emergencies, fires, and vehicle incidents, an event of this nature is something no one anticipates. Understandably, it has left those involved shaken, but we are incredibly thankful that everyone returned home safely to their families,' says an official statement on the unit's Facebook page.



ABS launches new route-based container lashing evaluation tool

A new online tool from ABS called Eagle CRoute is designed to help containership operators improve operational flexibility through route-based container lashing reduction factor calculations.

Changing port rotations, blank sailings, evolving stowage plans and shifting geopolitical conditions are increasing pressure on operators to make faster loading decisions. Eagle CRoute supports these decisions by calculating specific reduction factors for onboard lashing force assessments for any given route.

"Containership operators need practical tools that help them respond quickly to changing operating conditions without compromising safety," said Dr. Christina Wang, ABS vice president, engineering applications. "Eagle CRoute helps operators evaluate route-specific loading options and apply the flexibility available through ABS lashing notations."

Depending on the vessel's lashing notation, Eagle CRoute can determine different types of reduction factors. For vessels with the CLP-V notation, the tool calculates reduction factors for the entire route. For vessels with the CLP-V(PARR) notation, it can provide more detailed calculations, including split-route reduction factors between specific ports as well as seasonal reduction factors based on the time of year.



Nominations now open for the Saudi Maritime Awards 2027

The Saudi Maritime Awards 2027 will take place on 31 March 2027 at The Leylaty, Jeddah, bringing together leading voices from across the maritime industry for an evening dedicated to excellence, recognition, and meaningful connection.

The 2027 edition will feature 32 carefully selected award categories, evaluated by an independent panel of respected industry experts and thought leaders. The judging process is designed to ensure fairness, credibility, and transparency — recognizing measurable performance, innovation, and leadership across the maritime value-chain.

More than a ceremony, the Saudi Maritime Awards represent a gathering of industry leaders who share a common commitment to progress. The event highlights the Kingdom's expanding role as a regional maritime and logistics hub, reinforcing its dedication to advancing maritime excellence, strengthening partnerships, and supporting sustainable growth in global trade.

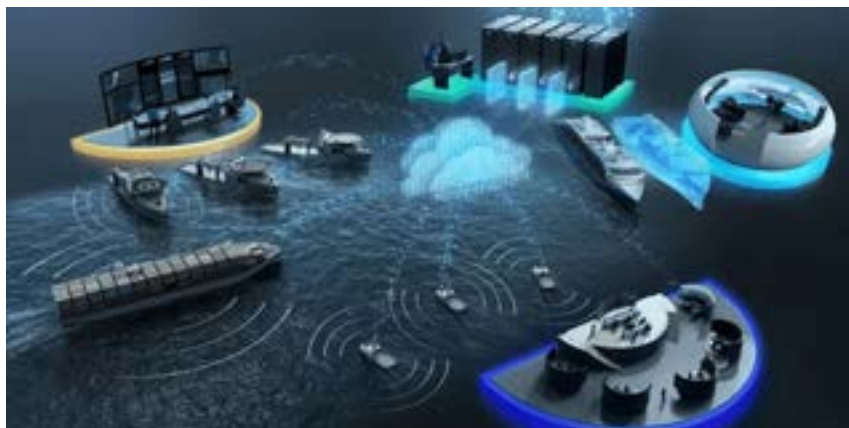
More information at <https://bit.ly/4vW74QX>.

Brunswick Corporation earns record number of employees on Boating Industry's 2026 'Women Making Waves' list

Brunswick Corporation has announced that seven of its female leaders have been named to Boating Industry magazine's 2026 list of Women Making Waves, the highest number of Brunswick honourees in the award's history.

The annual Women Making Waves list celebrates women across the marine industry who are driving meaningful impact within their organisations while championing innovation and growth across the sector. This year's Brunswick honourees highlight the impact and influence of its female leaders across the organisation, including:

- Kim Chapman, Senior Manager of Communications, Navico Group
- Jamie Evans, VP of Marketing, Brunswick Boat Group
- Laura Fleischman, Director of Dealer Sales, Mercury Marine
- Kim Greene, Executive Administrative Assistant, Mercury Marine
- Crystal Hollenbaugh, Chief Operating Officer, Freedom Boat Club of Wilmington
- Rebecca Waters, Senior Director, Marketing & Sales Enablement, Freedom Boat Club
- Jenny Westfall, Director of Internal Communications, Brunswick Corporation



U.S. recreational marine spending hit \$54 billion in 2025

The latest annual total industry sales by category and state report, part of NMMA's 2025 U.S. Recreational Boating Statistical Abstract, found that U.S. recreational marine retail spending totalled \$54 billion in 2025, reflecting the broad economic impact of recreational boating across sales of boats, engines, trailers, accessories and related spending categories.

Total marine retail expenditure include spending on new and pre-owned boats, outboard engines, trailers, aftermarket accessories, as well as boat use spending, including fuel, financing, insurance, docking and maintenance, according to NMMA. The aftermarket accessories category remained flat at \$12.1 billion.

New boats accounted for 20.3% of total boat unit sales in 2025 and pre-owned boats accounted for 79.7% of total boat unit sales, according to NMMA. Outboard boats led the new segment with 12.4% of all boats sold, followed by personal watercraft at 5.9%.

Kongsberg Maritime and BCIT announce landmark Marine Innovation Simulation Centre of Excellence

Kongsberg Maritime, and BCIT are pleased to announce a significant investment that will establish the Marine Innovation Simulation Centre of Excellence (MISE) in British Columbia. The initiative is designed to strengthen maritime innovation and skills development, support ongoing research and development, while building on key objectives outlined in Canada's Defence Industrial Strategy.

Through the partnership, BCIT's new Simulation Center will be built around the Kongsberg Maritime's simulation technology, providing a synthetic environment, development tools, and APIs to support collaborative applied research with Canadian industry, academia, defence, and public-sector stakeholders. It will serve as a platform for prototyping, human factor studies, testing, and accident and incident analysis including de-risking new concepts in areas such as maritime safety, autonomy, cyber resilience, critical infrastructure, port development, and low- and zero-emission operations. The hub will also help accelerate commercialization opportunities and support the development of sovereign Canadian capability in a strategically important sector.

Historic Maine windjammer sinks at Brooklyn pier

Victory Chimes, a 128-foot schooner featured on a 2003 commemorative Maine state quarter, was previously based out of Rockland, Maine. In 2023, it was sold to two brothers who have a history of converting ships into floating restaurants and moved to New York.



The U.S. Coast Guard confirmed receiving a report of a vessel, later determined to be Victory Chimes, taking on water near Henry Street Basin, near the Red Hook area of Brooklyn. Coast Guard Sector New York issued an urgent marine broadcast, and New York City police responded and tried to remove water from the vessel before it sank, said Sydney Phoenix, a Coast Guard public affairs specialist. She said there were no known pollution risks from the sinking.

Built in 1900, Victory Chimes operated as a windjammer starting in 1954, giving tours of the Maine coast and accommodating up to 43 passengers.



Oceanco acquires Dutch equipment manufacturer

Dutch boatbuilder Oceanco has acquired Winel, a specialised Dutch marine and offshore equipment manufacturer. The move brings Winel's engineering expertise into the group, which also includes Alewijnse, Aluship, Lateral and Mercury.

Winel produces custom-made and standardised products for the maritime sector through its businesses Staalart and Yachtsupport. Its product range includes tank vent check valves, manually operated doors and hatches, watertight sliding doors, hull doors and yacht equipment.

The company, founded in 1956, is headquartered in Assen, the Netherlands, where its main production facility is located. It also serves the commercial shipping and offshore sectors. Oceanco says Winel will continue to operate with the same team and strategic direction while serving both existing and new clients.



Eric Alström appointed group president and CEO of Hempel

Eric Alström will become group president and CEO of Danish coatings manufacturer Hempel on 1 August 2026. He succeeds Michael Hansen, who left the company in June 2026. The appointment follows an interim leadership period led by Peter la Cour Gormsen, executive vice president and chief financial officer, and Emilie Barriau, executive vice president and chief technology officer.

Alström joins Hempel after more than 30 years in international executive leadership roles across Europe, the US, Japan and China, spanning the industrial technology, automotive and manufacturing sectors. He holds a master's degree in management from Stanford Graduate School of Business.



Salvage team has cleared nearly all cargo from wreck of MSC Baltic III

The salvage efforts to remove the wreck of the containership MSC Baltic III from the shores of Newfoundland, Canada, are continuing to make progress, with nearly all the cargo now off the ship. Preparations continue for the key step when the hulk will be split, and the forward section pulled onto shore for dismantling.

The Canadian Coast Guard had previously said the efforts were making good progress with the good weather and the team from Resolve Marine, which took over this spring to undertake the removal operation. The efforts continue to make progress, both clearing the wreck and with onshore preparation for the massive pullers and chains that will bring the wreck ashore.

The Canadian Coast Guard reported the ship is down to its final four containers. The efforts have been proceeding with the remaining badly damaged and waterlogged containers in the holds, which

contained rotting materials. When Resolve took over, 409 of the 462 containers aboard the ship, including dangerous goods, had been removed. The remainder were in the holds, which were flooded.

There remains a concern about hydrogen sulphide levels from the submerged containers. The Coast Guard reports that experts are on-site to monitor the levels, and crews working in the area are taking appropriate precautions. The containers are being carefully removed and placed on barges with sides to prevent any leakage from the material.



Sanlorenzo launches first Heritage model ahead of Cannes debut

Sanlorenzo has launched the first unit of its new Sanlorenzo Heritage model, named SHE, ahead of the yacht's world debut at the Cannes Yachting Festival in September.

The vessel features exterior design by Zuccon International Project and interiors by Piero Lissoni of Lissoni & Partners. The design draws on 1960s yacht styling, reinterpreted through contemporary engineering and materials.

The yacht emphasises spatial continuity between interior and exterior areas, with a focus on proportion and functional layout. Design elements prioritise onboard living over decorative features.

Massimo Perotti, executive chairman of Sanlorenzo, said, "Innovation rooted in respect for tradition, SHE demonstrates how the most enduring ideas continue to inspire when reinterpreted with a clear and conscious intent."



Alex Gregg-Smith takes over as IACS Council Chair

IACS announced that, with effect from July 1, Mr Alex Gregg-Smith, President Marine & Offshore at Bureau Veritas, has assumed his duties as Chair of the IACS Council having been unanimously elected in December 2025.

In preparation, Alex Chaired the 93rd meeting of the IACS Council (C93) which took place in Busan on 17/18 June where he set out his vision for his term in office. In his opening speech, Alex highlighted that increasing geo-political upheaval and irregular operating conditions, exacerbated by disruptive technologies, reinforce the need for apolitical, technical leadership from IACS if quality shipping standards are to be upheld across the globe. He added that by speaking with a single, powerful voice, IACS can add significant value to the many technical and regulatory debates that are currently taking place, and which will determine the future shape of the industry.

100 Years of the Voith Schneider Propeller

In 2026, Voith celebrates a special milestone: 100 years of the Voith Schneider Propeller (VSP). This unique propulsion system revolutionized ship manoeuvrability and remains one of the most ground-breaking innovations in marine engineering.

The VSP concept originated from Austrian engineer Ernst Schneider, who was born on June 18, 1894. In 1926, his entirely new propeller design was successfully tested for the first time in model trials at the Vienna Ship Model Basin. Voith recognized the invention's potential early on and quickly developed it into a compelling, market-ready product.

Today, the VSP is considered one of the most significant maritime inventions of the 20th century and has become indispensable in tug and ferry operations, offshore applications, and a wide range of specialized vessels.

The operating principle of the Voith Schneider Propeller remains unique to this day. Several vertical blades arranged in a circular rotor move along a circular path while continuously adjusting their pitch. This allows thrust to be varied in any direction – providing instantaneous 360-degree manoeuvrability. As a result, the system offers extremely fast response times to steering commands, enabling highly responsive, safe and precise manoeuvring – even in wind, waves, currents and confined spaces. With its comparatively low rotational speed, the VSP is also highly robust and generates low underwater noise levels.

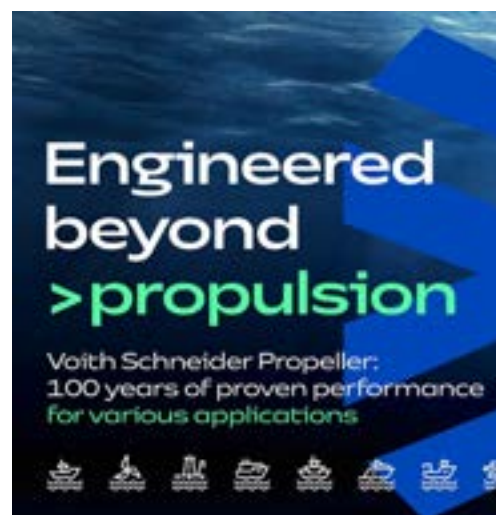




Photo credit: CMG

China commissions its largest semi-submersible crane vessel

China has delivered its largest semi-submersible crane vessel by lifting capacity, adding a new heavy-lift vessel that will support offshore wind farms, cross-sea bridges, ports and deep-sea resource projects. Built by Jiangmen Hengtong Shipbuilding, a subsidiary of CCCC Fourth Harbor Engineering Co., the vessel combines heavy lifting with offshore transportation, allowing it to move and install large marine structures.

According to state media, the vessel will be used for offshore wind projects, port construction, cross-sea bridges, marine ranches and deep-sea resource exploration.

The Sihang Yongsheng is a non-self-propelled semi-submersible barge designed for heavy lifting and offshore cargo transport. It is 110 metres (361 feet) long and 43.8 metres (144 feet) wide, with a 4,800-square-metre (51,700-square-foot) deck that can carry structures weighing up to 10,000 tonnes. At the stern is a fully revolving luffing crane with a 149-metre (489-foot) boom. The crane can lift cargo to a maximum height of 172.5 metres (566 feet), about the height of a 50-storey building.

When anchored for lifting operations, the crane can lift up to 2,200 tonnes (about 2,425 U.S. tons) in a single operation, making it China's largest fully revolving semi-submersible crane vessel by lifting capacity.



SEA Index certification expands to smaller pleasure boats

The Superyacht Eco Association (SEA) Index – an emissions measurement tool originally developed for yachts above 24 metres – is extending its certification programme to cover smaller pleasure boats.

The SEA Index was designed by Yacht Club de Monaco, and acts as an independent and impartial reference tool that allows stakeholders to measure the carbon intensity of yachts over 24 metres. To date, the SEA Index has certified more than 120 vessels using a carbon emissions assessment framework for yacht design.

The expanded scope of the index includes smaller pleasure boats from 10 metres, covering both monohulls and catamarans. SEA Index, working with Lloyd's Register, has developed reference models for displacement, semi-displacement and planing monohull boats, as well as production catamarans up to 35 metres.

Why New Zealand's best boat recycling idea isn't recycling at all

Two recent examples indicate older owners, no longer physically able to skipper a boat, have handed their vessels down to younger sailors rather than selling up or scrapping. The younger generation gets the boat without the upfront cost of buying one, and brings the enthusiasm and energy to refit and refurbish a hull that might otherwise have sat unused or gone to landfill. It's a hand-me-down model rather than a disposal model, extending a boat's useful life instead of ending it, and it costs nothing to set up beyond one owner knowing another boatie who's keen.

It's a small idea against a growing problem. New Zealand has one of the highest rates of boat ownership per capita in the world, and a huge slice of that fleet dates back to the boom years of the 1970s and 80s, when fibreglass production ramped up fast and boats were built in serious numbers. Many of those hulls are now pushing 40 to 50 years old. Fibreglass doesn't fail the way steel or wood does. It doesn't rust and it doesn't rot, so a well-kept polyester hull can stay structurally sound for decades. Eventually, though, every boat runs out of road, whether through damage, cost of upkeep, or simply nobody wanting it anymore.





Boskalis Christens Largest Subsea Rock Installation Ship 'Windpiper'

Boskalis has christened the Windpiper after completing an 18-month-long conversion program, which transformed the ship into what the company claims is now the largest subsea rock installation vessel in the world. The ship is 227 m long, 40 m wide and can carry up to 45,500 metric tons of rock in two of its cargo holds, enabling it to undertake projects which require long transits between loading facilities and offshore construction sites while decreasing the number of trips.

The Windpiper has 7 thrusters, a moonpool for fall-pipe rock installation, and an inclined fall pipe to place protective rock around offshore infrastructure, including foundations of offshore wind turbines. The ship also has over 100 cabins for crew and client representatives.

ISO-compliant fuels are increasingly causing operational problems

Lloyd's Register (LR) has warned that routine fuel quality checks may no longer be enough to identify emerging risks, as some bunker fuels pass standard ISO 8217 testing while concealing stability, compatibility and performance issues.

In its latest Fuel Oil Bunker Analysis and Advisory Service (FOBAS) Fuel Quality Report, covering the first half of 2026 (H1 2026), LR highlights that off-specification fuels remain a persistent concern for the maritime industry.

However, the most disruptive cases are increasingly linked to fuels that technically meet specifications but later reveal operational risks during use.

Investigations have found that some compliant fuels contain unconventional blend components or exhibit poor stability and compatibility characteristics that are not detected through routine testing, requiring deeper forensic analysis to identify the underlying causes.

Several recent incidents have highlighted the growing concern. In March and April, multiple vessels experienced operational problems after taking on fuel at a major bunkering hub. Subsequent analysis found elevated levels of Estonian shale oil in many of the affected fuels, with concentrations estimated in some cases at around 10–15%.

Download the report at
<https://bit.ly/4plGzSF>.



CNB founder and former Groupe Beneteau Boat Division CEO dies

Groupe Beneteau has announced the death of Dieter Gust on Wednesday, July 8, following a 10-year illness.

Gust co-founded Construction Navale Bordeaux (CNB) in 1987 with Olivier Lafourcade. He joined Groupe Beneteau in 1992, serving as chief executive officer of CNB before becoming chief executive officer of Groupe Beneteau's Boat Division, a position he held until 2019.

During his tenure, Gust established CNB Yacht, which specialises in large aluminium sailing yacht construction, and was instrumental in developing the Lagoon multihull brand.



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Canal & River Trust survey shows boater satisfaction falling after drought disruption

England and Wales's prolonged drought in 2025 left a lasting mark on the country's inland waterways, with new figures showing boater satisfaction has fallen as cruising plans were disrupted by unprecedented canal closures. While Canal & River Trust says confidence has held up better than expected the survey highlights how increasingly extreme weather is reshaping expectations for canal networks across the UK.

In its latest Annual Boaters' Survey results, Canal & River Trust says overall satisfaction is now 50 per cent, down from 55 per cent in 2024 but remaining above the 2024 low point of 46 per cent. This comes in a context of 'significant disruption' across the network.



Photo credit: Canal & River Trust

Safe removal of masts from historic WWII shipwreck carrying wartime explosives begins

Work to remove the masts from the SS Richard Montgomery will begin in early September, marking a significant milestone in the long-term management of the historic wreck, the UK Government has confirmed. The operation will involve constructing an underwater platform to allow specialist maritime engineers to cut the three masts over the course of several weeks.

The wreck contains around 1,400 tonnes of wartime explosives, which is why every aspect of the operation has been developed under rigorous safety and engineering standards. Once removed, the masts will be sent to The Historic Dockyard Chatham, which is home to specialist restoration facilities, where they can be properly preserved. This means an important piece of Anglo-American maritime history will be preserved for future generations – telling the infamous story of the American Liberty ship that ran aground in the Thames Estuary in 1944 while carrying munitions to support the Allied War effort.

The project is backed by £9.5 million Government funding. The iconic shipwreck, which lies in the Thames Estuary 1.5 miles off Sheerness and is surrounded by an exclusion zone, has been subject to continuous monitoring and extensive technical assessment since it sank in 1944.

Independent expert advice has confirmed the planned operation can be carried out safely without increasing the risk posed by the explosives remaining onboard. Works are due to begin in September.



Mixed financial picture of concern for British Marine

Ahead of the recent AGM, the directors released the group strategic report and consolidated financial statements of British Marine Federation and its subsidiaries for the 12-month period ended 31 December 2025.

The report reveals a mixed financial picture for the organisation. Turnover in the period was reduced by £524,513 compared to 2024, largely due to a reduction in marina-generated turnover at the 2025 Southampton International Boat Show.

However, on the plus side, British Marine returned to profit in 2025. For the 2025 financial year, they produced a profit of £50,309, compared to a loss of £359,025 in 2024.

Overall net assets for the group increased by 10.1 per cent, compared to a reduction of 41.9 per cent in 2024, from £497,505 reported at the last financial year end to £547,814 reported at this financial year end.

Notably, membership has fallen from a high of around 1,500 in 2019 to about 1,300. This has been highlighted by the directors as a point of principal risk for the organisation.

British Marine continues to operate with negative working capital and relies on financing and cash flow management. Current liabilities exceed current assets by £2.78m, although this improved slightly from £2.9m in 2024.

Although the group returned to a modest profit and improved its net assets in 2025, its interest costs remained high at £146,375 – almost three times its annual surplus.



Women in Marine returns to Southampton International Boat Show 2026

British Marine has announced the return of its popular Women in Marine panel and networking event at Southampton International Boat Show 2026, bringing together an inspiring panel of young female professionals to share honest insights into careers across the marine industry.

Taking place on Wednesday 23 September from 17:00–19:00 at Dockside, the event will once again provide a platform for open discussion, career inspiration and meaningful networking, while highlighting the breadth of opportunities available across the sector. Following record attendance in 2025, which attracted more than 130 industry professionals, students, career changers and aspiring marine talent, this year's event returns with the theme: 'Real Women. Real Jobs. Real Opportunities'.

Designed to challenge perceptions and showcase the diverse career paths available within the marine industry, the 2026 panel will feature young women working across marine manufacturing, superyachts, yacht brokerage and marine law, each sharing their personal career journeys, professional experiences and lessons learned along the way.



Now, with changes at the dockyard forcing the vessel to vacate its current berth, campaigners fear the historic warship's future is once again in jeopardy. The Q-Ship Society, which has been leading efforts to preserve the vessel, is calling for urgent action to secure a permanent home for the ship on the Medway.

Launched in 1918, HMS Saxifrage was built as an Anchusa or Flower class sloop and served as a so-called 'Q-ship', a heavily armed vessel disguised as an ordinary merchant ship in an attempt to lure German U-boats into attacking before revealing its hidden weapons. Campaigners describe the vessel as an exceptionally rare survivor of a conflict that transformed naval warfare.



Photo credit: Royal Navy

Royal Navy achieves world's first airborne launch of uncrewed boat

The Royal Navy has successfully carried out the world's first airborne launch of an uncrewed surface vessel (USV) from a military transport aircraft.

During a six-day trial over the North Sea, engineers and defence partners completed four successful airdrops of a Kraken K3 SCOUT uncrewed surface vessel from an Airbus A400M aircraft flying at 1,300 feet. Using a parachute-based delivery system, the vessel landed safely in the water, remained fully operational and was ready to begin its mission.

The trials were conducted as part of the Royal Navy's Project Beehive, which is working to bring uncrewed and autonomous technologies into service as the Navy develops a future hybrid fleet of crewed and uncrewed vessels. The new launch method allows an uncrewed boat to be deployed directly into an operating area without the need for a nearby port or support ship.

Race to save First World War warship at Chatham Dock

A campaign has been launched to save one of the world's last surviving Royal Navy warships from the First World War after the vessel was told it must leave its berth at Chatham Docks, raising fears that it could be removed from the River Medway altogether.

HMS Saxifrage, later known as HMS President, is currently moored within the commercial docks at Chatham, where she has remained largely hidden from public view since being relocated from London in 2016. The ship was previously a familiar landmark on the River Thames for more than nine decades before being moved to Kent to make way for the Thames Tideway Tunnel project.

Ocean Signal recognised with King's Award for Enterprise at royal reception

The UK safety equipment manufacturer was honoured at St James's Palace for innovation behind its rescueME PLB3 personal locator beacon. The company has been recognised with a King's Award for Enterprise at a royal reception hosted by His Majesty The King at St James's Palace. The Margate-based company was represented by chief technical officer and founding member Simon Nolan at the event on 8 July, where King Charles III congratulated business leaders and innovators from across the UK. His Majesty was joined by senior members of the Royal Family, including Her Royal Highness Princess Anne, The Princess Royal, who is President of the RYA.

Ocean Signal received the King's Award for Enterprise 2026 in the Innovation category for its rescueME PLB3 Personal Locator Beacon – the world's first personal locator beacon to combine 406MHz and AIS (Automatic Identification System) capability.



Ocean Signal's Chief Technical Officer Simon Nolan (right) meets Her Royal Highness Princess Anne, The Princess Royal Photo credit: Ian Jones



BBA graduates launch their new boats

The latest graduates from the Boat Building Academy (BBA) couldn't disguise their joy as they launched their new boats into the sea at Lyme Regis on the hottest June day ever recorded. The 16-strong cohort enrolled at the college in September 2025 and together have built an 18ft (5.5m) traditional clinker double ender commissioned by the family of student George Snellgrove, a 16ft (4.9m) glued clinker, cutter-rigged sailing dinghy, based on Francois Vivier's Ebihen design commissioned by student John Piper, and a 17ft (5.2m) strip-planked Gartside runabout powered by a 30hp outboard motor, commissioned by student Gordon Gray.

The June launch is the latest in a run of successes for the BBA. The student cohort which launched their boats in June 2026 was evenly split between men and women for the first time ever and collectively won the Rising Star accolade at this year's Classic Boat Awards.

New Isles of Scilly ferry Scillonian IV undergoes sea trials

The Isles of Scilly Steamship Group reports that its new purpose-built passenger ferry, Scillonian IV, has undergone sea trials in Vietnam. This marks a significant milestone in the ship's construction, during which its performance, manoeuvrability, propulsion and onboard systems will be rigorously tested at sea to ensure they meet design specifications and international standards.

Following the completion of sea trials, Scillonian IV is undergoing final fit-out and certification before making her delivery voyage to the U.K. ahead of entry into service. Once in service, Scillonian IV will carry up to 600 people, a 24% increase on current levels, while reducing journey times. It will feature roll and pitch reduction systems, enhancing passenger comfort, and is designed utilising modern propulsion technologies that improve efficiency and reduce environmental impact.



Phot credit: Isles of Scilly Steamship Group

Shipping and Boating by Number 5

In this regular feature, numbers are widely used to highlight some of the key points of the stories. Numbers are often considered more important than words when conveying precise information, as they provide an objective way to represent data, making it easier to compare, analyse, and understand facts quickly. Words can be subjective and open to interpretation.



Dometic Group president and CEO Juan Vargues said the company remains focused on elements it can control to protect profitability

Dometic Group reported growth in its marine business during the second quarter of 2026, despite a soft US market affected by weakening consumer confidence.

Dometic Q2 marine business grows despite softer US market

The company reported **consolidated net sales of SEK 5.96bn** for the second quarter of 2026, representing **a 5% year-over-year decline from SEK 6.26bn** earned in the corresponding period of 2025. **Organic sales fell by 1% YoY.**

Gross profit totalled SEK 1.79bn, down from the SEK 1.86bn reported one year ago, although **gross margin improved to 30.1% of net sales from 29.7% in Q2 2025**. The company attributed the margin improvement to a favourable sales channel mix and benefits from restructuring initiatives, partly offset by higher material and freight costs. Tariff-related costs were largely offset by refunds received during the quarter.

EBITA amounted to SEK 739m, representing **a margin of 12.4%, compared with SEK 877m and a 14.0% margin for the prior-year period**. The company said earnings were affected by higher material and freight costs, together with a SEK 52m bad debt charge relating to the bankruptcy of US retail chain West Marine.

Net profit for the quarter was SEK 240m, compared with SEK 348m earned in Q2 2025.

Photo credit: Chinese State Media



China deploys first 16MW floating offshore wind tension-leg platform

China continues its developments, placing it at the forefront of the offshore wind energy sector. In the latest development, officials reported deploying the largest tension-leg floating offshore wind platform **designed to hold a 16 MW turbine**.

The platform was assembled at the Gaolan Port in Zhuhai, south China, and departed on June 28 for its deployment in the South China Sea. The **structure stands more than 307 meters (1,007 feet) and weighs almost 8,000 tonnes**. It is the largest of its kind, designed to support a single turbine. Once it is operational, it will **generate around 54 million kWh annually**.

Officials said the deployment is part of China's accelerated efforts to scale up and commercialize deep-sea floating offshore wind technology. The industry has already conducted several demonstrations, and it is ready to move forward with commercial deployments.

The deployment is also unique as the single turbine will be positioned near the Lufeng oilfield cluster. It is **located approximately 250 km (155 miles) southeast of Hong Kong** in the South China Sea. It is in an area with a **water depth of 330 meters (1,082 feet)**, and it is prone to tropical cyclones.

The turbine will be providing power to the power grid for the oil field through subsea cables attached to the grid. Norway in 2022 launched a similar application on a smaller scale with an **11-turbine wind farm, Hywind Tampen**, which **uses 8.6 MW turbines** supplying electricity to Equinor's oil and gas fields Snorre and Gullfaks in the Norwegian North Sea. This will be China's first installation where it is integrating renewable energy into oil and gas operations.

Nimbus reports lower first-half sales

Nimbus Group has reported lower sales for the second quarter and first half of 2026 as demand in the recreational boat market remained subdued, although quarterly earnings were broadly in line with the previous year after cost reductions and higher gross margins offset the impact of lower sales.

Net sales for the second quarter (April-June 2026) **fell 16 per cent year on year to SEK 479m (\$47.9m) from SEK 571m (\$57.1m)**. Commercial sales **declined to SEK 203m (\$20.3m) from SEK 297m (\$29.7m)**, while retail sales were **broadly unchanged at SEK 276m (\$27.6m) compared with SEK 274m (\$27.4m)** a year earlier. Organic growth was **negative 16 per cent**.

EBITDA was a loss of SEK 4m (\$0.4m), compared with a **profit of SEK 13m (\$1.3m)** a year earlier. Operating **cash flow improved to SEK 110m (\$11m) from an outflow of SEK 37m (\$3.7m)**.

For the first six months of 2026, **net sales fell 16 per cent to SEK 736m (\$73.6m) from SEK 871m (\$87.1m)**. Commercial sales **totalled SEK 408m (\$40.8m)**, down from **SEK 541m (\$54.1m)** in the corresponding period of 2025, while retail **sales were broadly stable at SEK 328m (\$32.8m) compared with SEK 330m (\$33m)**. **EBITA was a loss of SEK 4m (\$0.4m)**, compared with a **profit of SEK 13m (\$1.3m)** a year earlier. Operating **cash flow improved to SEK 110m (\$11m) from an outflow of SEK 37m (\$3.7m)**.

Gross profit was unchanged at SEK 68m (\$6.8m) despite lower sales volumes. The company says this reflected improved production performance, a more favourable product mix and the effect of cost-saving measures.

During the quarter, Nimbus secured its first order for the MSMB200 workboat from the Swedish Armed Forces. The contract is **valued at approximately SEK 260m (\$26m)**, **with deliveries scheduled to begin in January 2027 over a 36-month period**.

UK sail training sector records more than 47,000 days at sea

The UK's sail training sector **delivered more than**

47,000 days at sea during 2025, according to a new impact review from the Association of Sail Training Organisations (ASTO), underlining both the scale of its activities and growing demand for programmes that develop skills and confidence among young people.

ASTO's **Spring 2026 Impact Review** found that its members collectively **delivered 1,334 voyages, accounting for 47,467 days at sea and supporting 10,684 participants** during the year.

The association represents **more than 30 charitable organisations** operating a **combined fleet of over 60 vessels**, providing residential sail training programmes focused on practical seamanship, teamwork and shared responsibility at sea.



Photo credit: Ellen MacArthur Cancer Trust

ASTO chief executive, Kerry McMillan said, “The need for sail training is increasing, particularly among young people who lack opportunities to build confidence and valuable life skills.

“This review demonstrates the scale of what the sector already delivers, and the importance of sustaining capacity across the UK fleet.”

D-Marin sold to European private equity firm

CVC has entered into an agreement to sell CVC Capital Partners VII's stake in D-Marin, the international marina operator, to InfraVia Capital Partners, a leading independent European private equity firm.

During **CVC's ownership since 2020**, D-Marin evolved into the EMEA region's leading premium marina operator. CVC assembled a new management team and drove substantial geographic expansion beyond the company's established presence in Turkey, Croatia, Greece, and the UAE, adding operations in Spain, Italy, France, Malta, and Albania.

The company now **operates 28 premium marinas across 9 countries, serving more than 50,000 customers** annually. Its portfolio **includes over 14,300 berths** – among them **more than 1,000 superyacht berths** – and **12 professional boatyards that service over 2,500 yachts** each year. CVC also invested heavily in digital infrastructure, developing what the company describes as one of the industry's most technologically advanced operating and customer experience platforms.

István Szőke of CVC said: “When we invested in D-Marin, we saw a business with tremendous potential. Having put in place an outstanding management team, led by Oliver Dörschuck, we transformed the business from a hidden gem into the clear market leader in premium marinas across Europe and the wider EMEA region. We expanded significantly across the Mediterranean, built the sector's most digitally advanced platform, and created a business with unmatched scale, customer experience and operational excellence. We are incredibly proud of what we have achieved together and believe D-Marin is uniquely positioned for continued success in its next chapter.”



Marina Didim



Chinese shipyards double their new order volume in first half of 2026

In the first half, China's shipyards took on *twice as many new orders as they did during the same period in 2025*, according to the latest numbers from Clarksons.

Out of a **total of 1,481 vessels ordered worldwide** during the period, China **took**

in 1,131 orders totalling 31 million compensated gross tonnes – about **72 percent of total market share**, roughly equivalent to its dominant position in the industry in 2025. China has secured the majority of global shipbuilding orders for the last four years running and continues to solidify its wide lead over its nearest competitor, South Korea.

The large **Korean shipyards brought in 195 vessel orders totalling about eight million CGT** – **60 percent more** than they won during the same period last year, but far behind China, with just a fifth of global market share for the first half of this year. **China's market share lead over Korea is expected to widen to 53 percentage points** for the full year in 2026.

However, Korean yards are optimizing for profit rather than volume and have been selective in picking orders. The Korean Big Three have secured a much higher proportion of the more profitable vessel classes – like LNG carriers, a longtime Korean specialty. Korea holds about two-thirds of the global orderbook for LNGCs, according to Wood Mac.

Swedish Maritime Administration faces SEK 26m loss after Marell Boats bankruptcy

When Marell Boats entered bankruptcy proceedings earlier this year, the Swedish Maritime Administration had received only **one of four pilot boats covered by a contract signed in 2024**. Having paid almost the entire contract value in advance and failing to **extend the bank guarantee in March 2025** despite project delays, the agency now risks losing the payment.

"The day the bank guarantee expired, we lost every opportunity to recover that money," Erik Eklund, director general of the Swedish Maritime Administration, told Sveriges Radio.

A bank guarantee is an agreement under which a bank guarantees payment to a beneficiary if its customer fails to fulfil contractual obligations. Such guarantees reduce commercial risk and provide security for both parties, without transferring contractual responsibilities to the bank beyond the agreed terms.

The contract, **valued at approximately SEK 30m**, covered four **13-metre aluminium pilot boats**. Around **SEK 26m was paid in advance**, according to Sjöfartstidningen and Sveriges Radio.

An **advance payment of around 85% of the contract value** is unusual for this type of shipbuilding contract. Speaking to Sjöfartstidningen, Eklund suggested one possible explanation was that the Swedish Maritime Administration had received **annual government funding of SEK 45m over three years** to develop solutions for a future fossil-free fleet. He said this may have created pressure to utilise allocated funding before the end of the financial year, combined with insufficient procedures to ensure the bank guarantee was extended once delays occurred.

"When it comes to investments in fossil-free solutions, there are unfortunately suppliers trying out new technology that do not have the financial strength to complete everything," Eklund told Sjöfartstidningen.

In addition to the boat already delivered, **two further vessels remain partially completed** and form part of the bankruptcy estate. The hull for the fourth boat is reportedly at a subcontractor's facility.



Swedish Maritime Administration, director general, Erik Eklund. Photo credit: Sjöfartsverket/Ulla-Carin Ekblom



Nicolas Gardies, CEO of Fountaine Pajot, who will oversee a phased handover ahead of his planned 2027 retirement

Fountaine Pajot announces management reshuffle amid revenue and profit decline

Fountaine Pajot has announced a management reshuffle following a **decline in sales and profits for the first half of fiscal year 2025/26**. The group reported **revenue of €136.3m, down from €156.2m in the same period of 2024/25, while net profit fell to €5.2m from €15.3m**.

Despite challenging market conditions, the company said it continues to invest in renewing its product ranges, including its Fountaine Pajot sailing catamarans, Fountaine Pajot yachts and Dufour brands.

According to the company, the changes in its management team reflect the board of directors' commitment to "strengthening the organisation in order to support sustainable growth, prepare for future developments and rely on an agile, collaborative and internationally focused leadership structure". After many years leading the group, chief executive officer Nicolas Gardies will oversee a phased transfer of his responsibilities ahead of his **planned retirement in 2027**. To ensure a smooth transition, the board has appointed Mathieu Fountaine as deputy chief executive officer.

Stéven Guedeu becomes joint deputy chief executive officer. For the **past 15 years**, he has played a key role in the commercial development of the brands while strengthening their international presence. In his new role, he will oversee the group's sales and marketing activities and support the execution of its long-term development strategy.



Mike Proudlove (left) accepting the President's medal from IIM CEO, Mike Schwarz



Mike Proudlove takes over as IIMS President

At the IIMS Annual General Meeting, broadcast live from the Institute's headquarters on Tuesday 2 June, long-standing member, Mike Proudlove FIIMS, took over as the next President. He will serve a two-year term.

In handing over the reins to Mike, the outgoing President, Capt Ruchin Dayal, gave a passionate final address from his Goa location as he spoke to an audience of nearly 100 members and other interested parties (in-person and online). He said how honoured he has been to have carried out the role of IIMS President and offered some highlights of his time in office, one being last year's high-profile Goa conference. He stressed how his time in office had flown by and said it has been one of his proudest professional career achievements.

Following in the footsteps of the now immediate Past President, Capt Ruchin Dayal, Mike paid tribute to the excellent work he had done to promote IIMS over the past two years and thanked him on behalf of the Board and members worldwide.

Mike Proudlove presenting Ruchin's outgoing President's medal remotely Mike then went on to offer some parting gifts to Ruchin, which included the Past President's medal, an engraved gold nib Parker Pen, a novel pair of nautical socks and an as yet unfinished piece of artwork in watercolour that IIMS has commissioned as a special and lasting memento.

In his acceptance speech, Mike said what an honour it was to take over the IIMS presidency. He reminded attendees that he has been a member for over 20 years. He brings significant and deep experience of the workboat sector in which he is currently working.

With Mike Proudlove assuming the presidency, David Pestridge has taken on the role of Vice President. Australian-based Mick Uberti MIIMS, was elected as the new Deputy Vice President.



Mike Proudlove presents a Lifetime Achievement Award to Capt John Noble HonFIIMS (pictured left)



2026 Annual General Meeting Report

The IIMS AGM was held on Tuesday 2 June 2026. Members of the management board in the office were joined by nearly 80 online members (and others) as well as the IIMS head office team. 28 apologies were received.

IIMS CEO, Mike Schwarz, anchored proceedings from Murrills House as he hosted his twelfth AGM.

Mike gave a comprehensive presentation and overview of the work of the IIMS

Voting on Institute matters

A total of 131 votes were cast, the highest number anyone can recall. However, not all those who voted were entitled to do so. This left a balance of 75 eligible votes. Here are the results.

1. Appointment of Mick Uberti as Deputy Vice President. **Votes in favour 66**

Those abstaining 10 **Votes received against 1**
Mick's appointment is approved.

2. Management Board re-election en-bloc **Votes in favour 72**

Those abstaining 4 **Votes received against 1**
The management board is re-elected en-bloc.

3. Proposed Fee Structure for 2027 Membership **Votes in favour 53**

Those abstaining 7 **Votes received against 17**

The proposal to increase membership fees by 4% in 2027 is approved.

At this year's AGM, two Lifetime Achievement Awards were announced

Awarded to John Heath HonFIIMS

John is a long standing Executive Director of IIMS Ltd. He has served the maritime industry with distinction for over half a century. Furthermore, he has been heavily involved with the IIMS Certifying Authority and is its deputy Chair. Despite moving into semi-retirement, he continues to be on-hand to advise and attend

meetings. John's in-depth knowledge of naval architecture, stability and vessel structure are exemplary and have been invaluable in his work as the IIMS Technical Director. Sadly, John was unable to be at the AGM in person to receive his award.

Awarded to Capt John Noble HonFIIMS

Not only has John, a former member of the IIMS management board, displayed exceptional qualities as a marine surveyor for many decades before retiring a few years ago, but he also became something of a recognised media and television personality, often commenting on maritime disasters. Additionally, John was an engaged member of the Institute's Education Committee as well as being a tutor, author and marker. John's visits to the office were always appreciated by the team, for he always brought the best selection of biscuits imaginable!

In closing the AGM, Mike Schwarz proposed vote of thanks to the many people who are involved in keeping IIMS at the forefront of the marine surveying industry, including the head office team, management boards and committees, suppliers and of course, the Institute's members.

Royal honour for yachtsman, author and IIMS Honorary Fellow, Ian Nicolson

News has reached the IIMS head office about a prestigious Royal award that has recently been given to the Institute's oldest member.

Ian is still surveying, winning races and writing books at the grand old age of 97.

Ian, who lives in Cove, Scotland, will receive an MBE after being included in the King's Birthday Honours List last month.

Recently, he won the CYCA two-handed class at the Scottish Series on Loch Fyne and has since competed again in the Round Bute Race, partnered by a relative youngster aged just 80. An expert in surveying, yacht design and restoration, he has published 27 books (including several handy guides through IIMS) and is still writing.

A citation from the Cabinet Office said, "Ian has dedicated nearly eight decades as a sailing enthusiast, volunteer instructor, and role model, profoundly shaping the lives of countless individuals.

"He is a widely regarded subject matter expert in yacht design, maintenance, and restoration, having authored over 27 books, including the "bible of boat data," and continuing to contribute as a prolific writer and illustrator for yachting publications.

"His unparalleled technical knowledge, particularly of older vessels, and his passion for sharing this expertise have ensured that vital seafaring knowledge is preserved and passed on.

"As a founding member and long-serving port officer of the Ocean Cruising Club, he provided guidance and hospitality to visiting sailors for over 70 years.

"He remains an active sailor, yacht racer, surveyor, designer, and advisor, serving as an inspiration through his enduring enthusiasm, humility and commitment to community engagement."

Mike Schwarz, IIMS CEO, added, "I am fortunate enough to have got to know Ian quite well over the years. He has spoken at IIMS events with authority and clarity, and he is revered throughout the marine surveying profession for his contribution to the sector. And let me tell you, no one illustrates a book better than Ian with his enchanting hand-drawn illustrations that are beyond compare. Your award is well deserved, Ian. Congratulations from all at IIMS and the wider membership and surveying community."



New face joins IIMS

At the end of last month, IIMS waved goodbye to Erin Kelsey. After a couple of years working in the IIMS Certifying Authority team supporting David Parsons, she has relocated with her partner to the north of England.

Erin is replaced by Meggan Bell who steps into the hot seat. Meggan is an experienced administrator whose most recent role was working for the UK National Health Service in Southampton.

Meggan has had a couple of weeks side by side training with Erin, and her first job is to become capable to process and authorise the many tonnage applications IIMS receives. Thereafter, she will learn to support David with MCA coding administration.

We wish Meggan good luck in her new position.



A special plea to IIMS members to check how accurate is what we say about your surveying skills on your listing pages?

A recent open debate at the quarterly management board meeting sparked an interesting debate about an individual member's list of specialisations that they have been approved to display.

After much discussion, it has been decided to discard the word 'specialisation' in favour of 'surveying categories'.

The word 'specialisation' is defined as the process of focusing on a specific subject, skill, or type of work, or a particular area of expertise. Specialisation occurs when a marine surveyor concentrates their efforts and resources just on a narrow range of surveying activities to build high proficiency in that area of work.

It is apparent from looking at some existing members' listings that they offer and perform a far wider range of surveys than just those they specialise in. Therefore, the term 'surveying categories' better serves the thousands who will search the IIMS website or search app looking for a surveyor. For example, if it is 20 years since you last conducted a bulk cargo survey, or 15 years since you inspected a wooden craft, IIMS would urge you to consider if you are still competent to carry these out.

Furthermore, in discussion with a number of senior and experienced members, it became apparent that they no longer perform the surveying activities they were approved to do some years ago. Indeed, some said they are now engaged in other activities having extended their experience and knowledge, which are not shown on their listing.

This is a long-term project which will take time to complete. But for now, IIMS is asking members to take a long hard look at their surveying categories. Are they still correct? The Institute won't remove any of your existing listings without your permission, but you are asked to do an honest assessment and appraisal.

We will be writing to all members to notify them that this process is underway. If in the meantime you want to start the ball rolling, please reach out to Membership Secretary, Rachel Lock, by email at membershipsupport@iims.org.uk.



The first IIMS President, Capt Bill MacDonald visits IIMS HQ

IIMS Chief Executive Officer, Mike Schwarz, was delighted to welcome Capt Bill MacDonald (pictured left) to Murrills House last month during his visit to the UK from his home in Belize. Capt Bill was the first President from 1991-1993 following the formation of the Institute.

Capt Bill and Mike shared stories and talked about the growth and development of IIMS in recent years over a convivial lunch. Bill reminisced with Mike about the challenges and opposition he and colleagues faced to get the Institute off the ground in the early days.

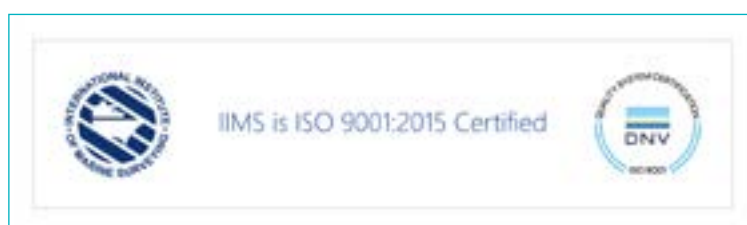
In a follow up email after the meeting, Capt Bill said, "It was a great pleasure for me to go to the IIMS head office and meet, not only you, but also all the great staff who help in making things happen. I had a most interesting day, and I thoroughly enjoyed every minute of it. The Institute has gone from strength to strength. It is just amazing and believe me, it has pleased me immensely."

IIMS extends its ISO 9001:2015 certification

ISO 9001 is the world's leading standard for a Quality Management System (QMS). Created by the International Organization for Standardization (ISO), it gives businesses a framework to consistently meet customer expectations, follow rules, and improve their work over time. Millions of organisations around the world have met the standard and have been certified.

In 2025 following a lengthy period of preparing the business for an ISO 9001 external audit by DNV, IIMS gained ISO 9001:2015 certification with a scope of 'Training services in marine surveying'. There were no major and no minor findings recorded at that initial audit.

Roll on one year to June 2026, and IIMS decided to extend its ISO scope further to bring the Institute's Certifying Authority into certification. The new scope is reflected in the certification that now reads as follows: 'Training services in marine surveying, administration, management, and certification of vessel coding activities for commercially operated vessels under 24 metres,



undertaken under delegated authority from the Maritime & Coastguard Agency for applicable Merchant Shipping Regulations and Red Ensign Group Flag State requirements, including the management and oversight of authorised surveyors'.

Once again, the external auditor found no major or minor non-conformities.

Much of the credit for the work undertaken behind the scenes to maintain and develop the ISO standard goes to IIMS General Manager, Camella Robertson.

Commenting on the latest ISO certification following the recent audit, IIMS CEO, Mike Schwarz, said, "Taking IIMS through the ISO 9001 auditing process was a daunting process first time around. By putting our Certifying Authority up for scrutiny by an external third party auditor, we have demonstrated our commitment to setting and maintaining the highest standards. It is a proud achievement for the Institute."

Recent new IIMS members, upgrades and graduates

Full members (MIIMS)

Antonio Coi	Italy
Michael Moldenhauer	Costa Rica
Albertus Venter	South Africa

Technician members (TechIIMS)

David Ball	Germany
Pier Luigi Benedetti	Italy
Ibrahim Coskun	Turkey
Paul Gostick	UK
Piotr Lowicki	Poland

Associate members (AssocIIMS)

Michael Downer	Canada
Geoff Grainger	USA
Andrew Maglio	USA
Akeel Syed	Australia

Affiliate members (AffliIIMS)

Omer Arslan	Turkey
Gennaro De Marco	Italy
Oleksii Legorov	Germany
Andrew McCaughey	Canada
Gerry Murray	Ireland
Prabhu Muthu	India
Mohd Fitri Najmi	Malaysia
Orhan Okan	Turkey
Ankur Pandey	India
Mohan Perumunda	India
Oguzhan Polat	Turkey
Michael Torbilo	Italy
Sean Whelan	Australia

Supporting members (SupplIIMS)

Yeo Aun	Malaysia
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Y&SC Graduate members (GradIIMS)

Marcelo Tapia	Chile
Brendon Stuckey	New Zealand
Justyn Lane	Australia
Rod Holland	UK
Dudley Hooper	UK
Neil Urey	UK
Enes Tetik	Turkey
David Cooke	UK
Michel Leenaarts	The Netherlands

C&CS Graduate members (GradIIMS)

Emmanuel Nunoo	Ghana
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IIMS congratulates all those who have completed the IIMS Professional Qualification.



Boiler burner inspection and operational safety recommendations

The United States Coast Guard (USCG) has issued a safety alert following an investigation into a serious engine-room fire following a boiler burner inspection aboard a cargo ship in the Port of Mobile, Alabama. On January 4, 2025, while moored in the Port of Mobile, Alabama, a foreign-flagged cargo vessel equipped with a SAACKE Monoblock Rotary Cup Burner SKVJ-M 14 Mark I burner system on a marine boiler experienced a significant engine room fire.

The incident began with a high-pressure fuel leak from the oil fittings block, which caused atomized marine diesel oil to ignite on the hot surface of a nearby auxiliary generator exhaust stack. The fire rapidly spread from the boiler flat through two upper deck levels, resulting in extensive structural and equipment damage, though no personnel were injured.

The subsequent marine casualty investigation identified critical mechanical and control system failures related to the burner's fuel system.

The vessel's fixed water mist fire suppression system actuated automatically but was unable to control the fire, which was ultimately extinguished by manual activation of the engine room's fixed carbon dioxide (CO₂) suppression system.

The Coast Guard investigation revealed two primary causal factors:

Seal Failure: During assembly of the oil fittings block, an O-ring intended to seal the high-pressure fuel interface between the oil flow meter and the oil fittings block was improperly seated, resulting in a pinched seal. This improper installation compromised the seal's integrity, leading to material failure over time and the eventual high-pressure release of fuel.

Control System Misconfiguration: A software configuration error was identified in the burner control system. Following a normal shutdown sequence, the external marine gas oil (MGO) fuel supply pumps feeding the burner unit were not de-energized. This failure to secure the fuel pumps kept the fuel lines pressurized up to the burner's internal rapid shut-off valves. The residual high pressure was a significant contributing factor to the volume and velocity of the MGO fuel released when the O-ring failed.

A subsequent investigation by the vessel's parent company identified identical risks of improper O-ring installation and software misconfiguration on several sister vessels utilizing the same burner model.

Read the full story at <https://bit.ly/4bGMHPy>.

Degraded part cause of Interislander Kaitaki blackout incident

A degraded rubber expansion joint failed putting 864 people on board passenger vessel Kaitaki at risk, according to New Zealand's Transport Accident Investigation Commission (TAIC).

TAIC has released its final report three years after the Interislander ferry suffered a blackout and loss of propulsion while carrying out a scheduled service between from Picton to Wellington.

The incident on 28 January 2023 left the ship drifting in strong onshore conditions towards Sinclair Head on Wellington's south coast. The master issued a Mayday. The ship avoided grounding after anchors held and power was restored.

The immediate cause was the failure of a single degraded component in a safety-critical system. A rubber expansion joint (REJ) in the engine cooling system ruptured, causing the system to lose most of its water and automatically shut down the engines. The component had exceeded its recommended service life and age limits.

The rubber expansion joint had been in service for at least five years and was approximately 18 years old.



Cargo liquefaction greatest contributor to seafarer deaths in INTERCARGO bulk carrier report

Between 2016 and 2025, 17 bulk carriers of more than 10,000 deadweight tonnes were reported lost, with a tragic 71 seafarer deaths, according to an INTERCARGO annual report. And cargo liquefaction remains the greatest contributor to loss of life with 37 lives – 52.1% of the total loss of life in the past ten years.

INTERCARGO's annual Bulk Carrier Casualty Report examines the safety performance of bulk carriers over a rolling 10-year period in order to identify risks and improve safety for seafarers and vessel operations.

The newest edition also revealed that four flooding casualties (23.5% of the total) cost 34 lives – a significant 47.9% of the total number of lives lost

Groundings also remain the greatest cause of ship losses, with seven losses or 41.1% of the total.



Cargo liquefaction has been the greatest contributor to loss of life, as shown by the 12 reported liquefaction cases since 2009:

- 2 casualties involving iron ore fines from India, with the loss of one life
- 8 casualties involving nickel ore from Indonesia, with the loss of 119 lives
- 1 casualty involving bauxite from Malaysia, with the loss of 18 lives
- 1 casualty in 2026, involving nickel ore from the Philippines, with the loss of six lives

Improving safety

Within the report, the INTERCARGO Secretariat shared the ways in which stakeholders should collaborate to improve bulk carrier safety. The IMO International Maritime Solid Bulk Cargoes (IMSBC) Code was developed to improve safe transport of dry bulk cargoes. INTERCARGO and its members have been making efforts to raise safety awareness among all stakeholders including local authorities, shippers and terminals, to jointly strengthen both the technical provisions and the practical implementation of the IMSBC Code.

Learning from incidents, the industry has continued to raise concerns in order to achieve more frequent and responsive updating of cargo schedules to reflect emerging commodities and changing cargo characteristics, as well as clearer, more prescriptive requirements on moisture testing, sampling procedures, and declaration of cargo properties by shippers.

Download the report at <https://bit.ly/4fFmDpx>.



Misdeclared cargo remains a persistent threat to shipping and supply chains

New statistics released by Allianz show a container ship fire occurs every 17 days, underscoring the persistent risk misdeclared cargo and undeclared dangerous goods pose to seafarers, shipping and global supply chains. Allianz Safety & Shipping Review 2026 says misdeclared cargo is still a major contributor to container ship fires.

"Misdeclared and undeclared dangerous goods are a known and preventable threat to seafarers, ships, cargo and the marine environment. This is not a paperwork issue. It is a life-and-death safety issue," said Joe Kramek, President and CEO of the World Shipping Council.

"The vast majority of shippers do the right thing. But a small group of irresponsible actors are cutting corners, hiding risk and creating danger for everyone in the supply chain. They are also undermining diligent shippers who follow the rules."

In response to this growing threat, WSC has implemented its Cargo Safety Program, an AI-enabled screening tool designed to identify high-risk shipments before they are loaded. For example, a shipment that was described as "hand tools" was flagged and discovered to be lithium-ion battery-powered tools, which, if not handled correctly, could pose a serious fire risk. This is one of thousands of incidents that the Cargo Safety Program has already prevented.

The latest data published by Allianz also highlights the fire risk facing vehicle carriers, with a fire recorded every 37 days. WSC has taken leading efforts at the International Maritime Organization in support of updated regulations to improve fire safety on vehicle carriers, including the safe transport of electric vehicles.

REPORT bites

Panama has been reinstated on the White List of the Paris Memorandum of Understanding (Paris MoU), according to the organization's recently published Annual Report.

Chinese shipbuilder Funing Heavy Industry has completed construction of a new electric sightseeing boat that will be operated out of Lujiang County in Anhui province.

BC Ferries has held a naming ceremony in Victoria, British Columbia, for its newest hybrid-electric vessel, Island Sarlequun. The ship recently arrived from Galati, Romania.

New electronic speed advisory signs are helping to improve safety on South Australian waterways. Using radar technology, the signs display a vessel's speed in real-time, providing a clear reminder to operators to stay within speed limits.

India's Directorate General of Shipping has introduced a revised digital procedure for reporting marine casualties, incidents and emergencies, making the eNAVIK Portal the exclusive reporting channel from 1 July 2026.

Brunswick Corporation (BC) has received worldwide recognition for its online marketing efforts, having received eight 2026 dotCOMM Awards in four categories from the Association of Marketing and Communication Professionals (AMCP).

Ocean Signal has been recognised with a King's Award for Enterprise for its rescueME PLB3 personal locator beacon.

New RNLI figures show how quickly a routine day by the water can turn serious, with lifeboat crews launching more than 9,000 times in 2025.

Yachting Ventures will host the IBEX Start-Up Pavilion for a third consecutive year at the International BoatBuilders' Exhibition & Conference (IBEX) in Tampa, Florida, from 6-8 October 2026.

The UK's Falmouth Harbour has invested £50,000 in new high-capacity mooring buoys to support superyachts and large commercial vessels visiting the port.



Peaky Blinder. Photo credit: MAIB

Fatal RIB crash exposes law gap between leisure and commercial marine

The Marine Accident Investigation Branch has renewed its long-standing call for statutory alcohol limits in recreational boating after finding alcohol was a factor in a fatal RIB accident. Excessive speed and poor lookout also contributed to the accident that happened in Portsmouth Harbour in August 2022. The report also said not one of the three people on board was wearing a PFD.

The MAIB investigation found that William Blake and Gary Huntington, two of the three people on board, were fatally injured when their RIB Peaky Blinder struck navigation beacon 81, ejecting them all from the boat. The other person survived with minor injuries.

In its report, the MAIB says it has "repeatedly recommended that the Department for Transport expedite the commencement of the subsections to Section 80 of the Railways and Transport Safety Act 2003, in order to implement the limits on the amount of alcohol which may be consumed by persons in charge of pleasure vessels."

The MAIB's recommendation highlights a contrast with the commercial shipping sector, where alcohol limits have long been enshrined in law. Under that Act, masters, officers and crew carrying out safety-critical duties on commercial vessels are subject to prescribed alcohol limits. In practice, however, many shipping companies operate even stricter standards, with zero-alcohol policies while on duty or, in many fleets, throughout a crew member's time on board, supported by routine alcohol and drug testing as part of their safety management systems.

The UK is also unusual among Europe's leading maritime nations in having no prescribed alcohol limit for operators of private pleasure craft.

The MAIB has argued that introducing similar legislation in the UK would bring it into line with many neighbouring countries and help address a long-standing gap in recreational boating safety.

Investigators concluded that the coxswain had consumed alcohol throughout the day, reducing his ability to safely navigate the vessel. "The effect of the alcohol he had consumed through the day reduced his attentional capacity and cognitive resources that would have enabled him to both recognise and correct the impending departure from the channel at an early stage in the passage," it says.

The MAIB also found that the coxswain "was not maintaining an effective lookout to enable him to monitor the RIB's position and make effective decisions for the RIB's safe navigation" before the collision.

The report concludes that sunlight reflecting from the water may have impaired the coxswain's vision as the RIB turned directly into the low evening sun, but says he was almost certainly unaware of his proximity to the beacon because he had not anticipated the manoeuvre or monitored the vessel's position relative to the navigation channel.

SAFETY Briefings

How to document PFOS free fire extinguishing foam on board

DNV has provided a short summary of how to document compliance at the first safety equipment survey after 1 January 2026, given that all fire extinguishing foams on board must be PFOS free, and this must be verified by the attending surveyor.

From January 1st, 2026, the use or storage of fire-extinguishing media – including firefighting foams – containing perfluorooctane sulfonic acid (PFOS) is prohibited. This applies to both fixed and portable systems and equipment. The requirement to document PFOS free fire extinguishing foams applies to all types of foam on board, i.e. both fixed systems and portable equipment. Compliance will prevent part-held surveys and/or Conditions of Authority.

Briefly summarized, there are three ways to document PFOS free foam:

- A PFOS-free declaration is provided by the manufacturer of the foam.
- The foam can be sampled and tested according to a recognized standard by an accredited laboratory and concluded to be PFOS-free through a laboratory test report confirming that the PFOS concentration in the foam is below 10 mg/kg (0.001% by weight).
- Although not required, the type approval (TA) or Marine Equipment Directive (MED) certificate for the foam may state that it is PFOS-free. If this is the case, it is considered equivalent to a PFOS-free declaration.

If none of the above can be provided successfully, the foam will need to be replaced with PFOS free foam, with documentation according to 1), 2) or 3) above.

For the surveyor to verify that the PFOS documentation corresponds to the actual foam on board, the documentation must contain sufficient information to trace it to the foam in use. Such information may include the manufacturer, foam type, production date / batch number and relevant TA/MED certificate references.

Furthermore, the marking of and documentation for the foam(s) carried on board must include adequate information to demonstrate traceability back to the PFOS documentation.

To avoid follow-up actions, Conditions of Authority or part-held surveys, preparation should start early to ensure the necessary documentation for all foams on board is in place before the survey.



Turning embarkation and disembarkation regulations into safe practice

Photo credit: C.Olavo Vieira & Capt Jorge Gonzales

A single defective ladder step, improperly secured gangway, or poorly rigged pilot ladder can turn a routine transfer operation into a serious accident within seconds as embarkation and disembarkation regulations have been neglected.

Ship operators need to always remember that safe embarkation and disembarkation operations depend not only on compliant equipment, but also on a well-implemented Safety Management System (SMS), effective crew training, and a strong safety culture onboard.

Safe embarkation and disembarkation operations remain a critical aspect of shipboard safety management. Although international regulations establish the minimum technical and operational requirements for access arrangements and pilot transfer operations, the effective implementation of these requirements ultimately depends on the vessel's Safety Management System (SMS) and the ability of ship managers and onboard personnel to apply them consistently in practice.

As the maritime industry moves toward the early implementation of revised IMO pilot transfer regulations, shipping companies are increasingly expected to go beyond simple regulatory compliance and adopt a more proactive safety approach.

Compliance today is no longer limited to maintaining certified equipment; it also requires robust procedures, effective supervision, crew competence, and a strong onboard safety culture.

Read the full story at <https://bit.ly/4hjt10>.

REPORT bites

A shake-up to wedding laws in England and Wales could soon allow legal wedding ceremonies to take place onboard boats that are either moored or underway.

The Estonian State Fleet has signed a design and shipbuilding contract with the Polish shipyard CRIST for the construction of its first fully electric passenger ferry.

Consumer behaviour is shifting and so is the boating audience. As traditional boat buyers start aging out, reaching the next generation of boaters is critical to future growth.

A Community Memorial recognising the sacrifice and service of Marine Rescue Ballina volunteers, and to remember fallen Marine Rescue Ballina volunteers Bill Ewen and Frank Petsch who lost their lives during the Ballina 30 rescue tragedy was held on Sunday 5 July.

The Singapore Yachting Festival has confirmed revised dates for its fifth edition, now set for 22–25 April 2027 at ONE°15 Marina Sentosa Cove, a shift from the 15–18 April dates first flagged after the 2026 show closed.

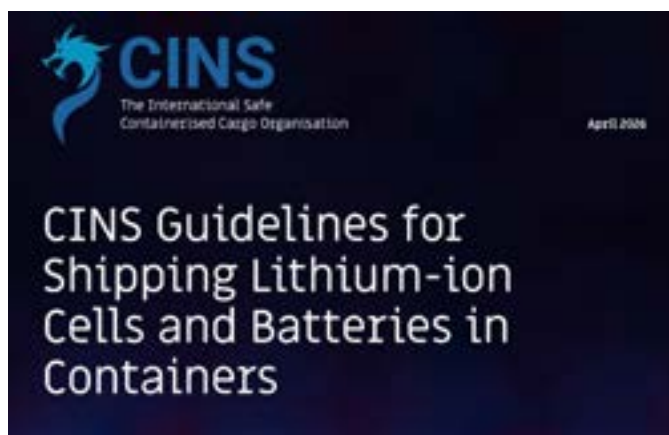
New Wire Marine has broken ground on a US\$2m expansion of its manufacturing facility in Dorchester County, South Carolina, as the company increases production capacity to meet growing demand from the recreational boating industry.

Port of Aberdeen welcomed its longest-ever vessel, the 294m-long Norwegian Star cruise ship, on July 15, 2026.

New western Canada boat show to launch – The Vancouver International Fall Marina Boat Show and Sale will run from September 18 to 20.

The President of Panama, Jose Mulino, has announced the decision of the Board of Directors of the Panama Canal Authority to appoint its first-ever female administrator for the vital waterway.

Humphree and Prospeed have formed a strategic partnership focused on protecting stabilisation systems and supporting more reliable performance at sea.



Latest guidance for shipping lithium-ion cells and batteries in containers

In response to the growing risks associated with the maritime transport and shipping lithium-ion cells and batteries, the following guidance for shipping lithium-ion cells and batteries in containers has been published. Lithium-ion cells are the core components of batteries and come in various forms, as they are widely used in portable electronics and electric vehicles because they can efficiently store and release energy through the movement of lithium ions between positive and negative electrodes. However, due to their chemical properties, lithium-ion cells and batteries are classified as dangerous goods and must be handled with care. Released against a backdrop of rising concern, the guidance comes as battery-related incidents at sea become both more frequent and more severe.

A key hazard is thermal runaway, a chain reaction that can result in intense fires, the release of toxic gases and even explosive force. These fires are particularly difficult to extinguish and may reignite days or even weeks after the initial incident.

According to the Nordic Association of Marine Insurers (Cefor) in its 2025 year-end ocean hull report, fires remain a major source of marine losses. The report highlights an increase in severe fire incidents involving both container vessels and car/RoRo ships. As a result, the marine industry, including insurers, has become increasingly concerned about the rising number of onboard fires, particularly in cargo holds and engine rooms.

What is a Lithium-ion cell?

Lithium-ion cell is a rechargeable electrochemical cell in which both the positive and negative electrodes are intercalation compounds. Lithium exists in an ionic or quasi-atomic form within the electrode material. Lithium polymer cells using lithium-ion chemistry are regulated as lithium-ion cells or batteries. Lithium-ion cells and batteries are classed as dangerous goods because of several hazardous properties.

- Fire Hazard: Flammable electrolytes can ignite if damaged or overheated, triggering thermal runaway reactions that lead to fires or explosions.
- Chemical Reactivity: Reactive materials may explode or catch fire if punctured or short-circuited.
- Toxic Emissions: Fires release harmful gases such as hydrogen fluoride (HF), which are toxic and corrosive.
- Explosion Risk: Internal pressure buildup can cause rupture or explosive vapour clouds.
- Electrical Hazard: Short circuits or mishandling can lead to burns, sparks, or fires.
- Environmental Risk: Improper disposal can contaminate soil and water, causing environmental harm.

Download the guidance at <https://bit.ly/4vtRDyw>.



FMG Nicola engine shutdown due to erroneous switch activation

The Australian Transportation Safety Bureau (ATSB) has said that bulk carrier FMG Nicola's went adrift after a main engine emergency shutdown switch erroneously activated.

On 7 February 2025, the fully laden bulk carrier FMG Nicola was departing Port Hedland under the conduct of 2 marine pilots with 3 tugs in attendance. At 1515 local time, about 5 miles into the

pilotage, FMG Nicola's main engine unexpectedly shut down. An emergency was declared, and the pilots immediately took action to control the ship's movement while the port's vessel traffic service mobilised additional port tugs and the ship's engineers rectified the engine fault. The main engine was restarted at 1523, and the ship was brought back under control. Multiple tugs attended and the ship was brought clear of the channel side and taken safely to sea.

What the ATSB found

The ATSB investigation found that FMG Nicola lost propulsion because the main engine low lubricating oil pressure emergency shutdown switch erroneously activated with all system parameters otherwise normal.

Also, the investigation found that the emergency response was as per port guidance, procedures and training. The ship remained underway and kept moving and was safely navigated via the channel to sea. While the ship departed, and tracked along the edge of, the charted shipping channel, there was no evidence to show that the ship had contacted the seabed.

What has been done as a result

Pilbara Ports Authority advised that port operations have been reviewed in the areas of ship reliability and vetting, towage strategy and arrangements and pilotage and emergency response and relevant procedures have been updated. Actions taken included improved operational awareness of and training in escort towage arrangements and updating of pilotage and emergency response procedures.

Kommandor Susan fire caused by substitute engine components, says MAIB

Sea trials in the Firth of Forth, Scotland that ended in catastrophic engine failure and a fire on board a vessel last year was caused by substitute components said a report by the Marine Accident Investigation Branch (MAIB).

What happened

At 1305 on 25 January 2025, the site investigation vessel Kommandor Susan suffered a catastrophic failure of a diesel generator engine while conducting sea trials in the Firth of Forth, Scotland. The failure resulted in an engine room fire and a complete power blackout. The crew responded promptly, extinguishing the fire and mustering safely. The vessel lost propulsion and began drifting eastwards. Attempts to deploy anchors were unsuccessful because the anchor winches required electrical power to operate. Kommandor Susan was eventually returned to Leith harbour with limited propulsion restored.

Safety issues

- use of non-genuine engine components during a major overhaul in 2019
- approval of extended service intervals, which assumed use of genuine components
- a shortfall in oversight and contractor assurance by the vessel owner during overhaul, which allowed the non-genuine components to be installed.

MAIB
MARINE ACCIDENT INVESTIGATION BRANCH

ACCIDENT REPORT

SERIOUS MARINE CASUALTYREPORT NO 10/2026MAY 2026

Extract from The United Kingdom Merchant Shipping (Accident Reporting and Investigation) Regulations 2012 – Regulation 5:

"The sole objective of the investigation of an accident under the Merchant Shipping (Accident Reporting and Investigation) Regulations 2012 shall be the prevention of future accidents through the ascertainment of its causes and circumstances. It shall not be the purpose of an such investigation to determine liability not, except so far as is necessary to achieve its objective, to apportion blame."

NOTE

This report is not written with litigation in mind and, pursuant to Regulation 14(14) of the Merchant Shipping (Accident Reporting and Investigation) Regulations 2012, shall be inadmissible in any judicial proceedings whose purpose, or one of whose purposes is to attribute or apportion liability or blame.

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Catastrophic engine failure and subsequent fire on board the site investigation vessel Kommandor Susan in the Firth of Forth, Scotland on 25 January 2025

SUMMARY

At 1305 on 25 January 2025, the site investigation vessel Kommandor Susan suffered a catastrophic failure of a diesel generator engine while conducting sea trials in the Firth of Forth, Scotland. The failure resulted in an engine room fire and a complete power blackout. The crew responded promptly, extinguished the fire and mustered safely. The vessel lost propulsion and began drifting eastwards. Attempts to deploy anchors were unsuccessful because the anchor winches required electrical power to operate. Kommandor Susan was eventually returned to Leith harbour with limited propulsion restored.

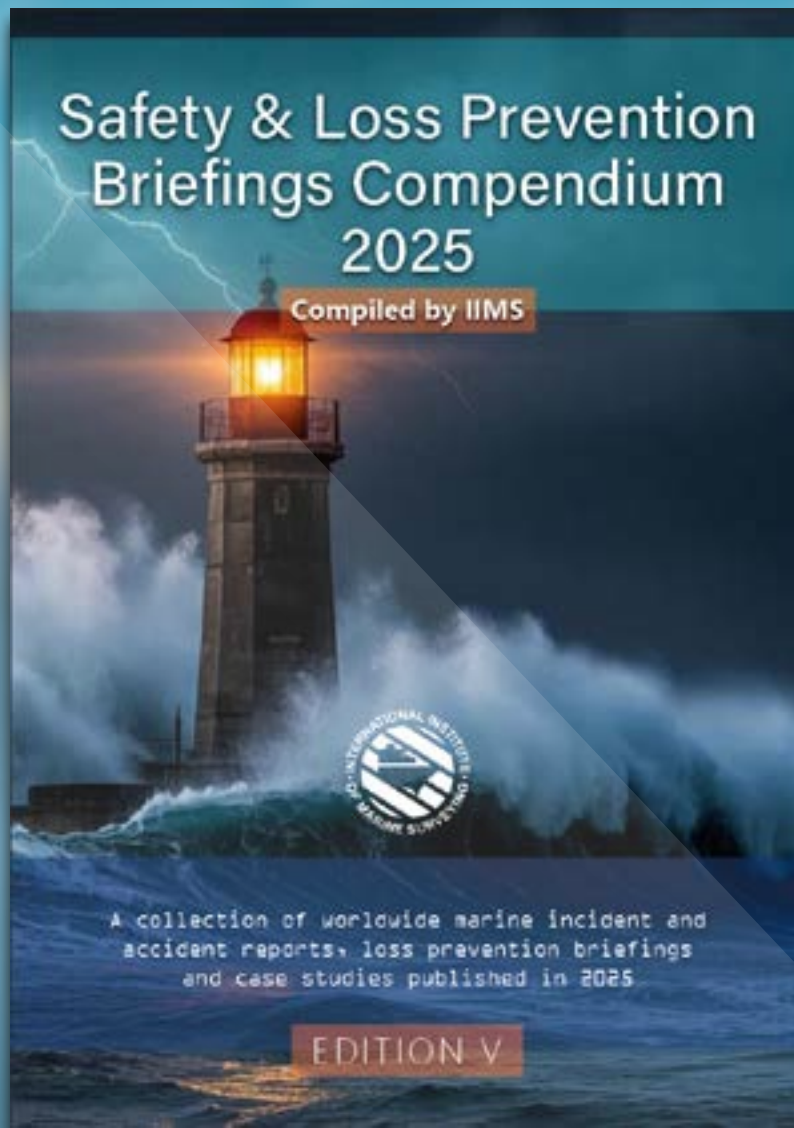
The investigation found that the engine failure was caused by premature wear of bearings fitted during a major overhaul in 2019. These components were not approved by the engine original equipment manufacturer and exhibited weaker material bonding than genuine parts. The extended service intervals applied to the engines were valid only for original equipment manufacturer components, making the use of substitute parts a critical factor in the failure.

The vessel's former owner had minimal oversight of the overhaul process and assumed that original equipment manufacturer parts were used. This lack of verification meant that the presence of substitute components remained undiscovered and was not communicated to subsequent owners. Additionally, the vessel's anchoring procedure did not account for the risk of power loss, leaving the anchors inoperable during the emergency.

The vessel's owner, Gardline Shipping Limited, has since rebuilt the affected engine, and overhauled all other generator engines on board

Image courtesy of fabian (@TheCooling.com)

THE 2025 COMPENDIUM IS
available for download



<https://bit.ly/4pKqd5n>

OR VIEW PAST COMPENDIUMS AT
<https://www.iims.org.uk/safety-briefings-compendium/>



Landmark support for shipping innovation with publication of Maritime Autonomous Surface Ships (MASS) Code

A landmark international code, the Maritime Autonomous Surface Ships (MASS) Code, was published on 1 July, paving the way for stronger, clearer global standards supporting technology, innovation and safety at sea.

The International Maritime Organization (IMO) has launched the non-mandatory MASS Code which provides the first international regulatory framework for remotely operated and autonomous cargo ships covered under SOLAS Chapter I. It was drafted at the IMO with the Maritime and Coastguard Agency (MCA) taking a leading role to uphold UK interests.

The UK will ultimately use the high-level principles to bring forward national legislation in close consultation with the maritime sector.

Leanne Page, MCA Assistant Director – Future Technical Standards, said: “Publishing the MASS Code is a major step towards delivering clearer, stronger, safer regulations that reduce risk and support innovative technology.”

“The MCA is very proud to have played a leading role in reaching this stage, upholding the UK’s interests with safety at the heart of negotiations. We look forward to working with industry to refine and develop the Code into the future.”

The Code is in three parts, plus an appendix:

- Part 1: High-level purpose, principles and objectives.
- Part 2: Principles applicable to all cases with resulting provisions met through certification including surveys and certification, software, security, manning, training and watchkeeping.
- Part 3: Goals and functional requirements based on modes of operation and functionality including navigation, remote operations, fire management, cargoes, and search and rescue.
- Appendix: Forms for certificates and records for autonomous and remote operations.

Global research and feedback will contribute to the next stage of developing the MASS Code through a two-year Experience-Building Phase. The mandatory version of the MASS Code is scheduled to come into force by 2032.

Rising detention rates and recurring areas of concern in Paris MoU Annual Report 2025

The Paris MoU has published its 2025 Annual Report with a total of 16,474 inspections recorded last year. In 2025, there were 9,879 inspections with deficiencies, 688 detentions and 19 bannings.

During 2025, the number of refusals-of-access (bans) increased to 19, marking a rise following several years of relatively low figures.

The detention rate also trended upward, reaching 4.18% in 2025, compared to 4.03% in 2024. This follows a period of consistently elevated detention percentages in recent years, including the 4.25% recorded in 2022. The Paris MoU will continue to closely monitor these developments.

An analysis of deficiencies and detainable deficiencies reveals no significant shift towards non-compliance within any single convention or regulatory area. Instead, the data underscores recurring areas of concern that consistently show higher rates of noncompliance in both absolute and relative terms.

These include:

- fire safety (SOLAS Chapter II-2: 16.8%),
- structural and electrical elements (SOLAS Chapter II-1: 11.6%), and
- health protection, medical care, welfare and social security protection (MLC Title IV: 10.0%).

Download the report at <https://bit.ly/4yjzeHe>.



REPORT bites

Danish offshore wind contractor Cadeler has taken delivery of its 11th wind turbine installation vessel, Wind Ace, from COSCO Shipping Qidong Offshore in China.

FFS Africa has confirmed its return as a sponsor of the African Boating Conference (ABC) 2026, which will take place on 20-21 October at the V&A Waterfront in Cape Town.

The Boating Industry Association Ltd (BIA) of Australia has introduced an accreditation program for its marine broker members to address consumer confidence in boat transactions.

NatPower Marine, a company enabling the energy transition in the maritime sector, has signed a strategic agreement to acquire the Aqua superPower international charging network from ATV Power, a provider of marine electrification technologies and charging infrastructure.

Norway's government has announced a new round of funding to support newbuild orders for green ships with the Norwegian state-backed energy innovation fund Enova awarding over \$130 million to seven local maritime companies.

The salvage industry saw its revenues halved in 2025 after a big drop in wreck removal contracts, according to a leading industry group. Gross revenue for members of the International Salvage Union (ISU) fell from \$406m in 2024 to \$190m.

Off The Hook YS Inc, the largest wholesaler of pre-owned boats in America, is set to rebrand as NextBoat Inc.

Ferretti Group secured three awards at the Blue Design Awards 2026 during this year's Blue Design Summit, held in La Spezia, Italy.

The Chamber of Shipping of America has recognized 48 Crowley owned or managed vessels with 2026 Jones F. Devlin Safety Awards for achieving a combined 427 years of service without a lost-time injury.

Research into safer pump stations and better fish passage has earned Waikato Regional Council the highest honour at the 2026 local government awards.



Photo credit: Skuld Club

Engine room fire risk highlighted due to auxiliary engine erosion plug failure

Fire in the engine room remains the most common and costly risk in Hull and Machinery insurance, due to the combination of flammable materials, complex machinery and human factors, according to Skuld Club. Skuld has seen recent cases of engine room fires due to (fusible) erosion plug failure. An erosion plug failure in a fuel pump can cause engine room fires by allowing pressurised fuel to escape as a fine spray, which can ignite instantly upon contact with hot surfaces. An erosion plug is a safety device built into fuel pumps, and particularly in high-pressure fuel pumps.

Erosion plugs are made from a low-melting-point alloy and are designed to relieve pressure during overheating, preventing the fuel pump casing from rupturing or exploding. However, excessive temperatures, internal friction, pump seizure and inadequate maintenance can cause the plug to melt, erode or blow out prematurely. When this happens, pressurised fuel oil escapes, often as a fine atomised spray rather than a liquid leak. This fine mist presents a serious fire hazard. If it comes into contact with hot surfaces such as exhaust manifolds or turbochargers, it can ignite almost instantly.

Combined with high fuel pressure and the presence of hot machinery, the resulting flash fire can spread rapidly through lagging gaps, cable runs and accumulated oil deposits, significantly increasing the extent of damage in the engine room. Skuld strongly advises to always strengthen their maintenance controls and inspection.

Recommendations

- Ensure strict compliance with the manufacturer specifications, such as torque setting, verification of installation of the locking devices, such as locking wire, and tabs. To implement post-maintenance inspection and sign-off procedures.
- Conduct operational checks after reassembly and under load conditions of the fuel pumps, fuel lines, and their fittings.
- If the maintenance is conducted by shipboard personnel, ensure adequate competency and training of the personnel performing the maintenance. Avoid critical repairs when appropriate tools are unavailable and where spare parts are not compliant or incomplete.
- Conduct frequent inspections of the fuel system, implement leak detection routines and thermal imaging for early identification of abnormal conditions.
- Ensure that exhaust systems and turbochargers are properly insulated. Repair the damage immediately and treat any exposed hot surface as a critical hazard.
- Perform regular tests on fire detection systems and fixed firefighting systems onboard. Conduct regular fire drills focusing on early isolation and shutdown action for fuel spray fire scenarios.
- Furthermore, operators are encouraged to review their planned maintenance systems, work controls and verification processes.
- Implementing a robust Safety Management System (SMS) can help ensure compliance with procedures for fuel handling, maintenance and hot work operations, reducing the risk of similar incidents.



Guidance for the safe carriage of cocoa butter in containers

The International Safe Containerised Cargo Organisation (CINS) has published revised guidelines for the safe carriage of cocoa butter in containers, updating industry practices for one of the sector's most temperature-sensitive cargoes.

Developed by a working group of CINS members, the updated guidance is aligned with the principles of the IMO/ILO/UNECE Code of Practice for Packing of Cargo Transport Units (CTU Code), which sets out international standards for the safe packing and handling of containerised cargo.

The 2026 edition replaces the previous January 2018 version and reflects significant developments across both the cocoa butter industry and container shipping sector over the past eight years. CINS said the updated guidelines are intended

to enhance cargo integrity and reduce risk by addressing the unique characteristics of cocoa butter, which is highly susceptible to melting and temperature-related damage during transport.

Cocoa butter is derived from whole cocoa beans which are fermented, roasted, and then separated from their hulls. About 54–58% of the residue is cocoa butter. It contains various amounts of saturated fats (57–64%) and unsaturated fats (43–36%).¹ Cocoa butter becomes soft and malleable at high temperatures and can melt between 30°C and 37°C. Having become warm or molten, it can retain the latent heat and remain in such a condition down to as low as 17°C.

Upon heating, cocoa butter expands and may cause it to burst the packaging and seep out, staining adjacent cartons and possibly leaking outside of the container or causing damage to the container structure. There have been incidences of cocoa butter melting on board ships, resulting in the clogging of ships' bilges.

Download the guidance at <https://bit.ly/4fiRgAE>.



Black Sea MoU publishes Port State Control Annual Report 2025

The Black Sea MoU said that in 2025 the average detention percentage rose to 6.78% — the highest level recorded since 2007.

In its Port State Control Annual Report 2025, the Black Sea MoU said its member authorities carried out a total of 5,117 inspections, representing an 11.6% increase compared to 2024. This remains approximately 3% below the ten-year average of 5,274 inspections under the New Inspection Regime, which began in 2016.

The reporting period was marked by the ongoing armed conflict between the Russian Federation and Ukraine, which continued to pose serious risks to the safety and security of crews and vessels operating in the region.

Due to the ongoing war, exact data on the number of individual ships operating in the region was unavailable. As a result, data for the broader region was not accessible. Therefore, for the purposes of this analysis, it has been assumed that throughout the year, vessels calling at Ukrainian ports also visited at least one port in other Member States. Based on this assumption, the regional inspection rate for 2025 (calculated as individual ships inspected as a percentage of individual ship visits) was determined to be 74.74%.

Out of 5,117 inspections conducted last year, 3,596 of them were found with deficiencies, corresponding to a deficiency rate of 70.3%. This represents the second-highest rate recorded since the establishment of the BS MoU on PSC, exceeded only by 72.4% in 2007.

Download the report in full at <https://bit.ly/4aWYR6O>.

REPORT bites

Larkman's Boatyard, a UK-based facility offering maintenance, engineering, rigging services and lay-up packages, has been acquired by Sam and Kayleigh Whitworth.

The joint owner/operator of Four Seasons Yacht, the new luxury cruise line, has placed an order for a third ship to be built by Fincantieri at its Ancona shipyard in Italy.

Marine fuel supplier Dan-Bunkering has become an official sponsor of the 2026 African Boating Conference (ABC), reinforcing its commitment to the development of Africa's superyacht industry.

An independent statistical analysis of WATCHIT collision-prevention telemetry has confirmed that the system's alerts consistently correspond with near-miss conditions and that vessel operators measurably modify their behaviour following alerts, resulting in safer manoeuvres in approximately 77% of cases.

Northern Ireland's premier port, Belfast, has launched an ambitious 25 year Masterplan setting out £1.3 billion of planned investment to ensure that the port remains resilient, efficient, and competitive.

The Balearic Islands continue to lead the Spanish nautical market in the first four months of 2026. According to the latest report from the National Association of Nautical Companies (ANEN), the archipelago registered 225 recreational boats.

South Korean companies have secured ABS approval for 15,000 TEU container ship with 2 nuclear reactors.

Jan De Nul Group recorded a turnover exceeding €4.2 billion (\$4.9 billion) for the financial year ending December 31, 2025.

Autonomous vessel developer Saronic has selected Brownsville, Texas, as the site of a planned \$3 billion shipyard that the company says will dramatically expand U.S. capacity to build autonomous vessels.



Photo credit: Daniel Ramirez

Hull corrosion sank fishing vessel

The flooding and sinking of fishing vessel North American in Seattle, Washington, USA was a result of hull corrosion, said the National Transportation Safety Board.

On May 14, 2024, about 0550 local time, vessel representatives for the fishing vessel North American, which was uncrewed and docked on the Lake Washington Ship Canal, in Seattle, Washington, were notified that the vessel was flooding. Salvors arrived on scene and attempted to dewater the vessel but were unable to keep up with the flooding, and the vessel eventually sank. There were no injuries, and no pollution was reported. Damage to the vessel was initially estimated at \$3 million.

Analysis

On May 13, the vessel had been underway for about 6 hours on a sea trial to familiarize the new captain and chief engineer with the vessel and its systems. Other than a short trip to get fuel and another trip to drop off equipment at a nearby dock (both in the previous month), the vessel had been laid up for the entire winter at its dock. While underway, a bilge alarm alerted the crew to flooding in the engine room.

Crewmembers stated that the flooding was coming from the shaft alley, which ran beneath the vessel's three floodable fish holds. Crewmembers emptied all the water from the three fish holds, successfully pumped the bilge, and reported that water was no longer coming from shaft alley. When they returned to the dock that afternoon, crewmembers attempted to identify the source of the flooding into the shaft alley without success. When the last crewmember left about 1830, he reported there was no visible flooding and that there was no water in the bilges.

A post-casualty dive survey found three wastage holes in the hull. The diver found no other potential sources of water ingress after examining the entire hull, the rudder, propeller, and all thru-hull fittings (including the stern tube). The crewmembers did not report striking any objects or grounding during their sea trial, and the dive survey confirmed that there were no signs of collision or grounding. Therefore, it is likely that the source of the flooding into the shaft alley, and subsequently the engine room, was the three holes in the hull, which were located beneath the shaft alley.

The vessel's owner had been aware of corrosion within the double bottom areas since 2020, when a hole in the hull was found during a survey. The owner conducted additional hull surveys in 2021 and 2023 in an attempt to identify and address any areas needing repair. The survey found potential areas of concern, but immediate repair of the areas was not deemed necessary. It is likely that localized corrosion within the shaft alley resulted in the holes identified post-accident, and that the holes manifested or worsened during the sea trial on May 13.

Why it happened

The National Transportation Safety Board determines that the probable cause of the flooding and sinking of the fishing vessel North American was hull corrosion, which resulted in wastage holes that allowed water ingress into the engine room overnight while the vessel was unattended.

Download the report at <https://bit.ly/4ymbd2l>.



Manual rescue boat davits raise PSC compliance concerns

The American Bureau of Shipping (ABS) has issued guidance for cargo ships equipped with rescue boat launching appliances that rely entirely on manual operation without stored mechanical power.

The guidance follows the adoption of IMO Resolution MSC.459(101), which introduced an exemption applicable only to rescue boats installed on or after 1 January 2024. The exemption does not apply to systems installed before that date, meaning existing arrangements remain subject to previous requirements.

During a recent Port State Control (PSC) inspection at a Europe an port, a container ship (keel laid December 2008) received deficiency Code 11113 – Launching arrangements for rescue boats. The PSC officer reported that:

- The rescue boat davit could not be slewed out using stored mechanical power or gravity
- It was not possible to actuate the launch from a position within the rescue boat
- No Flag State acceptance of the alternative arrangement could be demonstrated on board

The vessel's dedicated rescue boat weighed 610 kg, fully equipped with engine and without crew. The manual hand crank operated launching arrangement consists of a single-arm radial davit without a hydraulic accumulator.

The PSC argued that the amended LSA Code paragraph 6.1.1.3 (introduced by Resolution MSC.459(101)) applies only to rescue boats installed on or after January 1, 2024. An alternative design for the rescue boat davits may be accepted if it can be clearly demonstrated that it had been approved or accepted by the flag Administration. At the time of the inspection, such approval or acceptance could not be demonstrated.

Read the full story at <https://bit.ly/44rJFLI>.

Prototype shaft seal failure causes engine room flooding

The U.S. Coast Guard (USCG) has issued a safety alert after a prototype component used in a mechanical shaft-seal system failed onboard a USCG inspected deep draft vessel.

In February 2026, a U.S. flagged crude oil tanker transiting near Delaware Bay experienced simultaneous failures of its port and starboard shaft seals, resulting in substantial seawater ingress. The crew subsequently deployed emergency collars supplied by the seal manufacturer and used the vessel's emergency bilge system to remove the water.

The investigation revealed that the failed component was a prototype composite seal-facing material installed during dry-dock as part of a shaft-seal system previously approved by a Recognized Organization (RO).

Importantly, the investigation found that the RO-approved design drawings lacked specific material details, vaguely describing the seal-facing material only as "composite." During the vessel's first post dry-dock voyage, seawater flooded through the seals' split face butt when exposed to cold seawater after operating in warm conditions. Although the overall seal system was approved by the RO, the seal manufacturer did not disclose its use of the unapproved prototype material. The USCG, RO, and the vessel owner became aware of the substitution only after the incident occurred.

Vessel owners and operators are reminded to inform the cognizant USCG Office in Charge, Marine Inspection (OCMI) and the applicable RO of any deviations from existing approvals, including prototype or substitute materials, prior to installation. They should also ensure that any novel materials or arrangements that deviate from applicable standards are properly communicated and approved in advance.



Figure 1: Sea water discharging through seal face

Credit: USCG

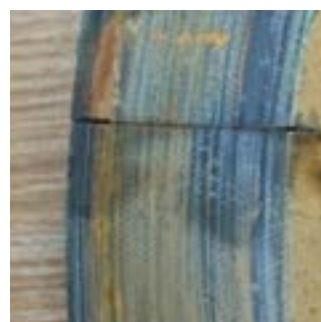


Figure 2: Seal split face butt

New vessels review



Announcing the arrival of the Krogen 53 from Kadey-Krogen

Founded in Florida in 1976, Kadey-Krogen builds owner-operated cruising yachts. The company has produced nearly 700 hulls across its history, with the current Krogen brand range spanning from 44 to 70 feet. The 53 replaces and updates the Krogen 52.

The new model is built on Kadey-Krogen's Pure Full Displacement hull, which the brand has used for its trawler range since inception. Full-displacement hulls operate at hull speed rather than planing - typically around eight to nine knots on a vessel of this size - prioritising fuel economy, range, and seakeeping over outright speed. The hull features a fine bow entry, balanced waterplane, and the builder's signature wineglass transom.

Unveiling the new Dufour 39

With Dufour 39, the yacht builder continues the evolution of its range with a new-generation cruising sailboat designed to meet the diversity of today's sailing lifestyles and cruising programs. At 37 feet, this new model introduces an approach where sailing performance, onboard comfort, and modularity come together within a single platform, without compromise between uses. Designed for short-handed sailing, family cruising, and more performance-oriented programs alike, the Dufour 39 delivers a smooth, intuitive sailing experience with a strong connection to life outdoors.

Dufour 39 has been conceived as an adaptable platform capable of evolving with different ways of sailing. Its deck plan and rigging setup can range from a simplicity-focused configuration featuring a self-tacking jib and furling mainsail, to a more performance-oriented version with a genoa on tracks and a square-top mainsail controlled directly from the cockpit. This modular approach allows the yacht to adapt to a wide variety of uses, from coastal cruising to more performance-focused sailing, while maintaining consistency in both handling and onboard experience.



Landing craft delivered to Scottish mussel harvester

A new landing craft workboat was recently handed over to family-owned Blueshell Mussels of Scotland. The vessel, which has been named Bountiful, is already operational, supporting the Blueshell's mussel harvesting operation in the Shetland Islands.



With a length of 21.7 metres and a beam of 7.5 metres, the landing craft has been designed to perform a range of coastal and harbour operations, including transport of both people and equipment. The vessel will often be deployed to islands where it operates in the aquaculture industry or as a lifeline for remote communities.

In the aquaculture sector, the workboat will be able to handle large nets and cables and, with its robust bow ramp, load and unload harvests. It boasts a large, free deck area capable of handling up to 70 tonnes of equipment. The vessel can also be outfitted with a crane able to lift loads of 2,500 kg at 15.5 metres and 15 tonnes at 3.5 metres.

Third WindWings tanker Monza delivered to Union Maritime

The LR2 tanker Monza, fitted with two 37.5m WindWings® developed by BAR Technologies, has been delivered to Union Maritime, marking the third vessel in the company's newbuild series to adopt wind-assisted propulsion. Together, the vessels form the world's first dual-fuelled LR2 tanker series combining LNG propulsion with WindWings® sail technology.

Built by Jiangsu Province, Yangzijiang Shipbuilding and equipped with WindWings® manufactured by CMET, the vessel adds to a growing number of large tankers integrating rigid wind propulsion technology.



Photo credit: Horizon Yachts

Horizon Yachts announces the Lexus LY680 built by Vision Shipyard

Horizon Yachts is proud to highlight the Lexus LY680, which has solidified its position as a masterclass in automotive excellence on the open water. When a luxury automotive giant turns its attention to the water, the LY680 proves that its interest in the yachting world is a profound commitment to excellence. Production of this flagship takes place at Vision Shipyard,

part of the Horizon Group, drawing on the group's renowned reputation for advanced superyacht construction technology. Building on its predecessor, the LY650, this new model unites Horizon's custom-build heritage with Lexus's management philosophy expressed in the Toyota Production System.

Beneath the elegant exterior, the LY680 is powered by twin Volvo Penta IPS units, available in 1050 or 1350 configurations, providing propulsion with reduced fuel consumption and emissions. With a fuel capacity of over 1,060 U.S. gallons (4,012 L), the yacht is highly capable of extended coastal cruises. The hull design delivers a predictable, stable platform that handles chop with a composure familiar to any Lexus driver.

Brazilian Navy places new rescue boat into service

The Brazilian Navy has placed a recently acquired search and rescue (SAR) boat into service. The new SAR boat has an FRP hull, a length of 15.7 metres, a beam of 4.8 metres, and a wave-piercing design that offers improved seakeeping capabilities and fuel efficiency at high speeds while providing comfort for the crew.

A thermal camera for man-overboard detection and night time operations has also been installed.

The vessel's wheelhouse also features a forward-leaning windscreen to help reduce glare from the helm station and to reduce reliance on wipers when operating under inclement weather conditions. The navy also required that the vessel be capable of operating at speeds in excess of 25 knots, with an operational range of up to 80 nautical miles offshore and an endurance of three days.



New vessels review



First hull of the Majesty 145 launched

The launching of the first hull of the new Majesty 145 marks a milestone in the growth path of Gulf Craft and consolidates the brand's positioning in the superyacht segment over 40 metres. The project represents a symbolic step in the evolution of the Majesty range, set to be completed with the upcoming launch of the Majesty 160 by the end of the year to join the flagship Majesty 175.

The debut of the Majesty 145 testifies to the speed and efficiency of the Arabian shipyard's production process. The Majesty 145 was designed with a strong focus on the owner's lifestyle, integrating large convivial areas and dedicated wellness solutions on board. Key features include two infinity-style pools, wellness spaces with infrared sauna, spa areas, and a fully equipped gym. The semi-custom platform also allows for a high level of customization. Owners can configure different areas of the yacht, from the stern to the bow to the upper decks, adapting spaces to their operational and entertainment needs while maintaining the construction efficiency typical of a semi-custom production.

New SAMAR solar electric yacht marries 21st century tech with timeless Mediterranean hull

Inspired by the llaut boats that have been plying the waters of the Balearic Islands since the Middle Ages, the SAMAR 50 solar electric yacht marries a hull that's been proven over the centuries with the latest advances in zero emission propulsion.

The 50 is the first model from SAMAR Yachts, who are based on Mallorca with a name derived from the local words "Sa Mar" — "The Sea". The company says it reflects the essence of the brand: "to return yachting to its most natural state, where the experience is defined by the sea itself."

The serial hybrid has twin 40 kW (55 hp) electric motors, for a total available power of 80 kW (110 hp). The battery pack stores 139 kWh of energy, enough by 'rule of thumb' measurement for the electric motors to operate at full power for about an hour and three quarters ($139 \text{ kWh} \div 80 \text{ kW} = 1.75$). SAMAR estimates those motors deliver a top speed of 10 knots ($\approx 19 \text{ kmph} / 12 \text{ mph}$).



World's largest LNG-powered containership transits Suez Canal

Adm. Ossama Rabiee, Chairman and Managing Director of the Suez Canal Authority, announced that the Canal has witnessed the transit of the mega container ship CMA CGM GRAND PALAIS, the newest and largest environment-friendly container ship. The vessel was on its first voyage through the Canal amongst vessels of the southern convoy after its safe navigation through the Strait of Bab El-Mandab on its way from Singapore to Malta.

The vessel operated by CMA CGM is considered the world's largest LNG-powered container ship, and it operates as part of the MEX maritime service connecting ports of the Far East and the Mediterranean. The vessel is 400 m. in length, has a beam of 61 m., a maximum capacity of 23,876 TEUs and a tonnage of 240 thousand tons.



696 Xpedition expands Extreme into amphibious

Built on the award-winning Game King platform, the new Extreme 696 Xpedition marks Extreme Boats' latest step into the amphibious market. Combining the proven offshore pedigree of the Game King hull with integrated amphibious capability, the 696 Xpedition is designed to expand where and how owners can launch, retrieve and explore.

At 8.10m overall with a 20-degree deadrise hull, the 696 Xpedition retains the brand's focus on rough-water performance while adding the flexibility of seamless beach and land access. Construction is robust throughout, with an 8mm transom and hull thickness paired with 4mm sides and deck plating.

Power comes from a recommended 250hp outboard, fed by a 260-litre fuel tank aimed at extended day trips and coastal adventures. With a 2.42m beam, the new model balances offshore capability with trailerable practicality.



Damen delivers CSOV 9020 TSS Cruiser

Damen Shipyards Group has delivered the first of two Commissioning Service Operations Vessels (CSOV) 9020 to Ta San Shang Marine Co., Ltd. (TSSM) at Ha Long in Vietnam.

The delivery follows the successful completion of sea trials conducted in Ha Long Bay. A formal naming ceremony was held for the vessel, attended by senior management representatives from both joint venture partners as well as from Damen. During the ceremony, the vessel was officially named TSS Cruiser by Mrs Patricia Liao, President of the Welcome to Taipei International Club. Following the naming, guests were invited to tour the vessel before participating in a cruise of the bay.

The 90-metre Damen CSOV 9020 is designed to accommodate up to 120 offshore personnel, who can transfer safely via a motion-compensated gangway. The vessel is equipped with hybrid diesel-electric propulsion and has been prepared for a future conversion to methanol propulsion.

Loopia 290 wins award

The Sea Loop Marine shipyard has just been awarded the "Innovative Project" label by the Pôle Mer Bretagne Atlantique for its Loopia 290. Behind this 9-metre electric catamaran, the Vendée-based shipyard offers a different approach to coastal yachting. Accessibility, electric propulsion and eco-design are the hallmarks of this project.



According to Sea Loop Marine, the majority of owners sail little and use their boats mainly as leisure platforms at anchor.

The catamaran designed by Marc Lombard Design Group adopts an architecture focused on stability at standstill and ease of movement on board. With a beam of 3.90 metres and a length of 9 metres, the boat emphasizes living space and ease of movement.

This orientation has a direct influence on the hull and the desired performance. The Loopia 290 is equipped with two 40 kW electric motors and a 92 kWh battery pack. Sea Loop Marine has announced a range of around 60 miles at 6 knots, and a top speed close to 17 knots. The technical positioning is aimed more at coastal sailing, inland waters, day-anchoring or professional tourist use than long-distance crossings.



IMO passes non-mandatory safety code for autonomous ships

The IMO has taken a new step forward towards comprehensive regulation of unmanned shipping, building upon years of debate and detailed development work. At the latest meeting of the Marine Safety Committee, delegates approved a final text for the non-mandatory Maritime Autonomous Surface Ships code (MASS code), which codifies a set of safety standards for unmanned vessels in international trade. While the code is only a guideline for now, it is on track to become mandatory as early as 2028, and it gives a sense of what the requirements for unmanned shipping might soon look like in operation.

According to IMO, the purpose of the code is to regulate emerging technology and maintain safety while also enabling innovation. Autonomous ships - which entail scaled-up size and risk compared to autonomous boats - are still in their infancy, and this is the first set of specifications that applies globally to their development.

The MASS Code text has not yet been released, but a marked-up final draft from February shows the committee's intent. For now, the rules are largely goal-based, without the prescriptive specificity of a SOLAS regulation on lifeboat design or a VDR installation.

Safe navigation is the first item on the list for evaluating autonomous shipping. The MASS code incorporates by reference the familiar collision avoidance rules of COLREGS, with its human-focused recognition requirements for sounds, lights, shapes and vessel classes. To complement the standard COLREGS lookout

requirement, the MASS code institutes a situational awareness requirement that the ship's self-navigation system must "continuously monitor all information necessary for safe navigation." More specific standards - like an ability to evaluate audible sounds and VHF hails, which most autonomous navigation systems cannot currently perform - are as-yet not part of the code.

The rules do outline a long list of equipment requirements that would be unique (and perhaps technically challenging) for unmanned ships. Without crew aboard, unmanned vessels would need to be designed differently for safety and for emergency response, including fallback operations in "reasonably foreseeable degraded states." This implies different standards for "structure, subdivision, stability and watertight integrity, fire protection, fire detection and fire extinction, life-saving appliances and arrangements, security, search and rescue, cargo handling, towing and mooring, machinery installations, electrical installations and external support systems."

Some of these standards will be challenging to achieve and maintain in a harsh marine environment, just as they are for current equipment. For safety reasons, anchor windlasses will have to be capable of raising and lowering autonomously or remotely during an emergency, without crew to remove the devil's claw or fan the windlass brake. Emergency tow arrangements will have to be configured to be made up without a crew to handle heaving lines and hawsers in rolling seas. Much of the supplier R&D work needed to meet the requirements will continue for years to come.

Amendments to the IGC Code set to enter into force in July 2028

Major amendments to the International Code for the Construction and Equipment of Ships Carrying Liquefied Gases in Bulk (IGC Code) are set to take effect on 1 July 2028.

Since 2022, the International Maritime Organization (IMO), through its Sub-Committee on Carriage of Cargoes and Containers (CCC), has been undertaking a comprehensive revision of the International Code for the Construction and Equipment of Ships Carrying Liquefied Gases in Bulk (IGC Code).

The review reflects the maritime industry's growing adoption of environmentally friendly technologies and increasing pressure to reduce greenhouse gas emissions. The resulting amendments were approved at the 111th session of the IMO's Marine Safety Committee (MSC 111) in May 2026 and are expected entry into force on 1 July 2028.

Once adopted, the amendments will introduce updated requirements for the construction and equipment of ships transporting liquefied gases in bulk.

The amendments cover a variety of issues, including:

- Clarification of the application of the "one ship, one code" discussion in relation to the use of alternative fuels on board gas carriers under the provisions of the IGC Code.
- Application of finite element analysis to type C tanks.
- Carriage of CO₂ cargoes and the use of LPG, ethane and toxic cargoes as fuel.
- Enhancement and clarification of Causes and Effects Matrix of an ESD (Emergency Shut Down).
- Cargo tank filling limits.

Applicability of amendments

The IGC Code amendments apply to existing and new ships as appropriate. However, if an amendment requires changes in a ship's design or construction, that amendment will only be applicable to ships constructed on or after 1 July 2028.

Consequently, a three-date application system has been agreed that defines "new ships" as those for which:

- The building contract is placed on or after 1 July 2028; or

In the absence of a building contract, the keels are laid or which are at a similar stage of construction on or after 1 January 2029; or

- The delivery of which is on or after 1 July 2032.

Certificate of Fitness

To reflect this three-date application system, revisions have also been approved for the form of the International Certificate of Fitness for the Carriage of Liquefied Gases in Bulk of the IGC Code.

MSC 111 confirmed that only products listed in Chapter 19 of the IGC Code should be included in the ship's International Certificate of Fitness for the Carriage of Liquefied Gases in Bulk and identified as cargo and/or fuel, as appropriate in the revised table of the Certificate of Fitness.

Unified interpretations

When the approved IGC Code amendments come into force, the following IMO unified interpretations will no longer apply to new ships constructed on or after 1 July 2028:

- MSC.1/Circ.1543
- MSC.1/Circ.1559
- MSC.1/Circ.1590
- MSC.1/Circ.1606
- MSC.1/Circ.1617
- MSC.1/Circ.1625
- MSC.1/Circ.1651
- MSC.1/Circ.1669
- MSC.1/Circ.1679

The above will remain in effect for existing ships constructed prior to 1 July 2028.



AMSA outlines National Compliance Plan for 2026–27

The Australian Maritime Safety Authority (AMSA) has released its National Compliance Plan 2026–27, outlining a risk-based approach to improving maritime safety, strengthening compliance and protecting seafarers across Australia's shipping industry.

The plan sets out how AMSA will target high-risk areas over the next 12 months, including conducting at least 2,400 Port State Control inspections on foreign-flagged vessels and 2,300 inspections on domestic commercial vessels.

The plan follows the reporting of 46 serious crew injuries across regulated Australian vessels and foreign-flagged vessels in 2025. While this was fewer than in 2024, the continued occurrence of serious injuries highlights the need for targeted action on occupational health and safety, crew fatigue management, safety management system implementation and electrical safety.

For the first time, AMSA has committed to conducting 15 inspections under the Occupational Health and Safety (Maritime Industry) Act 1993 (OHS(MI) Act), reinforcing its focus on improving workplace health and safety at sea.

The 2026–27 compliance program will focus on:

- Risk-based inspections of foreign and Australian-flagged vessels, with an emphasis on navigational safety, pollution prevention, and cargo securing and stowage.
- Seafarer safety and welfare under the Maritime Labour Convention, including occupational health and safety, and hours of work and rest.
- Domestic commercial vessel safety, with priorities including electrical safety, watchkeeping, lookout practices and fatigue management.
- Pollution prevention through inspections of exhaust gas cleaning systems and support for

safe environmental practices.

- Strengthening safety management system implementation and safe operations among Aboriginal and Torres Strait Islander operators.

Compliance activities that will be applied as part of this plan include:

- Education: This may include a range of activities, including the development and dissemination of guidance material through various communication and engagement channels.
- Inspections: These include both scheduled and unscheduled inspections of vessels carried out by marine inspectors to ensure compliance with maritime legislation. Vessel inspections also seek to detect systemic performance issues within the accredited surveyor scheme and other associated entities.
- Safety compliance: This includes a combination of education, focused inspections and audits. We will generally commence with an education campaign followed by focused inspections to identify and measure the level of compliance. This will help identify what further compliance activities are necessary.
- Compliance checks: Compliance checks and monitoring activities are combined with education programs. We have compliance partner arrangements with State and Territory agencies across Australia. Monitoring activities can be undertaken with our compliance partners.

"Our focus for 2026–27 is clear: safer vessels, safer operations and safer working conditions for the people who keep Australia's maritime industry moving," AMSA said.

The authority said the plan reinforces its zero-tolerance approach to breaches of Maritime Labour Convention requirements for seafarer health, safety and welfare, while ensuring maritime employers meet their obligations under Australian and international law.

Download the Compliance Plan at <https://bit.ly/4eVIPfJ>.

IMO III 12: Key outcomes

The 12th session of IMO's Sub-Committee on Implementation of IMO Instruments (III 12) took place from 20 – 24 July.

The Sub-Committee on Implementation of IMO Instruments (III) brings together flag, port and coastal States to consider implementation issues, including the analysis of consolidated audit summary reports from the mandatory IMO Member state Audit Scheme. Following the conclusion on the Sub-Committee, Lloyd's Register (LR) has provided the following overview of some of the significant outcomes from III 12:

Key outcomes

The draft amendments to the 2025 Procedures for Port State Control (A.1206(34)) were progressed, including new guidance for PSCOs on machinery and maintenance inspections and revised PSCO qualification requirements, with the 2027 edition of the PSC Procedures planned to enter into effect on 1 January 2028.

The draft amendments to the Survey Guidelines under the Harmonized System of Survey and Certification (HSSC) 2025 (A.1207(34)) were progressed, including updates to reflect new IMO requirements, upcoming pilot transfer arrangement provisions, and the introduction of a coding system for remote surveys, with the 2027 edition of the HSSC Procedures planned to enter into effect on 1 January 2028.

The draft amendments to MSC/Circ.1140 – MEPC/Circ.424 on Transfer of ships between States were finalized, introducing a notification mechanism for ships deregistered without a new flag State. These are expected to be approved by MSC 112 and MEPC 85 in late 2026.



1 Draft amendments to the “Procedures for Port State Control, 2025”

The Procedures for Port State Control, 2025 A.1206(34), while not mandatory, are widely implemented and referenced by regional Port State Control (PSC) regimes (e.g. Paris MoU, Tokyo MoU) and are regarded as the global benchmark for PSC inspections. The Procedures are typically revised every two years to reflect amendments to IMO instruments and evolving inspection practices.

The following proposals for the 2027 revision of the PSC Procedures were considered and progressed as follows:

- A new appendix providing harmonized guidance for Port State Control Officers (PSCOs) on the inspection of ship machinery and maintenance systems.
- It is recognized that machinery-space inspections and the assessment of maintenance arrangements can be technically challenging, and that the current PSC Procedures lack detailed guidance in this area. Dedicated guidance to support more consistent and effective inspections has been developed.

Amendments to section 1.9 of the PSC Procedures concerning PSCO qualifications

It was discussed that requiring a PSCO to be qualified as a flag State surveyor may unnecessarily be restrictive. However, it was emphasized that the issue was not whether PSCOs should be competent, as the need for competent PSCOs worldwide was undisputed, but rather the appropriate minimum entry requirements and training pathways for officers entering the PSC system.

Draft appendix 21 covering list of instruments relevant to PSC Procedures

The list includes but is not limited to MEPC.400(83) Amendments to the 2021 Guidelines on the operational carbon intensity reduction factors relative to reference lines (CII reduction factors guidelines, G3), A.1204(34) Code on Alerts and Indicators, 2025 etc.

However, due to time constraints, the work could not be completed during the session and will continue intersessionally, with finalization currently expected at III 13 (July 2027). Once finalized the revised PSC Procedures are expected to be implemented from 1 January 2028.

2 Survey Guidelines under the Harmonized System of Survey and Certification (HSSC)

a. Draft amendments to 2025 HSSC Survey Guidelines (A.1207(34))

The Survey Guidelines under the Harmonized System of Survey and Certification (HSSC) are regularly reviewed and updated to accommodate new regulatory requirements. While these guidelines are not made mandatory by the IMO, the guidelines are mandatory for all European Union Recognized Organizations (most IACS members) under EU Regulation 391/2009.

The development of the 2027 edition of the HSSC Survey Guidelines has been initiated with work expected on:

- Draft amendments arising from mandatory instruments that have entered into force, or are expected to enter into force, by 31 December 2027, including the Hong Kong Convention, together with any amendments adopted under the SOLAS four-year cycle with entry into force dates between 2028 and 2029;
- Draft amendments related to the new SOLAS regulation V/23 on Pilot Transfer Arrangements and the associated Performance Standards; and
- A Draft Coding System for Remote Surveys, to be incorporated into the HSSC Guidelines to indicate the remote survey eligibility of individual survey items.
- The revision of the Survey Guidelines will continue intersessionally, and is expected to be finalized at III 13, and adopted at Assembly 35 (December 2027), with an anticipated implementation date of 1 January 2028.

b. Method for developing and assigning a coding system to update the Survey Guidelines under the HSSC

As part of its work on enabling remote surveys under the HSSC Survey Guidelines, there was broad agreement on the overall framework for identifying whether HSSC survey items are eligible for remote surveys, including:

- Adding a new "Remote survey eligible" column to the Survey Guidelines under the HSSC.
- Using a three-code system:
 - Y = Eligible for remote survey.
 - N = Not eligible.
 - C = Conditionally eligible, subject to specified criteria.
- Converting the existing Guidelines into a tabular format with standard headings:
 - Code
 - Survey Item
 - Survey Requirements
 - Eligibility for Remote Survey (Y/C/N)
- Applying the coding based on normal operating circumstances, while recognizing that Administrations may authorize remote surveys on a case-by-case basis in exceptional situations.

However, due to the complexity of the task and time constraints, the coding system was not finalized. The work is expected to continue intersessionally, with finalization expected at III 13 (July 2027).

3 Amendments to MSC/Circ.1140 – MEPC/Circ.424 on Transfer of ships between States

Concerns were raised about ships that are deregistered by a flag state for non-compliance with statutory requirements before securing registration with a new flag State. To address this gap, draft amendments to MSC/Circ.1140 – MEPC/Circ.424 were developed which introduce a notification mechanism under which flag States would inform the IMO when a ship is deregistered without a new registration. The objective is to improve information sharing through the IMO and enhance Member States' awareness of ships that may temporarily operate without a flag.

The draft amendments will be submitted to MSC 112 and MEPC 85 for approval (November–December 2026), where they may also consider whether related legal issues should be referred to the IMO Legal Committee.

Further, the potential safety, environmental protection and seafarer welfare risks associated with stateless or abandoned ships were noted, as well as broader legal issues concerning the responsibilities of former flag States and the jurisdiction of port States. This was referred to the Legal Committee for further consideration.



New study reveals the global superyacht industry is worth €54bn

A new study, conducted by Deloitte and Vrije Universiteit Amsterdam, reports that the superyacht sector generates approximately €54bn in total economic output worldwide annually – based on 2022 data – positioning the sector among the world's most impactful maritime manufacturing ecosystems.

The study was commissioned by the Superyacht Builders Association (SYBAss) and Superyacht Life Foundation (SYL) as part of a campaign to highlight the economic and industrial contributions of yacht construction and refit activities within the wider maritime sector.

According to the study, titled Global Economic Impact of the Superyacht Industry, new vessel construction accounts for 37 per cent of the global superyacht industry's economic impact, representing about €20bn. The report says the industry generated €22bn in direct expenditure, which subsequently created an additional €32bn in indirect economic activity through global supply chains, tourism, operations, hospitality and maritime services.

Economic activity from a newly delivered yacht contributes to downstream activity for decades through maintenance, refit work, marina services, crew employment, fuel supply and tourism-related spending. Across the global fleet, a single superyacht contributes on average €9m annually to the economy throughout its lifecycle, according to the study.

The study identifies the new-build segment as the single most economically catalytic activity in the superyacht sector, generating a multiplier effect of 2.8 – among the highest in advanced manufacturing and maritime industries. In practical terms, every €1 invested in building a yacht creates an additional €1.8 in economic value across the wider global economy.

The association says the refit and maintenance sector contributes a further €5.6bn, representing around 11 per cent of total industry impact. The figures are presented as one of the sector's longer-term growth areas as the global fleet continues to age and modernise.

The campaign also examines the relationship between yacht builders and the wider supply chain. According to the study, builders carry a large share of industrial investment, delivery risk and long-term accountability, while much of the recurring economic activity generated by yachts takes place after delivery.

Industrial activity and superyacht workforce

SYBAss states that the upstream sector, including new build and refit activity, generates an estimated direct economic impact of €9.5bn. Within this segment, the new build market accounts for 76 per cent of total turnover, equivalent to €7.2bn, while refit contributes the remaining 24 per cent, or €2.3bn.

The report describes yacht construction as a manufacturing sector supported by engineering, project management and specialist craftsmanship. Modern yacht construction involves coordinated work between welders, electricians, engineers, carpenters, painters, naval architects, metal workers, project managers and specialist suppliers.



The campaign also highlights the long-term economic contribution of the global superyacht fleet, which it estimates at approximately 5,600 vessels.

Superyacht market rebounds as 2025 sales surge

The 2026 Knight Frank Wealth Report reveals a strong market in 2025, with sales values up by 70%

"The superyacht market rebounded spectacularly in 2025," according to the recently published 20th edition of the Knight Frank Wealth Report. The 80-page report, while focusing on the overall global wealth market, highlights many key factors affecting the superyacht market.

Report highlights include:

- The 70% sales surge was unlocked by necessary adjustments in asking prices. This triggered a wave of buying activity from ultra-high-net-worth individuals (UHNWIs) who had been waiting out inflated post-pandemic pricing
- The "mega" scale shift: the ultra-large vessel segment is driving the highest returns. Sales for superyachts over 70m (230ft) increased by 60%, pushing the average asking price of a sold yacht to US\$16.6m
- Fresh inventory injection: market liquidity has been aided by the highest volume of new yacht listings entering the global brokerage ecosystem in seven years
- Demographic tailwinds: the average superyacht owner's age has dropped by 10 years over the last two decades, with the emerging 35-45 age bracket now the strongest demographic band
- Report data reveals that while traditional capitals such as Monaco remain critical, ultra-high-net-worth individuals (UHNWIs) are redefining where they buy, sail and dock

Demographics: American dominance and India's rise

According to the report, buyer profiles are rapidly diversifying across regions and age brackets:

- The US engine: American buyers continue to function as the primary driver of global yacht sales, accounting for up to half of all global transactions. This demand is heavily supported by strong US equity markets and domestic tax incentives
- India: wealthy Indian entrepreneurs are entering the superyacht market in record numbers, typically purchasing vessels to cruise the Mediterranean via transit hubs in Dubai and Abu Dhabi, and more recently in Southeast Asia and Australia
- The youth surge: the average age of superyacht owners has dropped by roughly ten years over the last two decades. The 35-to-45 age bracket is projected to become the core demographic within the next 10 years

The full report can be accessed at <https://bit.ly/4u8mWhw>.



EBI launches Energy Transition for Recreational Boating in Europe roadmap for alternative fuel infrastructure in marinas

European Boating Industry (EBI) has published a roadmap titled Energy Transition for Recreational Boating in Europe: A roadmap for alternative fuel infrastructure, setting out industry and policy recommendations relating to the decarbonisation of recreational boating and the development of marina infrastructure across Europe.

The document highlights the need for a technology-neutral and multi-pathway approach to the energy transition, recognising the diversity of Europe's recreational boating fleet of more than 6.5 million vessels and the operational realities of marinas across coastal and inland waters.

According to EBI, recreational boating accounts for approximately 0.4 per cent of EU transport greenhouse gas emissions. The roadmap examines how the sector is preparing for a transition towards alternative propulsion technologies while contributing to wider European climate objectives.

Marinas are identified as a key component of that transition. The roadmap calls for cooperation between industry, marina operators, EU institutions, national governments and regional stakeholders to ensure infrastructure development keeps pace with changes in propulsion technology.

The roadmap identifies sustainable drop-in fuels, including Hydrotreated Vegetable Oil (HVO), as an option that can be used in most existing diesel engines without major modifications or additional infrastructure.

According to EBI, HVO can reduce lifecycle CO₂ emissions by up to 90 per cent compared with fossil diesel, while also lowering particulate and NO_x emissions.

Electric and hybrid propulsion systems are also highlighted, particularly for smaller vessels and inland waterways. Hydrogen and methanol are being explored as potential future options for larger boats.

Download the roadmap at <https://bit.ly/4eiXdy8>.

Report finds that bunkering demand is concentrated around 19 ports

Lloyd's Register Maritime Decarbonisation Hub has published a report providing a global assessment of where alternative maritime fuels, including e fuels and selected sustainable biofuels, are most likely to be produced, exported and bunkered first.

According to the "Building the Sustainable Maritime Fuel Supply Chain" report, sustained uptake of sustainable maritime fuels will depend on supportive policy, but the speed and location of deployment will also be shaped by how quickly supply chains can be built and scaled.

Progress is likely to be fastest where projects can move from production to port delivery with clear economics and credible execution, aligned with national energy development priorities. It will also be influenced by energy security and resilience goals, which will shape where production clusters form and how new trade routes emerge.

Shipping decarbonisation is therefore increasingly constrained by infrastructure reality: sustainable fuels will only scale if they are available at the right ports, in the right quantities, with safe handling and credible assurance.

Key findings of the report

1. Bunkering demand is highly concentrated. The top 19 bunkering ports account for around half of global bunkering volumes, indicating that a small number of locations can unlock disproportionate impact and utilisation for early infrastructure.
2. Emerging sustainable fuel supply is often geographically decoupled from today's demand hubs. Many credible production and distribution nodes sit outside the current top bunkering ports, so early scaling depends on linking exporters to demand hubs through practical trade-route pairings while still recognising that a subset of locations can leverage local production and local demand in parallel.
3. Co-location between sustainable maritime fuels production facilities and industrial/port energy clusters is already a dominant development strategy. This is signalling that access to established utilities, logistics, and permitting environments is central to early project economics.
4. The next wave of early-adopter ports is not limited to today's biggest bunkering hubs. Feasibility factors, such as renewables, land, governance, and local benefits, can surface high-potential dual-role ports that mapping may miss.
5. Early trade in sustainable fuels is likely to develop in three overlapping regional patterns shaped by the distribution of demand and production.

Details of how to access the full report can be found at <https://bit.ly/4vj8Vc>.



Global Maritime Trends 2026 Barometer report

The maritime industry is set to undergo significant transformation over the coming decades, shaped by accelerating technology adoption, the global climate agenda, and intensifying geopolitical and macroeconomic shifts, according to the Global Maritime Trends 2026 Barometer from Lloyd's Register (LR) and Lloyd's Register Foundation.

The maritime and energy sectors are at a pivotal inflection point. While energy technologies continue to advance, progress remains too slow to meet net-zero targets. Data collection and reporting have increased significantly, but without stronger global cooperation, both the energy and digital transitions risk becoming increasingly regionalised and fragmented.

Tracking five key areas - maritime trade, energy, vessels, ports, and people - the barometer provides a data-driven view of how the industry is navigating the energy and digital transitions, while benchmarking progress against four future scenarios to highlight emerging trends.

These scenarios are structured around a matrix that considers the pace of technology adoption across society and the degree of global cooperation on climate change, and they are as follows:

- Just, gradual transition
- Rapid, tech-driven transition
- Regionalized and fragmented transition
- Delayed transition

Key takeaways

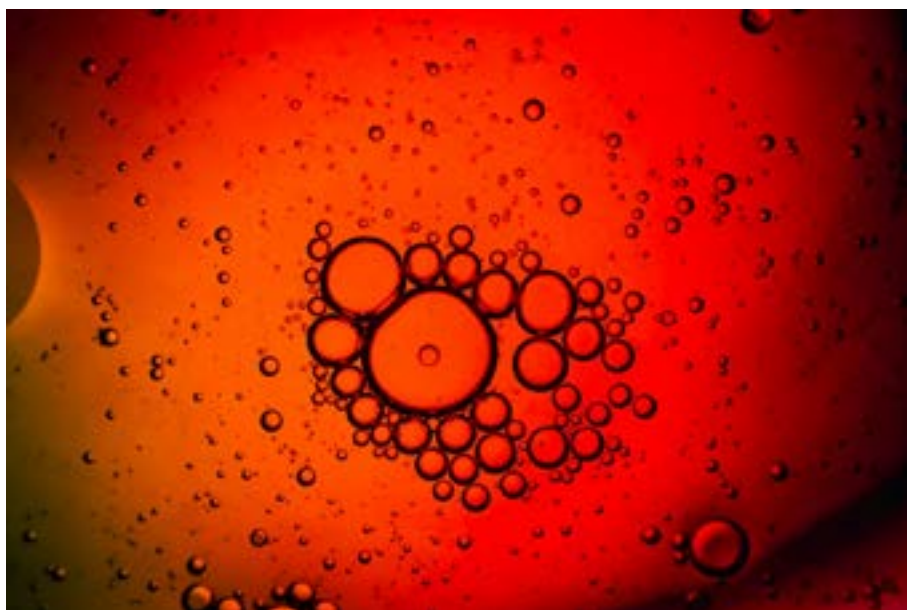
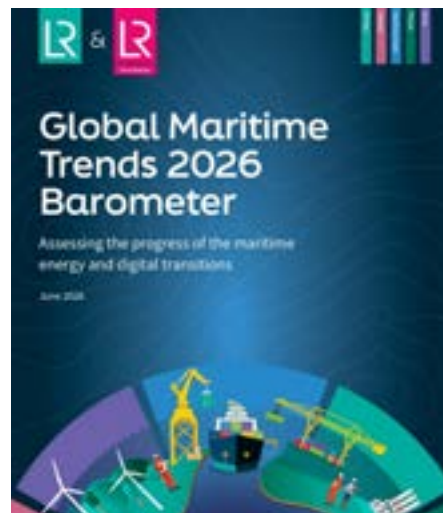
1. Progress in the energy transition is real, but it is structurally uneven and insufficient. There has been incremental technological progress. However, deployment lags ambition, and progress is concentrated in a few regions and hubs.
2. Policy misalignment and geopolitical fragmentation are now the primary pain points. The biggest constraint is no longer technology, but its coordination and governance.
3. The human dimension of the transition remains significantly misaligned with equitable net-zero ambitions. Progress in safety, training and workforce development is still uneven and slow. Structural changes persist across fleets and geographies. Without a more coordinated and inclusive approach, the sector risks a fragmented, tiered workforce, undermining both safety and long-term sustainability.

4. Fuel Emission reporting will continue, whether in a unified or fragmented approach, and now is the time to develop a strategy to ensure data collection, quality and maturity.

5. A lack of standardisation previously stood as a barrier to digital transformation, but the IMO compendium and other initiatives will accelerate digital uptake. As these initiatives move towards maturity, the opportunities for digital efficiencies increase. The direction is becoming clearer and so now is the time to act.

6. The barrier for crew digital services is no longer held back by connectivity. It is good to see the improvements in crew welfare through digital technologies. It is now time to build on this foundation and raise standards and support for crew.

Download the report at <https://bit.ly/3Qi04fZ>.



DNV issues recommended practice for hydrogen as a marine fuel

DNV has published a new recommended practice (DNV RP 0703) for the use of hydrogen as a marine fuel, with a focus on competence requirements for crew, inspectors, and technical personnel.

The guidance is intended to support safe handling of hydrogen systems on board vessels and can also be used as a basis for operational procedures and

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emergency preparedness planning. It builds on DNV's existing competence frameworks for other low GHG fuels such as LNG, ammonia, and methanol.

The context for the document is the growing but still early stage adoption of hydrogen in shipping. According to DNV's Energy Transition Outlook Hydrogen to 2060, by 2060, the strongest demand for clean hydrogen is expected to come from hard-to-electrify industries. Steelmaking and aviation are each projected to represent 18% of total clean hydrogen use, while maritime shipping is expected to account for 15%.

A small number of vessels are currently in operation and several dozen more are on order. At the same time, hydrogen presents significant safety challenges including leakage risks, very low ignition energy, and the complexity of handling high pressure or cryogenic storage.

"Hydrogen represents one of several possible pathways in maritime decarbonization. The development of efficient safety regulations and guidelines is fundamental for hydrogen to evolve from large-scale demonstration to commercial use," explained Cristina Saenz de Santa Maria, CEO Maritime at DNV, adding that to get there it is essential that the industry develops competence levels among seafarers in parallel with technical solutions so that they can operate hydrogen-fuelled vessels with confidence.

Meanwhile, Kirsten Birgitte Strømsnes, Business Development Leader at DNV stated that the use of hydrogen as a ship fuel requires that crew and shore-based personnel are trained on its specific hazards, and that organizations reflect these risks in their management systems and competence frameworks. It also means ensuring safer ship designs and implementing the necessary technical barriers.

The recommended practice is designed to complement existing maritime regulations such as the STCW Convention and ISM Code by adding hydrogen specific competence guidance. It is intended for shipowners, operators, maritime academies, training institutions, and certification bodies for use in training, curriculum development, and competence assessment.

Report on the impact of SIRE 2.0 which is becoming clear

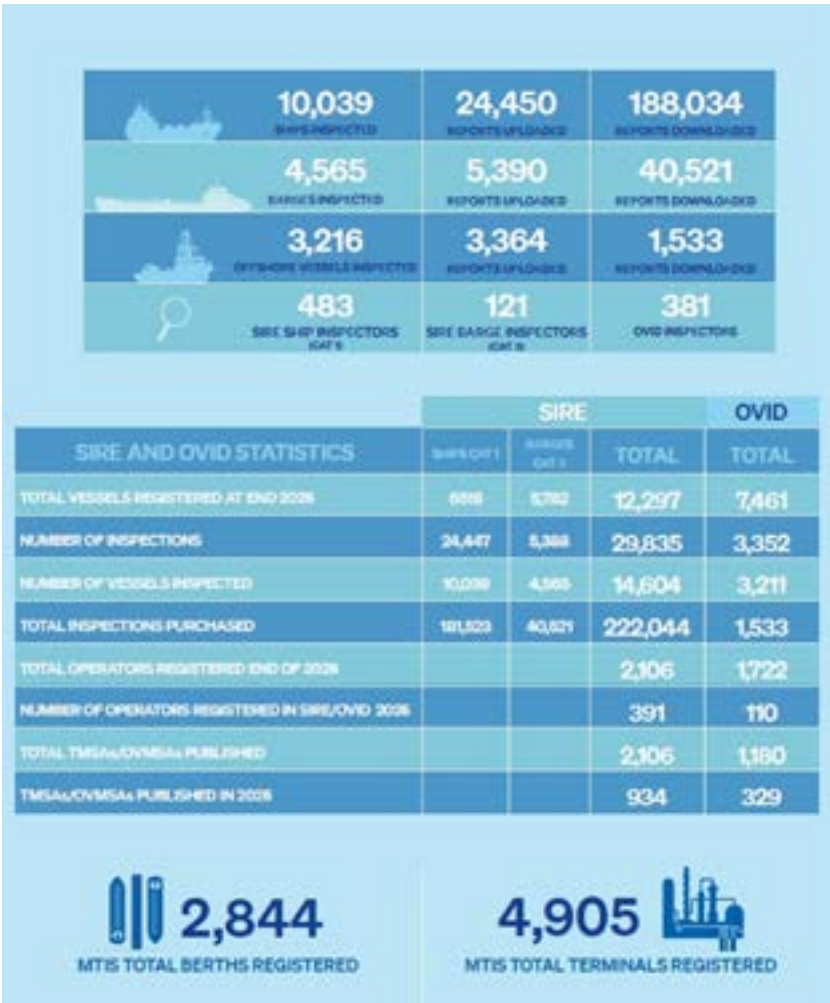
In its 2026 annual report, The Oil Companies International Marine Forum (OCIMF) reports on the impact of the SIRE 2.0 inspection regime.

Launched in 2024, SIRE 2.0 set out to modernise inspections through digitalisation, greater data transparency and a stronger focus on human factors. Now, with more than 24,000 inspections completed, its impact is becoming clear, as it is not just a technical upgrade, but a broader cultural shift.

From paper to digital

Transitioning from a long-established paper-based system to a fully digital inspection regime has been a significant challenge. Connectivity issues, hardware variability, and the sheer scale of data management tested the industry's adaptability.

But the biggest hurdle was cultural – changing habits built over decades. Despite these challenges, the level of engagement and industry's willingness to adapt have been tremendous, resulting in a more transparent, efficient, and insightful inspection process.



NEW marine reports and guides

Embedding preparedness through inspection

A central element of OCIMF's response during 2025 was embedding security preparedness more deeply into marine assurance activity. In October 2025, OCIMF launched a Focused Inspection Campaign (FIC) under the SIRE 2.0 inspection programme to reinforce onboard readiness and crew familiarity with company security procedures.

The FIC introduced targeted questions on vessel hardening, access control and onboard awareness, applied across all SIRE 2.0 inspections regardless of a vessel's operating area. By testing practical understanding rather than theoretical knowledge, the campaign aimed to ensure that security procedures could be applied effectively under real world conditions, including during periods of heightened stress or limited reaction time.

This approach reflected a broader shift away from checklist compliance towards behavioural assurance, aligning operational security with OCIMF's wider emphasis on human factors. By examining how well crews understand and implement security plans, the inspection campaign sought to strengthen preparedness at the point where it matters most, on board the vessel.

Human factors at the forefront

The integration of human factors into inspections has been a major innovation. Guided by OCIMF's Human Factors Committee, inspectors now look beyond compliance to understand why tasks are performed the way they are, considering fatigue, stress, and operational pressures.

This approach encourages inspections to turn into learning opportunities rather than simple audits. Early results are encouraging. There have been more open conversations on wellbeing and behaviour, which is vital for building trust and improving safety on board.

Collaboration and continuous improvement

Feedback loops have been central to success. OCIMF actively engages with inspectors, operators, and charterers to refine the system. The Suggestions for Improvement (SFI) portal has become a key tool for users to share insights, ensuring SIRE 2.0 reflects real-world conditions. Continually optimising the system will enable it to leverage benefits and ensure lasting safety improvements.

Measuring success beyond numbers

While the number of inspections is significant, the true measure of success lies in the quality of insights generated. Dynamic, data-rich reports now help stakeholders anticipate risks rather than simply respond to them. OCIMF is also working to maintain data integrity across its global network of 460 accredited inspectors through structured question sets, mandatory evidence capture and rigorous quality assurance.

SIRE 2.0 was designed with flexibility, allowing future modules to address emerging priorities such as environmental performance, cyber resilience and autonomous systems.

Sustainability in the tanker sector should be viewed holistically – it concerns safety, people and performance as much as environmental impact. SIRE 2.0 is a powerful example of how digitalisation and data transparency can enable proactive decision-making, ultimately supporting safer and more sustainable operations.



Allianz Safety and Shipping Review 2026

The Allianz Safety and Shipping Review 2026 has been published and is available to download now. It highlights geopolitical conflict and the closure of the Strait of Hormuz as a major factor that shaped shipping risk and activity.

According to Allianz, incidents like the closure and reported mining of the Strait of Hormuz signal a transition toward a "new maritime order" defined by escalating security risks along strategic shipping corridors, the disruption of established trade routes, persistent uncertainty, higher risk premiums, and a greater strategic emphasis on resilience over pure cost efficiency.

Despite the long-term improvement in the industry's safety record, loss spikes have continued to occur; while looking forward, the reshaping of sector forces is set to persist.

Strait of Hormuz disruption highlights importance of maritime chokepoints

The conflict in the Middle East paralyzed the Strait of Hormuz, a critical global oil trade route. Allianz Research data shows that around 1,150 cargo-carrying vessels (over 100GT) with an estimated vessel and cargo value of approximately \$125 billion, a volume of 29 million GT, and as many as 20,000 seafarers are in the Persian Gulf waiting to resume operations following recent diplomatic breakthroughs.

Shipping incident and loss developments

In addition to geopolitical uncertainty, traditional risks for the shipping industry highlighted in the Allianz Safety and Shipping Review 2026 remain a major concern, although the numbers of total vessel losses and incidents have continued to decline in recent years. Machinery damage or failure and fires are among the main loss drivers in this regard, leading to significant economic and insured losses.

Around the world, the number of reported shipping incidents on vessels over 100GT declined over the past year by around 16% (2,818 in 2025 compared to 3,353 in 2024).

The East Mediterranean and Black Sea region saw the highest number of reported incidents (622), followed by the British Isles (619), which is also the location of the most incidents over the past decade, reveals the Allianz Safety and Shipping Review 2026.

According to the Allianz Safety and Shipping Review 2026, machinery damage or failure was the major cause of all shipping incidents globally during the past year, accounting for over half (1,505), followed by vessel collision (260) and fire / explosion (218), which remains a major concern on vessels. Machinery damage being the main cause of shipping incidents is significant as machinery claims inflation has not yet returned to pre-Covid-19 levels, with repair costs having continued to rise, a trend which could be exacerbated by the recent conflict in the Middle East.

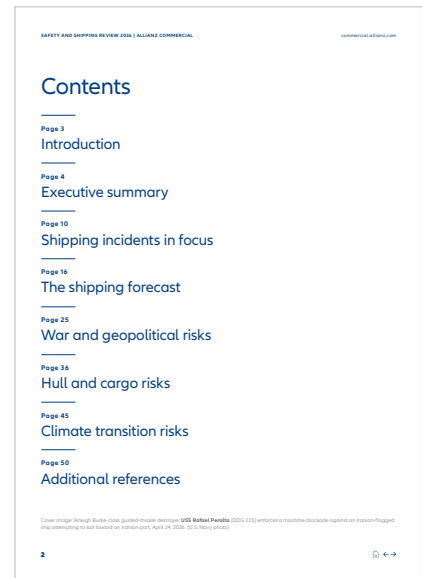
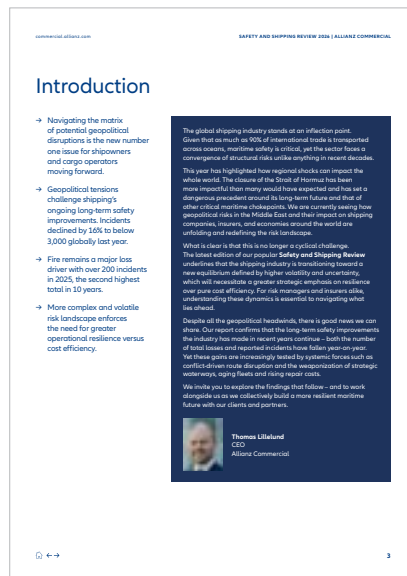
Fires on large vessels remain a persistent concern

Fires on large vessels, including container ships and car carriers, remain a worry. There were more than 200 incidents on large vessels reported during 2025, down from 2024, but still the second highest total over the past decade, with at least nine total losses reported.

Larger vessels drive more complex and costly claims

The increasing size of vessels is also driving a trend for a rise in general average claims, where the shipowner and cargo interests share losses or expenditure to save the whole venture in an emergency. Such claims are typically complex and large. Contributions to cover losses can be as high as 50% of the cargo value, which if a vessel is carrying a few thousand electric cars, for example, could easily be over US\$100mn.

Download the review at <https://www.iims.org.uk/download/1066/>.



Announcing two great practical training opportunities open to all



IIMS Practical Surveying Course

5-8 October 2026

Are you new to the marine surveying profession, or do you have limited surveying experience and need more knowledge? Perhaps you're wondering whether you're inspecting the boat correctly and if your reports have enough detail to meet modern-day expectations? Our Practical Surveying Course could be just the ticket for you.

This four-day residential programme being held at Portchester, UK, aims to offer delegates practical, hands-on surveying experience.

"Well done IIMS. I chose this course because I felt that this Institute would provide the technical and hands-on training that I was looking for. You continue to deliver. Overall, this course was really very good and I felt it was great value for money."
Andrew Summerell, IIMS student.

For more information,
go to <https://bit.ly/4xp919c>.



IIMS Practical Boat Building Course

7-11 December 2026

Having rested this programme for a couple of years, IIMS is bringing its practical boat-building course back by popular demand later in 2026. The Boat Building Academy is a recognised centre of learning excellence.

Numbers for this exceptional learning opportunity are strictly limited to just 8 students, so please act promptly to reserve your place.

The Boat Building Academy tutors are highly experienced and will host the event on behalf of IIMS. The content is based on two days of wooden boat theory, including discussions on faults in wooden boats and typical issues, followed by three days of FRP/GRP with some practical work, including hand lay-ups and repairs, and will cover faults in FRP/GRP, including osmosis. Faults in wooden boats and osmosis were both mentioned after the last course in 2022 as areas where the students would like more information, so the Boat Building Academy will focus time on these subjects.

For more details and to view the
day-by-day timetable of events,
go to <https://bit.ly/4gHbUeJ>.



Spotlight on emerging AI technology in the maritime sector

Introduced and collated by Mike Schwarz,
IIMS Chief Executive Officer



What is AI?

I cannot believe the term AI has passed you by, but in case it has, here is a definition.

Artificial intelligence (AI) is the capability of computational systems to perform tasks typically associated with human intelligence, such as learning, reasoning, problem-solving, perception, and decision-making. It is a field of research in engineering, mathematics and computer science that develops and studies methods and software that enable machines to perceive their environment and use learning and intelligence to take actions that maximize their chances of achieving defined goals.

AI doesn't strictly "think" like a human brain; rather, it uses advanced algorithms and massive datasets to identify patterns, make predictions, and adapt to new information.

Introduction

Now that we have that clear - as I browse my daily maritime news feeds, the surge of AI technology coming at us from all angles is evident. We can choose to try and ignore it, but in doing so we are likely to get left behind rapidly. The technology is developing so fast that by the time you have finished reading this article, this content will certainly be out of date!

The simple truth is that an article of a little more than 4,000 words cannot do justice to what is going on in today's world and the burgeoning impact of AI on all corners of the maritime sector.

So, this is my best attempt to bring together what I hope is an eclectic, and insightful collation of stories ranging from the small craft sector to large scale

commercial ship operations that give a flavour of some of the opportunities (and threats) posed by AI, and some of the likely future changes and their impact on our profession and personal lives.

As someone remarked earlier this year, we did not vote for AI, many of us do not want it and are concerned about the implications when it becomes too powerful. But it is here, surrounding us.

Where possible I have credited the authors of the stories you are about to read, but I have not been able to do so in all cases. But my thanks to all of them for providing me with the inspiration to compile this article.

Let's get on ...

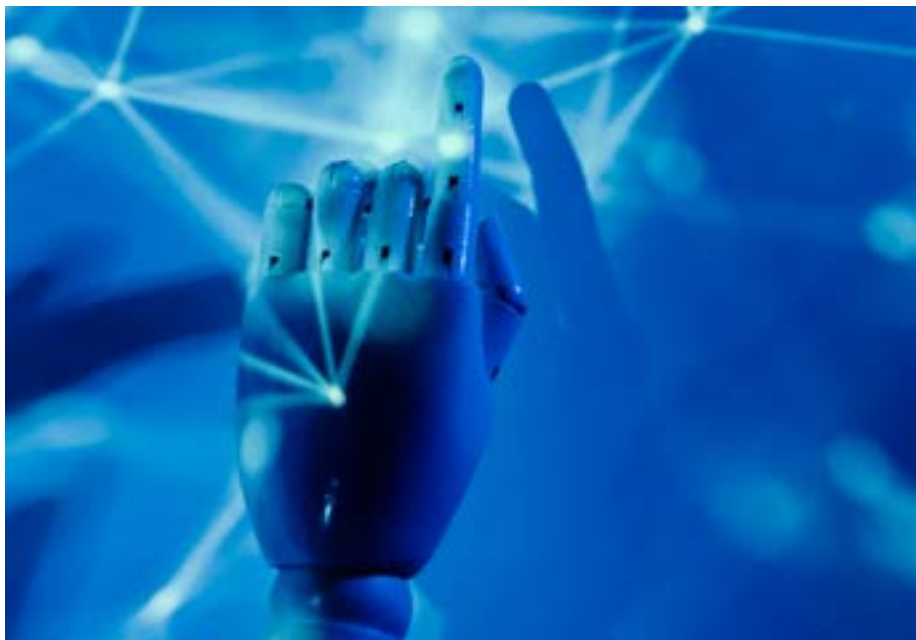


How AI is transforming yacht surveying

By Rick Kirton

The future of marine surveying isn't about replacing professionals. It's about giving them tools that let them work faster, clearer and with less stress.

Talk to any experienced yacht surveyor and you'll hear a similar story: the inspections are the easy part. The real work starts when you get home and open the laptop. Reports have grown longer, expectations have crept higher and clients want detail that goes far beyond "traditional" surveys. Add insurers, brokers and increasingly complex systems aboard modern yachts, and it's easy to see why many surveyors spend more time writing than inspecting.



This is where AI enters the picture. Not as a replacement, not as a shortcut for inexperienced people, but as a tool that removes the friction from the administrative side of the job. For the first time, surveyors can offload parts of their workflow that don't rely on experience, judgement or being physically present on the vessel. The idea isn't to change the craft of surveying. It's to take back the hours that reports quietly absorb every week.

What AI actually helps with

When people think about AI in technical industries, they often imagine machines attempting to replicate expert judgement. That's not what's happening in yacht surveying. The biggest impact today comes from much simpler, more practical tasks — the things that slow surveyors down even though they don't require hands-on expertise.

One of the most helpful uses is turning rough field notes into clear, structured text. Many surveyors prefer shorthand, voice notes or quick observations during an inspection. Raw notes like "stern gland slight leak, bilge oily, moisture high near stanchions" can be transformed into clean, coherent prose that's ready for a report. The same goes for long-winded manufacturer manuals, previous surveys or technical documents. Summaries that used to take half an hour can now appear in a few seconds and still read naturally.

AI is also surprisingly effective with images. Captioning photos, identifying what the picture shows and pointing out obvious issues removes another small but time-consuming part of the reporting process. Even something as simple as helping illustrate concepts for clients — a diagram of a hull cross-section or a simplified representation of a rig layout — can turn a confusing paragraph into something instantly understandable. These are not glamorous tasks, but they are the ones that quietly consume hours. AI handles them well, and it frees you to focus on the part of the job that only a trained surveyor can do.

What AI cannot do (and probably never will)

Despite the hype that sometimes surrounds AI, its limitations are clear when it comes to surveying. AI cannot smell fuel vapour, tap a deck and judge its response, or notice when a fitting feels loose. It cannot distinguish between a harmless stain and a structural concern. And it most certainly cannot make safety recommendations without guidance from the human in charge. Surveying remains a physical, interpretive discipline. No AI model — now or in the foreseeable future — can replace the value of experience gained on real boats in real conditions.

The real power of AI here lies in partnership. You inspect, evaluate and decide. AI helps you communicate those decisions quickly and clearly.

Here's a real example

Imagine you've just come back from a pre-purchase survey and your notebook contains a handful of quick observations:

- "stern gland weeping slight"
- "bilge oily"
- "moisture high port stanchion"
- "exhaust hose soft patches"



A general AI model will usually create something respectable with that information, but a domain-trained tool will produce text that sounds far closer to what an experienced surveyor would write:

“Light weeping was observed at the stern gland and should be monitored, with repacking likely to be required in the near future. The bilge area is contaminated with oil residue, limiting inspection access and warranting cleaning. Elevated moisture readings were recorded around the port-side stanchion bases, suggesting potential core saturation and the need for further investigation. The exhaust hose shows notable softening, consistent with age and deterioration, and is due for replacement.”

This is the kind of output that can go straight into a report with minimal editing — not a first draft, but a near-final version.

The Visual Side of Reporting

One of the unexpected benefits of AI is how it supports the visual component of surveying. Many clients, especially first-time boat buyers, struggle to interpret photos without context. What’s obvious to you isn’t obvious to them.

AI can help highlight the part of the image that matters, generate a caption that explains the issue in plain language or even produce simple diagrams when needed. These enhancements don’t replace the original photographs, and they certainly don’t alter evidence. Instead, they improve understanding, reduce miscommunication and make reports easier to digest.

What Lies Ahead

The next few years are likely to bring even more change. We can expect improvements in defect recognition, better interpretation of moisture readings and more accurate technical language. None of this replaces surveyors; instead, it gives them tools that make their work more efficient, more consistent and more accessible to clients.

Early adopters will have an advantage. They’ll complete reports faster, maintain a more consistent style and offer clarity that clients and insurers appreciate.

More information: <https://medium.com/@rickkirtton>



Saronic and Lloyd’s Register partner on maritime autonomy standards

U.S. autonomous vessel developer Saronic has entered into a strategic partnership with Lloyd’s Register (LR) to support the safe deployment of autonomous maritime systems in the United Kingdom, Europe and Australia. The companies said the collaboration would focus on advancing technical standards, regulatory guidance and classification pathways for autonomous surface vessels.

Saronic said it would pursue classification activities for its autonomous vessels with LR as part of the agreement. The partnership will also involve engagement with regulators and authorities to support the development of emerging frameworks governing maritime autonomy. The company said the partnership expands its ongoing efforts to certify autonomous vessel systems, building on existing work with the American Bureau of Shipping.

“Autonomy is fundamentally reshaping maritime operations, and as Saronic expands its presence across the United Kingdom, Europe, and Australia, we are excited to partner with Lloyd’s Register, a leading authority on maritime safety and sustainability.

“As we work together in these key markets, we are committed to ensuring our autonomous maritime capabilities meet a high bar for safety and security while aligning technological innovation with forward-looking frameworks that build trust and confidence in the safe operation of this emerging class of vessels,” said Dino Mavrookas, Co-Founder and CEO of Saronic Technologies.

“Through this partnership with Saronic, LR is helping to shape the standards, verification pathways and regulatory approaches needed to support the safe and scalable adoption of marine autonomous vehicles,” added David Lloyd, Vice-President Naval and Government Business at LR.



Illustration credit:
Saronic

Researchers aim to develop AI robots to help shipbuilders adapt

Researchers from the University of Michigan Engineering and Massachusetts Institute of Technology are partnering with Japanese institutions to develop AI-powered robots that help shipbuilders adapt when real-world construction no longer matches the original ship design.

The project is backed by a \$6.2 million grant from Japan's Ministry of Land, Infrastructure, Transport and Tourism and is overseen by NYK Line's Monohakobi Technology Institute. Shipbuilding often faces problems because pipes, cables, and equipment may arrive late or be installed out of sequence due to scheduling pressure. As a result, later components may no longer fit properly, forcing costly rework and delays.

The new system aims to reduce that risk by using autonomous robots equipped with LiDAR and cameras to scan the ship as it is being built. AI models will compare the "as-built" structure against a digital twin of the intended design and automatically flag mismatches or future risks. The AI assistant is designed as a "co-pilot" for shipyard workers rather than a replacement. When it detects a problem, such as blocked access routes or pipes that no longer fit, it will suggest alternative solutions and explain the tradeoffs. The system will also identify where sensor data is incomplete so human workers can step in when needed.

To train the AI, researchers will simulate shipbuilding scenarios and interview experienced tradespeople in both the U.S. and Japan so the recommendations reflect real shipyard decision-making. The technology will be tested using a reconfigurable "Shipbuilding Test Block," a physical mock-up of ship sections that can recreate different construction stages and outfitting challenges.

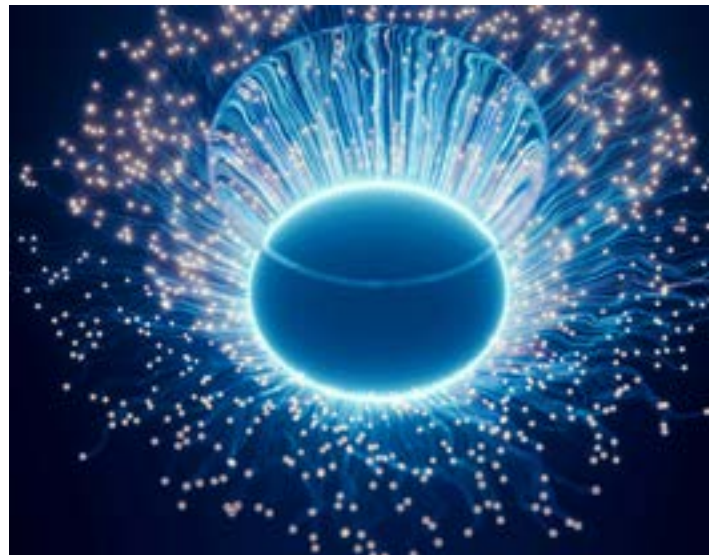


New data system aims to automate emissions reporting at ports

Awake.AI and Tidalis have partnered to integrate emissions monitoring into vessel traffic and port management systems used by ports, coastguards and maritime authorities worldwide.

The combined system will aim to automate emissions reporting by using operational data such as port calls, fuelling, cargo handling, shore power and gate events. It is designed to help ports, terminals and shipping companies meet growing regulatory requirements tied to FuelEU Maritime, the EU ETS and IMO decarbonization targets.

The platform aims to reduce manual reporting and improve visibility into Scope 1–3 emissions across port and vessel operations. Awake.AI CEO Karno Tenovuo explained that the challenge for ports is converting large volumes of operational data into reliable, auditable emissions reporting that supports both compliance and operational decisions.





How cutting-edge tech is shaping the future of boating

By Lucas Shane Chittum

The rise of artificial intelligence on the water

AI-powered systems are making waves in the boating industry. These innovative systems offer autonomous navigation, collision avoidance, and real-time data monitoring features. Using sensors and algorithms, AI can interpret environmental conditions like wind, waves, and currents, enabling boats to make real-time adjustments for optimal performance and safety.

For instance, autonomous docking systems now allow boats to manoeuvre into tight spots without

human intervention. This primarily benefits novice boaters, reducing the stress of navigating busy marinas. Additionally, AI-powered apps provide boaters with real-time updates on weather, fuel consumption, and maintenance needs, creating a more informed and enjoyable boating experience.

Electric propulsion

The shift toward sustainability has spurred the adoption of electric propulsion in the boating industry. Traditional internal combustion engines are being replaced by electric motors, which are quieter, cleaner, and more efficient. Companies like X Shore and Torqeedo lead the charge, offering electric boats that minimize environmental impact without compromising performance.

Electric boats cut emissions and reduce noise pollution, making them a popular choice for those who prioritize preserving marine life. With advancements in battery technology, electric boats are now capable of longer ranges, making them viable options for both recreational and commercial use.

Connected systems

The Internet of Things (IoT) brings unprecedented connectivity to the boating world. IoT-enabled boats allow users to monitor and control systems remotely via smartphone or tablet. Imagine turning on your boat's air conditioning or checking its fuel levels from the comfort of your home. IoT integration also enhances safety by alerting boaters to potential issues such as bilge flooding or engine malfunctions.

Fleet management is another area benefiting from IoT technology. Commercial operators can track multiple vessels in real-time, optimizing routes and ensuring timely maintenance. This level of connectivity enhances operational efficiency, saving time and money while improving overall safety.

Virtual Reality (VR) and Augmented Reality (AR): A new dimension in boating

Virtual and augmented reality are enhancing the boating experience in exciting ways. VR is used for boat design and training, allowing manufacturers and buyers to explore vessels in a virtual environment before they are built. This technology helps identify design flaws early and offers potential buyers a more immersive shopping experience.

AR, on the other hand, is improving navigation and maintenance. AR headsets or displays can overlay navigational information onto the real world, helping boaters identify landmarks, hazards, and optimal routes. Maintenance crews can also use AR to visualize internal systems and identify issues without dismantling components, saving time and reducing costs.

Advanced materials

The materials used to construct boats are also evolving. Lightweight composites, 3D-printed components, and graphene-infused materials make boats more substantial, lighter, and fuel-efficient. These advanced materials improve performance and enhance durability, reducing the need for frequent repairs.



For example, 3D printing allows manufacturers to create complex parts, precisely reducing waste and production costs. This technology is particularly valuable for custom boat designs, enabling faster prototyping and shorter production timelines.

The Future of boating

While these advancements are exciting, the boating industry remains rooted in its traditions. The challenge lies in blending the timeless allure of the water with modern technology to create an experience that appeals to both seasoned mariners and new enthusiasts. With continued investment in research and development, the future of boating looks brighter than ever.

As these technologies become more accessible, they promise to revolutionize the industry, making boating safer, more sustainable, and more enjoyable. Whether you're a weekend sailor, a commercial operator, or an aspiring boat owner, the innovations on the horizon will surely enhance your time on the water.

The waves are changing, and the boating industry is confidently steering into uncharted territories. These technological breakthroughs redefine what's possible and ensure that future generations can enjoy the beauty and adventure of boating.

For more information: <https://lucasshanechittum.com/>



The rise of AI in the maritime industry

By John Bensalhia

Artificial intelligence use continues to grow with the maritime AI market nearly tripling in size between 2023 and 2024, according to a Thetius report. AI continues its increasing contribution to the maritime sector, with one of the latest uses being ship condition monitoring. Artificial intelligence (AI) can help to test machinery and diagnose any potential problems on the ship.

But while it may offer positives, Condition Monitoring Technologies (CMT) has recently cautioned against placing too much reliance on AI in this field. Human involvement is still vital to make sure that maritime operations remain accurate and safe, it reports.

CMT's Managing Director David Fuhlbrügge commented that while AI still has a role to play – for instance, in analysing huge data sets generated during operations – there are still "critical limitations in relying on technology alone". In particular, CMT argues that human involvement is crucial when it comes to handling data – checking, interpreting and then dealing with information is especially important in the cases of automated vessels.

"A sensor can tell you a pressure reading or temperature value," explained Mr Fuhlbrügge. "It cannot smell burning oil, feel excessive vibration or recognise an unusual sound in the engine room. That's where human intuition, experience and judgement come in."

A valid argument for human involvement is that AI lacks that gut instinct in the case of any issues. Professionals can draw upon years of training and experience to recognise if there is any cause for concern. Another problem with using AI for ship condition monitoring is the cost and logistics involved of placing sensors all around the ship – and in the event of these systems failing, this can only reinforce the need for a human presence.

AI working in other areas

While a cautious approach is advised with respect to human involvement, AI usage presses ahead in a number of maritime sectors. A collaboration between Lloyd's Register and Microsoft's Azure OpenAI service has seen the technology being used to enhance the regulatory process for nuclear technology.



Lloyd's Register Global Offshore Power To X Director, Mark Tipping, explained that AI can swiftly interrogate from a huge data source in order to "identify good practice and lessons learned". Deputy Chief Technology and Innovation Officer, Jeff Scott, added that AI can cut through the "red tape" to "fast-track the future of nuclear in maritime".

In terms of protecting cargo, a March 2025 report from the International Union of Marine Insurance said that AI can help to optimise the fastest and safest transportation routes. Using predictive analytics and the study of weather conditions, AI can help to protect cargo by helping to plot the smoothest courses that eschew rough seas and thus, potential spillage of commodities such as foods, drinks and other perishable goods.

Meanwhile, research at Osaka Metropolitan University has resulted in a AI-driven fluid dynamics breakthrough. The researchers claim that their new machine learning-powered fluid simulation model can maintain accuracy while drastically lowering computation time rates – they say that this can boost industries such as offshore power, ship designing and real-time ocean monitoring.

Let's not be blinded by the promise of the full autonomous ship. Human engineers are not a relic of the past. They're the best safeguard we have for a safe and reliable future at sea."



Reducing operational costs in the maritime industry using AI

As digitalization continues to drive operational efficiency and streamline processes in the shipping industry, Artificial Intelligence (AI) stands out as a transformative technology. First introduced in the mid-20th century as a theoretical concept, AI has since evolved into a practical tool reshaping industries worldwide. In the maritime sector, its impact is profound, unlocking new levels of reliability, accuracy, and effectiveness, as well as paving the way for a more innovative and efficient future. From predictive maintenance to energy management, its applications are revolutionizing the industry.



Automation Opportunities in Maritime Operations

AI-driven systems for automated vessel navigation improve efficiency, reducing fuel consumption by up to 10% and cutting transit times by 5%. These systems use real-time data to adjust ship movements, enhancing safety and lowering the risk of accidents. Automation in cargo handling and port operations streamlines processes, from loading and unloading to inventory management.

AI ensures accurate cargo tracking, minimizing delays and errors in port logistics. In ship operations, these advancements predict maintenance needs, preventing breakdowns and costly repairs. Integrating AI into these areas enhances safety by reducing manual errors and ensuring smoother, faster operations. With AI handling repetitive tasks, human workers can focus on more strategic roles, reducing risks and improving overall productivity.

Real examples of AI implementations

Artificial Intelligence is transforming the shipping industry by optimizing operations, reducing costs, and driving sustainability. Below are three compelling case studies highlighting successful implementations in various regions worldwide.

1. CMA CGM's AI for Route Planning

CMA CGM, a leading global shipping company based in France, employs AI to optimize vessel routes by assessing historical data and real-time conditions to determine the most fuel-efficient paths. The AI platform analyzes weather forecasts, maritime traffic, and port conditions, making route adjustments dynamically according to vessel-specific parameters such as fuel consumption and speed. This approach has led to reduced fuel consumption, lower costs, fewer greenhouse gas emissions, improved punctuality, enhanced reliability, and greater customer satisfaction, delivering both environmental and operational advantages.

2. Port of Rotterdam's Smart Container Management

The Netherlands' Port of Rotterdam, Europe's largest port, has implemented AI-powered systems to optimize cargo handling and stowage planning, enhancing efficiency and throughput. The system uses predictive analytics to determine the most efficient loading and unloading sequences, considering factors including schedules, container weights, and destinations. Real-time data is integrated to enhance the usage of cranes and other equipment, ensuring smoother operations. Therefore, the port has seen faster ship turnaround times, reduced congestion, and a more streamlined logistics flow that minimizes delays, leading to greater operational efficiency and performance.

3. Orient Overseas Container Line

In Hong Kong, Orient Overseas Container Line (OOCL) has implemented an AI-driven fuel monitoring system designed to optimize fuel consumption and enhance environmental performance throughout its fleet. This system integrates with onboard sensors to analyze engine performance, sea conditions, and speed in real time, allowing AI algorithms to predict optimal operating conditions that minimize fuel usage. As a result, OOCL has achieved significant reductions in fuel consumption and greenhouse gas emissions.



Singapore's maritime sector to fast-track AI adoption

The Maritime and Port Authority of Singapore (MPA) and the Singapore Shipping Association (SSA) has announced a partnership to accelerate the adoption of AI among maritime companies to improve productivity and strengthen competitiveness.

In parallel with the announcement of the Singapore Maritime Technology & Research Roadmap 2026, which sets out a vision to position Singapore as a global leader in maritime innovation, MPA Singapore and SSA signed a Memorandum of Understanding (MoU) under which they will support maritime companies in adopting AI across key functions, including ship agency, ship management and chartering, shipping operations and bunkering.

Under this initiative, companies will gain access to a curated knowledge base of maritime AI use cases to guide their adoption strategies, connect with solution providers, and pilot AI applications within their own operating environments. Furthermore, they can also draw on AI Singapore's AI Readiness Index (AIRI) framework to understand their AI maturity and guide their next steps.





Tagged sharks could improve climate forecasts

A new study shows that electronically tagged sharks can serve as mobile sensors, collecting ocean climate data in regions that are difficult to observe using conventional methods. The study was led by Laura H. McDonnell, Ph.D., who conducted the research as a doctoral student at the University of Miami Rosenstiel School of Marine, Atmospheric, and Earth Science and the Abess Center for Ecosystem Science and Policy.

By incorporating shark-collected data into a seasonal climate model,

McDonnell and her team found that forecast errors at the ocean surface decreased substantially in certain regions, with improvements reaching as much as 40 percent in specific cases.

This is the first study to experimentally integrate animal-borne sensor data into a seasonal climate model and quantify its impact on forecast performance, suggesting potential for future operational use.

"Sharks are already moving through parts of the ocean that are challenging for us to observe," said McDonnell, now a postdoctoral investigator at the Woods Hole Oceanographic Institution (WHOI). "This research shows that data they collect can help fill important gaps and, when used carefully, can improve how we predict ocean conditions."

Satellite tags attached to sharks record depth and temperature as they travel through the ocean, collecting and transmitting this data in near real time. Marine predators like sharks naturally seek out dynamic ocean features such as fronts and eddies.

Photo credit:
Nola Schoder





13 FIRE PROTECTION
EQUIPMENT ITEMS
TO CHECK ANNUALLY

SMART MARINAS
INCREASING FLEET DRIVING
INCREASE IN INCIDENTS
ROTTEN WOOD AND POOR
INSPECTIONS CAUSED HISTORIC
MARINE SCHOONER REMASTING

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Latest guidance for shipping lithium-ion cells and batteries in containers

In response to the growing risks associated with the maritime transport of lithium-ion cells and batteries, the Cargo Incident Notification System (CINS) released its latest guidance for shipping lithium-ion cells and batteries in containers.



Lithium-ion cells are the core components of batteries and come in various forms, as they are widely used in portable electronics and electric vehicles because they can efficiently store and release energy through the movement of lithium ions between positive and negative electrodes.

However, due to their chemical properties, lithium-ion cells and batteries are classified as dangerous goods and must be handled with care.

Released against a backdrop of rising concern, the guidance comes as battery-related incidents at sea become both more frequent and more severe.

A key hazard is thermal runaway, a chain reaction that can result in intense fires, the release of toxic gases and even explosive force. These fires are particularly difficult to extinguish and may reignite days or even weeks after the initial incident.

According to the Nordic Association of Marine Insurers (Cefor) in its 2025 year-end ocean hull report, fires remain a major source of marine losses. The report highlights an increase in severe fire incidents involving both container vessels and car/RoRo ships.

As a result, the marine industry, including insurers, has become increasingly concerned about the rising number of onboard fires, particularly in cargo holds and engine rooms.



What is a Lithium-ion cell?

Lithium-ion cell is a rechargeable electrochemical cell in which both the positive and negative electrodes are intercalation compounds. Lithium exists in an ionic or quasi-atomic form within the electrode material. Lithium polymer cells using lithium-ion chemistry are regulated as lithium-ion cells or batteries.

Lithium-ion cells and batteries are classed as dangerous goods because of several hazardous properties.

Fire Hazard: Flammable electrolytes can ignite if damaged or overheated, triggering thermal runaway reactions that lead to fires or explosions.

Chemical Reactivity: Reactive materials may explode or catch fire if punctured or short-circuited.

Toxic Emissions: Fires release harmful gases such as hydrogen fluoride (HF), which are toxic and corrosive.

Explosion Risk: Internal pressure buildup can cause rupture or explosive vapour clouds.

Electrical Hazard: Short circuits or mishandling can lead to burns, sparks, or fires.

Environmental Risk: Improper disposal can contaminate soil and water, causing environmental harm.

Key risks during transport

These factors increase the risks involved in the carriage of lithium-ion cells and batteries:

- Packing not consigned in compliance with the IMDG Code.
- Packing into containers other than in accordance with the CTU Code.
- High temperature inside container(s) during transport
- Cell or battery not in compliance with UN 38.3

Packing the Cargo Transport Unit (CTU)

CINS does not recommend co-loading lithium-ion cells or batteries with other Dangerous Goods, except co-loading with each other.

To ensure adequate packing is carried out and there is no mixed loading, Shippers must pack and stuff in accordance with IMDG code/CTU code and shipping lines should conduct random checks to ensure compliance.

To assist firefighting and to mitigate risks, it is recommended that cargo stuffing should keep to:

- a minimum 30cm gap between the top of cargo and the container ceiling.
- a minimum 30cm gap between the cargo and the container doors.
- ensuring that the packaging is not in direct contact with the container walls.

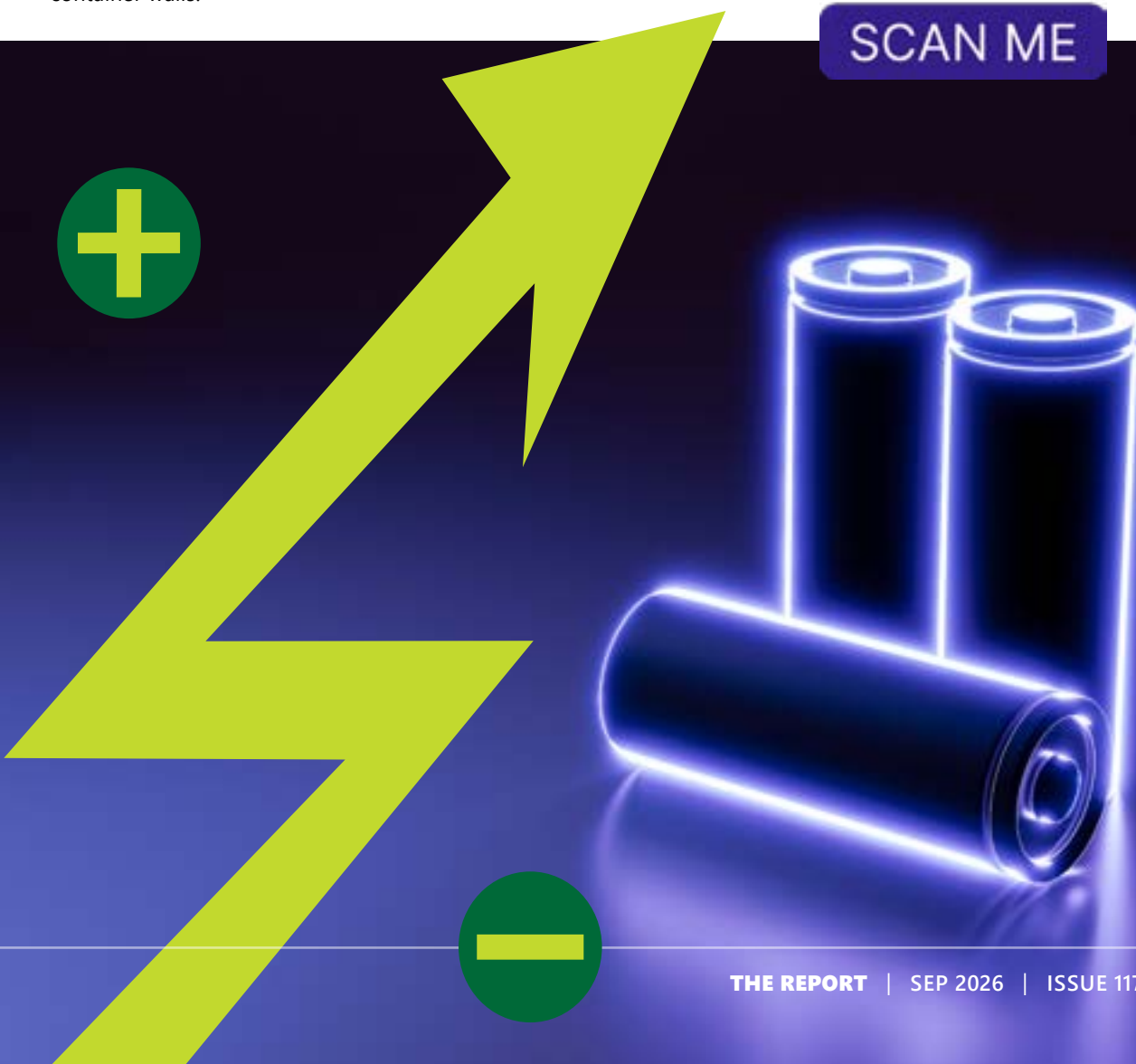
It is recommended to stow and secure cargo units within a container without any free gaps. Such gaps, unavoidable during stowage, shall be filled out completely by suitable blocking material. Blocking material can for example be hard boards for smaller gaps, empty pallets for medium gaps or measure made blockings for greater gaps.

Developed jointly with the International Group of P&I Clubs, TT Club, and IUMI, the guidelines offer practical safety advice for shipping companies, operators, and carriers handling lithium-ion batteries classified under UN 3480 and UN 3481 in Cargo Transport Units (CTUs).

By clearly outlining key risks and mitigation steps, the guidelines aim to help the maritime industry better control hazards and reduce the risk of costly and dangerous incidents during sea transport.

For more guidance about lithium-batteries, who not download the 48-page guide authored by IIMS entitled **'Lithium-ion battery fires: What we know so far'**.

Download the pdf at <https://bit.ly/4v1HNF0> or use the QR code.



EVs on roll-on and roll-off passenger ferries



CHIRP Maritime has issued guidance to support both operational and command-level decision-making by identifying EV-specific hazards, behaviours and uncertainties. According to CHIRP, Electric Vehicle (EV) fire risk is different, but not inherently higher. However, unfamiliarity with EV fire behaviour can significantly increase the consequences of an incident if these characteristics are not properly understood and anticipated.

EV incidents on RoPax ferries are low-frequency, high-consequence events. While incidents remain rare, limited operational experience and evolving evidence mean that risk understanding will continue to develop as EV carriage increases. A low probability of occurrence does not equate to low impact. Decision-making should therefore focus on consequence management, escalation potential, and time-dependent behaviour, rather than likelihood alone

Thermal runaway and fire behaviour

Thermal runaway is the defining characteristic of lithium-ion EV battery failure. It can escalate rapidly from localised heating to large-scale gas release, sometimes before any visible fire is present. Battery venting may be energetic and directional, producing jet flames or pressure-release events that differ from conventional vehicle fires.

Once thermal runaway begins, it is difficult to arrest and can involve extremely high energy release rates. Temperatures within the battery pack may exceed 1,000°C, even in the absence of sustained external flame. During this process, large volumes of flammable gases may be released.

In enclosed or semi-enclosed Ro-Ro spaces, these gases can accumulate and migrate, potentially forming an ignition-ready vapour cloud and creating the conditions for a Vapour Cloud Explosion (VCE) if ignition occurs. Early indicators of battery failure do not imply that it is safe to approach. Initial response should prioritise assessment, isolation, and preparedness for escalation over immediate close-range intervention.

Causes of EV battery failure

EV battery failure may result from a range of factors, including:

- Manufacturing defects or material failure
- Battery-management-system faults

Mechanical damage

(including damage from prior road accidents)

- Overcharging or over-discharging
- High ambient temperatures
- Internal or external short circuits
- Ageing and end-of-life degradation

In many cases, the initiating cause may not be immediately apparent.

Fire growth and energy release

Fire growth from EV batteries can be rapid and difficult to control once established, with high and sustained heat-release rates.

State of Charge (SoC) significantly influences severity. A higher SoC increases the peak heat-release rate and the overall energy available. Lower SoC reduces ignition likelihood but may still present significant gas-production and explosion hazards and should not be assumed to represent a low-risk condition.

Gas production and vapour hazards

Thermal runaway releases a mixture of flammable, toxic, and irritant gases. These include lighter-than-air gases (including significant quantities of hydrogen) and heavier vapours that spread unpredictably, accumulate at deck level, or migrate into adjacent spaces.

Early signs may include white vapour, often mistaken for steam or smoke. This vapour is flammable and toxic and can present an explosion risk even in the absence of visible flame.

Hazardous atmospheres can develop away from the vehicle and prior to ignition. The absence of flame or smoke does not indicate a safe environment.

Gases include hydrogen, carbon monoxide, hydrogen fluoride, hydrogen cyanide, hydrocarbons, and other toxic compounds including >100 trace organics. Emerging evidence indicates that exposure to these gases can cause serious respiratory and systemic health effects without appropriate protection.

Ventilation considerations

Ventilation strategies effective for ICE-vehicle fires may not behave as expected during EV incidents. Significant gas production can occur before ignition, and mixed-buoyancy gases may disperse in unpredictable ways within ro-ro spaces.

Ventilation should therefore be treated as a tactical decision, based on risk assessment rather than automatic application. Decisions should consider gas dispersion, flammability limits, ignition potential, and explosion risk, which may differ depending on whether the vessel is in port or at sea.

Risk controls and prevention

Advance Declaration

The number and type of EVs and hybrid vehicles should be declared prior to loading, with vehicle locations recorded on the loading plan where practicable.

Booking Declaration

Passengers should confirm that vehicles are in good condition and have not been recently damaged, involved in accidents, or subject to known battery faults.

Check-In Verification

Visual checks should be conducted to identify warning indicators, external battery damage, or other signs that may indicate elevated risk prior to embarkation.

Damaged or Faulty EVs

The carriage of damaged or faulty EVs should be subject to specific procedures, including risk assessment and defined control measures. Some operators may choose to refuse carriage in line with company policy.

Detection & Initial Assessment

Early detection saves time - time is the Master's greatest ally.

- Use continuous monitoring with CCTV, infrared cameras, thermal imaging, and gas detection (including HF sensors)
- If abnormal heat or smoke is detected:
 1. Alert the bridge immediately. Crew evacuate and monitor area
 2. Confirm source and extent (isolated or spreading)
 3. Inform Harbour Master and initiate SITREP 1

Thermal runaway can develop unpredictably and very quickly. Once confirmed, assume escalation until proven otherwise.

Activation Thresholds & Initial Actions

The Master activates the shipboard response as per SMS and emergency plan.

- Trigger: confirmed or suspected EV fire, or rapid heat rise
 - Sound alarm and muster crew
 - Consider ventilation control depending on port/sea conditions
 - Isolate power and stop vehicle movements
 - Begin boundary cooling using fixed systems or monitors
- Priority: Life before ship, but evacuation timing must balance heat/smoke/explosion risk.
- Situational Awareness & Decision Making
 - Maintain shared understanding through:
 - Observation (deck condition, smoke, thermal readings)
 - Orientation (fire plans and zones)
 - Decision (Go / No-Go / Abort)
 - Action (implement and communicate immediately)

All updates logged with time and rationale.

Further essential reading...

Command, Control, and Coordination

- Ship crew: firefighting systems, boundary cooling, evacuation control
- Port/Harbour authority: command, safe anchorage, pollution control
- Fire & Rescue: firefighting and hazmat response
- OEMs/Salvage: technical battery advice
- Regulators: oversight and coordination
- Unified Command: regular SITREPs between all parties

Tactical Onboard Response

- Evacuate non-essential personnel from affected decks
- Continuous cooling with SCBA rotation
- Monitor deck and boundary temperatures
- Maintain clear, short communications

If containment fails prepare evacuation or abandonment to safe anchorage.

Passenger Management

- Simple multilingual instructions
- Muster upwind of smoke
- Prepare for evacuation or shelter-in-place scenarios
- Pre-travel EV safety briefings required
- Port & Harbour Coordination

Before arrival:

- Confirm safe anchorage and tug readiness
- Establish exclusion zones
- Coordinate environmental/health response

Ports should maintain:

- Stand-off positions
- Evacuation reception plans
- Firefighting and pollution response capability

Information Management

Critical data includes: EV type, battery kWh, SoC, SoH, condition, and deck location. Segregation of EVs recommended. No charging unless risk-assessed.

Equipment & Monitoring

- Thermal, CCTV, gas detection systems
- Fixed deluge and portable cooling
- Contaminated runoff containment
- Drones for observation where authorised

Training, Drills & Learning

- Annual tabletop and live drills
- Multi-agency exercises
- After-action reviews shared
- Crew awareness of EV fire indicators (popping, hissing, vapour, odours)

Oversight & Assurance

Port State Control and Flag Administration should verify:

- EV manifest and SoC procedures
- Monitoring and containment systems
- Drill records and competency
- PPE and firefighting readiness

Post-Incident & Recovery

- Manage contamination and air quality
- Conduct structured debriefs
- Update risk assessments and training

The Maritime Professional Council of the UK has produced an essential 48 page guide entitled 'Lithium-ion battery fires: What we know so far'. The guide is available for free download in PDF format at <https://bit.ly/4v1MNF0>.

CONTAINER SHIP FIRES ARE PUSHING SALVORS TO THE LIMIT

Firefighting water within the hold had implications for the vessel's stability and structural integrity. Photo credit: USCG

The International Salvage Union's long-standing concerns over container ship cargo fires have again been highlighted by recent incidents handled by Dutch salvage contractor SMIT, underlining the growing complexity of responding to fires aboard modern container vessels. US businessman Malcolm McLean introduced the intermodal shipping container 70 years ago, revolutionising transport of goods by eliminating the labour-intensive handling of cargo between modes of transport.

With containers, however, the contents are sealed and out of sight with only the paperwork indicating what is (or is not) inside the box.

Containers can carry everything from raw materials to manufactured products, including dangerous goods. When hazardous cargo is properly declared, it can be handled and segregated safely. However, industry concerns persist over misdeclared or undeclared dangerous goods, with some operators suspected of avoiding the higher costs associated with transporting hazardous cargo.

Improperly declared cargo can be stowed incorrectly, increasing the risk of fire. At the same time,



container ships have grown dramatically in size. McLean's first converted tanker carried 58 containers; today's largest ships can carry more than 23,000 twenty-foot equivalent units.

That scale creates major challenges when fires break out. Ports equipped with giant gantry cranes can handle vessels carrying containers stacked 24 rows across, but access becomes far more difficult at sea or in ports lacking specialist infrastructure. Ship crews also have limited firefighting capability, meaning initial efforts are often focused on containment until professional salvors arrive.



FIRE IN THE HOLD

A recent incident attended by the US OPA-90 Alliance Donjon-SMIT (DJS) demonstrated the risks involved even when a vessel is alongside a berth.

A serious fire broke out in the cargo hold of a 336m, 98,849dwt container ship while berthed at the Port of Los Angeles. Alongside the onboard response, DJS deployed its Salvage and Marine Firefighting team under a Lloyd's Open Form salvage contract due to the scale and complexity of the incident.

Salvors boarded the vessel within 24 hours. When initial firefighting efforts failed to contain the blaze, the ship was moved away from the terminal to reduce environmental and commercial disruption within the port.



The fire broke out while the ship was alongside at Port of Los Angeles. Photo credit ISU

As firefighting water accumulated in the affected cargo hold, naval architects were required to monitor stability and structural stresses. Eventually the fire was brought under control, allowing the vessel to return to the terminal.

The operation extended well beyond extinguishing the blaze. DJS also carried out the controlled removal of contaminated firefighting water and fire-damaged containers before demobilising personnel and equipment.

SMIT Salvage faced a similar challenge in Malaysia after a fire and explosion aboard another container vessel. The company was tasked with assessing, managing and safely disposing of firefighting water and damaged containers during a multi-stage operation that was still ongoing at the time of writing.

GROUNDINGS AND BREAKDOWNS

SMIT's recent operations also demonstrate the wide range of work undertaken by marine salvors beyond firefighting.

The DJS alliance was called in after a 265ft tank barge grounded at the entrance to the Port of San Juan, breaching all of its double-bottom tanks and several cargo tanks.

Salvors selected what they described as the most cost-effective and environmentally responsible solution: increasing the vessel's buoyancy by pressurising the damaged tanks before towing it free.

As in many modern salvage operations, removing potentially polluting oil cargo was an immediate priority. The task proved difficult because of the narrow and winding access route to the casualty.

Once lightering operations were completed, the damaged tanks were individually tested before pressurisation. During higher tides, a 200m emergency tow wire was connected to a tug operating in shallow-water conditions, and the barge was successfully refloated and taken to dry dock.

Disabled ships requiring emergency towage also remain a regular source of work for commercial salvors. Operators frequently rely not only on their own fleets but also on partner companies and chartered vessels, reflecting the cooperative nature of the salvage industry despite commercial competition.

When a general cargo vessel suffered rudder failure in severe weather off Portugal, SMIT arranged a tow to Vigo after sourcing what the ISU described as a "unicorn" tug. In another case, a drifting bulk carrier off São Luís, Brazil, was towed safely into port through SMIT's partner network.

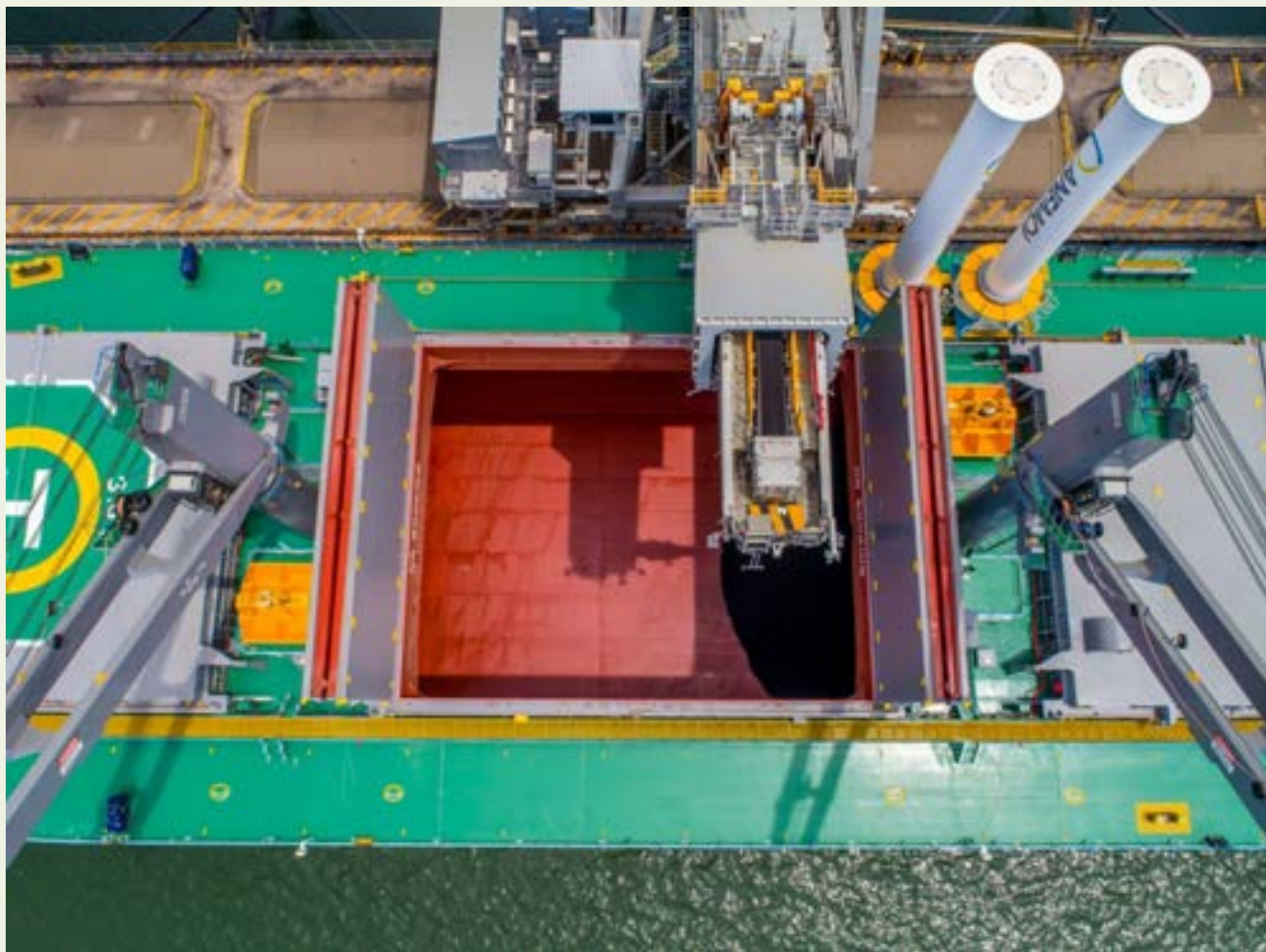
SMIT also joined forces with fellow ISU member AMSOL after a tug-and-barge combination encountered difficulties off South Africa while en route to Nigeria.

The tug was brought safely into Cape Town, while the anchor-handler Boka Keeper, operated by SMIT parent company Boskalis, towed the barge to Walvis Bay for onward towage.

Boka Keeper was later involved in another rescue operation off South Africa, towing a disabled bulk carrier safely to Durban Roads.

Together, the incidents underline both the increasing complexity of container ship fires and the expanding operational demands placed on modern salvors. As ships continue to grow in size and cargoes become more difficult to monitor, salvage teams are being required to combine firefighting, naval architecture, pollution control and emergency towage expertise in increasingly high-risk environments.

Anemoi Rotor Sails confirm long-term reliability as M/V Afros completes successful second dry dock survey



Aerial view showing two Anemoi Rotor Sails positioned clear of the open cargo hold

Anemoi Marine Technologies (Anemoi) has marked a major milestone for wind-assisted propulsion as M/V Afros, the world's first bulk carrier fitted with Rotor Sails, successfully completed its second intermediate survey after more than eight years of continuous operation.

The survey, carried out by Lloyd's Register at Jiangsu Watts Energy & Engineering Co, confirmed that the vessel's four Rotor Sails remain structurally sound and free of operational issues, providing independent verification of the long-term durability and reliability of Anemoi's Rotor Sails over an extended operational lifecycle.

Installed in January 2018 on-board the 64,000 DWT geared Ultramax bulk carrier, owned by Blue Planet Shipping, the system has since provided eight years of real-world evidence that wind-assisted propulsion systems (WAPS) can deliver sustained fuel savings, emissions reductions and high operational availability in everyday commercial service.

This milestone represents one of the most significant long-term operational proof points yet achieved in the WAPS sector, demonstrating that Rotor Sails can perform reliably across a vessel's lifecycle while integrating seamlessly into standard trading patterns.

Nick Contopoulos, Co-Founder and Chief Commercial Officer of Anemoi, said, "The successful completion of Afros' second intermediate survey is a landmark moment not only for Anemoi, but for the wider wind propulsion sector. Independent confirmation from Lloyd's Register after more than eight years of operation demonstrates that Anemoi Rotor Sails are not simply an innovative decarbonisation concept, they are a durable, practical and commercially deployable technology for the global fleet. This level of long-term operational validation significantly reduces uncertainty for shipowners considering wind-assisted propulsion and reinforces the role Rotor Sails can play in improving vessel efficiency and supporting compliance with tightening emissions regulations."



Four Anemoi Rotor Sails demonstrating the wind-assisted propulsion system in operation

Across 154 voyages, the Rotor Sails on the Afros have delivered 1,340 tonnes of fuel savings and 4,980 tonnes of well-to-wake CO₂ reductions, while maintaining greater than 95% operational availability since installation. The system has also completed about 200 port calls, demonstrating strong compatibility with commercial trading requirements and port operations.

These results are particularly significant given that the Rotor Sails installed on Afros were much smaller than the sails Anemoi deploys today, measuring just 2 metres in diameter and 16 metres in height. When scaled to the 5 metre diameter by 35 metre high Rotor Sails used on current projects, the Afros results equate to approximately 1.33 tonnes of fuel saved per sail per operating day, closely matching the performance being achieved on Anemoi's latest installations. This strong correlation demonstrates that the savings proven on Afros scale reliably to larger commercial systems, providing further validation of Anemoi's current Rotor Sail technology.



Wide view of M/V Afros in dry dock showing the Anemoi Rotor Sails and cargo handling areas

As a result of the efficiency gains achieved, Afros reduced its IMO Energy Efficiency Existing Ship Index (EEXI) rating by approximately 4.2%, extending compliance with international energy efficiency requirements and enhancing the vessel's regulatory profile.

Blue Planet Shipping Managing Director, Nikos Apodiakos, said, "Since it entered service, Afros has served 32 different charterers, which shows that its Rotor Sail system is welcomed by commercial customers and has been no hindrance to operating on the spot market. We are naturally pleased with the clean bill of health for the Rotor Sail system and positive about earnings and emissions saving potential for the remainder of the vessel's active life."

The Afros installation also pioneered Anemoi's longitudinal rail deployment system, enabling the vessel's Rotor Sails to be repositioned during cargo handling operations so that the geared bulk carrier retains full cargo flexibility. This deployment concept has since been adopted on current Anemoi projects, underlining the lasting relevance of the original Afros installation. The vessel has traded with 32 different charterers since entering service, confirming that the installation of Rotor Sails has created no barriers to spot market employment while improving vessel energy efficiency performance.

Lloyd's Register Lead Client Relationship Manager, John Prosilias said: "One of the key issues with any maturing technology is its long-term durability and reliability in real-world conditions. We are therefore very satisfied to report no issues during our recent survey of the Rotor Sails on M/V Afros, which represents an important example of successful long-term operation of wind-assisted propulsion systems."

With more than eight years of independently verified operational history, Afros now stands as one of the maritime industry's clearest demonstrations that WAPS have moved beyond pilot-stage deployment into proven long-term commercial operation.

For shipowners pursuing decarbonisation, Afros provides proven evidence that Anemoi Rotor Sails deliver reliable long-term performance while supporting emissions compliance. This milestone reinforces Anemoi's position as one of the few wind propulsion providers able to demonstrate verified commercial performance at scale, giving shipowners greater confidence as adoption accelerates across the global fleet.

Ensure the SMS adequately addresses electrical hazards



The Liberia Maritime Authority has issued a circular to reinforce

mandatory safety requirements and operational controls related to electrical hazards onboard vessels, with particular emphasis on the use, handling, relocation, and isolation of portable electrical equipment.



A number of very serious marine casualties involving fatal electrocution demonstrate that routine shipboard activities can present significant electrical risks when energized equipment is handled without adequate isolation, inspection, task-specific risk assessment, supervision, or appropriate safeguards. The Administration has reviewed several fatal electrocution incidents that occurred:

- Both at sea and in port.
- During routine operations such as cargo hold cleaning, cargo condition inspection, and night deck duties
- Involving portable electrical lighting equipment connected to shipboard power supplies

In all reviewed cases, the casualties involved direct or indirect contact with energized electrical equipment, frequently in conductive environments such as steel ladders, cargo holds, crane pedestals, or high-humidity conditions. Prompt emergency response actions were taken; however, all incidents sadly resulted in fatalities.

Case 1: Cargo hold cleaning

An Ordinary Seaman suffered fatal electrocution while carrying an energized portable light up a steel ladder during cargo hold cleaning operations. While ascending the ladder, the light struck the steel structure, shattering the protective glass enclosure and exposing

live electrical components. The seafarer came into contact with the energized components while simultaneously grounded through the ship's structure, resulting in an electrical shock.

Case 2: Cargo condition inspection

An Able Seaman collapsed while handling and adjusting a portable cargo light inside a cargo hold during a routine cargo condition inspection. The light was supplied via extension cables. A second crew member who attempted to assist also experienced an electric shock before the electrical supply was isolated. Emergency response actions were initiated after power was isolated.

Case 3: Night deck duties

An Ordinary Seaman assigned to night deck duties was found unresponsive inside a crane pedestal, a space containing energized electrical systems. A portable light projector remained energized and connected to a 220-V socket at the time of discovery. The projector's electrical cable had a temporary taped repair, and the space contained exposed and energized electrical components, increasing the risk of electrical contact.

Key safety failures identified

Investigations identified the following recurring deficiencies:

- Portable electrical equipment remained energized during handling or relocation
- Electrical tasks were treated as routine operations without task-specific risk assessment
- Use of portable lights in humid, wet, enclosed, or steel-structured environments
- Absence of a formal inspection, testing, and certification regime for portable electrical equipment
- Damaged or temporarily repaired electrical cables remaining in service
- Inadequate supervision of inexperienced personnel
- Entry into restricted or electrical spaces without authorization or permit
- Lack of appropriate electrical-grade PPE during handling of energized equipment

Flag administration requirements and best practices

The Administration has reviewed recent electrocution casualties and notes that non-compliance with established safety management system (SMS) requirements, including inadequate assessment and control of electrical hazards, remains a significant contributory factor.

In accordance with SOLAS, the ISM Code, and applicable Liberian marine notices, shipowners, operators, and masters are reminded that hazard identification and risk assessment are mandatory requirements for all shipboard operations, including routine tasks involving portable electrical equipment.

Review and implement risk-based procedures

- Ensure the SMS adequately addresses electrical hazards associated with the use, handling, relocation, and isolation of portable electrical equipment.
- Require task-specific risk assessments for operations involving:
 - Portable electrical lighting and temporary equipment
 - Cargo holds, crane pedestals, and restricted or enclosed spaces
 - Humid, wet, or high-conductivity environments
 - Night work or operations performed with limited supervision
- Risk assessments shall clearly identify:
 - Electrical isolation and disconnection requirements
 - Potential grounding paths through ship structures
 - Environmental factors increasing electrocution risk
 - PPE, supervision, and authorization requirements

The Administration emphasizes that classifying electrical work as a "routine task" does not remove the obligation to formally assess and control associated risks.

Portable electrical equipment control

- Establish and maintain a portable electrical equipment register within the planned maintenance system.
- Implement regular inspection and testing of portable lights, cables, and connectors.
- Remove from service any equipment with damaged housings, lenses, defective connectors, or temporary or taped cable repairs.

Ensure all portable electrical equipment is de-energized and unplugged prior to:

- Relocation or transport

- Climbing ladders or accessing elevated positions
- Adjustment, dismantling, or removal
- Verify electrical isolation prior to recovery or emergency response actions.

Supervision, training, and oversight

- Prohibit inexperienced personnel from handling energized electrical equipment without direct supervision.
- Reinforce crew training on:
 - Electrical shock hazards and conductive shipboard structures
 - Increased risks associated with moisture and humidity
 - Safe ladder use and three-point contact principles
 - Include electrical hazard management and portable-equipment control in onboard audits, drills, inspections, and toolbox meetings.

Required actions to prevent recurrence

- Prohibit carrying or relocation of energized portable electrical equipment.
- Implement routine inspection and insulation testing for all portable electrical equipment.
- Eliminate temporary or taped electrical repairs.
- Provide appropriate electrical PPE where exposure risks exist.
- Treat crane pedestals, electrical rooms, and similar spaces with power supply sources as restricted electrical spaces requiring authorization.
- Maintain records of inspections, deficiencies, corrective actions, and equipment removed from service.

The Administration reminds all operators that prevention of electrocution is a fundamental safety obligation. Strict compliance with electrical isolation, risk assessment, inspection, supervision, and training requirements is essential to prevent recurrence of fatal electrical incidents.



AI at Sea: From Maritime Hype to Operational Readiness

Why will Artificial Intelligence transform shipping only when data, people, systems and governance are ready to support it?

Abstract

Artificial Intelligence (AI) is now firmly part of the maritime transformation agenda. For an industry that carries much of global trade, the appeal is clear: safer operations, sharper decision-making, better fuel performance, stronger compliance, and more reliable sustainability outcomes. Yet the challenge is no longer whether AI has potential. It is whether maritime organizations are ready to turn that potential into trusted operational value. Across ship owners, operators, ports, regulators, engineers, and technology providers, expectations are high. But adoption remains uneven, often constrained by fragmented data, legacy systems, unclear problem statements, limited digital readiness, and a naturally cautious operating culture. This article examines the gap between ambition and execution and argues that maritime AI will succeed only when it is built on strong data foundations, clear use cases, domain expertise, responsible governance, and a realistic view of AI as a decision-support partner rather than a replacement for human judgment.



*By Venkat Krishna Soundarraja, Fellow,
Institute of Marine Engineers (India)*

Introduction

Artificial Intelligence is rapidly moving from conference discussions to practical maritime use cases. It promises better visibility, faster analysis, improved safety, and stronger environmental performance. But in marine operations, value does not come from adopting a tool alone. It comes from solving the right problem with reliable data, clear ownership, and people who understand both the technology and the realities of ship and shore operations. Shipping still operates through a complex mix of onboard machinery, shore-based systems, manual reporting, vendor platforms, and multiple stakeholders who often define the same data differently. This makes AI adoption a business transformation challenge as much as a technology challenge. Industry must therefore ask a more disciplined question: not simply what AI can do, **but whether the organization is ready to use it responsibly and on a scale.**

What Maritime Really Expects from AI

Shipping remains one of the most important pillars of the global economy, moving cargo across oceans and connecting producers, ports, and consumers. Yet it is also an industry where change has traditionally been measured, shaped by safety requirements, regulatory obligations, capital intensity, and operational risk. That makes the arrival of AI both exciting and challenging.

AI is no longer discussed only as a future technology. It is now part of boardroom conversations, fleet performance reviews, port modernization plans, and sustainability strategies. The question being asked across the sector is simple but important: **what practical role should AI play in maritime operations?**

From Automation to Intelligent Support

Although different stakeholders use different languages, their expectations are surprisingly aligned.

The industry does not simply want more automation. It wants systems that can interpret conditions, support judgment, and improve the quality and speed of decisions.

In practical terms, operators expect AI to function as an intelligent assistant that can:

- anticipate risks before they become incidents;
- recommend better decisions in near real time; and
- make sense of large, fragmented operational datasets.

Safety remains the first and most sensitive expectation. Whether in

navigation, machinery monitoring, cargo operations, or port movements, AI is expected to reduce uncertainty and highlight risk before it turns into an incident.

The second expectation is efficiency. With rising fuel costs, pressure on margins, and tighter environmental targets, organizations want AI to help them:

- Optimize routes
- Reduce fuel consumption
- Minimize downtime
- Improve fleet performance

Sustainability is another major driver. AI is expected to support better voyage planning, emissions monitoring, energy optimization, and evidence-based compliance with evolving regulatory requirements.

In short, maritime organizations are looking for AI that can observe, learn, predict, recommend, and improve operational confidence.

Where the Industry Stands Today

The current position, however, is more uneven than the ambition suggests.

AI adoption is increasing, but much of it is still cautious, isolated, and limited in scope.

Many organizations are experimenting with:

- Pilot projects
- Limited use cases
- Proof-of-concept initiatives

Yet only a smaller number have embedded AI deeply into daily operations or decision workflows.

Rather than a broad transformation, the industry is often seeing useful but narrow improvements.

AI is often used to:

- Automate repetitive workflows
- Support contract analysis
- Provide basic predictive insights

These applications are valuable, but they do not yet match the larger expectation of intelligent, connected, end-to-end maritime operations.

The most important signal is the level of trust.

Most maritime professionals are not yet comfortable allowing AI to make decisions independently.

They are more willing to use AI as a guide, warning system, analytical partner, or second opinion.

Why AI Is Not Yet Delivering at Scale

1. The Data Problem

Organizations today are collecting more information than ever and investing in stronger platforms. Still, many struggle to turn that information into action. Teams often spend considerable time locating, checking, cleaning, and reconciling data before it can be used. When confidence in the underlying data is weak, confidence in AI outputs naturally becomes weak as well.

AI depends on the quality, relevance, and reliability of the data behind it.

The real challenge is therefore not just data storage. It is data activation: making information discoverable, trusted, contextual, and available at the point where decisions are made.

In maritime environments, data is:

- Fragmented across systems
- Poorly structured
- Inconsistent between stakeholders

Without consistent, integrated, and well-governed data, even advanced AI tools produce uncertain or incomplete results.

If people cannot trust the data, they will not trust the recommendation generated from it.

What makes an enterprise AI-ready?

- clean, trustworthy, and contextual data;
- clear ownership of data, definitions, and governance;
- connected pipelines between AI models and live operational data;
- feedback loops that turn insight into action; and
- teams that can interpret and challenge AI recommendations.

Taken together, these issues show that many enterprises remain in an “insight only” phase. They can generate analysis, but they struggle to connect that analysis to execution, learning, and continuous improvement.

The business cost of poor data

- Productivity loss
- Increased costs
- Strategic missteps
- Revenue loss
- Customer churn
- Compliance risk

Recurring obstacles

- fragmented tools that make data stitching slow and error-prone;
- poor access, unclear permissions, and limited trust;
- missing definitions, context, and shared meaning;
- heavy IT dependency and delayed data availability.

Where better data creates the greatest impact

- faster and more confident decision-making;
- improved operational efficiency and profitability;
- stronger strategy, planning, and innovation;
- better customer experience and collaboration.

Tritex NDT Multiple Echo Ultrasonic Thickness Gauges



The Drone Thickness Gauge
MultigaUGE 6000



The Underwater Thickness Gauge
MultigaUGE 3000



The ROV Thickness Gauge
MultigaUGE 4000



The Surveyors Thickness Gauge
MultigaUGE 5650

Tritex NDT specialize in the manufacture and supply of Multiple Echo Ultrasonic Metal Thickness Gauges, used for verifying corrosion levels and measuring metal thickness from one side only, without removing any protective coatings. The MultigaUGE 5650 Surveyor Gauge can measure both metal and GRP, in one gauge, and also switch from Multiple Echo to Echo - Echo with the simple press of a button, using the same probe.

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2. Legacy Systems and Infrastructure

Vessels, ports, and maritime offices were not originally designed as fully connected digital ecosystems.

Many still operate on:

- Outdated hardware
- Non-integrated software systems
- Limited connectivity

Introducing AI into this environment cannot be treated as a simple software installation. It requires integration, modernization, connectivity, cybersecurity, governance, and a clear understanding of operational workflows.

3. Lack of Standardization

The maritime value chain includes ship managers, charterers, ports, classification bodies, regulators, logistics firms, vendors, and seafarers. Each may collect, label, store, and interpret data differently.

This lack of uniformity makes it difficult to deploy AI solutions across fleets, ports, and commercial networks on a scale.

AI thrives on integration, while maritime operations still often function through fragmented systems and stakeholder practices.

Technical standards such as ISO 19847 and ISO 19848 provide useful direction for shipboard data sharing and sensor-level structure. However, the wider commercial ecosystem remains fragmented. The challenge is not only defining data correctly, but also ensuring adoption across mixed fleets, older assets, vendors, and stakeholders with different priorities.

4. Skill Gaps and Workforce Readiness

The human dimension is one of the most important barriers to successful AI adoption.

The industry is undergoing a shift:

- From manual operations to digital workflows
- From experience-based decisions to data-driven insights

But the workforce is still catching up.

The capability gap lies between:

- Traditional maritime skills
- Emerging digital and analytical capabilities

The issue is not simply a shortage of manpower. It is a shortage of readiness, confidence, and shared language between maritime experts and digital teams.

Subject matter experts (Chief engineers, Masters, Fleet managers) are rarely embedded in design teams. Mariners need to be part of product design, not just end-users. AI outputs must be explainable, not black-box predictions. Without Subject Matter Experts' input, products miss the mark and fail to deliver.

5. Organizational Mindset and Resistance to Change

Maritime operations are naturally conservative because the consequences of failure can be severe.

Decisions are often conservative, shaped by:

- Safety concerns
- Regulatory pressures
- Established ways of working

AI challenges familiar ways of working and requires organizations to rethink how decisions are made, reviewed, and trusted. Even when technology exists, adoption is slowed down by:

- Resistance to change
- Lack of digital leadership
- Uncertainty about ROI

6. The Problem Statement Gap

One of the most common reasons AI initiatives lose direction is also one of the simplest:

Organizations do not always define clearly what problem AI is expected to solve.

Instead, they:

- Start with technology
- Experiment without a clear objective

- Expect transformation without redesigning processes

This leads to:

- Failed pilots
- Poor outcomes
- Frustration with AI initiatives

7. How AI Is Actually Being Used

Actual adoption is still relatively shallow in many organizations. AI is visible in analytics, but it is not yet deeply embedded in how information moves and how decisions are executed.

Many teams are experimenting at the interface level rather than redesigning the data pipelines, feedback loops, and operating processes that would make AI truly useful.

In many cases, AI remains a surface layer.

Natural language querying and dashboard assistance are often the easiest starting points, but the more transformative capabilities - automated insights, predictive analysis, recommendations, forecasting, and closed-loop decision support - require stronger data foundations and higher trust.

Until AI is trusted to improve data quality, support operational action, and learn from outcomes, it will remain more of a conversational interface than a transformation engine.

8. The Daily Reality for Data Consumers

Although dashboards are widely used, reporting remains fragmented in many companies. Dashboards, spreadsheets, manual summaries, and local extracts often exist side by side, producing different versions of the same metric.

Many teams still depend on 'Excel' files or manually prepared reports for leadership-facing KPIs. This creates delays, ownership confusion, version-control issues, and dependency on individual knowledge.

Where reporting methods are inconsistent, business intelligence adoption does not automatically create trust. Accuracy, consistency, lineage, and accountability remain fragile.

Common data platform frustrations

- unclear data ownership;
- too much clutter and too little documentation;
- unreliable, stale, or poorly governed data;
- time lost chasing permissions and lineage;
- unclear query costs or billing; and
- interfaces designed more for engineers than business users.

Platform promises that deserve caution

The most exaggerated platform promises are usually those that simplify human, organizational, and semantic complexity into neat marketing phrases. Users are rightly cautious of claims suggesting that everyone can build anything instantly, at any scale, with no trade-offs.

Common promises that should be treated with caution include:

- “Anyone can build or consume data products”;
- “Instant querying at any scale”;
- “Autonomous governance in one click”;
- “a single source of truth without operational discipline”;
- “real-time insights effortlessly”; and
- “Low-code transformation for everyone.”

The Shift Needed: From Hype to Execution

To gain real value from AI, the maritime industry must move beyond enthusiasm and begin focusing on disciplined execution.

The required shift is not only technological. It is strategic, operational, and cultural.

- From adopting tools → to building AI-driven strategies
- From isolated experiments → to scalable solutions
- From data silos → to integrated data ecosystems
- From automation → to intelligent augmentation
- From exclusion of SMEs → to inclusion in designing AI products

People must remain central to this transition. Organizations need to invest in:

- Upskilling workforce
- Building digital confidence
- Encouraging collaboration between domain experts and technologists

AI solutions in maritime must be continuously refined through input from those closest to operations. Feedback from crew, superintendents, fleet managers, port teams, and engineers is essential. Without this operational loop, even sophisticated systems can become disconnected from practical reality.

AI will not transform maritime operations through technical capability alone. It will succeed when it is responsibly embedded into how the industry observes, reasons, collaborates, decides, and learns.

The Future: A More Realistic View of AI

The future of maritime AI is often described through images of fully autonomous vessels and completely automated operations.

That future may arrive in stages, but it is unlikely to be the immediate reality for most of the industry.

A more practical near-term future will involve:

- AI assisting human decision-making
- Predictive systems preventing failures before they occur
- Connected ecosystems providing end-to-end visibility
- Human expertise augmented by intelligent systems

In this version of the future, AI is not a substitute for human expertise. It is a multiplier of human capability.

Conclusion: Readiness Before Reinvention

The maritime industry is not short of ambition. What it needs now is alignment between expectation and execution, technology and infrastructure, innovation and workforce readiness.

The key question is no longer only: **“What can AI do for us?”**

It is also: **“Are our data, people, processes, and governance ready for AI?”**

About the author

Venkat Krishna Soundarraja, Fellow of IME(I), blends 30 years of marine engineering and data science. Former Chief Engineer turned Chief Data Officer at Volteo Maritime Pte. Ltd., he drives digital transformation and sustainability in maritime operations. As educator, mentor, and researcher, he bridges theory with practice, translating complex data into clear insights while inspiring future engineers through teaching, writing, and innovation.

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By **Jordan Hatch.**
*Loss Prevention Executive,
NorthStandard*

Cat fines risk engine damage and operational delays

Recent bunker alerts have pointed to a growing presence of high-abrasive fuels containing cat fines in several regions. The latest VPS Bunker Alerts confirm this upward trend, which is increasingly contributing to operational challenges and disputes within the shipping sector.

If not properly managed, cat fines can cause severe engine wear and, in extreme cases, lead to complete engine failure in a relatively short period of operation. Damage involving multiple cylinder liners and piston rings can be particularly costly and disruptive. Because vessels typically carry only one or two spare liners on board, extensive damage can quickly exceed onboard repair capacity. This often results in prolonged off-hire periods, as additional spare parts must be sourced and shipped in, with supply chain delays further extending repair timelines.

ISO standards vs engine reality

One of the challenges lies in the disconnect between the recognised international fuel standards and the engine manufacturer's requirements. The international marine fuel standard, ISO 8217,

historically permitted cat fine concentrations (Al+Si) of up to 80 mg/kg. This limit has been reduced to 60 mg/kg (1) in later and current revisions. References to older versions still appear in charterparties and supply agreements, so ordering fuel to the latest edition of ISO 8217 helps reduce cat fine risks.

In addition, while established testing methods and standards are in place, every recognised testing method includes an inherent margin of error, known as repeatability and reproducibility (r&R). Each specific test has its own defined r&R values.

In practice, this means that although suppliers (e.g. charterers) must meet the limits set by ISO 8217 standards, the recipient, (e.g. the shipowner) has an adjusted acceptance limit that accounts for this testing uncertainty. As a result, the shipowner may

receive a fuel with a parameter which is higher than the published ISO limit when they test independently.

For example, in cat fine (Al+Si) testing, the recipient limit can be up to 72 mg/kg for a fuel with a specification limit of 60 mg/kg. ISO 4259 is the standard used for interpreting test results and a useful guide can be found here by the International Council on Combustion Engines (CIMAC) which correlates this to marine fuel use.

Consequently, shipowners may receive fuel that complies with all relevant standards yet still exceeds what engine manufacturers consider safe for operation. Most engine manufacturers specify a maximum Al+Si content of around 15 mg/kg at the engine inlet, with some recommending limits as low as 7 mg/kg.

Any bunker stem that has a significant cat fine content more than the engine manufacturer's instruction will require treatment on board before the fuel is suitable for injection. Achieving this reduction can be challenging for engineers aboard vessels. This creates a difficult legal and financial position for owners. If fuel supplied by charterers complies with ISO 8217 and 4259, but it has excessive cat fines, it becomes extremely challenging to pursue claims for any resulting damage. In essence, responsibility shifts from fuel quality at delivery to fuel management on board. The focus is on shipowners and crew to ensure that cat fine levels are reduced to safe limits before reaching the engine.

Cat fine trends

The graph below presents cat fine test results for residual fuels with $\leq 0.50\%$ sulphur in 2025. It shows that 0.8% of samples exceeded the ISO 8217 limits. However, a much larger proportion, 24% of samples, fell within the 41–60 mg/kg range.



While these values remain within ISO specifications, they still present a heightened risk and underline the importance of effective on board fuel management to reduce cat fines to safe levels at the engine inlet.

This concern is reflected in industry practice. For example, when VPS, a leading fuel testing laboratory, identifies a vessel manifold sample with cat fine levels exceeding 40 ppm, it typically triggers a request for additional 'before-purifier' and 'after-purifier' samples. This enables verification of purifier efficiency and highlights whether the vessel's fuel treatment system is adequately removing abrasive particles.

Managing cat fines on board

Fuel testing

After bunkering, send a representative sample for independent lab analysis against the relevant ISO 8217 parameters and carefully review the results. Don't focus solely on 'out of spec' results, as elevated values can still cause handling issues even if they're within specification. Where possible, wait for the analysis before using the fuel.

Settling and storage management

Settling tanks are designed to aid the separation of water and sediments from the fuel, with solids like cat fines sinking to the bottom. Draining these tanks regularly from dedicated points keeps any settled contaminants and water out of the fuel system and provides an indication to engineers on the quality of the fuel inside the tank. The same procedure is advised daily on service tanks, where the fuel is then further cleaned and prepared for the engine.

Tank cleaning practices

Regularly clean and inspect settling and service tanks, as far as practicable, to remove catalytic fines, which naturally settle and accumulate at the bottom of the tanks over time. Even when fuel initially complies with specifications, this buildup can result in quantities exceeding acceptable standards. While these sediments typically remain undisturbed during stable conditions, factors such as rough seas and tank stripping may resuspend them, leading to unexpectedly high concentrations entering the fuel system and potentially exceeding the capacity of separators.

Optimising centrifugal separation

Centrifugal separators serve as the main safeguard against cat fines. Operating at extremely high speeds, these devices spin fuel rapidly, pushing contaminants outward so they can be removed as sludge. Maintaining optimal and efficient operation, with the right settings, is crucial for minimising fuel related risks.

To maximise efficiency:

- Operate separators at the correct temperature relative to the density of the fuel which was bunkered.
- Reduce flow rates to ensure adequate residence time, relative to fuel consumption rates and manufacturer guidelines. Longer residence time enhances fuel purification for a given volume. Running purifiers in parallel can also achieve this benefit as each purifier processes only half the total fuel flow, which increases residence time without reducing the overall output to the service tank.



- Ensure all other parameters and conditions are within manufacturer limits, such as back pressure and operating water parameters.
- Some separators enable clarifier configuration to efficiently remove solids only; this is helpful when cat fines are elevated. Afterwards, conventional separator setup should be used in series to remove remaining impurities like water.
- Whenever possible, recirculate fuel from the service tank through the purifiers to ensure ongoing cleaning and prevent cat fines from building up. Some vessels achieve this automatically by allowing the service tank to overflow into the settling tank, maintaining constant circulation.

- Ensure planned maintenance regimes are followed in line with manufacturer requirements.

Filtration and final barriers

In-line filtration protects the engine by capturing larger particles before fuel arrives. Though filters can't remove all cat fines, they are crucial for blocking sudden contamination spikes, with finer filters placed closer to the engine. Regular filter checks and maintenance help maintain performance. Keep spare clean filters ready to minimise downtime when cleaning is needed.

Testing and monitoring

On board testing kits can provide an estimation of cat fine levels using centrifuge-based methods. Although these tests are not highly accurate,

they provide an indication which can aid the crew.

Regularly sending samples taken both before and after the separator to a laboratory for analysis is recommended, as this helps verify that the on board separators are operating efficiently and effectively removing contaminants.

Standards and management
The damage caused by cat fines can be severe. Repairs can involve major engine overhauls, off-hire time, and financial loss. The key takeaway is that compliance with fuel specifications is only the first safeguard.





Whitepaper highlights rising barnacle biofouling risk for ship operators as regulations tighten

Swedish antifouling technology company, I-Tech AB, has published a new industry whitepaper offering shipowners, operators, and technical managers a data-driven guide to understanding, assessing, and mitigating the growing operational and commercial risks posed by barnacle biofouling.

Drawing on extensive independent analysis of hull condition data by the Safinah Group, alongside key findings from leading academic and industry studies, the whitepaper reveals how, where, and why barnacle fouling develops across the global fleet and how coating choice influences risk. It also provides practical strategies to help ship owners manage risk, protect vessel efficiency, and maintain compliance with evolving biofouling and decarbonisation regulations.

GROWING RISK IN A TIGHTENING REGULATORY LANDSCAPE

As international biofouling management regulation moves steadily towards mandatory enforcement, and the number and stringency of regionally enforced mandatory rules increase, the new whitepaper — Managing Barnacle Biofouling Risk in a Tightening Regulatory Environment — provides the perfect tool for ship operators to act on controlling barnacle fouling below the waterline.



Barnacles are widely recognised as one of the most commercially damaging forms of marine biofouling. This is due to their strong adhesion to hull surfaces and their significant impact on hydrodynamic drag, which reduces vessel efficiency, increases fuel consumption, undermines decarbonisation efforts, threatens regulatory compliance, and negatively affects long-term profitability.

According to one academic study referenced in the whitepaper, as little as 10% barnacle coverage on an underwater hull may require up to 36% more shaft power to maintain speed, driving higher fuel consumption, greenhouse gas emissions, and voyage costs.

However, successful prevention of barnacle fouling on the hull yields multiple significant benefits for ship operators. Maintaining clean hulls is one of the few vessel efficiency measures capable of delivering immediate commercial and regulatory benefits across several environmental regulatory frameworks simultaneously. This includes Carbon Intensity Indicator (CII) ratings, and, for vessels operating in the European Union (EU), cleaner hulls reduce exposure to Emission Trading Scheme (EU ETS) and FuelEU Maritime costs, without any changes to propulsion systems, technology use or fuel choices.



COATING CHOICE AS A CRITICAL RISK FACTOR

Building on earlier studies published by I-Tech that seek to quantify barnacle fouling across the global fleet, this latest whitepaper places a new spotlight on the role of antifouling coating selection in determining barnacle fouling risk.

Through independent analysis of hull condition data from the drydock inspections comparing the two principal coating technologies used across the global fleet, self-polishing copolymer coatings and foul-release systems, the report concludes that coating technology choice has a significant influence on both the severity and variability of barnacle attachment. The findings in the whitepaper indicate that coating grade and suitability for the vessel's operational profile are critical to long-term performance.

The whitepaper contains one of the most extensive independent reviews of barnacle fouling prevalence to date, published by I-Tech in 2025, wherein the analysis of hull condition for 686 vessels inspected in drydock over a ten-year period confirmed that more than one in three vessels entered drydock with barnacles covering more than 10% of the hull, while nearly one in five exceeded 20% coverage.

"Coating selection should no longer be viewed as a periodic purchasing decision based primarily on drydock budget," says Per Svensson, Sales Director at I-Tech. "It needs to be treated as part of mainstream efficiency management with barnacle fouling specifically in mind. The wrong coating for the wrong operating

profile, or a change in a vessel's operating profile, can lock in years of avoidable fuel loss, higher emissions, and additional maintenance intervention."

INNOVATIONS UNVEILED: BARNACLE FOULING AND FOUL RELEASE COATINGS

Findings in the new whitepaper shows that ships with foul-release coating systems, who are dependent on biofouling removal by motion and regular ship activity to perform, can become vulnerable to barnacle settlement during prolonged idle periods, extended warm-water exposure and low-speed operation, particularly in areas where the coating surface has suffered mechanical damage.

Alongside conventional coating comparisons, the whitepaper presents findings from testing an experimental foul-release coating system incorporating Selektope®, I-Tech's barnacle-repelling active ingredient. The results demonstrate strong resistance to barnacle settlement—even when coating surfaces are mechanically damaged—highlighting a potential new direction in antifouling technology that combines foul-release functionality with targeted prevention of hard fouling.

INCREASING EXPOSURE FROM OPERATIONAL AND ENVIRONMENTAL TRENDS

Beyond coating performance, the report identifies broader

operational and environmental trends that are intensifying barnacle biofouling exposure across the shipping industry.

Low-speed steaming, longer idle periods, anchorage congestion, and warm-water trading routes continue to create more favourable conditions for barnacle attachment, particularly for tankers and bulk carriers. As unplanned idling during operations has increased in recent years – coating selection has become even more complex, as it must account for extended and unpredictable idle periods during normal operations. Climate change is also highlighted as a major risk multiplier, with rising sea temperatures accelerating barnacle growth rates, extending fouling seasons and expanding high-risk regions into new geographical areas.

The whitepaper concludes that since barnacle removal remains costly, disruptive, and potentially damaging to coating systems, prevention offers the most sustainable and commercially effective solution. Recommendations suggest that coating selection, idle-time management and awareness of high-risk fouling conditions must now be fully integrated into both technical and commercial decision-making as regulatory pressure increases globally.

Download the whitepaper at <https://bit.ly/4uShSih>.

Clay liquefaction: a sticky risk to bulk cargo safety



By V. Rama Chandran, Assistant Vice President, Technical Manager, Skuld

Photo credit: SPICA



In early December 2025, local media and the Malaysian Maritime Enforcement Agency (MMEA) reported on a general cargo ship M/V KAYO whose crew were rescued after the vessel sent out a distress signal off Malaysia's east coast in the South China Sea. The vessel was experiencing heavy listing, with the risk of possible loss of stability and capsizing.

The 15 crew members were later safely evacuated, and it was reported that the vessel carried clay cargo loaded at the port of Lumut. At the time of publication, the incident is subject to investigation by the relevant authorities. Skuld wishes to caution its members and other interested parties that the industry has experienced similar incidents in the past, where vessels carrying clay in bulk from Lumut developed severe listing and subsequently sank, resulting in fatalities. [HOPE (2013) and XIN HONG (2020)]

A MISLEADING COMFORT

Despite the fact that the International Maritime Solid Bulk Cargoes (IMSBC) Code classifies generic "Clay" as a Group C (neither liable to liquefy nor possess chemical hazards), Skuld has been monitoring and advising members closely on safe bulk shipments of clay from Lumut, Malaysia.

Alongside the tragic sinkings of HOPE and XIN HONG, a series of past near-miss liquefaction incidents has underscored the risks involved and contributed to growing concern and confusion among members, as clay remains classified as a Group C cargo under the IMSBC Code. In addition to "Clay", IMSBC also has an entry to a separate mineral named "Ilmenite Clay" which is classified as Group A. Notwithstanding "Clay" being a group C, it is worth noting that the IMSBC entry for Clay states the importance of keeping this cargo "AS DRY AS POSSIBLE".

This cargo shall be kept as dry as practicable. This cargo shall not be handled during precipitation. During handling of this cargo, all non-working hatches of the cargo spaces into which this cargo is loaded, or to be loaded, shall be closed. The moisture content of this cargo shall be kept as low as practicable to prevent the cargo becoming glutinous and the handling of the cargo from becoming extremely difficult. The above IMSBC precautions for Clay, despite being grouped as C, are indicative of the underlying liquefaction risk.

Skuld's experience with its members who carried out flow tests on Clay before loading in accordance with the IMSBC Code test methods demonstrated measurable flow properties. It is clear that Clay, although listed as a Group C, with excessive moisture and coupled with rough sea conditions, has exhibited Group A cargo behaviour.



Clay cargo showing signs of splattering and flattening in cargo hold (Photo credit: SPICA)

BACKGROUND

This clay cargo is commonly dug from open mines and trucked to a stockpile storage area close to the port, which is usually exposed to the weather. This cargo is primarily shipped from the ports of Lumut and Port Klang to Bangladesh, Taiwan, Vietnam, and China. Clay is also commonly known by its trade name, "Ball Clay", according to the BIMCO solid cargo database.

Members are advised to take extra caution when loading this cargo during the Northeast monsoon (November – March) where the stockpile areas and mines are exposed to heavy rain. This is the wettest season in the Malaysian Peninsula. The southwest monsoon (June – September) brings a drier climate with moderate rain at these ports.

Cargo loading observations
As reported during cargo operations attended by Skuld appointed surveyors, aside from the can tests showing an excessive presence of moisture, another clear tell tale sign of wet clay is when this cargo is in a splattered

condition on the trucks and/or when observed in splattered and flattened condition in the cargo holds. Again, it must be stressed that despite a "Group C" classification, if clay is damp or wet during loading, it may pose liquefaction risks similar to those of Group A.

LOSS PREVENTION

Since Clay is grouped as C, shippers and charterers may try to avoid performing the necessary laboratory tests to determine the FMP, TML and MC. It is important for members to demand for these tests results to come from a recognised and competent laboratory in accordance with the IMSBC code.

We have also seen cases where shippers conducted tests in their in-house laboratories without validation from a competent local authority. Members are to ensure cargo inspection, sampling, and testing prior to loading, as a contractual right agreed upon in the charterparty. It is important for the crew to carry out can tests and closely monitor any signs of wet cargo e.g. signs of cargo splattering and flattening. At the

load port, masters are to be given adequate support to exercise their overriding authority in rejecting wet, unsafe cargo. The crew must ensure that the vessel's cargo worthiness is properly maintained at all times to support the safe carriage of cargo. Skuld recommends that members appoint a competent surveyor to assist with the joint sampling, stockpile inspections, and to monitor safe loading of this cargo.

CONCLUSION

It is worth noting that the IMSBC Code is not carved in stone and is a work in progress. The IMSBC Code is subject to periodic amendments to reflect newly identified cargoes, emerging hazards and enhanced safety requirements, based on industry research and findings from casualty investigations. The IMSBC Code has its limitations, so the ship's crew must use professional judgement and consider real-world conditions. Compliance with the Code alone is not enough; crew must always apply a high level of caution and implement preventive measures based on actual shipboard, cargo and port conditions.

Cargo Securing in focus: Preparing for the 2026 PSC CIC

The Paris and Tokyo Memoranda of Understanding (MoUs) on Port State Control (PSC) will conduct a joint Concentrated Inspection Campaign (CIC) focusing on cargo securing. As the campaign approaches, Jordan Hatch, Loss Prevention Executive at NorthStandard, shares insights on how shipowners and operators can prepare.

By **Jordan Hatch**,
Loss Prevention Executive,
NorthStandard



From 1 September to 30 November 2026, the Paris and Tokyo Memoranda of Understanding (MoUs) on Port State Control (PSC) will conduct a joint Concentrated Inspection Campaign (CIC) focusing on cargo securing.

During this period, PSC officers will apply a dedicated inspection questionnaire alongside routine inspections across ports in Europe and the Asia-Pacific region.

While avoiding deficiencies or detention will be a priority for operators, the campaign is also a timely reminder that shortcomings in cargo securing often reflect wider operational risks, many of which can ultimately lead to P&I claims.

More than a compliance exercise

Cargo securing is a fundamental part of safe ship operations. Poorly secured cargo can shift on passage, damage the vessel or other cargo, potentially compromise the vessel's stability, create a risk to the crew, or lead to cargo being lost overboard.

Such situations can create environmental and navigational hazards, as well as having high associated costs of recovery.

From a liability perspective, the implications are significant. Under Article III Rule 2 of the Hague-Visby Rules, the carrier must:

"Properly and carefully load, handle, stow, carry, keep, care for, and discharge the goods carried."

Where this obligation is not met, cargo interests may pursue claims against the carrier.

At NorthStandard, these exposures are familiar. In many cases, investigations identify the following shortcomings:

- Incorrect lashing arrangements applied to the cargo
- Stability considerations not properly addressed
- Incorrectly declared verified gross mass (VGM) and vertical centres of gravity (VCG)
- Poor condition of lashing or securing equipment
- Using lashing equipment incorrectly or outside the manufacturers design limits
- Failure to follow the vessel's Cargo Securing Manual (CSM)
- Premature removal of lashings prior to port entry
- Failure to follow the requirements and guidance of the CSS Code

What PSC inspectors will be looking for

Although the final CIC questionnaire will be published ahead of the campaign, inspectors are expected to examine both documentation and how cargo securing procedures and the requirements of the relevant codes are implemented in practice, including:

- Availability and approval of a vessel-specific CSM
- Whether the CSM reflects the vessel's current configuration and equipment
- Condition, maintenance and identification of lashing gear and securing fittings
- Procedures and implementation for withdrawing damaged equipment from service
- Crew familiarity with cargo securing requirements
- Evidence that the CSM is being followed during cargo operations
- Inspection and maintenance records within the CSM and Safety Management System (SMS)

Importantly, PSC inspections have increasingly moved beyond paperwork. PSC officers are likely to question crew and test their understanding of cargo securing arrangements in practice. A compliant manual alone will not be sufficient if it is not effectively implemented on board.

Lessons from previous inspections

Previous PSC and focused inspection campaigns provide a useful indication of the types of deficiencies likely to be identified.

A 2020 Focused Inspection Campaign by the Australian Maritime Safety Authority (AMSA) identified recurring issues such as:

- Exceeding permissible container stack weights
- Incorrect weight distribution within container stacks
- Cargo not being properly secured throughout the voyage

In some cases, deficiencies were sufficiently serious to result in detention. Several container vessels also required extensive restows to bring the cargo stowage back into compliance with the CSM, resulting in significant costs, delays and, in some cases, disputes with charterers.

Earlier campaigns also highlighted that:

- Containers were not always lashed in accordance with the CSM
- The condition of lashing equipment and fittings was often substandard

A consistent theme across these findings is that procedures were typically in place but not always applied correctly. This gap between documented requirements and onboard practice is frequently where both PSC deficiencies and P&I claims originate.

Common causes of cargo securing-related claims

From a loss prevention perspective, there is a strong correlation between these PSC findings and the root causes of claims.

For container vessels, common contributory factors include:

- Damaged or incorrectly engaged twist locks leading to securing failure
- Use of lashing equipment that is not approved, documented or compatible with the vessel's CSM
- Worn or unserviceable lashing fittings and foundations
- Incorrectly declared VGM leading to overstressed securing systems, inaccurate stability calculations or adverse effects on vessel stability
- Stowage arrangements that do not comply with the vessels CSM
- Excessive vessel metacentric height (GM) leading to increased rolling accelerations and excessive loads on lashings and securing equipment

These issues can lead to container stack collapse and cargo losses, particularly in heavy weather.

For bulk carriers and general cargo ships, inadequate lashing, insufficient dunnage, or cargo securing arrangements not applied in accordance with the CSS Code can result in cargo shifting, structural damage, or stability concerns.

Incorrectly declared or poorly understood vertical centres of gravity (VCG), particularly for heavy-lift and project cargoes, can also adversely affect vessel stability and cargo securing arrangements.

There has been an increase in project cargo carried on hatch covers of bulk carriers, where concentrated loading and the installation of dedicated lashing points can lead to hatch cover damage, potentially compromising subsequent bulk cargo operations within the holds.

Across all vessel types, failures are often traced back to poor planning, insufficient supervision, or a lack of understanding of the securing arrangements.

Preparing ahead of the CIC

With the campaign approaching, members may use the time ahead to ensure that cargo securing arrangements are not only compliant, but evidently effective in practice.

Key steps may include:

Cargo Securing Manual

- Verify that the latest approved version is on board and vessel-specific
- Ensure it reflects current securing arrangements and equipment
- Remove any outdated or superseded copies
- Ensure all lashing maintenance and inspection records required by the CSM are completed and kept up to date
- Verify that certification for cargo securing and lashing equipment is current and readily available.
- For container ships, cargo lashing arrangement plans should clearly identify maximum permissible stack weights and limitations, rather than relying solely on reference to the loading computer

Lashing equipment

- Ensure all maintenance is up to date
- Identify and remove damaged, corroded or non-compliant items. These should be placed in a designated quarantined area until disposed of

Maintenance and records

- Ensure cargo securing systems are included within the planned maintenance system and that records align with the CSM
- Maintain clear records of inspection, repair and replacement

Cargo planning and verification

- Check stack weights and distribution against CSM limits
- Where computer-based systems are in use, ensure the software is up to date, all cargo, container and lashing details are correct, vessel parameters are accurate and that all test conditions provide results that are within permissible limits
- Ensure VGM has been verified with the planner, and where applicable, the exact VCG of the cargo is considered
- Review lashing arrangements prior to departure and, on long passages, check and tighten lashings again within 24 hours of departure and before and after heavy weather
- For project cargo on general cargo vessels and bulk carriers, inspect cargo and lashings where safe to do so at regular intervals throughout the passage.

Crew competence

- Ensure officers and crew understand the CSM and CSS Code principles
- Where computer-based loading systems are used, ensure both senior and junior officers are familiar with the operation of the system.
- Reinforce procedures through onboard briefings and drills
- Encourage practical familiarity, not just theoretical awareness

Effective cargo securing protects not only the cargo itself, but also the crew, the marine environment and the vessel, while reducing the likelihood of costly delays, disputes and P&I claims.



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Guidance for the safe carriage of cocoa butter in containers

The International Safe Containerised Cargo Organisation (CINS) has published revised guidelines for the safe carriage of cocoa butter in freight containers, updating industry practices for one of the sector's most temperature-sensitive cargoes.

Photo credit: CINS



Developed by a working group of CINS members, the updated guidance is aligned with the principles of the IMO/ILO/UNECE Code of Practice for Packing of Cargo Transport Units (CTU Code), which sets out international standards for the safe packing and handling of containerised cargo.

The 2026 edition replaces the previous January 2018 version and reflects significant developments across both the cocoa butter industry and container shipping sector over the past eight years. CINS said the updated guidelines are intended to enhance cargo integrity and reduce risk by addressing the unique characteristics of cocoa butter, which is highly susceptible to melting and temperature-related damage during transport.

Cocoa butter is derived from whole cocoa beans which are fermented, roasted, and then separated from their hulls. About 54–58% of the residue is cocoa butter. It contains various amounts of saturated fats (57–64%) and unsaturated fats (43–36%).* Cocoa butter becomes soft and malleable at high temperatures and can melt between 30°C and 37°C. Having

become warm or molten, it can retain the latent heat and remain in such a condition down to as low as 17°C.

Upon heating, cocoa butter expands and may cause it to burst the packaging and seep out, staining adjacent cartons and possibly leaking outside of the container or causing damage to the container structure. There have been incidences of cocoa butter melting on board ships, resulting in the clogging of ships' bilges.

FREIGHT CONTAINER SELECTION

Standard freight containers

Cocoa butter is generally transported in standard dry freight containers, provided that expected ambient temperatures throughout the transport chain are taken into account when determining appropriate packaging and packing arrangements.

The container used for transport must be structurally sound and cargo-worthy, clean, dry, and completely free from odour, with no signs of pest contamination and no residual odours or allergen traces left by previous cargo, to prevent contamination.

Shipper preferences regarding container selection should also be carefully considered, including the provision of a dry, clean, food-grade (Grade A) freight container specifically suitable for cocoa butter shipments.

Particular attention should be paid to the condition of the container floor, as a wet floor may contaminate pallets and cocoa butter packaging, potentially leading to condensation that can weaken the outer carton packaging. For this reason, containers with wet floors should always be avoided when transporting cocoa butter.



As noted in section 2.3, reefer containers will provide protection from radiant heat. Where the refrigeration machinery is operating, it is important that the cartons are packed to allow appropriate air circulation.

In less common cases, cocoa butter may be transported using a Flexitank. If this option is selected, it is strongly recommended to follow the Container Owners Association (COA) Code of Practice for Flexitank use, particularly with regard to the selection of the Flexitank and its compatibility with the commodity. The use of a Flexitank for cocoa butter is always subject to the Carrier's approval.

Reefer containers

Particularly when transporting through hot climate zones it is recommended that cocoa butter is shipped in reefer containers as it ensures a stable cargo quality throughout the whole transport chain.

It should also be noted that this cargo may be carried in non-operating reefer containers**, since the insulation may provide sufficient reduction in thermal transfer. Long exposure to sun light may however still permit some heat transfer, resulting in the outermost cartons softening.

When a non-operating reefer container is considered, the potential for heat accumulation inside the container must be carefully evaluated. Where it is decided to utilise operating reefers, this will successfully limit the heat transfer to the outermost cargo, so long as an air gap is appropriately maintained around the cartons.

Similar to standard dry containers, refrigerated containers must be inspected prior to stuffing to confirm their suitability for the intended cargo.

Tank containers

In specific cases, tank containers are used for the transport of cocoa butter. Such tanks shall be dedicated food-grade, fitted with food-approved seals and gaskets, and provided with a serviceable heating system and intact insulation jacket.

FREIGHT CONTAINER PACKING

Packaging and quantity

Cocoa butter shall be packaged in sealed plastic bags and placed within robust cardboard cartons.

When transported in dry containers, it is imperative that the cartons are engineered to withstand the total stacked weight, including scenarios in which the cocoa butter may soften due to elevated temperatures. A standard packing method involves placing 25 kg blocks in sealed bags within cartons measuring 40 x 30 x 25 cm. In a 20-foot standard container, up to 800 cartons may be stowed, typically in 8 tiers, resulting in a gross container weight of approximately 22 tons.

Stack heights must not exceed the load-bearing capacity of the bottom-most cartons.

To prevent direct contact between the cargo and the container sidewalls and to reduce heat transfer, it is recommended to use a food-grade liner or plywood sheets along the container walls. Additionally, the placement of plywood sheets above the fourth tier can help distribute pressure, mitigate the risk of crushing, and contain any potential leakage from upper cartons. However, it is important to ensure that the liner material used does not retain heat.

Recommended cargo inspection

A container vanning inspection should be conducted to ensure that cocoa butter is packed and stowed in a manner that preserves its quality during transit. This includes random checks of cartons and their inner linings, with the use of a food-grade polyethylene (PE) liner recommended; the liner should be properly sealed, either by heat sealing or securely folding and taping.

The temperature of the packaged cocoa butter should be measured using a probe or thermal thermometer at the time of stuffing.

All cartons should be in good condition, dry, and free from signs of expansion, tearing, or damage. While carton strength may be indicated by an Edge Crush Test (ECT) certificate, this is not mandatory for cocoa butter cartons, and packers may rely on supplier-provided strength data.

Stack heights must not exceed the load-bearing capacity of the bottom-most cartons. Inner liners or plywood should be used to prevent direct contact with container walls and to reduce heat transfer, and cargo should be stowed to minimize movement and distribute weight evenly.



*See https://www.cargohandbook.com/Cocoa_Butter

**See http://www.cinsnet.com/wp-content/uploads/2016/01/COA_CINS-NOR-Guidelines-1-August-2017.pdf

TRANSPORT

Terminal operations

A recent study indicates that, whether exposed to direct sunlight or radiant heat while positioned in a shaded location, the internal temperature of a container may remain at undesirably high levels for approximately 6 to 10 hours per day during its stay at a marine terminal in high-ambient-temperature environments.

As illustrated in Appendix II, the quality of cocoa butter shipments may be significantly affected during terminal dwell time when ambient temperatures reach 30 °C or higher.

Terminals rarely offer shaded storage for containers. Dry containers carrying this cargo should be packed and transported to the load port terminal as late as practically possible to minimise the exposure time to sun/heat before being loaded on board the ship.

An additional risk factor to be considered by cargo packers is the time in transshipment hubs where containers are exposed to various weather conditions. The entire routing of the container should be considered in determining appropriate actions to take in reducing the risks.

Carriers are encouraged to advise shippers to minimize prolonged container dwell times at both the Port of Loading (POL) and the Port of Discharge (POD), in order to reduce potential exposure to adverse weather conditions. Where operationally feasible, Carriers should also seek to limit multiple rollovers at transshipment ports and consider flagging cocoa butter shipments for prioritized loading due to product quality considerations.

These measures are intended as operational guidance and should not be interpreted as legally binding obligations.

Vessel operations and stowage

Shipping lines generally expect that cargo has been packed appropriately for the intended carriage and do not provide any guarantee regarding a specific stowage position on board the vessel.

Stowage on deck is recommended to facilitate monitoring and cleaning in the event of spillage, preferably in a shaded area to minimize heat exposure.

When cocoa butter shipments are loaded under deck, they should be kept away from heat sources and not stowed in the same cargo hold with live reefers to prevent them from being affected by radiant heat. The best practices for operating the shipboard bilge system should be followed to prevent bilge system damage in the event of cargo leakage.

Before deciding to load cocoa butter shipments under deck, a cargo inspection, is highly recommended to ensure the risk of melted cocoa butter leaking outside the container is low and at an acceptable level.



The objectives of CINS

To highlight risks posed by certain cargoes and/or packing failures in order to improve safety in the liner shipping industry, by:

- capturing and analysing information within the CINS database
- looking for specific incidents which may require immediate action or assessing incident trends.

Once areas of concern become apparent, they can be addressed to relevant authorities to formulate appropriate recommendations or advice, such as amendments to the IMDG Code. This may include advice on training issues on the packing and securing of cargo in containers.

For any clear pattern emerging that could require regulatory intervention, the lines will now have the hard facts to support their claims and no longer have to rely on anecdotal evidence when presenting their case.

For more information go to <https://www.cinsnet.com/>



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NEW ZEALAND'S MARINE INDUSTRY IN NUMBERS



New Zealand has 15,134 kilometres of sea coastline and another 3,166 square kilometres of inland lakes and waterways. It is, by any measure, a boating nation. But the full scale of the marine industry that sits behind those waterways, and what it actually produces, exports and employs, tends to get lost in the lifestyle imagery. A closer look at the data published in the NZ Marine Industry Association's Autumn 2026 News, drawing on both local industry research and the 2025 ICOMIA (International Council of Marine Industry Associations) Yearbook, puts some hard numbers around a sector that is larger, more export-oriented and more structurally complex than most people probably assume.

1,104 companies. 5,451 jobs. One coastline.

Start with the industry footprint. According to the 2025 ICOMIA Yearbook data, New Zealand's marine sector comprises 1,104 companies employing 5,451 people. That figure covers the full supply chain, from the people who build the boats to the businesses that keep them running.

Breaking it down: 149 boat builders account for 2,202 of those jobs, an average of nearly 15 employees per company. That is not a cottage industry. These are businesses with production lines, skilled tradespeople and capital investment in facilities. The 113 boat accessory and marine equipment manufacturers employ a further 987 people, while the largest segment by company count, 842 service providers, accounts for 2,262 jobs. The service provider category covers everything from marinas and repair yards to chandleries and surveyors, and it is worth noting that this segment is the most structurally resilient of the three. People keep boats in the water regardless of whether new boat sales are up or down, and someone has to antifoul, refit and repair them.

To support all of this, New Zealand has 215 yacht harbours, clubs and marinas, 13,595 wet berths and slips, 2,303 dry storage facilities, 9,000 moorings and 260 boat ramps. That is a marine infrastructure network with genuine national reach, and it underpins an ownership culture that the sales and production numbers reflect.

Who actually builds boats in New Zealand

The ICOMIA production data is where things get interesting. New Zealand domestically produced 4,077 outboard boats in the period covered, valued at €111.3 million. It produced 1,542 inflatable boats (100kg and over) worth €30.7 million, 703 sailboats and yachts worth €30.2 million, and 226 inboard, sterndrive and motor boats worth €61.3 million. The inboard and motor boat category, despite being the smallest by unit count, carries by far the highest per-unit value, reflecting the large, complex and often custom vessels NZ is known for building in this space.

There is also a substantial accessories and marine equipment manufacturing sector. Domestic production of boat accessories and marine equipment reached €220 million, with €106.2 million of that exported. That figure alone is a useful corrective to any perception that NZ's marine manufacturing is purely about complete vessels.

The picture that emerges is of a genuinely diverse production base: volume outboard hull manufacturing at one end, high-value custom inboard builds at the other, a significant inflatable production capability in the middle, and a large accessories and equipment sector running alongside all of it.

The fleet: 214,000 outboard boats and a lot of PWCs

The owned fleet data in the ICOMIA Yearbook gives a snapshot of what New Zealanders actually have in the water, and the outboard boat dominance is emphatic.

There are 214,247 outboard boats registered in New Zealand. To put that in context against a population of approximately five million, that is roughly one outboard boat for every 23 people. No other vessel category comes close. PWCs are second at 96,268 units, a number that reflects both their accessibility and the growth of that segment over the past decade. Inflatable boats (100kg and over) account for 34,970 units, sailboats and yachts 30,375, and inboard and sterndrive motor boats 13,189.

The inboard fleet sitting at 13,189 is worth pausing on. These are the larger, more expensive vessels, and a fleet of that size represents a significant ongoing market for servicing, refitting, parts and berthing. The 6,622 owned boats in the 12-24 metre range within this category point to a substantial cohort of serious cruising and commercial-adjacent vessels.

There is also a catch-all "other boats" category of 1,196,546 units, which encompasses smaller craft such as kayaks, tinnies and rowing boats. That figure is more a measure of how embedded on-water activity is in New Zealand life than it is a useful commercial metric, but it reinforces the breadth of the boating culture the industry is built on.

Exporting to the world from the bottom of it

The export data is where the conventional perception of New Zealand as primarily a boat-buying market comes unstuck most clearly.

In outboard boats, NZ produced 4,077 units and exported 1,673 of them, valued at €42.5 million. That means roughly 41 percent of domestic outboard boat production left the country. For a category most people associate with the local runabout market, that is a striking export orientation.

The inflatable boat figures are even more pointed. Of the 1,542 inflatable boats produced domestically, 1,157 were exported, against just 483 sold at home. New Zealand exports more than twice as many





inflatable boats as it sells domestically. These are not cheap inflatables, either. The 100kg-and-over category captured in the data points to substantial craft, including the RHIBs and commercial tenders NZ has built a genuine international reputation for.

Inboard and motor boats tell a similar story at the high-value end. Of 226 units produced, 83 were exported at a value of €59.3 million, almost equal to the €61.3 million total production value. These are large, expensive vessels going to international buyers.

In engines, 269 outboard engines were exported from NZ, and the accessories and marine equipment sector exported €106.2 million worth of product. Taken together, the export picture is of an industry that competes internationally across multiple segments, not just as a downstream consumer of imported product.

Where the market sits today

The bar chart data in the Autumn 2026 publication, drawn from the PowerStats programme run on behalf of NZ Marine, charts outboard retail sales and total imports from 2016 to 2025. The pattern is consistent with what the wider economy experienced: a significant COVID-era demand surge peaking at approximately 8,000-9,000 retail outboard units annually around 2021-2022 (approximate), followed by a correction back toward pre-pandemic norms.

By 2025, retail outboard sales had pulled back to approximately 6,000-6,500 units annually (approximate). The import data tells its own story: total outboards imported into NZ peaked at approximately 13,000 units around 2021-2022 (approximate), well ahead of retail sales volumes for the same period. By 2025, imports had dropped to approximately 6,000-7,000 units (approximate), suggesting distributors spent much of 2023-2025 running down inventory rather than replenishing it.

One nuance within the correction is worth noting. The over-90hp segment appears to have held its market share better than smaller horsepower bands through the downturn, suggesting that buyers who are still purchasing are skewing toward higher-powered, higher-value product. That has implications for margins across the distribution chain.

Trailer boat registrations by region follow the same broad arc. Auckland leads consistently, followed by Waikato, Bay of Plenty and Canterbury, with Northland a smaller but stable contributor. The 2020-2022 peak is visible across all regions, except perhaps Canterbury, and the subsequent softening is equally broad-based, meaning the correction is generally a national phenomenon rather than a specific regional market issue.

The diesel engine segment, tracked over a longer timeframe back to 2003, shows a different and more stable pattern. Sales in 2025 sit around 300 units (a PowerStats approximate), consistent with the prior several years and well below the mid-2000s peak of approximately 500 units (approximate). This is a smaller, more specialised market and it behaves accordingly.

None of this points to an industry in structural decline. The owned fleet is large and durable, the export performance is strong, and the service and infrastructure base is substantial. What it does point to is an industry working through the natural consequence of a demand spike it did not engineer and could not fully anticipate: too much imported stock, a buyer market catching its breath, and a return to the kind of steady-state conditions that characterised the years before 2020.

For an industry that produced over €220 million in accessories and equipment domestically, exported inflatable boats at a rate of more than two to one against domestic sales, and maintains a fleet of over 214,000 outboard boats in the water, catching its breath looks reasonably comfortable.

Large scale

required to
improve
boat recycling
efficiency



By Hans Buitelaar

Abandoned boats that remain along the shores of lakes, rivers and coasts are being removed for recycling in France and the United States in large numbers. In other European countries, removal of end-of-life boats has started and is scaling up. Funding these operations is a collective effort of industry associations and government. First operations prove positive. Continent-wide recycling is being prepared.

The National Oceanic and Atmospheric Administration (NOAA) Marine Debris Program in the United States provided a 10 million dollar grant in 2023, for a massive clean-up effort to remove abandoned and derelict vessels from US coastal waterways and the Great Lakes. BoatUS, the association of boat owners, received the funds to start the clean-up program.

LOCATE & COLLECT

The first action was to create a database of abandoned boats and their locations. Before taking these boats away and scrapping them, one needs to know where they are. Since 2023, the first end-of-life boats have been collected and scrapped. Last year, the BoatUS clean-up fund paid for the collection and retrieval of over three hundred boats in five states, US territories and one tribal reservation. During the now started 2026 boating season, all boaters are asked to use the database and report abandoned boats they observe along the waters they navigate. BoatUS is ready to start removing boats nationwide this season. "With boating season around the corner, boaters have an opportunity to spot, and report abandoned vessels that might otherwise go unnoticed," says BoatUS Foundation director of outreach, Alanna Keating. "Each report helps communities better address the issue of abandoned and derelict vessels by supporting both removal efforts and prevention." Reporting takes a few minutes. The information provided by boaters supports clean-up efforts.

Cost involved with collecting a boat, dismantling and recycling may exceed 24,000 dollar per vessel.

THOUSANDS OF BOATS, DOZENS OF FACILITIES

In France, a boat tax called 'Teamup' was introduced in 2022 to create funds for ocean life protection, maintenance of boating infrastructure and end-of-life recycling. This has initiated the founding of APER: Association pour la Plaisance Eco-Responsable. By the end of 2024, an impressive 11,000 boats had been dismantled. 36 facilities for boat recycling were established or provisions for recycling are installed on existing yards. APER claims to have three quarters of all reclaimed materials either recycled or burnt to generate electricity. Collecting and recycling is free for the last owners of the boat. These are the boaters who can only afford an old used boat at the end of its lifetime, while previous owners have had benefit of the vessel before. That is why the boating industry and the government argue that a tax

during ownership is the fairest way to fund the recycling. APER started as project for four years in 2015, but it is continued until at least 2029. The boat tax is raised on boats from 7 meters long, progressive over the length of a boat, and also weighed for the power of the engine, exceeding with the installed horsepower on board. A 10 meter yacht with a 35 horsepower engine, for example, would pay 254 euros per year. Estimated revenues from this Teamup tax are 45 million euros annually. The French tax collector is planning adaptations for the tax starting 2027, but the industry is heavily criticising the changes.

HIGH COST, LOW REVENUES

Dismantling boats and recycling the materials that remain, is a cost factor. The value of equipment and raw materials that can be reclaimed, is lower than the cost of collecting and treating the boats. Positive examples of the collection, dismantling and recycling of end-of-life boats do exist, but it is the cost factor that has prevented widespread adaptation of boat recycling. In France, boat registration is mandatory. In many other countries, including EU countries, it is not. There is no formal knowledge of the number of boats and their ownership. It is very hard to confirm ownership of an abandoned boat. With no registered ownership, no taxes can be raised. And the cost of recycling still isn't covered by the revenues of sales of parts and reclaimed materials. In order to proceed towards circularity, plans are presented to accelerate recreational boat recycling.

CIRCULAR BY 2030

In Europe, the most prominent plan is the 'Roadmap for the implementation of the circular economy for end-of-life boats' presented in March 2023 by the industry association EBI – European Boating Industry. This roadmap should show the way towards a fully circular boating industry by 2030. The groundbreaking idea is to set up a pan-European composite recycling industry. Not only boats, built with glass fibre and polyester resin, but also the blades from the wind energy turbines. The first generation of wind turbines on land and sea have been in service for over 30 years across Europe. They are replaced with new turbines and the old wings pose the same problem as end-of-life boats. They leave the same kind of material. Large scale will reduce the cost per item, is the idea presented in the report.

STRATEGIC SUPPLY

Action is taken. A Luxembourg & Bristol (UK) based start-up, Uplift360, has been awarded a 7.4 million grant to set up a European composite collection system. Not only environmental considerations are weighed in setting up a reclaiming system for used composites. There is a lot of end-of-life composite and re-using it can lead to better material independence in Europe. The fossil sourced materials are mostly not sourced in Europe itself and international supply chains do not provide the certainty they used to. These advanced materials might prove critical in the future. A recycling system would provide home resources.

VOLUMES TO RECYCLE

A lot of composite boats have been built in Europe and the US since mid 1950's. The early examples of boats being constructed in this then novel material are up to 70 years old. An estimate presented in the EBI roadmap calculates the number of boats reaching the end of their use to be around 30 to 40,000 in the EU by 2030. This would represent at least 30.000 tons of bare composite material. The technology to separate resin from fibres is available and the use of this technology is rapidly increasing. End-of-life wind blades represented also about 30.000 tons of composite material in 2025. This is estimated to increase up to 60.000 tons by 2030. Wind turbines have been installed a lot later throughout Europe than the first composite boats. As this industry rapidly developed during the 1990's, the number of end-of-life blades will grow over time. Combining the collection and recycling of boats and windmill blades, could provide the larger scale needed for cost-effective recycling.

DISMANTLING SCRAPS

Of course, GRP in boats is only part of the materials. There are steel wires, metal winches and stanchions, engines with oil and fuel in them, wood, fabric and foam in the interiors and electronics and paint. Before a boat can go to the Uplift360 recycling plant, a lot of dismantling needs to be done. Some of the equipment retrieved might have a resale value, but most of it is obsolete. Few boaters would install 1980's electronics for navigation. For this part of reclaiming materials, becoming a truly circular industry might prove a hard task for boat builders.

This article was first published on the Metstrade website and is reprinted here with our gratitude.



How are motorboats made?

This article was written by the FJORD team and first appeared on their website. It is republished here with our thanks and gratitude.

From sketch to sea...

The craft of motorboat building has evolved remarkably over the years, shaped by technological advances, innovation, and changing maritime needs. Yet, amidst this whirlwind of progress, certain core principles have stood the test of time.

History and evolution of motorboat building

The motorboat industry was born from humble origins, with early designs surfacing in the late 18th century. Among the first ones was the *Pyroscaphe*, a steam-powered vessel that sailed the Saône in 1783. These trailblazing machines, while innovative, presented numerous challenges, including managing heat and pressure control and bearing their size and weight on the vessels. Concurrently, these pioneering crafts were predominantly wooden; a material that was both abundant and workable. It allowed for structure diversity but presented issues of durability and efficiency.

With the advent of internal combustion engines in the late 19th century, the industry experienced a significant shift. Boats became smaller and more powerful, and their construction materials evolved. Incorporating steel, and subsequently aluminium and fibreglass, provided better durability, lighter weight, and resistance to water damage.

Into the 21st century, motorboat construction has become a blend of artistry and technology. Computer-



Precision is among the enduring cornerstones, essential for ensuring both the safety and high performance of each vessel. It goes hand-in-hand with craftsmanship, a blend of skill, experience, and artistry that holds its ground even amidst technological leaps and automation. Expert dexterity and knowledge are indispensable in tasks such as hull shaping, woodworking, and detailed finishing - areas where machines can't match the human touch.

Above all, the continuous pursuit of improvement anchors this industry, consistently pushing limits to enhance speed, stability, and comfort. This article seeks to illuminate this complex process, exploring how these fundamental elements have been preserved and adapted in the evolving landscape of boat building, from the initial design conception to the point of purchasing the motorboat.

aided design and manufacturing (CAD/CAM) tools have enabled precise and complex designs, boosting efficiency and performance. Materials have further evolved, with composites and advanced polymers offering enhanced strength and weight properties.

The role of technology in different types of motorboats

The influence of technology is profound in how motorboats are made, shaping the industry's future and continually raising the bar for what can be achieved. Computer-aided design and manufacturing systems (CAD/CAM) are foundational across all boat-building classes, from speedboats to fishing vessels. These systems facilitate the creation of efficient, custom designs and precise manufacturing of complex geometries.

Modular construction methods and laser-guided alignment systems are also increasingly utilised, especially in larger vessels such as yachts, ensuring precision and structural robustness. Moreover, digital templating tools quicken the fitting-out process, delivering a high degree of customisation and accuracy.

Industry 4.0 technologies, like IoT, robotics, and AI, are becoming ubiquitous, automating labour-intensive tasks, enhancing quality control, and optimising resource use in boatyards. They also enable efficient integration of complex systems, from luxury yachts' electrical networks to fishing boats' sonar systems (which use sound waves to detect underwater objects).



FJORD 41 XP

How motorboats are made: From concept to blueprint

The creation of a motorboat begins with an idea, a vision often born from a blend of consumer needs, engineering insight, and artistic creativity.

Here is the progression from the initial inception to the meticulously detailed final blueprint:

1. Initial sketches and digital design: Every boat starts its life as a concept or a sketch. Designers draw preliminary drafts, capturing the broad shape and aesthetics of the vessel. This vision is then translated into a more precise digital model using CAD software - a technology that allows creators to create 3D models, modify designs with ease, and experiment with various configurations.

2. Hydrodynamic and structural analysis: Once the preliminary digital model is ready, the next step involves rigorous hydrodynamic and structural analysis. Using Computer-Aided Engineering (CAE) tools, engineers simulate the boat's behaviour in various water conditions and evaluate its seaworthiness,

stability, and performance. These analyses inform crucial adjustments to the hull design, improving the boat's efficiency and safety.

3. Selection of the right motor and propeller: The boat's engine and propeller are crucial components that significantly impact its performance. The choice of motor depends on the boat's intended use, size, and weight, among other factors. Likewise, the propeller must be chosen with care, considering its diameter, pitch, material, and the number of blades, to ensure optimal propulsion and fuel efficiency.

4. Finalising the blueprint with precise measurements: Following the design adjustments based on analyses and motor selection, the final stage of the process involves refining the digital model into a detailed blueprint. This provides precise measurements for every boat component, from the hull and deck to the most minor fitting. It serves as the definitive guide for the construction phase, ensuring the boat is built to exact specifications.

What are motorboats made of? Material selection and preparation

The quality of materials selected for boat construction profoundly impacts the motorboat's longevity and performance. The strength of a hull braving harsh sea conditions, a propeller's seamless cut through waves, or the boat's endurance during off-season storage, all hinge on this crucial choice. Similarly, it informs interior aesthetics, comfort, and functionality.

Fortunately, today's advancements introduce a spectrum of materials, each abundant in properties and benefits. Here is a deeper understanding of some of the most widely used, their roles and distinct benefits in boat construction.

The process of selecting and preparing materials for boat construction is a thorough one. It involves careful evaluation of the types of motorboat, intended use, desired characteristics, and specific material properties. For instance, a high-performance speedboat may favour carbon fibre for its lightweight strength, while a fishing boat might prefer fibreglass for its durability and resistance. When it comes to the preparation, this typically includes:

- Procuring the raw materials.
- Verifying their quality.
- Shaping them into the required forms, such as sheets for hull construction or rods for masts.

Motorboat hull construction

Hull construction starts with creating a mould shaped to the boat's final design. Layers of materials, such as fibreglass or carbon fibre, are then applied, with resin acting as a binding agent. Once cured, this forms a robust structure. Further layers may be added for reinforcement, particularly around the keel, chines, and strakes. Internals like bulkheads

and stringers are integrated for additional strength. After final curing, the hull is released from the mould, revealing a strong, seaworthy vessel ready for the subsequent stages.

Crafting the deck and superstructure

The deck, much like the hull, is shaped using a mould for precision. This forms the basis for carefully laid layers of selected materials, each bonded with a resin. A steadfast commitment to accuracy underlies this process, vital to ensure an exact fit with the hull, precise placement of fittings like cleats and winches, and the seamless integration of essential motorboat safety features such as non-slip surfaces.

How are cabins on motorboats made? (The superstructure)

Next, the superstructure – encompassing the cabin and wheelhouse – is constructed. Precision remains the guiding principle, dictating the functionality and fit. Here, the earlier blueprinted internal layout comes to life, translating spaces for navigation, seating, and storage into tangible structures. This process is closely followed by cutting out window and door openings and installing necessary systems such as electricity and plumbing.

Merging deck and superstructure with the hull

The final stage involves securing the deck and superstructure to the hull. This process is often achieved through bonding and mechanical fastening and must be accurate to ensure a watertight seal and

structural integrity. Following this, installations such as railings, windows, and doors are completed.

Motorboat engine and propulsion system integration

The installation and integration of an engine and propulsion system into a motorboat represent the crossroads where design and functionality merge. This step turns the static structure into a dynamic vessel, underscored by five critical stages:

1. **Selection:** The process begins with choosing the appropriate engine - often an inboard or outboard type, depending on the type of boat. An inboard engine mounted inside the hull offers balance and space optimisation. In contrast, an outboard motor provides ease of maintenance and a higher power-to-weight ratio.
2. **Positioning:** The engine's positioning within the hull impacts stability, balance, and performance. Ideally, this is centred to evenly distribute its weight, but exact placement depends on hull shape and boat design.
3. **Compatibility check:** Before installation, a compatibility check is essential to ensure all decisions made can integrate seamlessly with the boat's design and existing systems.
4. **Installation:** The engine installation involves intricate procedures, including mounting it to the hull or transom, connecting the fuel and exhaust systems, and linking the engine to the boat's controls. Measures like rubber mounting and acoustic insulation around the engine compartment are employed to minimise vibrations and noise.
5. **Testing:** Finally, rigorous trials are run to assess the system's reliability and efficiency, ensuring the power output, thrust conversion, and overall manoeuvrability meet the required standards.

Motorboat fuel system installation

This marks an instrumental phase in the construction process, often orchestrated alongside or slightly prior to the electrical and plumbing works. Given its rigidity and safety requisites, the fuel system components - comprising tanks, lines, and pumps - are strategically placed to avoid any obstruction or interference. Adherence to safety regulations is paramount, and careful consideration of weight distribution and balance is essential to the boat's performance. This installation journey culminates in rigorous testing, aligning the system's efficiency with the boat's design, ensuring a seamless symbiosis with the engine and propulsion systems, and safeguarding the integrity of the motorboat's dynamic functionality.

Types of motorboat electrical and plumbing systems

Serving as the vital conduit of onboard functionality and safety, both at the dock and during motorboat cruises, the intricacy of electrical and plumbing systems proportionately escalates with the size of the vessel. A dual-battery setup marks the start, its redundancy powering an assortment of navigational tools, lights, pumps, and potentially appliances, all orchestrated via a circuit breaker panel. Marine-grade tinned copper wiring, colour-coded for easy identification, runs securely within the conduit. On the other hand, the plumbing system conveys freshwater through pipes to utilities like sinks and showers, propelled by pressure pumps. Critical bilge pumps expel intruding water, while the sanitation system efficiently manages waste.

How are yachts made from the inside?

The transformation from a hull to a comfortable and functional interior begins with the complex installation of structural elements, followed by fixtures, amenities, and finishing touches. Extreme precision and attention to detail ensure high-quality, durable finishes that enhance aesthetics, comfort, and practicality while thorough planning optimises space and aligns with the boat's intended use.

The level of customisation

Customisation levels in the interior installation and finishing stage can vary. Smaller, mass-produced boats usually have standard layouts, whereas larger motorboats often offer extensive personalisation, from layout options to materials and amenities. Regardless, safety regulations and the marine environment's demands must always be met.

What is the interior made of?

Motorboat interiors harness a fusion of materials, balancing durability, weight, aesthetics, and technical performance. Marine-grade plywood, known for its strength and resistance to moisture, often forms the base for flooring and partition walls. Lightweight and highly durable fibreglass is frequently used for wall linings, cabinetry, and furniture structures. Other composite materials like carbon fibre bring high strength-to-weight ratios and are crucial for maintaining boat stability and fuel efficiency. Additionally, metals like stainless steel or aluminium feature in hardware and fixtures for their corrosion resistance.

Electronics and navigation systems in motorboats

The rapid progression of marine technology continually enriches the electronics and navigation systems, creating safer, more efficient, and user-friendly boating experiences.



Compact runabouts might require only basic GPS, VHF radio, and fish finders, while luxurious yachts may feature sophisticated radar, autopilot systems, depth sounders, chart plotters, and satellite communications. Integrating these components during construction ensures seamless functionality and aesthetics. System choice and complexity largely depend on the boat's purpose and size. Importantly, flexibility is built into these installations, allowing for future tech advancements and upgrades, thereby ensuring the yacht remains at the cutting edge of innovation.

The final stretch in the journey of building a motorboat

The construction voyage concludes with finishing touches and stringent quality assurance. Aesthetic embellishments add personality, turning a boat into a unique marine masterpiece. Rigorous inspections and quality checks ensure every detail aligns with the design specifications and safety standards.

Once that's done, the motor yacht is carefully transported for its inaugural launch. Sea trials follow, testing the vessel under various conditions

and leading to final adjustments, fine-tuning performance, and ensuring seaworthiness. The process culminates in the handover to the customer, where the manufacturer's painstaking craftsmanship transforms into the customer's joy and satisfaction, setting the stage for their maritime adventures.

The bottom line

How motorboats are made is an intricate blend of design, engineering, and craftsmanship, each stage imbued with precision and care. From the first sketch to the last aesthetic touch, every component is thoughtfully chosen and installed to create a vessel that marries functionality, safety, and style.



The FJORD Journey

From humble Norwegian beginnings inspired by global craftsmanship, FJORD has evolved into an icon that melds raw power with unmatched comfort. Acclaimed awards like the European Powerboat of the Year and industry recognition punctuate the brand's longstanding alliance with HanseYachts AG, writing a tale of relentless innovation and exceptional seafaring elegance.

For more information: <https://fjordboats.com/gb/>

The harmonised future of electric boating



By **Hans Buitelaar**,
Metstrade



Vessel design, system integration, power management, shore infrastructure and regulations come together to make a solid business case for electric propelled boats. IEMA, the association bringing parties together to accelerate maritime electrification, pushes for co-operation of all stakeholders in electric boating.

"Electric boats are ready to be better than boats propelled by combustion engines." This is the conviction and objective of Daniele Gaviotis, managing director of Vulkan Italia. "The industry is moving towards fully integrated propulsion architectures, where energy management, power distribution and mechanical interfaces are designed as a single ecosystem."

Development

The branch in the marine industry that produces electric boats has matured. The experimental and early-adaptor phase is passed, and electric boats are now a serious consideration for anyone looking to purchase a boat. The electric motors, the controls, the charging equipment and the batteries have all gone through a phase of rapid development.

System integration

Vulkan Italia provides electric and hybrid propulsion solutions for yachts and commercial vessels. Gaviotis finds the segment of marine electrification at a crucial point in 2026. With global insecurity about the supply of fossil fuels, tightening regulations for low-emission transport and the growing acceptance of electric propulsion as a viable and economical option, now is the time that boat electrification can really make a breakthrough.

Technology is ready, but further development is foreseen. Gaviotis: "The most important change will be the transition from component-based design to system-level integration. In hybrid and electric propulsion, performance is no longer driven by a single component, but by how efficiently the entire system—mechanical, electrical, electronics and digital—works together."

Stakeholder co-operation

For electric propulsion to be most successful, the infrastructure needs to be in place and energy management on board should be re-evaluated, Gaviotis notes: "There is a growing awareness that electrification requires a holistic rethink of onboard energy systems—including propulsion, hotel loads, storage and interaction with port infrastructure. It is therefore of outmost importance that the electrification industry can consult the entire framework of institutions to drive the electrification path and not being driven by it."

Platform

To achieve this approach and involve all of the stakeholders in marine electrification, the IEMA was founded. The International Electric Maritime Association started in 2023. IEMA brings together some 100 organisations from around the world involved in manufacturing electric boats, providing charging infrastructure, knowledge platforms providing the newest insights in the science of electric propulsion and networking platforms. Metstrade is also partner with IEMA.

Demand

"The challenge is no longer whether electrification works, but how to scale it," says Adrià Jover, president at IEMA. "The greatest barrier to growth is infrastructure readiness. Demand for shore power and charging capacity is increasing rapidly, while grid expansion remains slow, capital-intensive, and constrained by permitting processes. Power availability is emerging as a critical bottleneck, requiring closer coordination between ports, marinas, utilities, and vessel operators."

Commercial fleet

One ground-breaking pioneer in electric propelled leisure craft, X-Shore has gone through phases of liquidation but has come back with renewed ambitions to be an industry leader in electric boating. CEO René Hansen shares his analysis of the current market and developments needed in the near future. "The professional segment is where the shift becomes undeniable. In Europe alone, there are approximately 36,000 boats in the 0–15 meter category that will need to change to electric propulsion."

Commercial boats are the first to be effected by regulations. When operators look at the numbers, the case is clear: significantly lower operational costs, less maintenance, and more uptime with electric propelled workboats. Regulation is accelerating this transition. Norway is already moving toward zero-emission requirements in key segments by 2027 (0–15 meter), which is shifting investment decisions today to avoid stranded assets."

Outperform

As a boat builder, we are also investing heavily in the digital layer, connectivity, data, and how the vessel interacts with its owner and its environment. That's where electric boating becomes fundamentally different, not just a replacement for combustion. The goal is simple: deliver boats that outperform traditional alternatives, not just environmentally, but operationally and experientially."

Momentum

Looking back over the past decade, Hansen sees how regulation and infrastructure have been key drivers for adaptation. And they continue to be in ever more regions around the world: "Scandinavia is where it all started, with its culture, infrastructure, and where policy environment is already aligned with electric boating. But this is no longer a regional shift. If you look at the automotive industry, the direction is clear, China, California, the Pacific Northwest, and Scandinavia are leading."

The same fundamentals now apply at sea. When technology reaches performance parity and delivers significantly lower operating costs, adoption accelerates. In the U.S., programs like CORE are helping accelerate that transition by making the economics even more compelling for operators. Beyond that, we see strong forward momentum in India and the Middle East. In India, it's driven by tourism, religious tourism, and increasing

government investment in cleaner infrastructure. In the Middle East, it's a combination of luxury tourism and stricter environmental requirements in key areas where noise and emissions are no longer acceptable."

Ferry Excellence

Sandith Thandasherry, CEO of Navalt Solar & Electric Boats has been a pioneer to introduce electric propelled ferries in his home country India. Aditya, our first solar ferry, has been running for nine years now. In that time, it has carried more than 3 million passengers, travelled over 200,000 km, saved 300,000 litres of diesel, and avoided around 780 tonnes of CO₂. These numbers tell a very clear story: solar-electric ferries are not an experiment anymore—they're a proven, mainstream solution for slow-speed inland transport.

Aditya is probably the lowest-cost operating ferry in the world. We now operate 40 such boats across India, and something interesting has happened because of Aditya's success: catamaran designs have become the default for ferries. The stability margin is so high that even when ferries get crowded, safety isn't compromised. Also, most of the new construction has moved to composites and in some cases aluminium to save energy by being lighter than steel and wood."

Design for electric

"A lot of people also underestimate the impact of design. If you simply take a diesel hull and put batteries in it, of course the CAPEX goes up. But if you redesign the hull to reduce drag and weight, the battery becomes smaller and cheaper. Add solar and you reduce both CAPEX and OPEX further. And if you build the system for reliability, maintenance costs drop dramatically. It's the combination of these three things—design efficiency, solar contribution, and reliability—that delivers the economics. And we've seen it play out exactly as predicted. For example, Aditya recovered its CAPEX difference in three years, and the battery replacement in year seven occurred exactly as planned. This is relevant for patrol boats, harbour craft, tugs, and cargo vessels—basically the entire segment that operates at heavy energy need (due to speed, function or cargo weight) for longer durations. That's where we expect major breakthroughs over the next decade."

Ecosystem

"The priority now is building the ecosystem that allows innovation to scale," says Jover: "Infrastructure, financing, standards, data, and policy frameworks that keep pace with technological progress. The organizations and regions that successfully align these elements will be best positioned to capture the economic opportunities, efficiency gains, and industrial growth enabled by the next generation of maritime technologies."

The quotations from Daniele Gaviotis, René Hansen and Sandith Thandasherry are derived from interviews they had with IEMA, published on LinkedIn.

The Future of Sustainable Marine Manufacturing



By Krystina Skibo

The glimmering allure of the open water has long been synonymous with the roar of a combustion engine and the smell of gasoline. However, as the global push for environmental stewardship reaches our coastlines, the recreational boating industry finds itself at a pivotal and complicated crossroad.



While “going green” is the phrase of the day, the path to true sustainability on the water is proving to be less of a sprint and more of a difficult upstream row.

At the centre of this transition is the rise of the electric boat. Over the past few years, battery-powered vessels have surged from niche novelties to high-tech contenders, promising a future of silent cruising and zero tailpipe emissions. Yet, for the average boater, the transition remains stalled in the face of practical reality.

When stacked against their internal combustion counterparts, electric engines often fall short on the two metrics boaters value most: speed and cost. With price tags that often double those of traditional boats and top speeds that struggle to keep pace, the value proposition remains a tough sell.

Beyond the showroom floor, a deeper irony complicates the narrative. While electric boats offer a cleaner experience on the lake, the environmental cost of production, specifically the mining and manufacturing of high-capacity lithium batteries, raises difficult questions about the “green” label. As the industry grapples with these

growing pains, it becomes clear that achieving sustainability in maritime recreation will require more than just swapping a fuel tank for a battery; it will require a fundamental shift in how we build, buy and behave on the water.

Investment and Innovation

The growing interest in sustainable and quieter, cleaner boating experiences is resulting in significant investment and innovation from Original Equipment Manufacturers (OEMs) in electric boats and propulsion systems. Not only are OEMs electrifying existing models, but they’re also fundamentally rethinking vessel design and propulsion architecture.

However, even though there’s effort being put into electric propulsion, we still have a long way to go before consumers can feel comfortable investing in them.

“There are definitely some interesting new concepts coming up for electric propulsion,” says David Brown, Business Development, GCM Contracting Solutions. “I’m not sure how commercially viable they

are, but there are some potential applications once the technology progresses a little further. It’s still in its development phase.”

Ollie Taylor, Director of Marine Futures, backs up Brown’s statement, also adding that technology remains a challenge for OEMs due to the energy densities of the cells available.

“I believe we’re waiting for a breakthrough in battery chemistry before it stacks up from a performance angle,” he says. “There’s a wide range of improvements coming, but very few options are currently available that are a direct replacement for your petrol or diesel engine as far as performance characteristics go.”

Brown breaks the logistics down, saying that in order for electric boats to be developed in mass, manufacturers need to spend millions of dollars to create these boats, which consumers aren’t purchasing on a scale for this to be profitable.

“The return on investment isn’t there yet,” he says. “I think there is a municipal push to try to bring these boats to the market and to help designers and manufacturers figure them out because there really isn’t enough private investment there to see any profit.”



The Cormorant Electric 490

Growing the Electric Manufacturing Market

Sustainable boat manufacturing, on the other hand, is undergoing a significant shift, moving from simple propulsion changes to holistic “cradle-to-gate” environmental strategies. Major OEMs are now focusing on circular materials, automated waste reduction and decarbonizing their global supply chains.

Volvo Penta, for example, has reduced the use of certain materials like virgin plastic in packaging. Since 2016, the manufacturer has also engineered all its engines to be compatible with renewable HVO fuel without modification.

The company also designs products with accessible service points and modular components to extend product lifespans and support material recovery.

Southern Pacific Boats is also making eco-friendly bounds in the marine industry, especially with the release of their new Cormorant Electric 490. Built upon a 16-degree aluminium hull, the Cormorant Electric has ZeroJet’s 30kW system and 22kWh of high-capacity batteries integrated to ensure equal parts performance and sustainability.

“We are thrilled to partner with Southern Pacific Boats to bring the Cormorant Electric 490 to life,” says ZeroJet’s CEO James Morton. “This project perfectly showcases our 30kW system’s ability to deliver high-performance, commercial-grade power in a lightweight package. In its first day of use at the bay’s regatta, the boat was the first on the water at 8:30am and the last off the water at 4pm. We covered over 20 nautical miles, and we still had plenty of battery to show the boat off at the end of the day. This was great proof that electric boats can do everything clubs and commercial operators need and more.”

Lithium battery systems are also beginning to play a central role in improving marine energy systems.

“Lithium batteries provide a stable voltage curve and allow deeper discharge compared to lead-acid batteries, meaning a significantly higher proportion of store energy is actually usable,” says LiTime’s Marine Application Product Manager, Ikun Liang. “This is critical for both propulsion systems and onboard electronics.”

Liang mentions that weight is also a fundamental performance factor in marine environments. Lithium batteries can deliver equivalent or greater usable energy at significantly lower weight and volume, directly improving vessel efficiency, range and handling.

“In today’s market, electrification is rarely a one-step replacement of primary propulsion,” Liang says. “Instead, it typically begins with specific use cases such as low-speed operation, harbour manoeuvring, nearshore short trips, trolling and auxiliary loads. Lithium batteries are particularly well suited for these high-frequency, short-duration and repetitive cycling scenarios. By delivering reliable performance in these applications, they help users build confidence in electric systems, ultimately paving the way for broader adoption of hybrid and fully electric propulsion.”

For example, LiTime’s 24V 100Ah Group 31 Bluetooth lithium battery is designed for 24V trolling motor systems (70–100 lb thrust). It delivers 2560Wh of usable energy within a footprint close to a standard Group 31 battery, while reducing overall volume by approximately 40.8% compared to typical 24V 100Ah lithium batteries.



LiTime lithium battery

Rough Waters Ahead for Electric Propulsion

While boat manufacturing has made strides in integrating eco-friendly materials and electric propulsion, several “elephants in the room” remain. As we move through 2026, the industry is shifting from simply making “greener” boats to addressing the entire lifecycle of the vessel.

1 The “Fiberglass Legacy” and Circularity

The most significant hurdle is the lack of a “cradle-to-grave” solution for fiberglass. Unlike aluminium or steel, fiberglass (a thermoset plastic) is notoriously difficult to recycle. Most end-of-life hulls are still ground up for low-value fillers or sent to landfills.

While thermoplastic resins (like Elium) and natural fibres (flax, basalt) are gaining traction because they can be melted down and reused, they are currently more expensive and have different structural properties that require manufacturers to redesign hulls from scratch.

2 The Energy Density Gap

Propulsion remains a physics problem that hasn’t been fully solved for the recreational market. While electric motors are efficient, the energy density of current battery technology still lags far behind gasoline or diesel. For high-performance powerboats or long-range cruisers, the weight of the batteries required to match traditional range often compromises the boat’s performance and safety.

“If you’re looking to replace a high-performance motor with an electric drivetrain, you’re going to need massive batteries, which will significantly impact how the boat performs,” Marine Futures’ Taylor says. “There’s also a high embodied carbon impact with producing those battery cells.”

3 Lack of Charging Infrastructure

Similar to when electric cars first began rolling out, there is very little charging infrastructure available to recreational boaters.

Ben Knowles, a Senior Broker at East Coast Yacht Sales, says the charging infrastructure across the nation is quite terrible.

“It’s very much a friction point right now,” he notes. “Customers have long wait times for charging and the distance that they would normally be able to travel on a gas boat is reduced. So, that’s the big elephant in the room right now when it comes to electrifying boats.”

However, Liang suggests that there is hope for the future, as certain companies are working to develop the charging infrastructure.

“In the United States, industry bodies such as the National Marine Manufacturers Association (NMMA) have identified marina electrification and charging network expansion as key priorities,” Liang says. “Programs are being developed to support the installation of electric and solar-powered charging systems at marinas and public access points.”

In 2022, Tahoe City Marina launched one of the first marine fast-charging stations in the U.S. Meanwhile, Michigan’s Fresh Coast Maritime Challenge has been recognized as the first dedicated grant program in the country to support companies in advancing marina and vessel electrification, with Aqua superpower also deploying fast-charging infrastructure and pilot projects in the region.

4 Maintenance and “Hidden” Pollution

Sustainability doesn’t stop once the boat leaves the factory. New research has highlighted that even “sustainable” hulls can shed microplastics through abrasion against docks or the seabed. Finding hull coatings that are both non-toxic (biocide-free) and durable enough to prevent shedding is a top-tier R&D challenge.

Knowles also suggests that continued maintenance is another challenge with electric boats.

“From the customer’s standpoint, there’s a perceived less maintenance perception with electric boats, but nevertheless, it’s still a boat and it’s going to need service work,” he says. “So, getting the service industry tuned up to the components and

the technology that’s needed to troubleshoot the system on the boat can be a setback.”

There’s always going to be trouble with owning a boat, but there’s also always going to be a lot of fun. “We just need the right ratio in order for people to keep coming back and wanting more,” Knowles adds. “If we can’t fix the trouble, then that won’t happen.”



The Axopar AX/E 22

Leading OEMs Driving Momentum

Even though there are fundamental concerns over electric boating, OEMs are actively working to overcome these challenges with the right technology and innovation.

Innovation in the market is being spearheaded by a diverse group of OEMs, each carving out distinct niches based on performance, luxury and use case.

Candela Technology AB in Sweden, for example, is currently working on hydrofoiling electric boats, which is a technology that significantly reduces drag and boosts efficiency by lifting the hull above the water. The company’s C-8 day cruiser exemplifies this, featuring a 69 kWh Polestar battery, achieving 30 knots and offering a 57 nautical mile range.

Candela is also expanding into commercial electric ferries, such as the P-12 Shuttle, demonstrating the scalability of hydrofoil technology for zero-emission water transport. The C-8 Polestar Edition supports DC charging, allowing it to recharge from 10% to 80% in under 30 minutes.

Arc Boats in the U.S. is also focusing on high-performance, fully electric boats with an aerospace-inspired design. The 24-foot Arc One boasts a massive 220 kWh battery, reaching 40 knots with a 50-mile range. The newer 23-foot Arc Sport wake boat packs a 226-kWh battery and a 500-horsepower equivalent electric motor.

Yet another OEM leader is X Shore in Sweden, often dubbed the “Tesla of the Sea,” according to The Marine EV Leadership Series: The Top Companies. The company produces stylish, modular electric “smart boats” for both leisure and professional use.

X Shore models like the Eelex 8000 offer a 126-kWh battery and up to 100 nautical miles range. On the other hand, the more compact X Shore 1 reaches 30 knots with a 50-mile range. These vessels feature modular decks, touchscreen controls and sustainable materials.

Krystina Skibo is a freelance journalist who writes on many topics. This article was originally published on the Boating Industry website and is republished here with our gratitude.



By Kim Hollamby

Justifying sustainable superyacht refits

Can you show genuine financial return on investment by prioritising sustainability within the list of upgrades on a superyacht refit? Or is the rationale more complex? Here's a summary of some of the points made from The Superyacht Forum's 2025 Justifying Sustainable Refits – ROI & The Value Beyond panel.

The need for focus on energy reduction in the operational world of superyachting appears compelling when you consider a 65m yacht can consume as much energy as a small town with 900 houses. There is a widely discussed peak of inefficiency among vessels constructed in the first few years of this century when hotel loads were rising exponentially and the important measure of performance was top speed. The issue was dealt with at the time by the provision of generation and propulsion systems that, in practice, have often proven to be a mismatch to the operational profiles of the yachts. Plus, technology has moved on considerably since then.

The good news is that formally conducted energy audits of superyachts in service indicate there is significant potential for improvement across the fleet. A typical refit may result in a quantifiable 5%-10% energy saving – even from basic changes like switching to the most efficient antifouling and fine-tuning onboard systems settings and operations to ensure they are running at peak energy efficiency. Major refits might yield in the region of 25%-35% savings and for rebuild projects involving wholesale changes to the yacht and its systems and machinery that can be pushed as high as 50%. There are no shortages now of technical solutions to deliver those savings.



Obvious wins from changing powerplants

Taking the most obvious target into account, upgrading propulsion engines may well yield discernible fuel savings over powerplants manufactured a decade or more ago. If you combine that with a more realistic take on the vessel's service speed, confirmed by studying the data accumulated during years

of years of use, then the use of smaller modern engines may well be considered appropriate. A superyacht's top speed may well have only ever been called for at the helm during sea trials; cruising speeds are typically lower and, on that basis, a lower power output might be specified with no difference to the onboard experience other than less fuel stops and perhaps reduced noise and vibration too.

If pure fuel savings aren't enough, there are several obvious side benefits to re-engining. Major overhauls on older engines may impact the time a superyacht has to stay in refit with increases in costs; whereas delivery of new engines can be timed to match the refit window. Improvements can simultaneously be sought in propeller efficiency and sound and vibration mitigation. Reduction in soot will result in less crew maintenance and improve the owner's experience. And compliance to the latest IMO and EPA standards will help future proof against ever tightening regional and local demands.

If you take this a step further and look at the increasing number of hybrid installations occurring now across the superyacht sector, then you can tackle one of the most wasteful issues. Generators installed to service considerable house loads are often incorrectly load balanced; a suggestion from the panel was that generation plant onboard some of the global superyacht fleet may be running at as low as 20%-30% efficiency.

Most modern hybrid systems are now stepping well beyond their propulsion brief to use energy storage either to supplement or even completely replace one or more of the generators aboard. The aim being to get much more energy efficiency from every litre of diesel burned.

A new kind of cool

Looking at why so much generation is needed in the first place, the obvious big target is air conditioning. Again, a refit can deliver significant savings in power consumption, as much as nearly two-thirds of typical consumption on a legacy superyacht if all potential areas of improvement are tackled.

The first savings may well simply come from just changing the settings and use profile of the HVAC system. Beyond that, an investigation of the chiller, how advanced it is and whether replacement would yield gains or considering transitioning from chilled water to direct expansion.

More substantial work might include changes to the ducts and airflow in the yacht, a source of potentially large gains. A lot of yachts dating back to around 2010 were designed to deliver high volumes of fresh air, which can lead to large energy losses. The hold-back on progress here being the difficulty of making changes without expensive disruption to expensive and complex interior fit-outs.

Pushing sustainability further up the refit agenda

Despite challenges, you can create an objective return on investment report if upgrading superyachts during refit to reduce their environmental impact. It helps that there will be sound data of superyacht's operational use to date and independent energy audits such as the Water Revolution Foundation's YETI (Yacht Environmental Transparency Index) are gaining traction. From that can flow a list of suggested changes and improvements with realistic estimates of what they will mean to owners and their families, both in terms of operational savings and improvements to their impact upon the planet.

So why are refits that place sustainability as a high priority still relatively rare in 2026?

One answer to that question may be found in the business background of superyacht owners who may look positively on the original capital expenditure of yacht as an investment in their leisure time or status, but frown on increases in



operational costs due to an expensive mid-life refit. There is also some resistance to what might be perceived as upselling or even greenwashing.

There may also be understandable reluctance too from yards in suggesting sustainable alternatives in the face of a precise refit brief driven by owners or their representatives. Classically trained salespeople know to address pain points presented by a customer and close the deal accordingly; it takes a braver person to suggest something that could be more expensive and less proven.

The panel universally agreed that sustainability may often be successfully driven through as an understood secondary benefit to primary priorities. Looking again at HVAC systems, another way to reduce power consumption is to improve shading or even reglaze with high technology solar controlled glass. Both initiatives can be hard to introduce with sustainability as the primary benefit. However, the owner may well be much more easily persuaded if a new set of awnings means greater comfort out on deck, or if the glazing is degraded or too transparent for his liking.

It's a similar story with transom extensions. The growing trend for legacy superyachts to be lengthened aft is that this work provides scope for an improved swim platform or beach club, capacity for more toys or even some expanded space below deck. The sustainability gain however comes from improved hull efficiency, with a further bonus for the owner to consider that seakeeping may also be improved.

It's important that these gains in environmental footprint are communicated well to the owner, irrespective of whether they were the original motive for authorising the work within a refit. Another important consideration is to have the refit planned as far in advance as possible, to maximise the possibility of incorporating more sustainable options within proposed solutions.

A further suggestion is to try and excite owners about the long-term potential they have in their yacht, or the one they're looking at buying. The proposal might even be a multi-year, multi-refit plan, with a lot of planning sat behind it. What you

would then be selling is a controlled transition towards a future-proof yacht with the ultimate goals of each step mapped out.

Importance of pioneers

There is recognition that, just as with new builds, the superyacht industry is reliant on pioneers of sustainable practice and technology among its owner cohort. We're on the very steep part of the innovator curve where it takes a certain level of courage and determination from owners and representatives to agree to step outside of a proven norm. Given the pace of change of technology and the small volume of superyachts in significant refits and builds each year, chances are the decision to implement a new sustainable solution may be committing to just its first, second or third iteration. Similarly, the panel recognised that shipyards also need to play their part as pioneers, to invest, develop and prove with partners the technologies of tomorrow. Putting a yard's money where its mouth will certainly assist owners to commit to concepts that may make a substantial difference in the future.

Immaculate is not enough

Irrespective of short-term return on investment, the panel also recognised that there may be a more important imperative to drive all refits towards driving environmental reduction in the future.

Basic refits only are likely to impact value over coming years. If you are not making your yacht more sustainable over time it might be immaculate but is it becoming obsolete? The advent of emission

regulations and other environmental regulations and protected areas could ultimately result in use of a beautifully maintained but older specification superyacht being constrained. There's an enormous amount of uncertainty around forthcoming regulations – by future proofing your yacht and upgrading it, you are hedging against uncertainty.

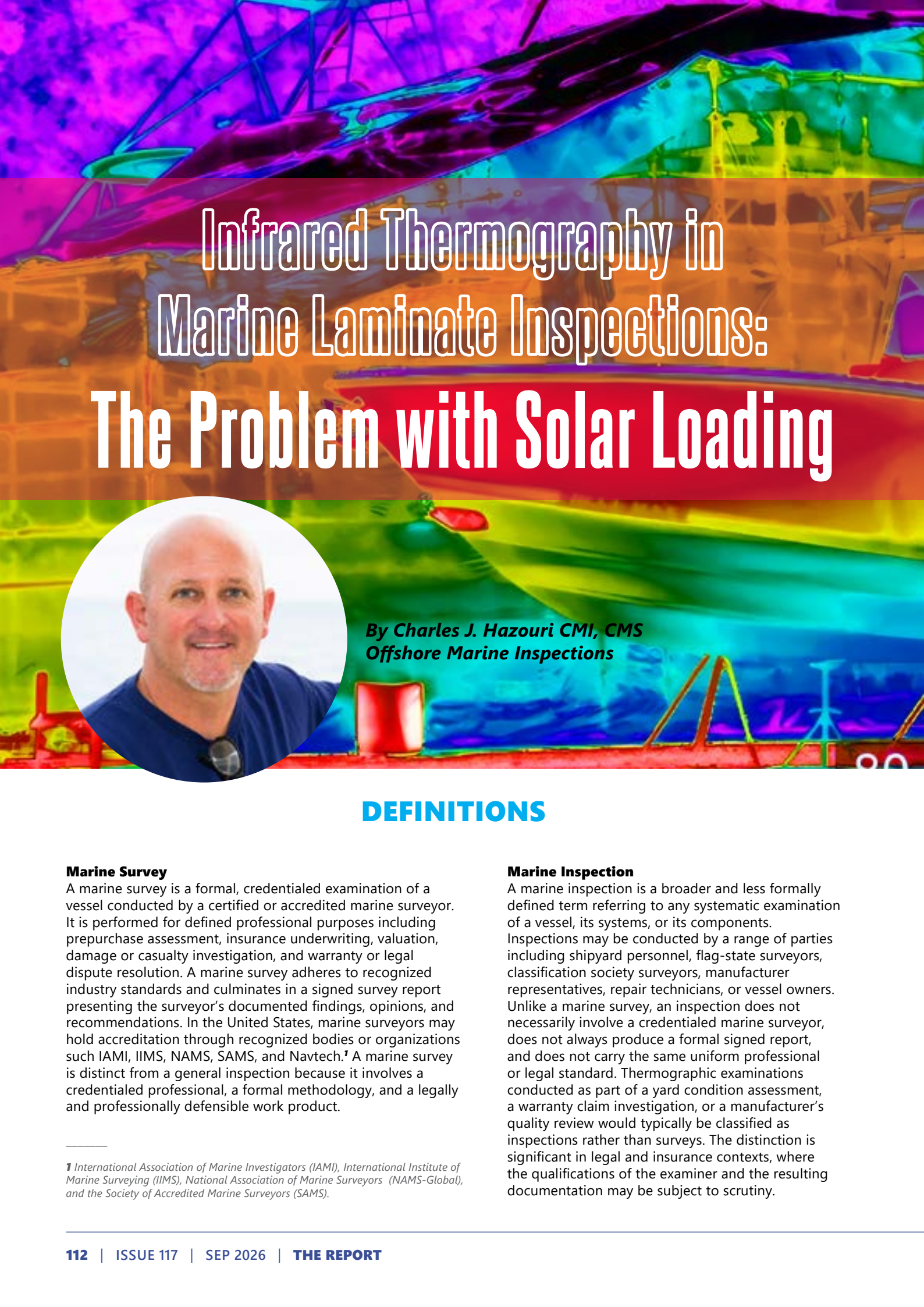
A vessel upgraded in refits to be more sustainable is not just an old yacht on the market. It's something which is still relevant, still looks cool, but has the appeal of more compliant and efficient operation. One which the children of owners' will also be more comfortable with as they consider their own environmental impacts.

The panel

The Superyacht Forum's 2025 Justifying Sustainable Refits – ROI & The Value Beyond panel comprised:

Hanneke Grijpma,
Founder and CEO, xullux
Simon Brealey,
Head of Consulting Services, Lateral
Rob Papworth,
CEO, MB92 La Ciotat
Alberto Perrone Da Zara,
Director Sales Yacht Refit, Lürssen
Tobias Kohl,
Vice President Application Engineering Marine, Rolls-Royce Solutions GmbH

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Infrared Thermography in Marine Laminate Inspections: The Problem with Solar Loading



*By Charles J. Hazouri CMI, CMS
Offshore Marine Inspections*

DEFINITIONS

Marine Survey

A marine survey is a formal, credentialed examination of a vessel conducted by a certified or accredited marine surveyor. It is performed for defined professional purposes including prepurchase assessment, insurance underwriting, valuation, damage or casualty investigation, and warranty or legal dispute resolution. A marine survey adheres to recognized industry standards and culminates in a signed survey report presenting the surveyor's documented findings, opinions, and recommendations. In the United States, marine surveyors may hold accreditation through recognized bodies or organizations such as IAMI, IIMS, NAMS, SAMS, and Navtech.¹ A marine survey is distinct from a general inspection because it involves a credentialed professional, a formal methodology, and a legally and professionally defensible work product.

¹ International Association of Marine Investigators (IAM), International Institute of Marine Surveying (IIMS), National Association of Marine Surveyors (NAMS-Global), and the Society of Accredited Marine Surveyors (SAMS).

Marine Inspection

A marine inspection is a broader and less formally defined term referring to any systematic examination of a vessel, its systems, or its components. Inspections may be conducted by a range of parties including shipyard personnel, flag-state surveyors, classification society surveyors, manufacturer representatives, repair technicians, or vessel owners. Unlike a marine survey, an inspection does not necessarily involve a credentialed marine surveyor, does not always produce a formal signed report, and does not carry the same uniform professional or legal standard. Thermographic examinations conducted as part of a yard condition assessment, a warranty claim investigation, or a manufacturer's quality review would typically be classified as inspections rather than surveys. The distinction is significant in legal and insurance contexts, where the qualifications of the examiner and the resulting documentation may be subject to scrutiny.

What is Infrared Thermography or Thermal Imaging?

The use of special camera-like device, which displays thermal patterns and temperatures across the surface of an object. The image produced can detect changes in materials used and temperatures, which can assist to identify moisture intrusion and heat loss.

Benefits of Thermal Imaging:
Non-Destructive, Visual Documentation, No Contact Required, Supports Other NDT Methods, Objective and Repeatable, Cost-Effective, Real-Time Results.

Thermographic Survey vs. Thermographic Inspection

Within this document, the terms *thermographic survey* and *thermographic inspection* are used in alignment with the above definitions. A *thermographic survey* refers to a broader thermal imaging examination conducted by a credentialed marine surveyor as part of a formal survey engagement. It includes ancillary testing not limited to percussion sounding, moisture analysis, hardness testing, and a complete visual inspection, with full documentation and conclusions. A *thermographic inspection* refers to a focused thermal imaging examination of a vessel or its components whose sole purpose is to collect and evaluate thermal data, producing findings and recommendations based on that data alone. In both contexts, every individual acquiring thermographic data must personally hold the required thermographic credentials, and findings are incorporated into a signed report, rendered as professional opinions. The standards of methodology, documentation, and defensibility described in this document apply most stringently to thermographic surveys, but represent best practice for all thermographic examinations of marine Fiber-Reinforced Polymer or Plastics (FRP) and advanced composite structures.

The Operational vs. Structural Interpretation

It is worth noting that within the marine industry, the terms survey and inspection are also commonly understood along functional rather than purely credentialing lines. Under this interpretation, a *marine survey* typically encompasses vessel condition, valuation, operational readiness, machinery, and systems — the broader assessment of a vessel's fitness for purpose, use, voyage, and market value. A *marine inspection*, by contrast, is often understood as a more focused, technical examination of a specific structural, mechanical, or material concern — including non-destructive testing, structural integrity assessment, laminate analysis, and thermographic examination.

Under this functional distinction, thermographic examination of FRP laminate and composite structure falls squarely within the inspection category — it is a specialized, technically focused, non-destructive examination of material condition rather than a broad operational assessment of the vessel as a whole.

In professional practice both interpretations have merit and are not mutually exclusive. A credentialed marine surveyor may conduct both surveys and inspections, and a formal survey report may incorporate thermographic inspection findings as supporting technical evidence. The standards described in this document apply equally to both.



Marine inspection of a controlled engine room fire. The thermogram was displayed using the Ironbow color palette, providing distinct, informative, and accurate thermal interpretation.

What Is Passive Thermal Imaging?

All objects above Absolute Zero (0 Kelvin) emit infrared radiation. Passive thermal imaging utilizes a thermal imager to detect and convert emitted radiation into a visible image. Typically, warmer areas appear brighter (or in false-color as red/orange), cooler areas appear darker (or blue/purple), depending on the palette used.

During passive thermal imaging, objects are inspected “as-is” without applying an external heat source. In marine surveys or inspections, passive thermography is used to detect moisture intrusion, laminate to core disbonding, interlaminar separation (delamination), and resin-starved laminates. Wet or disbonded laminate retains or releases heat at a different rate than sound laminate, creating detectable thermal differentials.

What Is Active Thermal Imaging?

Active thermal imaging is also referred to as active infrared thermography or active thermography. It is a non-destructive testing method in which an external energy source is deliberately applied to a structure to induce a thermal response, which is then recorded using an infrared thermal imager. Unlike passive thermography, which relies on naturally occurring temperature differentials, active thermography provides the thermographer with direct control over the thermal stimulus, its intensity, duration, and timing.

The fundamental principle is heat flow: when thermal energy is applied to a surface, it diffuses inward through the material over time. Defects within the laminates such as interlaminar separation-delamination, voids, moisture inclusions, or disbanded interfaces have different thermal conductivity and diffusivity than sound material. This difference interrupts normal heat flow, causing defective or deficient areas to heat or cool at a different rate than intact material. That differential becomes visible to an infrared imager as a thermal anomaly during the heating or cool down phase.



Hull bottom inspection using a Teledyne FLIR $f=5\text{mm}$ (80°) Field of View (FOV) wide-angle lens.

This baseline thermogram was acquired during overcast conditions at civil twilight. The subject was at thermal equilibrium. The active thermal imaging inspection was conducted after sunset with applied heat ensuring proper thermal imaging techniques.

This image is properly thermally tuned.



Common Active Stimulation Methods

Several excitation sources are used in active thermography depending on material type, depth of the target defect, and field conditions:

- Pulsed thermography – a brief, high-intensity flash of optical or thermal energy is applied, and the surface is imaged continuously during cool down. Well-suited for relatively thin laminates and shallow defects.
- Lock-in thermography – a sinusoidal (cyclic) heat source is applied at a controlled frequency, allowing phase and amplitude images to be extracted. Effective for detecting deeper anomalies.
- Step heating – a sustained heat source is applied over a longer period and then removed with imaging continuing throughout the cool down transient. Useful for thicker laminates.
- Ultrasonic or vibration excitation – sound or mechanical energy is introduced into the structure, generating frictional heat at crack faces and disbanded interfaces. Most applicable for dry delamination detection.

In field marine survey practice, the most *commonly* used active stimulus methods involve AC-powered or propane-fired heating systems used to apply controlled warm-air loading to a surface, followed by immediate thermal imaging during the cooldown phase. They should be used to warm an area, but not used to heat the laminates.

Key Advantages Over Passive Thermography

Active thermography offers several advantages that make it the preferred method for structural laminate inspection:

- The thermographer controls the thermal stimulus, making results repeatable and documentable
- The timing of heat application and image acquisition can be optimized for the specific laminate thickness and expected defect depth
- Signal-to-noise ratio is substantially higher than passive methods because the induced thermal contrast is known and calibrated against a controlled baseline
- Results are less sensitive to ambient environmental conditions, including Sun angle, surface color variation, and ambient temperature fluctuation
- Findings are more defensible in legal, insurance, and warranty contexts because the methodology can be fully documented and reproduced

Active thermography is the preferred standard in aerospace, military, and industrial composite inspection, and its application to marine FRP laminate surveying and inspections is supported by both the governing Infrasppection Institute Standard and peer-reviewed field research.

Three Distinct Thermographic Scenarios in Marine Inspection:

It is important to distinguish clearly between three separate thermographic scenarios, as they differ significantly in method, validity, and professional defensibility:

Scenario A: Passive Inspection (No Stimulus)

In a passive inspection, the thermographer observes thermal patterns with no external heat stimulus applied. The structure must be at thermal equilibrium — meaning that it has not been exposed to either solar loading or artificial heating. Any external heat source, including the Sun, is a confounding variable that corrupts the baseline. This approach is most appropriate for moisture detection and early-stage delamination identification under controlled conditions such as early morning or overcast weather.

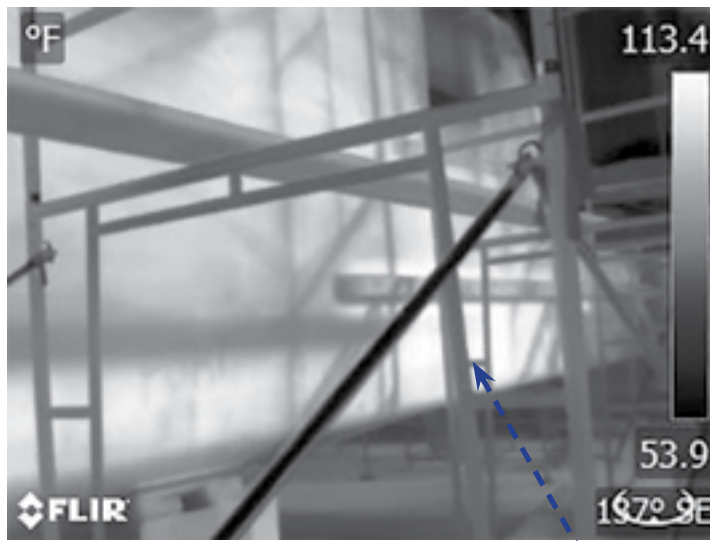
Scenario B: Active Inspection with Artificial Stimulus

In an active inspection, the thermographer applies a controlled heat source and then images the surface as heat diffuses through the laminate. Defects interrupt normal heat flow and appear as thermal anomalies during the heating or cool down phase. Solar loading is a confounding variable in this scenario and should be absent or fully accounted for, as it introduces an uncontrolled thermal gradient that reduces signal-to-noise ratio and undermines the repeatability of the applied stimulus.

Field studies and peer-reviewed research on composite laminate inspection consistently demonstrate that controlled active thermography using calibrated artificial stimulation produces superior defect detection, particularly for deeper subsurface anomalies, compared to uncontrolled environmental heating. Active thermography is the preferred approach for marine laminate inspections.

Scenario C: Solar Loading Thermography (Sun as Stimulus)

Solar loading thermography uses the Sun to heat the target. The structure is allowed to absorb solar energy over a defined period, after which it is shaded and imaged during the cool down phase. This is a recognized technique in nondestructive testing of large structures where artificial stimulation is impractical.



This image exhibits poor thermal tuning and the effects of solar loading from adjacent structures.

Reflections and Shadowing.



Why Solar Loading Is Problematic for Marine Laminate Thermography:

Solar radiation heats exposed surfaces directly and unevenly causing thermal gradients that completely mask the subsurface thermal signatures the inspector is trying to detect.

Problems in Passive Inspection

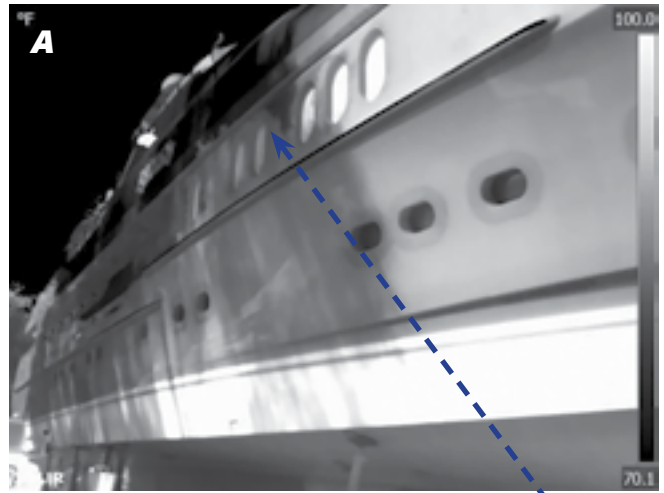
When solar loading is present during a passive survey:

- It heats the outer surface skin rapidly, creating a strong surface-to-subsurface gradient unrelated to structural defects.
- It causes differential heating based on surface color, texture, orientation, and geometry — dark nonskid absorbs far more energy than white gelcoat, producing apparent anomalies that are purely cosmetic.
- It creates hot spots that can resemble thermal anomalies.
- It produces thermal shadows in areas shielded from direct Sun, which appear anomalously cool relative to exposed surfaces.

The result is a thermal image dominated by solar-induced surface effects rather than subsurface defects.

Problems in Active Inspections with Artificial Stimulus
When solar loading is present alongside a controlled, artificial stimulus:

- It adds an uncontrolled, variable heat input that corrupts the established prestimulus baseline.
- It reduces the signal-to-noise ratio of the controlled stimulus, since the defect-related thermal contrast may be small compared to the solar-imposed surface gradient.
- It makes repeatability essentially impossible if Sun angle or cloud cover changes during the inspection window.



The thermal image above (A) was acquired under active solar loading conditions and exhibit characteristic artifacts including surface overheating, reflected radiation, and thermal shadowing from adjacent structures. These effects are unrelated to subsurface laminate conditions and render the thermal data invalid for professional thermographic reporting.

Reflections and Shadowing.

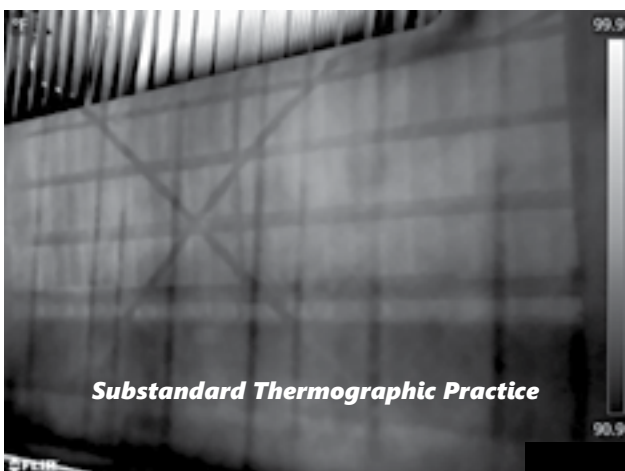
Problems When Solar Loading Is Used as the Primary Stimulus

Even when solar loading is used deliberately as the heat stimulus (Scenario C), significant limitations apply in marine laminate inspection:

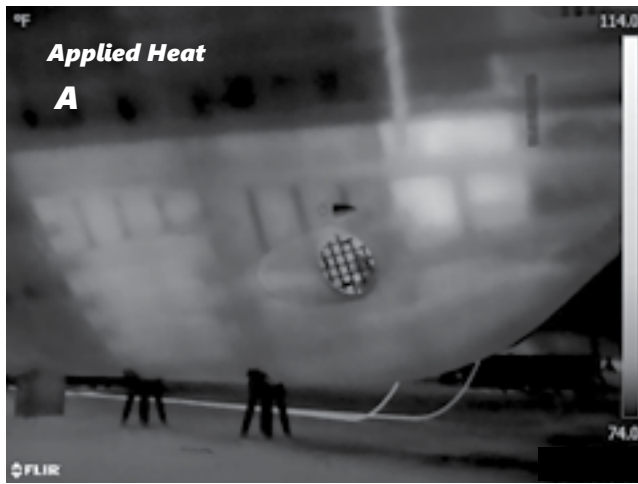
- Solar irradiance is non-uniform across complex vessel geometry — vertical topsides, curved hull sections, and overhanging structures receive uneven heating.
- Uneven heating caused by surface color and texture produces thermal patterns that are geometry-driven rather than defect-driven, complicating interpretation.
- Wind, cloud cover, and changing Sun angle introduce uncontrolled variability throughout the acquisition period.
- Thermal diffusivity of FRP laminate limits how deeply solar-induced heat penetrates before the cool down window closes, reducing sensitivity to deeper defects.
- The technique cannot be calibrated or standardized to the degree required for defensible survey documentation.



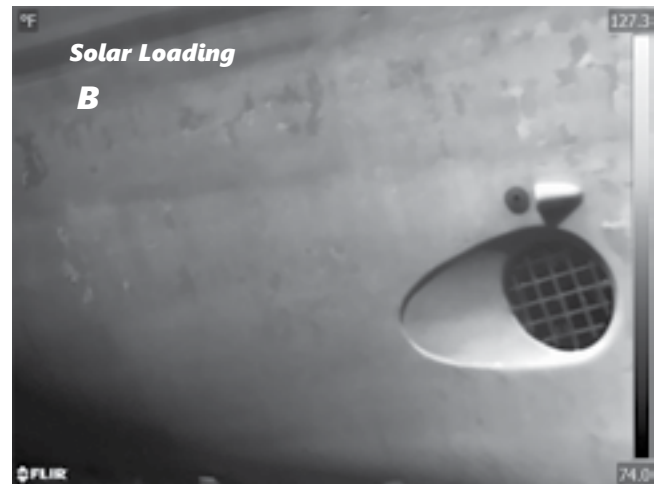
Infraspection Institute, the body that publishes the Standard for Infrared Inspection of Recreational Yachts & Small Craft Constructed of Fiberglass Reinforced Plastic and Composite Materials, states explicitly that solar loading should be avoided in thermographic inspections, as there is no reliable means to compensate or correct for its effects. The standard advises thermographers to image on heavily overcast days (obscured), at night, or early morning, or to shade exposed targets and wait for temperatures to normalize before imaging.



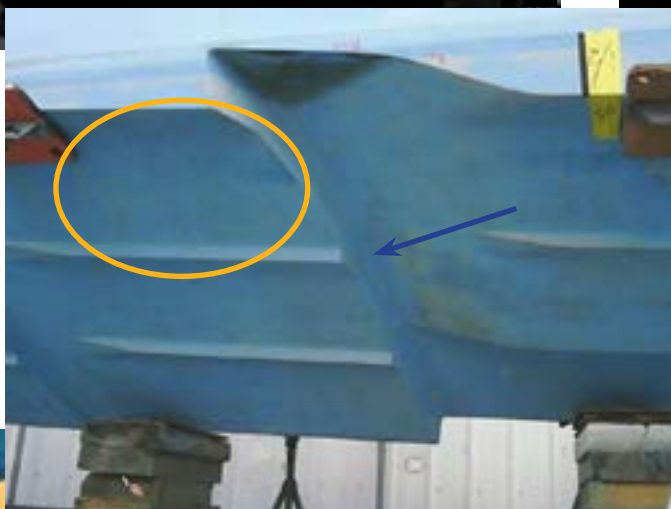
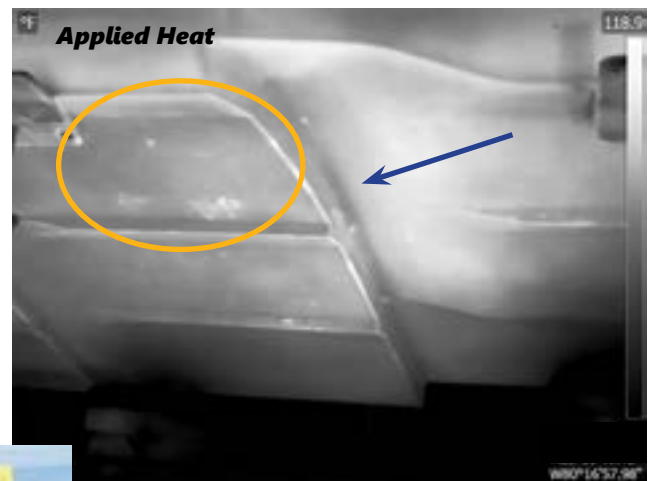
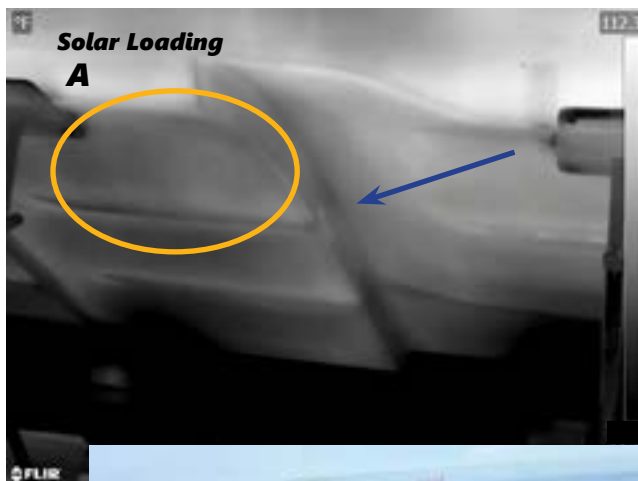
Solar loading combined with reflected radiation creates competing thermal effects that make accurate identification of laminate defects impossible. Under these conditions, emissivity and reflected temperature parameters cannot be correctly established, rendering any apparent thermal anomaly in the image unreliable as evidence of a genuine subsurface laminate failure. Presenting thermal images acquired under these conditions as professional thermographic findings is inconsistent with the standards of a certified infrared thermographer.



The thermogram on the left (A) was acquired prior to sunrise using controlled thermal excitation. The thermogram on the right (B) was acquired during moderate morning solar loading without controlled thermal excitation. The active image on the left reveals clear structural detail and subsurface definition consistent with professional thermographic standards.

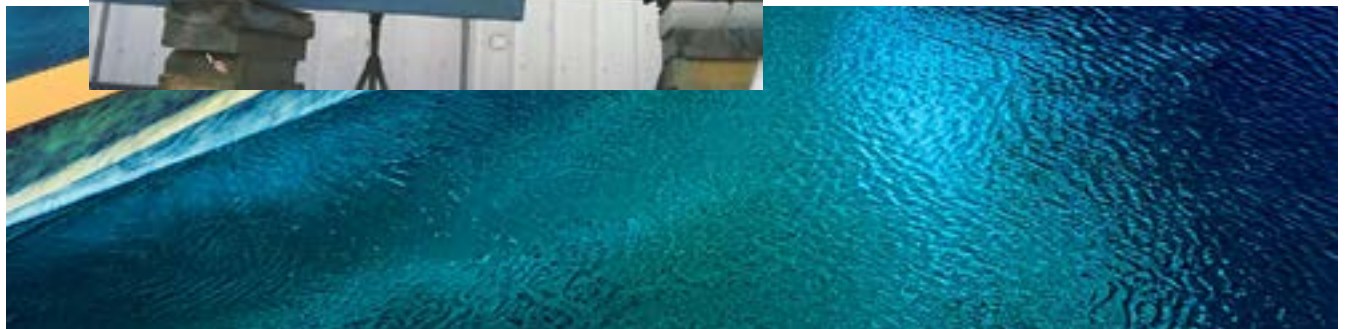


The solar loaded image on the right (B) exhibits significantly reduced structural resolution, demonstrating how even moderate solar loading suppresses thermal contrast and obscures subsurface laminate detail. This direct comparison illustrates why solar loading, even at low to moderate intensity, is insufficient as a primary stimulus for professional marine laminate thermographic inspection and why findings generated under these conditions cannot be considered reliable evidence of laminate condition.



These thermograms were acquired during low to moderate solar loading under overcast conditions without controlled thermal excitation. The solar loaded image (A) exhibits significantly reduced structural resolution, demonstrating how even low to moderate solar loading suppresses thermal contrast and obscures subsurface laminate detail.

Without applied controlled thermal excitation, the voids present within the laminate would have gone undetected, findings that would have been absent from any thermographic report generated under these conditions.



The Measurement Physics: Emissivity and Reflected Temperature Under Solar Loading

Accurate non-contact temperature measurement depends on two critical measurement parameters being correctly established before any thermal data can be trusted: Emissivity and Reflected Temperature (T-Reflect). Solar loading introduces compounding errors into both, undermining the validity of temperature measurements at a fundamental level.

Emissivity(ϵ)

Emissivity is the ratio of thermal radiation emitted by a surface compared to that of a perfect blackbody at the same wavelength and temperature. It is treated in thermographic practice as a fixed material property, assigned by the thermographer in the thermal imager. In marine FRP and composite surfaces, emissivity values typically range from 0.75 to 0.95 depending on material, surface condition, and viewing angle.

Solar loading destabilizes emissivity-based measurements in several ways. Uneven solar heating across a vessel surface causes adjacent zones with different emissivity values —

nonskid versus gelcoat, dark antifouling versus white topsides — to produce temperature differentials that are driven entirely by surface absorption characteristics rather than subsurface conditions. Additionally, solar-induced surface effects including moisture evaporation, thermal expansion, and oxidation can temporarily alter the emissive behavior of the surface in ways that cannot be properly adjusted by fixed emissivity correction.

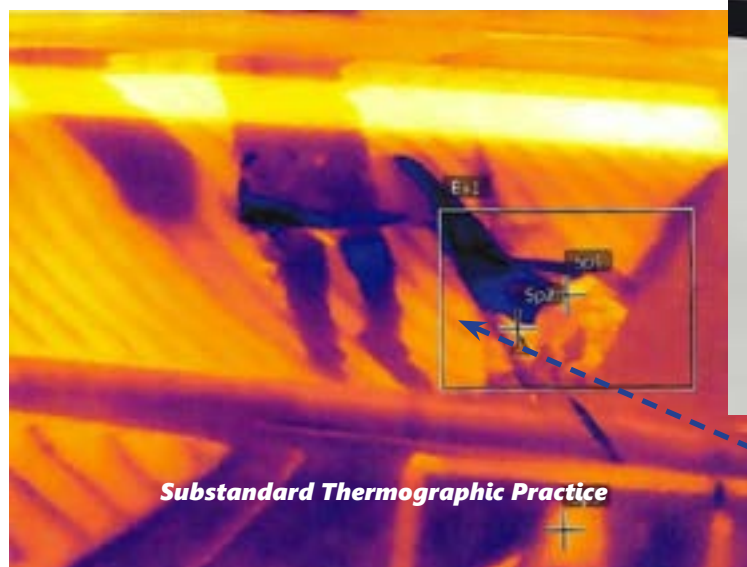
A thermographer who sets a single emissivity value for a hull or deck surface under solar loading is applying one correction to a surface that is behaving as multiple different emitters simultaneously.

It should also be noted that emissivity values for marine surfaces are rarely verified in the field through direct measurement. Most thermographers apply a generalized value based on material type alone, without accounting for weathering, fouling, surface contamination, or coating condition. Solar loading compounds this shortcut.

A surface that has been absorbing direct solar radiation for several hours becomes significantly overheated, obscuring subsurface anomalies. No camera correction applied at the start of an inspection can remain valid across a hull that is actively changing temperature under solar influence. The result is not a minor calibration concern — it is a systematic source of false data embedded in every image captured under those conditions.



Reflected Temperature (T-Reflect or T_{refl})

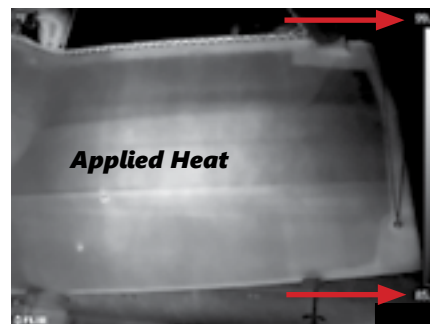
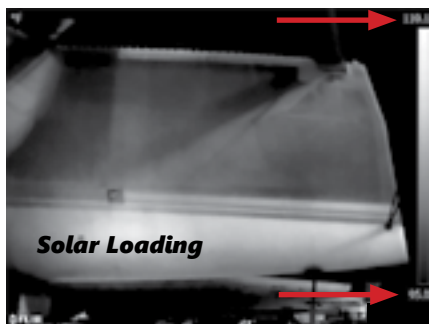


Reflected temperature compensation accounts for infrared energy that is reflected off the target surface rather than emitted by it. Under solar loading, T-Reflect error becomes severe. The Sun is an extraordinarily powerful broadband radiation source, producing shortwave and longwave infrared energy at intensities far beyond what the camera's T-Reflect compensation is designed to handle under normal ambient conditions. Reflected solar energy adds directly to the apparent temperature reading, causing systematic overestimation of surface temperature across the inspection area.

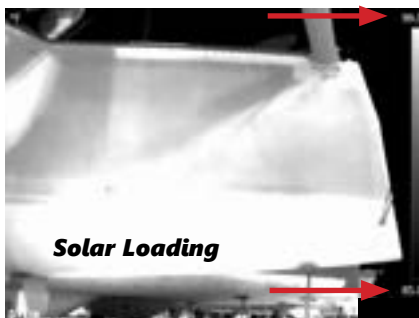


Reflections and Shadowing.

This error is not constant. It varies continuously with Sun angle, cloud cover, and the geometry of the surface being imaged, meaning that a T-Reflect value entered at the start of an inspection becomes increasingly incorrect as conditions change throughout the inspection. On curved hull surfaces, specular reflections can produce localized apparent temperatures substantially above actual surface temperature, generating false anomalies indistinguishable from genuine defect signatures.



The solar loading thermograms were acquired during moderate solar loading under partly cloudy conditions. The applied heat thermograms were acquired after sunset under partly cloudy conditions using controlled thermal excitation. The solar loading images exhibit extreme reflected radiation and could not be thermally tuned to produce comparable image quality. The kerfs and termination lines of the coring material are clearly visible in the applied heat images, subsurface detail that solar loading failed to reveal.



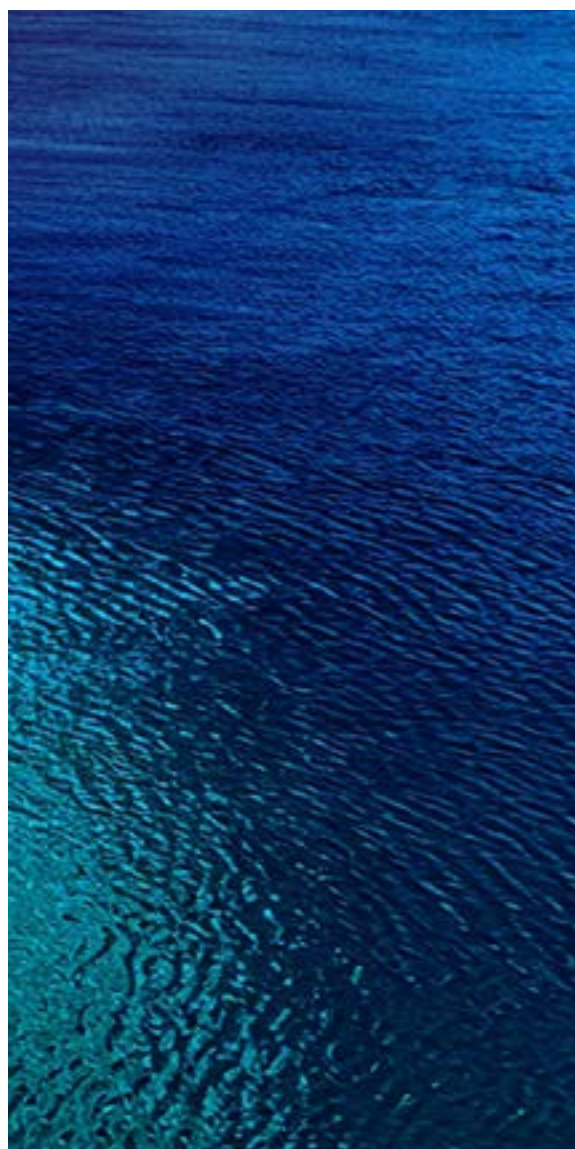
Deficient coring non-conformities of direct structural significance would have gone undetected and unreported under solar loading conditions alone. Subsurface detail is lost entirely under solar loading.

Solar Loading Is Not the Preferred Method for Marine Laminate Inspection:

Based on both published standards and field research, solar loading thermography should not be the preferred or primary method for marine FRP and composite laminate inspection. The following professional position is supported by field studies and the governing industry standard:

- Controlled active thermography with calibrated artificial stimulation consistently demonstrates superior defect detection sensitivity for composite laminate defects, including delamination, moisture intrusion, voids, and disbanded tabbing.
- Solar loading introduces variables that cannot be fully controlled, compensated for, or documented to the standard required for survey reports submitted to vessel owners, insurers, or legal proceedings.
- Peer-reviewed research on FRP laminate inspection confirms that active thermography with controlled excitation sources outperforms passive or environmentally stimulated techniques in signal-to-noise ratio and defect characterization accuracy.
- The Infraspection Institute Standard, the only published industry-specific standard for FRP marine vessel thermography, addresses both active and passive techniques but does not endorse solar loading as a primary inspection methodology.

Solar loading thermography may serve a supplementary role in field conditions where no artificial stimulus is available, but findings generated under such conditions should be clearly documented as such, corroborated by other non-destructive methods (percussion sounding, moisture meter readings, core sampling), and interpreted conservatively.





The thermogram above is poorly tuned and displayed using a Rainbow palette. Due to the effects of solar loading and the inappropriate choice of color palette, the resulting image is considered unreliable for accurate forensic evaluation of the laminate structure. Any level of active solar loading — low, moderate, or high — introduces uncontrolled thermal variables that suppress subsurface thermal contrast, corrupt measurement parameters, and compromise the validity and defensibility of thermographic findings. There is no threshold which solar loading becomes acceptable for professional marine thermographic inspections.



Best Practice in Marine Thermography Inspections or Surveys:

“If an object absorbs enough heat from the Sun, significant thermal anomalies may be hidden and go undetected. As there is no way to compensate or correct for solar loading, the most prudent course of action is avoidance. Solar loading can be avoided by imaging on cloudy days, at night, or early in the morning. Solar loading can also be overcome by shading an exposed target and waiting for the object’s temperature to return to normal.”

— Infraspection Institute, “The Problem with Solar Loading,” IRINFO.org, Tip of the Week, July 13, 2025

The following practices represent the professionally defensible standard for thermographic inspection of marine FRP and composite laminates:

- Conduct inspections at dawn, dusk, nightfall, or under extreme overcast conditions, ensuring the structure has had sufficient time to thermally equilibrate and residual solar heating has fully dissipated prior to initiating a thermal imaging inspection.
- For active inspections, use controlled, calibrated artificial heat sources and document the heat source type, intensity, duration, and distance.
- Document conditions, ambient temperature, surface temperature, relative humidity, and Sun angle at the time of inspection for all sessions.

- Corroborate thermographic findings with percussion sounding, calibrated moisture metering, and where appropriate, physical sampling or destructive testing.
- Do not rely on solar loading as the primary heat source in any inspection where results will be used to support survey opinions in legal, insurance, or warranty contexts.
- The certified thermographer who personally conducted the thermographic survey or inspection must be the sole signatory of the final report — findings may not be signed, certified, verified, or reviewed by any party who was not present during the examination.
- Follow the Infraspection Institute Standard for Infrared Inspection of Recreational Yachts & Small Craft Constructed of Fiberglass Reinforced Plastic and Composite Materials as the governing procedural framework.

The professional standard is not merely to be aware of solar loading, but to actively control for it and to select inspection methods that produce repeatable, calibrated, and defensible results.

Thermal Palette Selection

The selection of an appropriate thermal imaging palette is a critical and often overlooked component of professional thermographic practice. The palette determines how thermal data is visually represented and directly affects both the thermographer’s ability to detect anomalies in the field and the clarity and credibility of findings presented in a formal report.

Ironbow (Iron) is the recommended palette for active detection and field examination of marine FRP and composite laminates. It provides a broad, distinguishable color gradient across the thermal range, making subtle subsurface temperature differentials more visually identifiable than other palettes. It is widely referenced in structural, building, and composite inspection literature as the preferred detection palette.

Ironbow is best suited for the following marine thermographic applications:

- Moisture detection and moisture mapping across hull and deck surfaces, where subtle variations in thermal retention across a broad area need to be visually distinguishable.
- General temperature variation surveys where the thermographer is scanning for the presence and extent of thermal anomalies across large surface areas.
- Active thermography detection phases where the full thermal gradient needs to be visible across the cooldown sequence.

Grayscale (White Hot or Black and White) is recommended for formal reporting. It reproduces accurately in both color and black and white print, is not subject to visual misinterpretation based on color bias, and is the palette most consistently referenced in ASTM standards and peer-reviewed thermographic research. Best practice is to capture images in Ironbow for detection purposes and present final report images in Grayscale for documentation purposes.

Grayscale is best suited for:

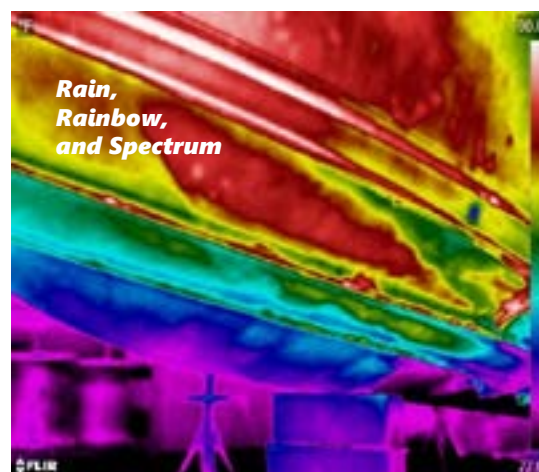
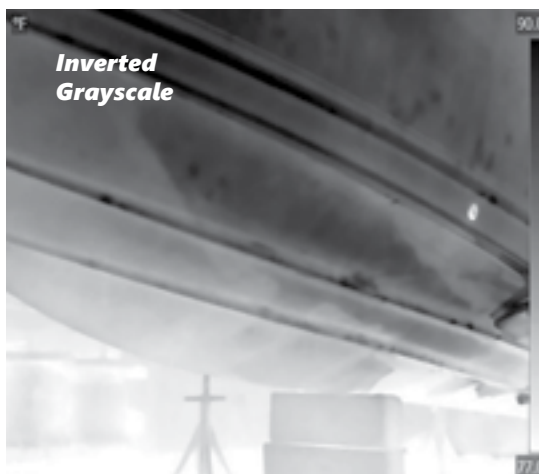
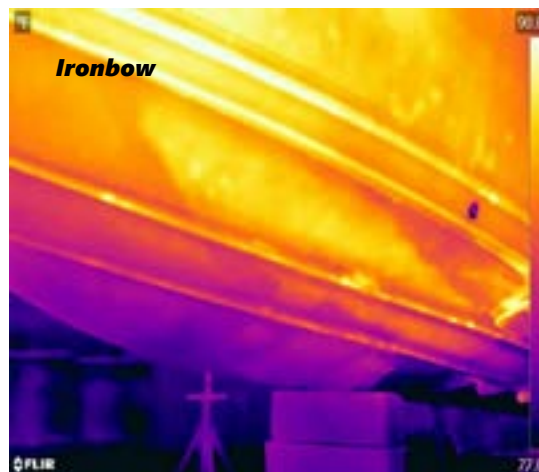
- Formal report documentation where images must reproduce accurately in print.
- Laminate discontinuities and structural imperfections where high contrast between sound and defective material is more important than color differentiation.
- Legal and insurance submissions where palette neutrality and print reproducibility are required.

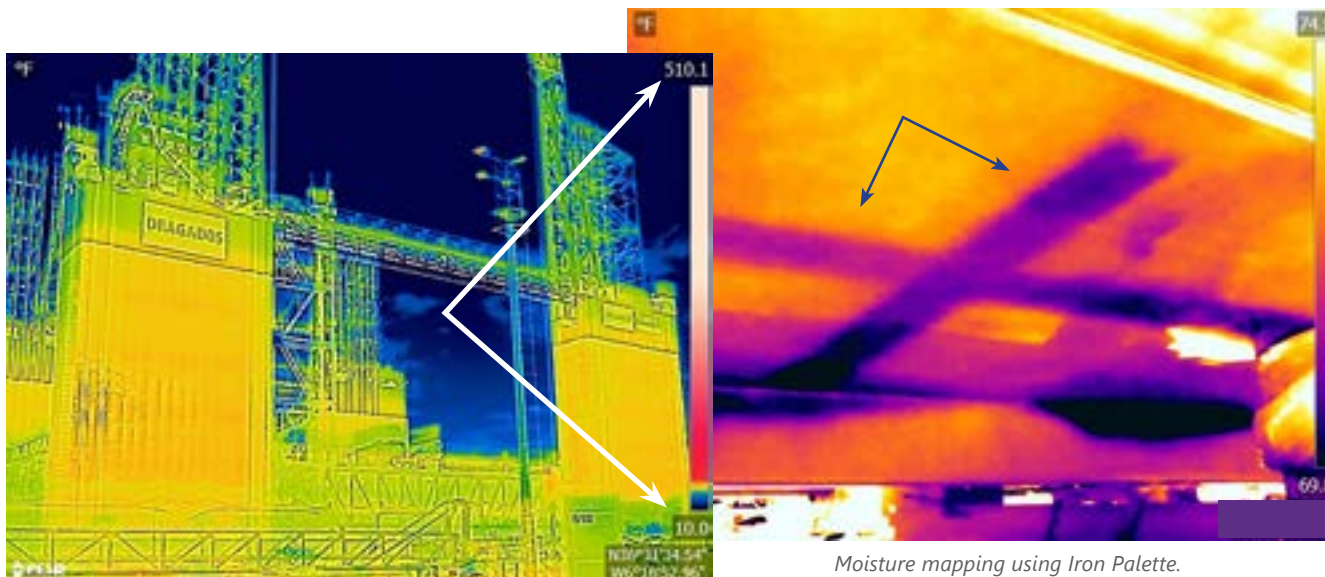
Inverted Grayscale (Black Hot) is best suited for:

- Laminate discontinuities, voids, and disbanded interfaces where the inversion reverses the contrast, making cooler anomalies appear as dark features against a light background — often making subtle imperfections more visually apparent than standard Grayscale.
- Situations where the defect signature is a thermal depression rather than a thermal elevation. Inversion can make these easier to identify and document in formal reporting.

Rain, Rainbow, and Spectrum are *not* recommended for thermographic reporting in technical, legal, or insurance contexts. These palettes compress subtle thermal differentials, introduce visual artifacts at palette transition boundaries, and can present thermal data in a visually misleading manner that does not accurately represent actual temperature gradients across the inspection surface. The use of Rainbow or Spectrum palette images in a formal survey report or inspection document is inconsistent with the standards of professional thermographic practice and may undermine the credibility of the findings presented.

It should be noted that Rainbow and Spectrum palettes have legitimate and well-established applications in other thermographic disciplines, most notably medical and clinical thermography, where controlled environments, uniform surface emissivity, and physiological pattern recognition make them appropriate and effective. Their unsuitability is specific to technical, structural, and professional marine inspection and survey reporting.





This solar loaded image in Rainbow Palette exhibits poor thermal tuning.

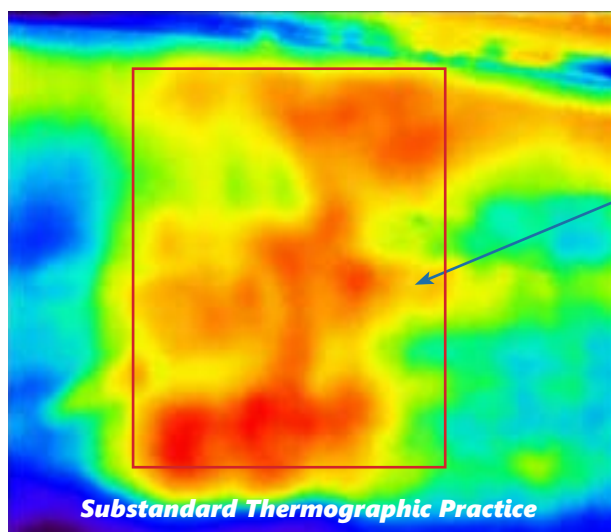
Moisture mapping using Iron Palette.

CONCLUSION

Field studies and peer-reviewed research on composite laminate inspection consistently demonstrates that solar loading produces inferior thermographic results compared to controlled active thermography using calibrated thermal excitation. The evidence is clear. Solar loading is not, and should not be, the preferred method of thermographic examination in professional marine FRP and composite laminate inspection. It is uncontrolled, uncalibrated, and incapable of producing the defensible thermographic data required for professional marine inspection and/or survey reporting.

The integrity of thermographic examination in the marine survey field depends not on the sophistication of the equipment employed, but on the discipline, methodology, and professional accountability of the thermographer behind it. Solar loading is uncontrolled, uncalibrated, and incapable of producing defensible thermographic data. It represents the antithesis of that standard. The client deserves an accurate report with accurate findings, and the vessel deserves a thorough and methodologically sound examination. When the integrity of the vessel, the accuracy of the findings, and the credibility of the thermographer are all at stake, solar loading has no place as a primary method in professional marine thermographic inspection.

Every credentialed marine surveyor, inspector, investigator, and thermographer is bound by the codes of ethics of each organization under which they hold certification. Those codes universally require that professionals accept only assignments they can complete with competence and professionalism, that findings be honest, accurate, and defensible, and that no false, misleading, deceptive, or unfair statements be made against others in the field outside of formal legal proceedings. Submitting thermographic findings acquired under substandard conditions — including solar loading — as professional survey or inspection evidence is not merely a methodological failure. It is a potential violation of the professional code of ethics governing every credential the maritime professional holds. This document does not seek to impugn any individual practitioner. It seeks to elevate the standard of the practice in the interest of the clients, the vessels, and the profession we serve.



Reflected infrared energy from the thermographer or adjacent personal can become visible within thermograms during solar loading.

Such reflections will create misleading thermal signatures and reduce reliability of forensic interpretation.

Reflections move. Structural anomalies do not.

This thermogram is poorly tuned and inadequately optimized.

Charles J. Hazouri
Offshore Marine Inspections

Certified Level I – Infrared Training Center (ITC)
Certified Level II-III and Master Thermographer® – Infrasppection Institute
Infrared (IR) Technician IR-TechIIMS – International Institute of Marine Surveying
Certified Marine Investigator CMI – International Association of Marine Investigators
Certified Marine Surveyor CMS – National Association of Marine Surveyors



About the Author

Charles J. Hazouri has spent his life in the marine industry, serving as a Captain, Project Manager, Marine Surveyor, Investigator, Inspector, Auditor, Published Author, and Thermographer. Holding certifications as a Master Thermographer® through the Infrasppection Institute alongside four independent marine-specific credentials, he is one of the most credentialed thermographers currently practicing across the marine survey, inspection, and investigation fields.

His work spans engagements with vessel owners, insurance professionals, legal counsel, and law enforcement — bringing the same standard of methodological rigor and professional accountability to every assignment regardless of context or audience. He has a passion for thermal imaging, non-destructive testing, and marine surveys and inspections, and is always on the lookout for new technologies, proper techniques, and improved reporting standards that advance the effectiveness and integrity of the profession.

*A prominent Infrasppection Institute Master Thermographer/Colleague has expressed to me over and over again; “**Magic comes from the Thermographer, not the Imager.**”*²

Special thanks and professional recognition to the following individuals for their insight and contributions:

Mr. James Seffrin, Director of Infrasppection Institute,
Mr. Nicholas J. Zehner from Robert Allen Law (PA),
Mr. F. Sean Hodgson, Drawings, Fabrications and Details (DFD),
Mr. John Banister SAMS-AMS®, Level III Master Thermographer, Suenos Azules Marine Surveying and Consulting,
Ms. Lynda H. Cobb, Editor, and
Dr. Lisa K. Hawk, Spousal Support.

² Mr. James Seffrin, Infrasppection Institute— Certified Level III Infrared Thermographer, Master of Thermography, and Director of Infrasppection Institute.

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Infrasppection Institute. Standard for Measuring and Compensating for Emittance Using Infrared Imaging Radiometers. Infrasppection Institute.

The professional codes of ethics governing the maritime and thermographic credentials referenced throughout this document are published by their respective organizations and are available for review. These include the Society of Accredited Marine Surveyors (SAMS) Code of Ethics, the National Association of Marine Surveyors (NAMS-Global) Code of Ethics, the International Association of Marine Investigators (IAMI) Code of Ethics, the International Institute of Marine Surveying (IIMS) Code of Professional Conduct, and the Infrasppection Institute Code of Ethics for Certified Infrared Thermographers.

The thermograms presented in this document were acquired using the *currently calibrated* Teledyne FLIR T865, 640 x 480 U-Max® 30 Hz, 7.5 - 14.0 µm, Digital HP Thermal Infrared Camera. The spectral range (µm) and 30 Hz frame rate meet the minimum instrumentation requirement specified in the Infrasppection Institute Standard for Infrared Inspection of Recreational Yachts and Small Craft Constructed of Fiberglass Reinforced Plastic and Composite Materials. Controlled thermal excitation was applied using the Ripack 3000-70 Propane Fired Heat Tool, a professional-grade propane heat source delivering consistent, adjustable, and documentable thermal excitation, as distinguished from uncontrolled environmental solar loading. All thermographic data was acquired, post processed, thermally tuned, and interpreted in accordance with the Infrasppection Institute Standard.

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Marine Bunker Value Chain: Avoiding disputes and claims

By Gilmark D'Mello, Loss Prevention Executive at Steamship Mutual P&I Club

In a recent Risk Alert, Gilmark D'Mello outlined best practices across the Marine Bunker Value Chain, aimed at preventing operational issues and disputes.



The Marine Bunker Value Chain involves multiple stakeholders with competing interests, where lapses in diligence can quickly lead to operational disruption and contractual disputes.

Ensuring diligence and adhering to industry best practices at each of these stages is crucial in avoiding disputes between stakeholders.

The selection of marine fuel is influenced by both commercial and regulatory considerations, requiring vessels to carry multiple fuel grades, balancing costs with compliance.

While Heavy Fuel Oil (HFO) and Marine Diesel Oil (MDO) have traditionally formed the marine fuel mix, additional fuel grades have been introduced owing to the emission regulations implemented in the past two decades.

The advent of Emission Control Areas (ECAs) required 0.1% sulphur fuels, introducing Low Sulphur Marine Gas Oil (LSMGO) and Ultra Low Sulphur Fuel Oil (ULSFO), while the IMO 2020 Global Sulphur Cap limited the sulphur content to 0.5% introducing Very Low Sulphur Fuel Oil (VLSFO), except for vessels installed with scrubbers.

In May 2024, the latest version of the fuel quality standard ISO 8217:2024 expanded the categorisation of fuels, effectively creating distinct categories for residual fuels based on the sulphur limits, and including biofuel blends for both distillate and residual marine fuels.

The ISO 8217:2024 intends to address the shift in the marine fuel landscape, moving away from fuels sourced exclusively from traditional oil products derived from the processing of petroleum crude, towards fuels derived from synthetic and renewable feedstocks, as well as recycled and alternative sources.

The ISO 8217:2024 categorises fuel grades into four tables:

- Table 1 – Distillate and bio-distillate marine fuels (DM / DF grades)
- Table 2 – Residual marine fuels ≤ 0.50% sulphur (VLSFO / ULSFO)
- Table 3 – Bio-residual marine fuels (RF grades)
- Table 4 – Residual marine fuels > 0.50% sulphur (HSFO)

By streamlined categorisation of fuel grades and inclusion of clauses 5 to 10 in the tables, ISO 8217:2024 has strengthened the quality assurance of marine fuels, and it is therefore strongly advised to include the latest standard in Bunker Purchase Agreements and Charter Party Clauses.

The activities from the moment the need to supply bunkers arises until the fuel is consumed make up the Marine Bunker Value Chain, comprising of four key stages – Bunker Procurement, Bunkering, Fuel Analysis and Fuel Management.

The marine bunker value chain involves multiple stakeholders with competing interests, where lapses in diligence can quickly lead to operational disruption and contractual disputes.

Ensuring diligence and adhering to industry best practices at each of these stages is crucial in avoiding disputes between the stakeholders.

1 Bunker Procurement

Bunkers are procured either as a one-off spot purchase agreement through a Bunker Confirmation Note or through a long-term supply contract concluded as a Bunker Supply Agreement. In a time charter, the Charterer is expected to procure fuel to the specification agreed within the Charter Party, in a quantity mutually agreed with the vessel and considering all relevant factors pertaining to the intended voyage.

The factors taken into consideration in determining the fuel specification and quantity for a voyage could typically include:

- Fuel required to safely perform the voyage
- Regulatory requirements
- Maximising cargo uplift
- Fuel availability and cost

Recommendations:

- Implement a robust fuel procurement protocol incorporating risk metrics in supplier selection.
- Ensure that the fuel specification and quality analysis agreed in the fuel procurement contract align with the terms in the Charter Party

2 Bunkering

Bunkering is performed through Ship-to-Ship, Truck-to-Ship, or Shore-to-Ship transfers. It is often the case that 3rd party physical suppliers are entrusted with the task of the 'last mile' delivery of the nominated fuel to the vessel, which introduces additional layers of competing interests within the bunker supply chain.

These competing interests can manifest in various forms, notably in disputes related to timely fuel delivery, as well as over the quantity and quality of the supplied fuel. These issues have the potential to escalate into costly claims, underscoring the importance of clear procedures and robust documentation around the bunkering operation.

The Safety Management System (SMS) should have procedures covering the following key aspects to ensure the safe receipt of the nominated bunker stem: Bunker Planning, Grade Verification, Quantity Verification and Fuel Sampling.

3 Quality Validation

Bunkers are contractually procured and supplied with ISO 8217 as the acceptance criteria for fuel quality. This ensures that the fuel delivered meets internationally recognised specifications and regulatory requirements, providing a benchmark for quality assurance in marine fuel procurement.

However, in recent years, chemical contaminants have been found in marine fuels, prompting the need for enhanced testing through pre-burn screening of fuels. It is pertinent to note that the supplied fuel must comply with all the clauses of ISO 8217, not merely the relevant table parameters.

Clause 5 of ISO 8217 requires the supplied fuel to be homogeneous and conform to limits set out in the relevant tables, and for it to be free of any materials, including added substances and chemical species, which could be harmful to personnel or adversely affect the safety and/or performance of the vessel.

If the fuel meets the ISO 8217 parameter limits, the presence of chemical contaminants by themselves cannot establish that the fuel is not compliant vis-à-vis Clause 5. While Clause 5 provides a wide safety net, invoking it requires machinery damage to have occurred, and establishing that the fuel was causative to the damage.

4 Fuel Management

A proactive approach, adhering to industry best practices in managing fuel storage, transfers, conditioning and consumption, is crucial not only for operational reliability, but also for meeting regulatory compliance. With the rapidly evolving regulatory landscape, new fuel grades introduced in the recent past and their behaviour in the operational environment are being analysed by industry bodies such as the International Council on Combustion Engines (CIMAC), providing guidelines in building operational knowledge for managing these fuels.

A fuel could be 'on-spec' to the ISO 8217 table parameters, but if the fuel is not diligently managed on board, operational issues with machinery can arise, causing vessel delays, stoppages and in certain cases, even regulatory non-compliance.

In a time charter, when an Owner claims for machinery damage attributed to the fuel, the defence would seek to ascertain whether everything that a prudent Owner would do was reasonably done to manage the fuel on board, and that any action or lack thereof was not causative of the claimed damage. Consequently, it is essential that the vessel's staff ensure utmost diligence during storage, transfers, conditioning and consumption of the fuel.





Promoting excellence in
professional maritime standards

The purpose of the **Maritime Professional Council of the UK** is:

- To promote the professionalism and esteem within the British Merchant Navy and to those organisations directly concerned with the sector.
- To provide a central point from which professional opinion on maritime matters can be offered to the Maritime Community, Industry, Government and the Media.
- To provide independent expert advice and guidance based on our combined professional knowledge and experience unhindered by any financial or commercial interests.
- To provide guidance to regulators and employers on the professional training standards adequate for our maritime professionals.maritime standards

www.mpc-uk.org



Do you know why a Ship Structural Access Manual is required on board?

Maintaining a ship's structural condition requires regular surveys and inspections throughout its operational life and the Ship Structural Access Manual is an integral part of this process. These checks help ensure that structural components remain free from damage, such as cracks, buckling, deformation, corrosion, or thickness diminution beyond acceptable limits.

For this reason, suitable means of access to the hull structure are essential, enabling safe and effective overall and close-up inspections, as well as thickness measurements.

Regulation II-1/3-6 of SOLAS, as amended, requires oil tankers of 500 GT and above and bulk carriers of 20,000 GT and above, constructed on or after 1 January 2005, to be provided with means of access in each space within the cargo area and forward spaces.

These means of access must allow for overall and close-up inspections, as well as thickness measurements of the ship's structures, throughout the vessel's operational life.

Where permanent means of access may be exposed to damage during normal cargo loading or unloading operations, or where fitting permanent access is impracticable, movable or portable means of access may be accepted.

However, the arrangements for attaching, rigging, suspending, or supporting these alternative means must form a permanent part of the ship's structure.

Such alternative means of access may be used either independently or in combination with the permanent means of access provided on board.

SOLAS further requires that the ship's means of access for carrying out overall and close-up inspections and thickness measurements be described in a Ship Structural Access Manual, approved by the Administration. An updated copy of the manual must be kept on board.

The Manual shall include the following for each space in the cargo area:

- Plans showing the means of access to the space, with appropriate technical specifications and dimensions;
- Plans showing the means of access within each space to enable an overall inspection to be carried out, with appropriate technical specifications and dimensions;
- The plans shall indicate from where each area in the space can be inspected;
- Plans showing the means of access within the space to enable close-up inspections to be carried out, with appropriate technical specifications and dimensions. The plans shall indicate the positions of critical structural areas, whether the means of access is permanent or portable and from where each area can be inspected;
- Instructions for inspecting and maintaining the structural strength of all means of access and means of attachment, considering any corrosive atmosphere that may be within the space;
- Instructions for safety guidance when rafting is used for close-up inspections and thickness measurements;
- Instructions for the rigging and use of any portable means of access in a safe manner;
- An inventory of all portable means of access; and
- Records of periodical inspections and maintenance of the ship's means of access arrangements.

If the Ship Structural Access Manual is submitted to the Administration for review, the following documents are also required to be provided, as applicable:

- General arrangement plan
- Tank arrangement
- Record of inspection
- Inventory of portable means of access
- Access hatch arrangement
- Water ballast tanks – permanent ladder arrangement
- Cargo tanks – permanent ladder arrangement
- Engine room tanks – permanent ladder arrangement
- F.O tanks – means of access
- Void spaces – mean of access.

The Ship Structural Access Manual supports safe and effective access for structural surveys, close-up inspections, and thickness measurements on board.

Seven pillars for improved PSC performance

1. Competent people

People remain the most important factor influencing PSC outcomes. Regardless of how advanced a management system may be, compliance ultimately depends on the knowledge, awareness and actions of the individuals operating and supporting the vessel.

Competent people understand not only regulatory requirements but also the practical expectations of inspectors. They know how to maintain standards, identify weaknesses before they become deficiencies and respond professionally during inspections. Competence extends beyond certificates and mandatory training. It encompasses leadership, accountability, communication, situational awareness and a genuine understanding of how daily operational decisions influence compliance performance.

Equally important is the competence of shore personnel. Technical, marine, crewing and HSQE teams must be capable of supporting vessels with timely guidance, effective decision-making and practical solutions. Companies that invest in developing both onboard and shore-based competence establish a strong foundation for long-term PSC success.



Port State Control (PSC) remains one of the most visible indicators of a vessel's operational readiness and a shipping company's commitment to safety, compliance and continuous improvement, argues Apo Belokas, CEO & Founder at RISK4SEA.

Every year, thousands of PSC inspections worldwide identify deficiencies that can lead to delays, reputational damage, increased scrutiny and, in severe cases, detention. While regulations continue to evolve and inspection practices become increasingly data-driven, the fundamentals of strong PSC performance remain unchanged.

Successful companies do not view PSC as an isolated inspection event. Instead, they treat PSC performance as the outcome of a structured management process involving people, assets, intelligence, collaboration, execution and learning. Organizations that consistently achieve superior results typically excel in seven key areas which together form the foundation of sustainable PSC excellence.

2. Reliable ships

A reliable ship is one that consistently operates in a condition that demonstrates compliance, preparedness and operational excellence. PSC deficiencies often reveal deeper issues such as ineffective maintenance practices, poor defect management, inadequate supervision or insufficient resource allocation.

Achieving ship reliability requires a proactive approach to maintenance, equipment testing, housekeeping, documentation management and statutory compliance. Critical systems must be maintained continuously rather than inspected only before arrival. Safety equipment, navigation systems, machinery, accommodation areas and operational records must reflect the standards expected throughout the vessel's voyage.

Reliable ships do not depend on intensive last-minute preparation. Instead, they maintain a state of continuous readiness that allows crews to approach inspections with confidence and transparency. Reliability reduces operational stress, minimizes surprises and significantly improves inspection outcomes.

3. Port Intelligence

Modern PSC preparation is increasingly driven by intelligence rather than assumptions. Not all ports inspect vessels in the same manner, and not all deficiencies receive equal attention across different PSC regimes, regions and inspection offices.

Port Intelligence enables shipping companies to understand where risks exist before a vessel arrives. By analysing historical inspection trends, detention patterns, recurring deficiencies, Concentrated Inspection Campaigns (CICs), local enforcement practices and emerging risk indicators, organizations can focus their efforts on the areas most likely to attract inspector attention.

This targeted approach allows crews and shore teams to prioritize resources effectively, concentrating on high-risk deficiency areas rather than relying on generic inspection checklists. The result is a more efficient preparation process, improved situational awareness and enhanced readiness for specific inspection environments. In an increasingly data-rich industry, intelligence has become a critical competitive advantage for PSC performance management.

4. Ship-Shore collaboration

Strong PSC performance is rarely achieved by the vessel alone. It is the result of effective collaboration between onboard personnel and shore-based teams working toward a common objective.

The ship possesses real-time knowledge of operational conditions, equipment status and practical challenges. The office provides broader oversight, technical expertise, regulatory guidance, resources and performance monitoring. When these two perspectives are combined effectively, PSC readiness improves substantially.

Successful organizations establish clear communication channels before, during and after inspections. Potential weaknesses are identified early, resources are mobilized efficiently and corrective actions are implemented in a timely manner. Rather than operating independently, ship and shore teams function as an integrated compliance ecosystem.

Companies with strong ship-shore collaboration often demonstrate greater consistency across their fleets, reduced deficiency recurrence and more effective preparation for challenging inspection environments.

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5. PSCO Management

The inspection itself represents a critical moment where preparation, professionalism and communication converge. While the condition of the vessel remains the primary focus, the manner in which the inspection is managed can significantly influence the inspection experience.

Professional interaction with Port State Control Officers begins with preparation. Crew members should understand their responsibilities, know where documentation is located and be familiar with inspection procedures. Inspectors should be welcomed professionally, escorted appropriately and supported throughout the inspection process.

Transparency, cooperation and confidence are essential. Attempts to conceal issues, provide inconsistent information or demonstrate uncertainty often increase scrutiny and prolong inspections. Conversely, organized and professional engagement promotes a constructive inspection environment and reflects positively on the vessel's safety culture.

Effective PSCO management is not about influencing inspection outcomes; it is about ensuring that the vessel presents itself as a professional, compliant and well-managed operation.

6. Learning & Feedback

Every PSC inspection provides valuable information regardless of the number of deficiencies recorded. Organizations that consistently improve their performance recognize inspections as learning opportunities rather than isolated compliance events.

A robust learning process examines what worked well, what weaknesses were identified, what could have been predicted and what improvements are necessary. Deficiencies should not simply be corrected; their underlying causes should be investigated and addressed. Inspection outcomes can reveal trends related to maintenance practices, training effectiveness, procedural weaknesses, communication gaps or management system deficiencies. By systematically capturing and sharing lessons learned across the fleet, companies prevent the repetition of mistakes and accelerate organizational learning.

The most effective operators transform inspection findings into knowledge that strengthens future performance.

7. Continual improvement

PSC excellence is not achieved through one successful inspection or a short-term compliance initiative. It is the result of an ongoing commitment to improvement across people, ships, systems and processes.

Lessons learned from inspections should feed directly into Safety Management Systems, training programs, maintenance strategies, internal audits, risk assessments and operational procedures. Performance metrics should be monitored continuously, emerging trends should be analysed and corrective actions should be evaluated for effectiveness. Organizations that embrace continual improvement move beyond reactive compliance. They develop the ability to anticipate risks, adapt to changing regulatory expectations and strengthen their operational resilience over time.

Ultimately, continual improvement transforms PSC performance from a compliance requirement into a strategic management discipline that supports safer operations, stronger reputations and improved business performance.

Conclusion

Strong PSC performance does not occur by chance. It is the product of competent people, reliable ships, effective intelligence, close ship-shore collaboration, professional inspection management, structured learning and a commitment to continual improvement.

These seven pillars reinforce one another, creating a framework that enables organizations to move from reactive inspection preparation to proactive performance management.

As PSC authorities continue to leverage data, target higher-risk vessels and increase expectations for compliance, shipping companies must adopt a more systematic approach to inspection readiness. The organizations that succeed will be those that embed these seven pillars into their daily operations, transforming PSC performance from an operational challenge into a sustainable competitive advantage.

ECDIS Training Assessment (ETA) - Learning from the Data

Bridge Team Knowledge Explored

ECDIS Knowledge Gaps Exposed reveals report

The NorthStandard ECDIS Training Assessment (ETA) Report provides one of the most revealing datasets yet on how bridge teams understand and use ECDIS onboard. Based on more than 5,000 assessments conducted since February 2024, the report exposes a reality the industry has long suspected but rarely quantified: mandatory ECDIS certification does not necessarily translate into operational competence.

The findings are important because ECDIS today is no longer simply a chart display tool. It is effectively the primary navigation environment onboard most SOLAS vessels. When bridge teams misunderstand safety contours, datums, ENC updates, alarms, display layers or data quality indicators, the result is not merely inefficiency. It creates elevated grounding risk, unsafe passage planning, alarm fatigue, positional inaccuracies and degraded situational awareness.

The report is particularly valuable because it moves beyond generic “training awareness” discussions and identifies where the actual knowledge gaps exist at a granular operational level.

What the ETA initiative is about

NorthStandard launched the ECDIS Training Assessment (ETA) platform in February 2024 as a structured competency assessment tool for bridge teams. The objective is to evaluate practical ECDIS

knowledge across the four pillars of passage management: Appraisal, Planning, Execution and Monitoring.

The platform is not designed merely as another CBT module. It functions more as a diagnostic intelligence tool for identifying competency weaknesses at both individual and fleet level. The assessment evaluates how bridge teams understand:

- ENC installation and updates
- Safety settings and contours
- Alarm management
- Display layers and scale usage
- Datum interpretation
- CATZOC and data quality
- Passage plan verification
- Monitoring and positional awareness

The report’s core message is clear: many bridge teams can operate ECDIS mechanically, but a significant portion do not fully understand the underlying navigational logic and limitations of the system.

That distinction matters enormously.



Why this report matters

The significance of the report lies in the fact that it moves beyond theoretical training discussions and quantifies actual operational weaknesses using real assessment data.

The findings suggest that while most bridge teams can operate ECDIS functionally, many officers still lack a strong understanding of the system's logic, limitations and risk implications. This distinction is critical.

Modern navigational incidents increasingly stem not from absence of technology, but from overreliance on automation, alarm fatigue, poor understanding of safety settings and incorrect interpretation of navigational data.

Among the report's key findings:

- Around one-third of bridge teams lacked understanding of critical ECDIS features such as datum discrepancies and ENC updates.
- Nearly half failed to prioritise correct ENC scale during passage planning.
- Half of respondents struggled to distinguish alarms from alerts and highlights.
- Significant gaps were identified regarding safety contours, symbols, display layers and ENC update management.

Perhaps most concerning, the report found that many bridge teams relied excessively on automated route checking without performing sufficient visual verification of planned passages.

The broader implication is clear: compliance with mandatory ECDIS certification requirements does not necessarily guarantee operational competency.

10 Key lessons learned from the ETA Report

1. Mandatory ECDIS certification is not enough

The report demonstrates that certified officers still show major competency gaps in operational ECDIS use. Knowledge deficiencies appeared consistently across all four operational pillars. This reinforces that compliance-driven training does not automatically produce operational mastery.

2. Datums remain a major industry weakness

Datum-related misunderstanding appeared repeatedly throughout the report. Many bridge teams failed to understand WGS84 discrepancies, sounding datums and vertical datum implications. This is dangerous because datum errors directly affect positional accuracy, under-keel clearance calculations and air draft assessments.

3. ENC updating is poorly understood

Nearly two-thirds of crews struggled to recognise ENC updates and understand update content. This is not a procedural detail. Outdated or improperly updated ENCs can create direct navigational hazards.

4. Officers over trust automation

The report highlights overreliance on automated route checks and automated alarm logic. ECDIS should support navigational judgement, not replace it. Visual verification and critical assessment remain essential bridge team responsibilities.

5. Alarm fatigue and alarm confusion are still widespread

Half of the assessed personnel struggled to distinguish alarms, alerts and highlights. Poor alarm understanding leads directly to alarm desensitisation, which is a recurring

contributor in navigational incidents and casualty investigations.

6. ENC scale selection is frequently mishandled

Nearly half of bridge teams failed to prioritise correct ENC scale during passage planning. Using the wrong scale can hide critical hazards or create excessive clutter that reduces situational awareness.

7. Safety contours are commonly misunderstood

The report repeatedly identified confusion around safety contours, deep contours and available charted depth contours. This is one of the most operationally critical findings because incorrect contour logic directly affects grounding prevention.

8. Crews often do not understand data quality indicators

Many respondents misunderstood CATZOC, M_SREL, pick reports and survey reliability indicators. ECDIS is only as reliable as the underlying hydrographic data. If officers cannot assess data quality, they cannot assess navigational risk properly.

9. GPS overreliance persists

Some respondents reportedly believed GPS provides "100% accuracy." This remains a dangerous mindset in an era of spoofing, jamming and sensor degradation.

10. Practical familiarisation is still weak

The report identified weak understanding of hover-over functions, display layers, symbol recognition, time zones and practical monitoring features. This suggests that many officers use ECDIS functionally but not fluently. There is a major difference.



Action plan for ship managers and maritime stakeholders

The ETA findings suggest that ECDIS competence should increasingly be treated as an operational risk management issue rather than purely a training compliance matter.

Ship managers and maritime stakeholders should consider the following actions:

- Conduct fleetwide ECDIS competency assessments
- Managers should identify vessel-specific and rank-specific weaknesses through structured assessments and scenario-based evaluations.

Prioritise high-risk competency areas

According to the report, urgent attention should focus on:

- ENC installation and updating
- Datum understanding
- Safety contours and safety settings
- Alarm management
- ENC scale usage
- Symbol recognition
- Display layer configuration

Strengthen practical, scenario-based training

Traditional CBT and generic certification alone are insufficient. Practical simulator-based training involving real operational scenarios should become standard.

Rebuild manual verification culture
Bridge teams should be encouraged to challenge automation rather than rely blindly on automated checks and alerts.

Standardise ECDIS procedures fleetwide

Companies should harmonise:

- Safety setting procedures
- Alarm management protocols
- ENC update verification
- Passage planning standards
- Watch handover checks

Improve bridge audits and navigational assurance

Internal audits should focus more closely on actual ECDIS operational practices, including alarm settings, ENC management and safety contour logic.

Enhance type-specific familiarisation

Differences between ECDIS manufacturers and presentation libraries remain a source of confusion and require more robust familiarisation practices.

Integrate ECDIS competence into SMS risk management

ECDIS competency should become part of navigational risk assessment frameworks and not remain isolated within training departments alone.

Final thoughts

The NorthStandard ETA report sends an important message to the industry: ECDIS competency gaps remain widespread despite years of mandatory implementation.

The issue is no longer whether bridge teams can operate ECDIS systems mechanically. The challenge is whether they fully understand how those systems behave under operational conditions, how to interpret their limitations and how to manage navigational risk when automation fails or becomes misleading.

As vessels increasingly depend on integrated digital navigation systems, strengthening operational ECDIS competence may become one of the most important loss prevention priorities for the maritime industry over the coming years.

Key AMSA PSC focus areas for foreign-flagged vessels



Some months ago, The Australian Maritime Safety Authority (AMSA) issued its National Compliance Plan 2025-2026. In it, they highlighted inspection trends and enforcement focus that may lead to deficiencies or detention.

The AMSA 2025-26 National Compliance Plan sets out the priority activities for the year, giving industry a clear understanding of the regulatory focus and its underlying rationale.

The National Compliance Plan confirms that in 2025-26 AMSA will conduct a minimum of 2,400 PSC inspections on foreign-flagged vessels, using an enhanced risk-profiling algorithm to target higher-risk ships. Where systemic or repeated deficiencies are identified, inspections will be expanded, with a combination of education and enforcement applied where warranted. Shipboard maintenance will remain a continued focus during PSC inspections.

Vessels with poor maintenance standards, weak Safety Management System (SMS) implementation, or a history of previous deficiencies can therefore expect more detailed and intrusive inspections.

Liberia Maritime Authority issued a Marine Advisory summarizing AMSA's compliance strategy and priority risk areas relevant to foreign-flagged vessels trading to Australia.

To assist vessel operators in preparing for Port State Control (PSC) inspections, the Liberia Maritime Authority highlights the following PSC focus areas requiring particular attention:

Primary PSC focus areas for foreign-flagged vessels

1 Shipboard Maintenance (High-Risk Area)

Shipboard maintenance remains a leading cause of PSC detention in Australia. AMSA has confirmed this will continue as a core inspection focus.

Inspectors will pay close attention to:

- i. Main and auxiliary engines (leaks, alarms, safeguards)
- ii. Power generation and emergency power systems
- iii. Steering gear and emergency steering arrangements
- iv. Fire safety systems and critical safety equipment
- v. Planned Maintenance System (PMS) implementation
- vi. Defect reporting and close-out records

Temporary repairs, oil contamination, outstanding defects, and incomplete maintenance records regularly trigger expanded inspections.

2 Occupational Safety & ISM Code Effectiveness

AMSA recorded 74 serious seafarer injuries in 2024, many related to maintenance and cargo operations.

This has resulted in increased scrutiny of:

- i. Risk assessments carried out under the ISM Code
- ii. Task-based risk controls (maintenance, cargo operations, access)
- iii. SMS implementation beyond paperwork compliance

AMSA inspectors will verify whether risk assessments are practical, vessel-specific, documented, and implemented.



3 Pilot Ladder & Pilot Transfer Arrangements

Following 84 reported pilot ladder incidents in 2024, AMSA has elevated pilot ladder safety as a priority PSC risk area. Checks will include strict compliance with SOLAS Chapter V / Regulation 23 and applicable IMO resolutions and AMSA guidance – Marine Notice 04/2023 “Pilot transfer arrangements”.

Key inspection points include:

- i. Condition, certification, and age of pilot ladders
- ii. Correct rigging and securing arrangements
- iii. Side ropes, stanchions, man-ropes, and embarkation platforms
- iv. Crew knowledge and supervision during pilot transfer operations

Non-compliance in this area is frequently considered detainable and pilot transfer arrangements remain a critical safety risk requiring attention.

4 Cargo Handling and Cargo Securing (Marine Order 32)

AMSA analysis shows cargo-related deficiencies remain a significant safety and environmental risk.

PSC inspections will concentrate in the verification of:

- i. Availability and approval of a ship-specific Cargo Securing Manual (CSM)
- ii. Condition and certification of lashing equipment and any equipment related to lashing e.g.; lashing eye, sockets etc.
- iii. Proper stowage and safe access to securing gear
- iv. Practical compliance with the CSS Code
- v. Officer and crew competence in cargo securing procedures

Inadequate securing arrangements, damaged lashing gear, or unfamiliarity with the CSM are common deficiency findings.

Reminder: The Tokyo MOU & Indian Ocean MOU will conduct a concentrated inspection campaign (CIC) on cargo securing scheduled for late 2026.

5 Marine Pollution Prevention (MARPOL)

AMSA continues strong enforcement of pollution prevention requirements due to inconsistent compliance trends, particularly as discharges from sewage, garbage, and systems such as exhaust gas cleaning units can have significant detrimental impacts on the marine ecosystem.

AMSA Inspectors will focus on:

- i. Oily Water Separator (OWS) operational integrity
- ii. Absence of bypass arrangements or tampering
- iii. Accuracy and consistency of Oil Record Book entries
- iv. Garbage Management Plans and Record Books (Annex V)
- v. Sewage discharge controls (Annex IV)

Serious breaches may result in detention, fines, or prosecution.

6 Maritime Labour Convention (MLC) – Seafarer Welfare

AMSA continues joint inspections with the Fair Work Ombudsman (FWO), particularly on vessels operating under temporary licenses and focusing on seafarer wages.

Inspection focus includes:

- i. Seafarer employment agreements (SEA) and wage payment
- ii. Hours of work and rest compliance
- iii. Crew fatigue management
- iv. Accommodation, food, and welfare conditions
- v. Complaint procedures

Wage-related non-compliance remains the most common MLC issue reported to AMSA. As part of the Australian Government’s Strategic Fleet Review, a two-year pilot program has been launched, which will increase compliance activity on foreign vessels operating under temporary licenses and enforcement of wages.

Primary PSC focus areas for foreign-flagged vessels



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The Marine Surveyor and the Gut Feeling



By **Hans de Koning**,
MBA MIIMS

Most likely it has started long before but for me it became obvious during the pandemic, driving home from a port one day the outside of my car was disinfected by local government employees in white overalls. Of course, there is zero scientific proof that viruses are spread by cars, but someone's gut feeling said that it might be a good idea.

Social media became the main source of information and the checks and balances were efficiently removed. Politicians can spread lies but still be believed because, yes, that gut feeling.

A valid question to ask now is, "will this affect our profession?" I am sure that most surveyors will say, "no, we collect and report based on objective evidence and fact" and I was amongst those until recently.

An accident occurred on board a vessel during discharge due to an equipment failure. Our company was representing the owner's P&I and H&M. The vessel was certified by an IACS member and covered by a reputable IG P&I Club. Because of the equipment failure

the Classification Society issued a Condition of Class. Repairs were made, the Classification Society invited, equipment tested and approved, Condition of Class rectified, and new certificates issued. Problem solved, case closed one would think, but not so.

Because of the type of accident, during cargo operations and affected cargo, a whole team of surveyors were involved, eight in total, amongst whom were cargo insurance and warranty surveyors.

When the information was shared with all surveyors that the vessel was ready to continue discharge, the warranty surveyors "rejected" the Class certificate and demanded additional corrective actions and testing. Port State Control (PSC) got involved, apparently on request of the cargo interest, and PSC issued a deficiency, requesting more information regarding the certification renewal.

Now we come to the point of gut feeling:

- The warranty surveyors didn't trust the testing and certification of Class, without any objective evidence.
- PSC issued a deficiency, which in fact was unjustified because there was no deficiency, merely a request for more information while the vessel was fully certified.

The owners now requested the Class to confirm that all was tested, in good condition, and to the satisfaction of the Class Surveyor and Society, and confirmation was received by return. The Class statement, as well as the Class status report mentioning the Condition of Class, was rectified fortunately and convinced the PSC officers but not the warranty surveyors.

It slipped into our life, in our thinking, into our way of obtaining information, in the way information is provided and manipulated; the Gut Feeling. Used by politicians and social media algorithmics to gain votes or please advertisers.

A meeting between surveyors, ship staff, owners and charterer's representatives was held resulting in a monologue from the warranty surveyors about why they considered the equipment being unsafe despite being tested and certified. Now they had adopted this position, there was no way out. According to the charter party the receivers had a certain number of days at their disposal to delay the cargo operation, but a conflict has arisen based on just gut feeling.

In the end, the situation was solved in a commercial way.

The interesting question now is, how could this be avoided in the future? Apparently objective evidence in this case was insufficient to convince receiving parties and commercial losses were suffered.

For the future, in similar events, we will promote and facilitate more interaction between the Class surveyor and attending parties. We will organise meetings where the Class will explain their plans and approach, provide feedback and explanation to the attending parties. The way we used to do it. Class comes on board, does their job, and issues their certificates or eliminate a Condition of Class, apparently appeared insufficient.

We, surveyors, are being led by gut feeling at times. That feeling that leads you in a certain direction in your investigations. Only objective evidence should lead you to conclusions. Apparently not for all surveyors' objective evidence is leading the way, and we have to anticipate those colleagues who have a prevailing gut feeling above evidence.

We surveyors must become more like politicians and play on gut feeling, unfortunately, or maybe I am just conservative.

Shipping's decision in 2026: Act with pace, preserve flexibility



By **Roger Holm**, President of Wärtsilä Marine
and Executive Vice President at Wartsila

Shipping now has a range of credible decarbonization options, from alternative fuels to energy-saving technologies. With regulations tightening and cost pressures mounting, the critical challenge for the industry is not about identifying a single 'perfect' solution. It is about making decisions now that keep options open for the future.

By any measure, shipping is entering one of the most complex operating environments in its history. Decarbonization regulation is tightening and capital costs are rising. Fuel pathways remain fluid, and geopolitical volatility continues to disrupt markets and trade flows. Yet despite this uncertainty, most maritime leaders are not paralysed by indecision. On the contrary, industry confidence remains high.

Research commissioned by Wärtsilä among 225 senior maritime executives indicates that more than 90% believe they can lead their businesses successfully through the transition ahead. That confidence matters. But it does not remove the structural pressure the industry now operates under. Nearly seven-in-ten leaders say unpredictability makes prioritization a constant challenge, while more than 40% struggle to balance investment costs with return expectations. This tension between confidence and complexity defines the real decision-making challenge of 2026.

For much of the past decade, the industry's problem was a lack of credible decarbonization options. Today, the opposite is true. Methanol, ammonia, LNG, biofuels, battery hybridisation, energy saving technologies, digital optimization, carbon capture all have a role to play. Regulation has moved from ambition to execution, turning emissions performance into a direct cost and operational constraint. The risk now is not choosing the "wrong" technology – it is delaying action or

making fragmented decisions that lock assets into inflexible pathways.

The hardest decision facing shipowners in 2026 is therefore not whether to act, but how to act with pace, while preserving adaptability.

When regulation meets capital discipline

Compliance is no longer a distant policy discussion – it is a commercial reality. Instruments such as the EU Emissions Trading System, FuelEU Maritime and the IMO's Carbon Intensity Indicator directly influence voyage economics, charter attractiveness and asset value. Carbon now has a price, efficiency now has a rating, and both affect competitiveness.

The implication for investment strategy is significant. Ships ordered or retrofitted today will operate well into the 2040s and beyond, long after today's regulatory milestones and fuel assumptions have evolved. Decisions that focus purely on short term compliance risk creating stranded or suboptimised assets over the longer term.

This is why leading operators are increasingly shifting from technology first decisions to lifecycle led strategies. Rather than betting on a single fuel or solution, they are prioritising flexibility. This means fuel ready designs, modular upgrades, digital performance monitoring and propulsion efficiency improvements that deliver immediate returns while

keeping future options open. In an environment where regulation tightens over time rather than settling into equilibrium, optionality becomes a financial discipline, not a nice-to-have.

Operational risk is no longer just operational

Alongside regulatory pressure, operational risk is increasing. Vessels are becoming more complex, crews are harder to attract and retain, and the consequences of failure – from downtime and emissions penalties to reputational damage – are intensifying.

Human error has always been a factor in maritime incidents, but complexity magnifies its impact. Multifuel engines, advanced automation and digital control systems require new skills and new support models. At the same time, unplanned downtime is becoming more costly as utilization margins tighten.

Operational reliability and compliance are now inseparable. Predictable performance is no longer just about safety and uptime; it is about protecting revenue, managing emissions exposure and maintaining asset value.

This explains the growing focus on data led operations, predictive maintenance and performance based service models. When maintenance shifts from a reactive technical function to a planned, outcome based discipline, it becomes a tool for risk management and financial predictability rather than a source of uncertainty.

ROI in the age of transition

One of the most persistent misconceptions about decarbonization is that it is primarily a cost exercise. The same research commissioned by Wärtsilä found that 82% of maritime leaders agreed that structured lifecycle partnerships strengthen regulatory adherence and reduce operational risk – suggesting that the right investments deliver returns beyond the balance sheet.

Investments that improve fuel efficiency, emissions performance and

operational uptime tend to generate returns across multiple dimensions: lower fuel consumption, reduced carbon exposure, improved charter competitiveness, lower insurance risk and stronger residual asset value. The challenge is less about whether these returns exist and more about sequencing investments correctly.

Short term, isolated decisions – particularly under regulatory pressure – often deliver suboptimal outcomes. By contrast, phased investment strategies grounded in real operational data allow owners to move step by step, aligning compliance milestones with commercial logic and cashflow realities.

Trusted partnerships are increasingly central to making this possible. With access to fleet wide operational data, regulatory insight and lifecycle modelling, long term partners can support decision making that balances near term requirements with long term value creation. In practice, this means acting early enough to stay ahead of compliance, and carefully enough as fuel markets and regulations mature.

Acting without locking in

The defining capability for successful operators in 2026 will be treating uncertainty not as a reason to delay decisions, but as a condition to plan around. That requires moving beyond binary choices and instead building strategies that combine flexibility, transparency and collaboration.

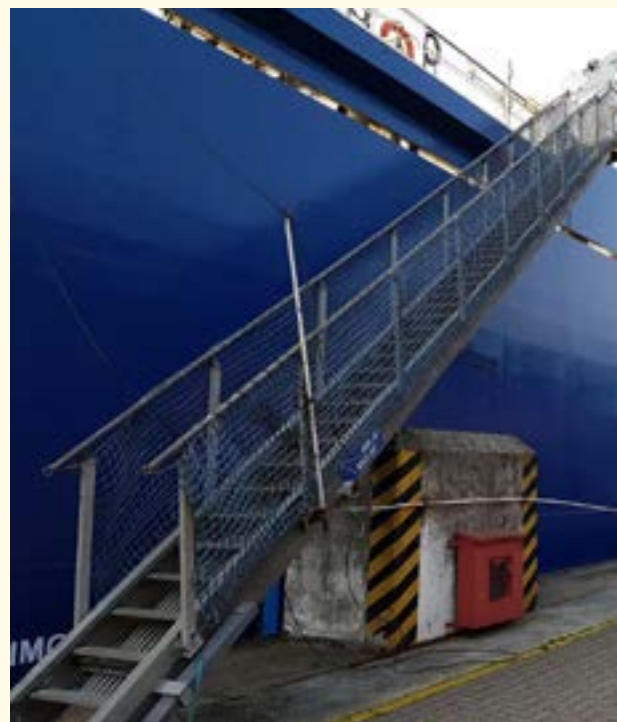
The path to decarbonization is not linear. Neither is regulation, fuel availability or market demand. Progress does not require perfect clarity – it requires momentum grounded in data, integrated planning and disciplined capital allocation.

The industry has reached a point where waiting for certainty carries greater risk than acting with foresight. Those best positioned will be the ones who invest in efficiency today, design for adaptability tomorrow and treat partnership, data and lifecycle planning as core strategic assets – not secondary considerations.

In 2026, progress means moving early and moving wisely so that today's choices keep tomorrow's options open.



Understanding the updated IMO embarkation and disembarkation guidelines



A gangway refers to a platform, a walkway or a ramp connecting the ship to land or other vessels and is used as a means of safe access for the crew. The gangway must be properly rigged and maintained to prevent accidents or injuries and to counter the movement from tidal streams, swell, cargo operations and surge movements caused by ships in the vicinity.

LEGISLATION

Accommodation ladders and gangways fitted on ships before 01 July 2026 on board ships constructed on or after 1 January 2010, should, to the extent possible, adhere with the IMO circular MSC.1/Circ.1331, Rev.1 – IMO “Revised Guidelines for Construction, Installation, Maintenance and Inspection of means of Embarkation and Disembarkation”. This circular should be referred to in conjunction with the Safety of Life at Sea (SOLAS) regulation II-1/3-9 (Means of Embarkation on and Disembarkation from Ships).

ARRANGEMENTS

Always ensure that each accommodation ladder is long enough. Even when tilted at its steepest working angle, its lowest platform must stay less than 600mm above the waterline, even when the ship is empty and at its lightest.

Moreover, the arrangement for the gangway should allow direct access between the ladder and the landing at the ship's deck. The platform should be securely guarded by handrails and adequate handholds.

When the gangway overhangs the water in port, a net or suitable protection should be provided to prevent personnel from falling.

CAUTIONARY NOTE

The maximum and minimum permissible designed angles of inclination, design and maximum load on the bottom end plate should be clearly displayed on each side of the gangway. Personnel embarking on the gangway should be aware of the maximum number of persons allowed on the gangway at any one time to avoid overloading. Additionally, if the maximum operational load differs from the design load, this distinction should be noted on the marking plate.

GANGWAY OPERATIONS

The ship must actively engage with the local authorities, as they may interpret and enforce varying safety requirements related to secure methods of access. Accidents may occur while rigging the gangway, whether during the setup of stanchions or side ropes, especially when the gangway is overhanging the side, and the crew is working at height. Many ships now feature a gangway safety wire to which safety harnesses can be attached to, or they have fall inertia blocks, allowing for greater freedom of movement. Crew members' safety harnesses should have a slightly taut safety line, rather than being fully slack. This slight tension can help prevent crew members from landing abruptly in the event of a fall, reducing the risk of severe injuries.

If the vessel is doing a ship-to-ship (STS) operation, the gangway should not be placed on a bulwark or on the side railing of the vessel, unless these structures are designed to have sufficient strength and can support the weight of the gangway.

As part of the installation process, a lifebuoy equipped with a self-igniting light and a buoyant line should be available for immediate use in the vicinity of the embarkation and disembarkation area.

Furthermore, it can sometimes be difficult when positioning the gangway on the pier, especially when there are bollards or other fixtures on the wharf. In such cases, all kinds of extensions, extra steps, small gangways, or portable walking bridges may be used to connect the gangway with the quay side. If these solutions are required, a risk assessment should be carried out and the solution approved by the master and in some cases, you may obtain class approval.

GANGWAY SECURITY

To effectively deter a stowaway, the vessel should conduct a thorough risk assessment to systematically address all the vulnerabilities on board and manage the likelihood of any security threats. Often, the gangway serves as the first line of defence against stowaways boardings and is regarded as the primary deterrent to stowaway incidents.

To implement the Ship Security Plan (SSP) and comply with the International Ship and Port Facility Security (ISPS) Code, ship crew members typically restrict access to the vessel to a single focal point – the gangway. They secure and lock all other unauthorised entry or exit points. The gangway becomes the primary access point, where the crew controls boarding and conducts security checks and routine inspections of baggage before allowing anyone on board.

Stowaways may sometimes attempt to gain access to the vessel by disguising themselves as stevedores walking up the gangway. Therefore, gangway access should be a priority and should be placed under round-the-clock watchful eyes of gangway watchkeepers to check the visitor's photographic identification (ID). The Ship Security Officer (SSO) should verify visitors against the anticipated visitors list. If any unexpected visitors arrive, the SSO can identify them and take measures to prevent potential

stowaway incidents. Additionally, conducting a practical headcount helps the SSO track the number of visitors on board at any time.

Prevention is the primary strategy, but the security level at individual ports may require a combination of watchkeepers, shore-based security personnel, or gangway watchmen, especially at high-risk locations. Therefore, vessel operators should confirm requirements with local regulators and adapt to the specific demands of each port. Furthermore, adequate lighting at night is also crucial for gangway watchkeepers to monitor approaching small crafts or inconspicuous visitors. In practical terms, vessels may raise the gangway during low tides or when they have a low freeboard, if permitted by the port authority, to prevent unauthorised boarding.

While gangway watchkeepers stationed at the gangway could significantly reduce the risk of stowaways, it is also essential to recognise that security extends beyond the gangway. A more comprehensive approach, following the recommendations of IMO's Resolution FAL.13(42) – Revised Guidelines on the Prevention of Access by Stowaways and the Allocation of Responsibilities to Seek the Successful Resolution of Stowaway Cases, may be adopted.

POTENTIAL HAZARDS

Potential gangway hazards include:

- Loose handrails
- Insufficient lighting
- Wet and slippery surfaces
- Unsecured gangway netting
- Poorly positioned nets
- Falling off gangway or ladders
- Movements of the gangway
- Being struck by moving materials

SAFETY TIPS AND BEST PRACTICE

Here are some potential practical safety tips and best practice recommendations when using gangways:

- The gangway should be free from repair and attention should be paid to areas where there are aluminium to steel connections. The absence or deterioration of

- an insulating gasket can lead to electrolytic corrosion, which will cause wastage and weakening of the gangway structure.
- The gangway should be inspected regularly to ensure it is in good condition and free from defects.
- The gangway should be maintained as per the vessel's planned maintenance system to allow early detection of defective moving parts and ensure it is kept in good condition.
- The gangway should be secured to the ship to prevent it from moving or slipping.
- The gangway should be trimmed correctly to ensure that it is level and not inclined at an excessive angle. It should not be greater than 30°, nor should it exceed the maximum permitted design angle of inclination, as indicated on the marking plate.
- The gangway should be clearly marked with the safe working load to forewarn personnel boarding the gangway and ensure it will not be overloaded.
- The gangway should be illuminated adequately to ensure it is visible and safe to use at night.
- The gangway should be kept clear of obstructions to provide a safe passage for users.
- The gangway should have handrails on each side to provide support and prevent falls.

- The gangway should only be rigged by authorised personnel who have received training on gangway operations.
- Crew should always wear a safety harness and lifejacket while rigging a gangway.
- The gangway should be used with caution, especially when carrying heavy or bulky items which may affect its balance and stability.
- Crew should always wear proper footwear that provides good traction and grip to prevent slips and falls.
- The gangway should be inspected regularly by the officers on duty or gangway watchmen.
- All visitors should be verified against their photo ID and the visitor list.
- A proper headcount should be carried out to determine the number of visitors boarded.
- A risk assessment should be completed prior to rigging and the gangway secured as per the company's safety management system, SSP and the provided checklists.
- The master should engage with the port authority or terminal representative to discuss the placement of the gangway, ensuring that the available landing area is sufficient to allow for surge movements or the rise and fall of the tide.





Embarkation and disembarkation come under PSC scrutiny

Analysis of global Port State Control (PSC) inspection data over the last 36 months shows that deficiencies related to embarkation and disembarkation arrangements remain widespread across the industry. Safe access arrangements remain among the clearest indicators of a vessel's overall safety culture. Crew and shore personnel use the gangways, accommodation ladders, pilot ladders and embarkation platforms to safely embark or disembark.

Failures in these arrangements can lead to serious injuries, fatalities, operational delays, detentions and reputational damage. For this reason, Port State Control (PSC) authorities worldwide continue to pay close attention to embarkation and disembarkation means during inspections.

PSC figures confirm that access equipment is not only a routine maintenance matter, but a critical safety issue directly linked to the prevention of accidents. The data also demonstrates that deficiencies affecting safe access arrangements continue to generate detainable conditions across multiple inspection regimes.

Recurring deficiencies identified during inspections

Several PSC inspection reports over the period illustrate the nature of recurring problems identified onboard cargo vessels.

Common findings include:

- damaged or wasted accommodation ladders
- cracked gangway welds
- missing securing bolts
- deteriorated handrails
- defective pilot ladder steps
- damaged man ropes
- improperly secured pilot ladders
- inadequate embarkation lighting

Particularly concerning are cases where PSC officers identified severe structural deterioration or unsafe operating conditions. Examples include gangways with significant cracks at turning platform connection points, pilot ladder ropes showing signs of dry rot, and pilot ladder winch reels missing brakes or locking arrangements.

In several cases, vessels were unable to provide valid pilot ladder certificates or evidence of compliance with testing intervals. Other deficiencies revealed poor operational practices, including safety nets rigged incorrectly, stanchions not secured with safety pins, and pilot ladders attached to non-approved strong points.

From maintenance issue to serious safety hazard

Such deficiencies expose both seafarers and shore personnel to significant risk. Pilot transfer operations are especially sensitive because they frequently take place in adverse weather conditions, darkness or congested traffic areas.

A single failure involving a ladder step, side rope or securing arrangement can result in a fall from height directly into the sea or onto the ship's side structure. Similarly, defective gangways and accommodation ladders may cause injuries during cargo operations or crew changes, particularly where corrosion, poor maintenance or improper rigging practices are present. Beyond the immediate safety implications, such incidents may also lead to operational disruption, vessel detention, commercial impact and reputational damage for operators.

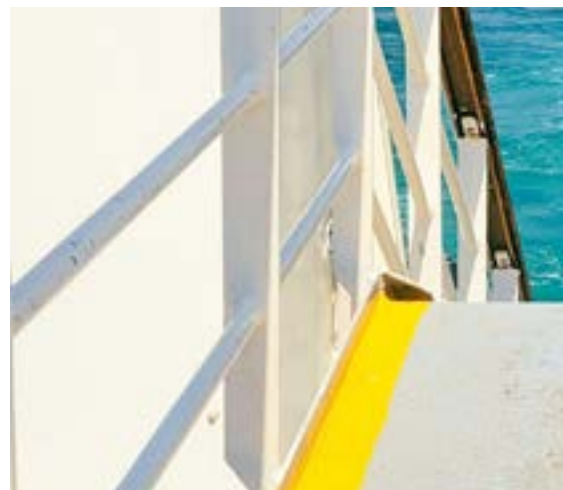
New IMO requirements expected to intensify PSC focus

The importance of this issue is expected to increase further with the implementation of IMO Resolution MSC.576(110), which introduces more stringent requirements related to pilot transfer arrangements and associated equipment.

The amendments strengthen expectations regarding:

- design standards
- maintenance
- inspection routines
- marking and identification
- operational readiness
- equipment traceability

PSC officers are expected to apply closer scrutiny to compliance documentation, equipment condition and crew familiarity with proper rigging procedures. Under the forthcoming requirements, ship operators will need to demonstrate not only that equipment is certified, but also that it is properly maintained, traceable and fit for safe operational use at all times.



Particular attention is likely to be given to:

- pilot ladder identification and certification
- replacement intervals
- maintenance records
- winch operational condition
- securing arrangements
- compatibility between pilot ladders and accommodation ladders used in combination arrangements

Practical compliance expectations onboard

In addition to IMO requirements, practical compliance and operational readiness will become increasingly important during PSC inspections.

PSC officers are expected to verify:

- the physical condition of embarkation equipment
- evidence of maintenance and inspection routines
- testing intervals and records
- correct rigging arrangements
- proper securing points
- operational condition of winches and brakes
- availability and condition of safety nets
- adequate lighting arrangements
- crew familiarity with rigging and transfer procedures

Increasing emphasis is also expected on equipment traceability, including serial numbers, certification records and replacement history for pilot ladders and associated equipment.

Best practices to reduce PSC exposure

The following actions are strongly recommended to reduce PSC findings related to embarkation and disembarkation arrangements:

Inspection and maintenance

- Conduct frequent inspections of gangways, accommodation ladders and pilot ladders, with particular attention to corrosion, cracks, wastage, loose fittings and damaged welds.
- Verify that all pilot ladder steps, spreaders, side ropes and man ropes remain in good condition and free from wear, dry rot or deformation.
- Test gangway and accommodation ladder winches regularly, including brakes, locking devices and emergency stopping arrangements.
- Include embarkation and disembarkation arrangements within planned maintenance systems and defect reporting procedures.

Documentation and traceability

- Ensure pilot ladders are correctly marked, certified and traceable to onboard records.
- Verify that service records correspond with serial numbers and identification plates.
- Confirm that pilot ladders remain within required testing and replacement intervals.

Operational readiness

- Verify that all stanchions, handrails and securing pins are properly fitted and effectively secured before use.
- Ensure safety nets are rigged correctly beneath gangways and accommodation ladders in accordance with regulations and company procedures.
- Maintain adequate lighting at embarkation and disembarkation stations during hours of darkness.
- Verify that pilot ladders are secured only to approved strong points and rigged in accordance with SOLAS requirements and IMO guidance.

Crew training and familiarization

- Conduct regular crew training and familiarization regarding proper rigging, inspection and operational checks for pilot transfer arrangements.
- Encourage senior officers to perform pre-arrival checks before pilot boarding operations and PSC inspections.

Early implementation of new IMO requirements

Arrange the early implementation of IMO Resolution MSC.576(110) within Safety Management System (SMS) procedures.

Conclusion

PSC statistics clearly show that deficiencies related to embarkation and disembarkation means and procedures continue to occur at high levels throughout the industry.

Beyond the risk of detention or commercial impact, unsafe embarkation and disembarkation arrangements present a direct threat to human life.

As IMO requirements become more demanding under MSC.576(110), ship operators must ensure that maintenance standards, crew awareness and inspection practices evolve accordingly.

Well-maintained, fully compliant and properly operated access arrangements will not only reduce PSC exposure, but most importantly help protect the lives of everyone required to board or leave a vessel.

Keep in mind that:

Accommodation ladders and gangways, including associate winch and fittings, should be properly maintained and inspected at appropriate intervals as required by SOLAS regulation III/20.7.2, in accordance with manufacturers' instructions.





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IIMS Past President shares an update on the Tall Ships Youth Trust >

I am pleased to share an update on the Tall Ships Youth Trust, the IIMS President's chosen charity for 2022. Kirsty French, Director of Youth Development & Outdoor Learning, has kindly provided the following update.

Expanding Capacity, Creating Pathways

What the Tall Ships Youth Trust's Fifth Challenger yacht means for the maritime sector

For 70 years, TTSYT has used life at sea to develop confidence, capability and ambition in young people across the UK. Founded in 1956 as the Sail Training Association, the charity has evolved alongside the maritime sector itself, maintaining a clear focus on youth development and outdoor learning while increasingly supporting skills progression and career pathways at sea.

Adding a fifth Challenger yacht to TSYT's offshore fleet is not simply about expanding the number of vessels. It represents a practical investment in increased sea days, strengthened operational resilience and long-term workforce development at a time when the maritime industry is facing well-documented skills shortages.



Peter Board, IIMS Past President, shares an update on the work of the Tall Ships Youth Trust (TSYT), the charity he supported when in his role between 2022-2024.



The Challenger platform: built for learning offshore

TSYT's Challenger yachts are 72-foot ocean-going vessels originally designed for the BT Global Challenge. Their robust construction, straightforward but demanding systems, and watch-based operation make them exceptionally well suited to experiential learning offshore.

Life onboard a Challenger requires teamwork, watchkeeping discipline, practical seamanship and effective communication in a way few classroom-based environments can replicate. Participants are actively involved in sail handling, helming, navigation, safety routines and daily maintenance, gaining exposure to the realities of operating a commercial-standard vessel at sea.

For young people, many of whom arrive with no prior sailing experience, the platform provides an accessible but authentic introduction to offshore operations. For the maritime sector, it offers a proven training environment where aptitude, resilience and leadership potential quickly become visible.

Why a fifth vessel matters

During the main sailing season, TSYT's Challenger fleet operates at near capacity. Demand for youth development voyages, progression sailings and skills-focused programmes consistently exceeds availability.

The introduction of a fifth yacht directly addresses this constraint by:

- Increasing annual sea days, allowing more concurrent voyages;
- Reducing waiting times for partner organisations and returning participants;
- Supporting progression pathways, enabling participants to move from introductory experiences to roles with greater responsibility onboard;
- Improving operational resilience, allowing more effective maintenance rotation and crew development without reducing delivery.

In practical terms, this means more young people gaining meaningful offshore experience each year, and greater scope to deliver structured progression rather than one-off interventions.

From youth development to industry pathways

TSYT's core purpose remains youth development and outdoor learning, with a strong focus on young people facing disadvantage. However, the outcomes increasingly align with the needs of the modern maritime workforce.

Participants develop competencies directly relevant to employment at sea and beyond: situational awareness, problem-solving, teamwork under pressure, leadership and accountability. Many go on to pursue further qualifications including RYA certifications, STCW basic safety training and commercial endorsements.

A growing number of former participants progress into professional sailing, commercial yachting, maritime





apprenticeships, the Armed Forces and wider marine industries. Importantly, Challenger yachts offer an environment that, in practice, mirrors commercial watchkeeping structures and operational standards, helping to bridge the gap between youth experience and professional expectation.

Industry collaboration and shared responsibility

The acquisition of the fifth Challenger yacht has been made possible through the support of partners who recognise the link between youth development and the long-term health of the maritime sector. Contributions from organisations including the Worshipful Company of Shipwrights have played an important role in bringing Challenger 5 into service, reflecting a shared commitment to widening access and investing in the next generation of maritime talent.

TSYT also works directly with commercial partners who sponsor voyages, volunteer professional expertise, or charter vessels for their own team development. These collaborations allow businesses to support young people while also engaging their own staff in meaningful, skills-based experiences afloat.

Together, these partnerships demonstrate how charitable sail training can complement industry priorities - developing future talent while reinforcing the professional values that underpin safe and effective operations at sea.

Looking ahead

As TSYT looks beyond its 70th anniversary, the fifth Challenger yacht will be central to delivering its mission at scale. It enables not only greater reach, but greater consistency and quality, supporting more structured progression, deeper industry links and clearer pathways into maritime careers.

Every voyage remains, at its heart, a personal journey for the young people onboard. Collectively, however, these experiences contribute to something broader: a more confident, capable and engaged generation with the skills and ambition to sustain the future of the maritime sector.

For industry professionals, organisations and institutions, the message is clear: investing in platforms that develop people offshore is not only a social good, but a strategic one.

It is clear that TSYT continues to go from strength to strength, helping young people enter the marine environment in a safe and professional manner. The programmes give them solid foundations for becoming competent mariners, and for those who choose to pursue it, a clear pathway into a professional marine career. The purchase of a fifth Challenger yacht is a wonderful addition to their fleet and significantly expands their training capacity.

**For more information
about the Tall Ships
Youth Trust and the
outstanding work they
do, please visit
<https://tallships.org/>**



Read the IIMS News Bulletin

A monthly publication by the International Institute of Marine Surveying



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A Day in the Life of **Jason Caple**



Jason checking engine details

In this edition's "A Day in the Life of..." feature, Mike Schwarz interviewed the IIMS Canadian Branch Secretary, Jason Caple and posed a series of questions.

Q1. As you know, most marine surveyors fall into the career as there is no obvious mapped out pathway into the sector. What is your backstory?

My journey started in Western Australia. My father was Chief Engineer on the Fremantle tugs. While most ten-year-olds were kicking footballs, I was happily disappearing into engine rooms,

crawling through bilges, opening seacocks, helping with pre-start checks, and generally getting in everyone's way while learning far more than I probably realised at the time. Looking back now, those noisy, oily engine rooms were where my education really began.

That early exposure naturally led me into an apprenticeship as a Fitter and Machinist. Over the following

years I worked on a variety of vessels across the Western Australian marine industry, from refitting bulk carriers and submarines to building high-speed passenger ferries. Every project presented a different challenge, and every vessel taught me something new. I already knew that if it floated, I was destined to work on it.

Marine surveying has given me something I never expected; the

freedom to work almost anywhere in the world while still being surrounded by the boats, people and engineering. Today I call beautiful British Columbia home, and I still don't really think of what I do as a job. It's a lifestyle, one that combines decades of practical experience with continuous learning, problem-solving, and the privilege of helping owners understand and care for their vessels.

When I look back, the route seems almost obvious. From a ten-year-old crawling around tugboat engine rooms to a marine surveyor inspecting vessels on Canada's west coast, every stage of the journey built on the one before it.

Q2. Typically, what types of surveys do you conduct and what is the most satisfying aspect of the job for you?

No two days are ever the same, and that's one of the things I enjoy most. My work is primarily focused on pre-purchase surveys, insurance condition and valuation surveys, damage assessments, and consultancy work on a wide range of vessels, from recreational craft through to commercial boats. Every vessel has its

own story, and every survey presents a different set of challenges.

What I enjoy most isn't necessarily finding problems; it is knowing that I've given my client the information they need to make an informed decision. Sometimes that means confirming they've found the right boat and can proceed with confidence. Other times it means identifying issues that save them from making an expensive mistake.

I have always believed that a survey is far more than simply completing a checklist. It is about applying decades of practical experience, asking the right questions, and looking beyond the obvious. I don't believe in rushing through a job because someone is waiting for a report. Every vessel deserves the same level of attention.

For me the satisfaction comes at the end of the process. After spending long hours crawling through engine rooms, inspecting inaccessible spaces, testing systems, documenting findings and writing detailed reports, I know that I've done everything possible to give my client an accurate picture of their vessel. At the end of the day, my reputation is attached to every survey I produce.

Q3. How important is keeping up to date with new technology and how fearful are you of AI, remote surveys and the onslaught of similar technological challenges that might affect your role?

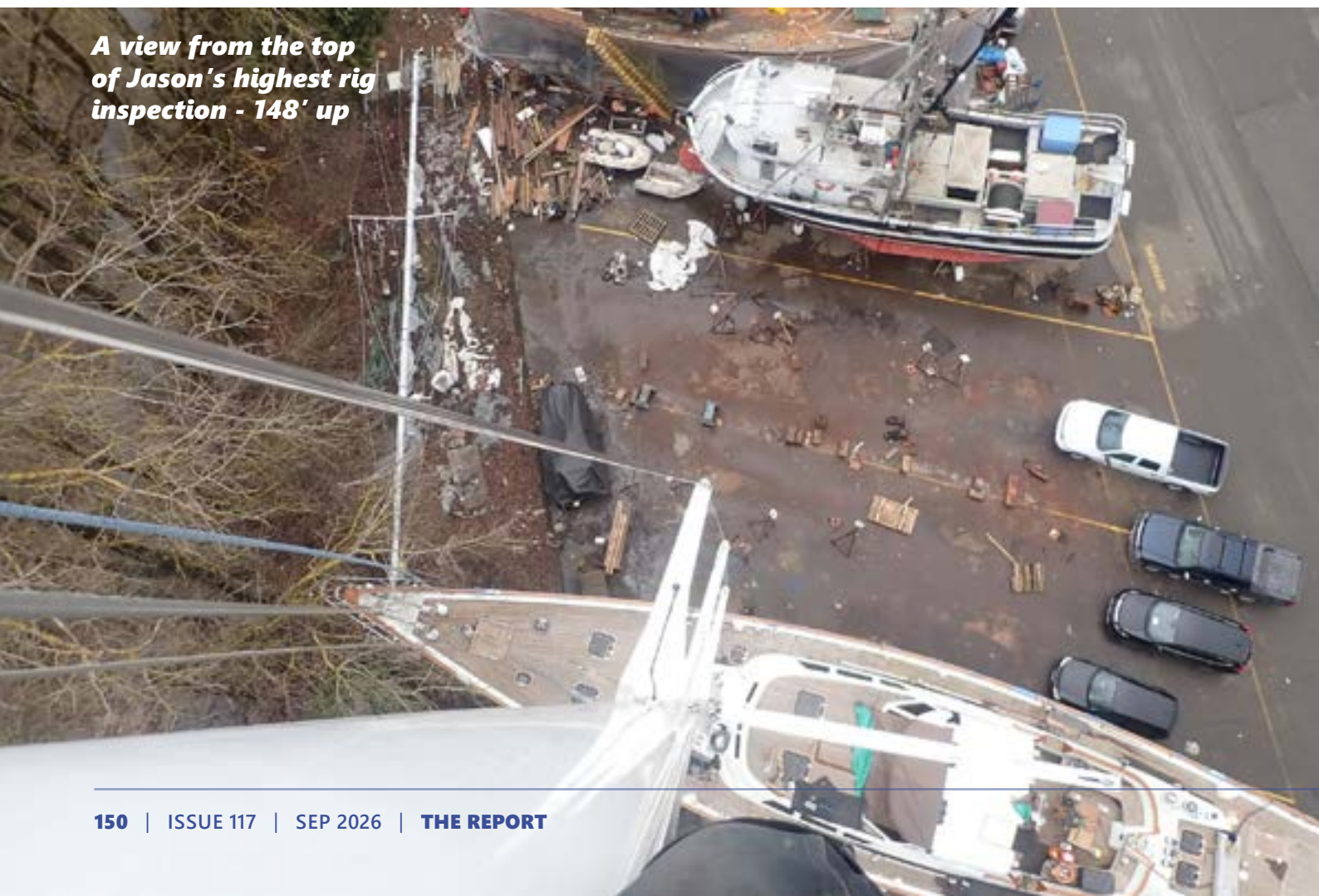
Technology has always been a part of the marine industry. From the days of hand-drawn plans and paper charts through to thermal imaging, drones, moisture meters and digital reporting. I saw how quickly technology entered the marine industry, especially when I was in the superyacht sector.

Am I fearful of AI? Not in the slightest.

I use AI almost every day. It's an extremely useful research tool, a great sounding board for developing ideas, and incredibly useful when it comes to refining technical reports, organising information or helping communicate complex subjects in a simpler non-jargon way. However, like any tool, its output is only as good as the person using it. I always verify what it gives me because AI can still be wrong.

One thing I am sure of is that a marine survey is not simply a collection of data points that can

A view from the top of Jason's highest rig inspection - 148' up





Jason doing a battery load test

be analysed remotely. It's about walking around a vessel, opening lockers, crawling into engine spaces, smelling areas where there shouldn't be mysterious smells, spotting the slight distortion in a hull, hearing an unusual bearing noise, or noticing a tiny crack.

I don't believe technology will totally replace experienced marine surveyors any more than sophisticated medical software has replaced doctors or ECDIS has replaced experienced captains. It's changing how we work, making some tasks more efficient and undoubtedly removing some of the time-consuming administrative aspects, but it cannot replace onsite professional judgement, practical experience and accountability.

Q4. I had the pleasure of attending the IIMS Canada Branch Conference in Hamilton last autumn. What are your lasting memories of that event, and did you feel it made an impact?

Without a doubt, it made an impact.

I must admit that I didn't experience the conference in quite the same way as most of the delegates. While everyone else was listening to presentations and networking over coffee, as the IIMS Canadian Branch Secretary, I had the unenviable task of keeping the live Zoom stream functioning. With limited experience of managing a hybrid conference, there were certainly a few moments where I wondered if technology was going to win. Thankfully, it didn't, and (I must mention with the help of Mike), we pulled it off.

The Canadian Branch has a fantastic mix of surveyors from very different backgrounds. There are people with decades of commercial shipping experience, yacht specialists, naval architects, insurance experts and independent surveyors, all bringing different perspectives to the same profession. It's easy to spend most of your working life on your own, so having everyone together in one room created a great and memorable experience.

One of the biggest takeaways for me was hearing everyone's own stories of what they have encountered in the industry. Marine surveying isn't a profession where anyone knows everything. Every surveyor has encountered something unusual, solved a difficult problem or learned a valuable lesson the hard way. The conference was the perfect environment where people were happy to share those experiences.

Having Mike Schwarz attend and speak also reinforced that the IIMS isn't just an organisation with members scattered around the globe - it's a genuinely connected professional community.

Q5. Transport Canada spoke at that Conference in glowing terms about IIMS and its Canadian surveying members. There is a suggestion that IIMS members could become part of a national inspection programme going forward. Indeed, you have mentioned the concept of a National Registry of Marine Surveyors. How could this work?

I certainly believe this could be a significant development for the marine surveying profession in Canada, but it won't happen overnight.

Unlike many other professions, there is currently no nationally recognised pathway to becoming a marine surveyor in Canada. We come to the profession from incredibly diverse backgrounds.

From what I see the challenge is that it can be difficult for regulators, insurers and the public to distinguish between someone with decades of relevant experience and someone who has simply decided to print "Marine Surveyor" on a business card.

That is where I believe a National Registry of Marine Surveyors could make a real difference.

In my view, a registry should never be about creating barriers to entry or limiting competition. Instead, it should provide a recognised benchmark of professionalism, competence and accountability. So, in a national registry, surveyors could demonstrate appropriate qualifications, relevant industry experience, continuing professional development and adherence to a recognised code of ethics. Being listed in a national registry would give clients confidence that the person inspecting their vessel has met nationally accepted standards.

This could be beneficial for Transport Canada. There is already a pool of experienced, independent professionals working across the country. A structured system could allow suitably qualified surveyors to undertake specific inspection or compliance functions on behalf of the regulator, while remaining independent in their professional judgement. This is already a standard in other areas of the marine industry, where recognised organisations and accredited professionals work alongside government to achieve common safety objectives.

Of course, making something like this work will be a challenge. Transport Canada, organisations such as the IIMS, insurers, boat builders, brokers and surveyors themselves would all need a seat at the table. Clear standards, transparent accreditation processes, ongoing training and oversight would be essential.

A National Registry would elevate the standing of the marine surveying profession. It would encourage higher standards, promote continuing education, provide clearer career pathways and give boat owners confidence that they are engaging a recognised professional. It would also help address one of our industry's greatest challenges - attracting and developing the surveyors who will replace many of today's experienced practitioners as they retire.

Will it be easy? No! There is an abundance of practical, administrative and legislative hurdles to overcome. But every profession reaches a point where it needs to ask how it wants to evolve. I believe marine surveying in Canada has reached that point.

6. Apart from sometimes having to travel long distances, what are the key challenges facing marine surveyors in Canada?

For me, the answer is simple - the weather.

Canada is an incredible place to work, but Mother Nature has a habit of reminding you who's really in charge. I've carried out surveys in temperatures well below freezing, standing in four feet of snow with icy winds coming off the water, trying to inspect a boat while wondering if I'd ever feel my fingers or toes again. It's amazing how difficult it is to concentrate on the finer details of a survey when your hands have gone completely numb!

Unlike many parts of the world where marine surveying is a year-round outdoor activity in relatively mild conditions, Canadian surveyors often must contend with snow, ice and prolonged freezing temperatures. Boats are shrink-wrapped, covered in snow or frozen solid in the yard, making access difficult and sometimes preventing a complete inspection. Ironically, that's when experience becomes even more important. Cold weather has a way of encouraging people to rush.

Of course, geography presents its own challenges as well. Canada is a vast country, and travelling to survey vessels can involve long drives, ferry crossings or flights to remote communities. Despite those challenges, I wouldn't change it.

Working across Canada's diverse waterways means one week I could be inspecting a yacht on the Pacific coast, the next a commercial vessel in a remote community, and another in a frozen boatyard where the biggest challenge is keeping the moisture meter warm enough to function.

Q7. We often speak of a shortage of younger people being attracted to the marine surveying profession. What role can IIMS Canada play in promoting the profession and how important is mentoring?

I think marine surveying has a visibility problem rather than an attraction problem. Ask most people in the marine industry what a marine surveyor does, and they'll have a rough idea. Ask them how to become one, and you'll absolutely be met with a blank stare.

The IIMS is in an ideal position to promote marine surveying as a rewarding and respected profession, not only to young people entering the industry but also to experienced engineers, masters, naval architects, shipbuilders and superyacht professionals who may be looking for a shore-based career later in life. Many of these people already possess the technical knowledge and practical experience that make excellent surveyors - they simply don't know that pathway exists.

Mentoring is just as important as recruitment. I've been fortunate throughout my career to learn from people who were willing to share their knowledge, whether it was in shipyards, engine rooms or aboard yachts. The trickier part I see is as experienced surveyors retire, we need to ensure that their knowledge is passed on rather than walking out the door with them.

The IIMS can play a pivotal role by creating opportunities for experienced surveyors to mentor those entering the profession, encouraging practical learning alongside formal education and fostering a culture where asking questions is seen as a strength rather than a weakness.

Q8. What is your best advice to someone thinking about becoming a marine surveyor?

If you're thinking about becoming a marine surveyor, my first piece of advice is simple - If the thought is there, start now!

Professional accreditation doesn't happen overnight. Whether you're working towards IIMS membership or another recognised surveying qualification, it takes years to build the experience, complete the training and progress through the various membership grades. The sooner you



begin, the sooner you'll start building both your qualifications and your professional reputation.

My second piece of advice is to be patient.

When you first start out, don't expect your phone to ring off the hook. Like any professional service, surveying is built on trust, and trust takes time to earn. Every survey you complete, every report you write and every client you help contributes to your reputation. Before long, people begin recommending you, brokers start calling, insurers know your name, and opportunities begin to snowball.

Most importantly, never stop learning.

Finally, remember that your name appears on every report you sign. Your integrity and your reputation are your greatest assets. Be thorough, be objective, and never let client or commercial pressure influence your professional judgement. Clients may not remember every detail of your report, but they will remember whether they trusted you.

Oh, and be ready to answer endless questions and remember to say, "I Don't Know".

Q9. Have you got a strange, funny or bizarre story that happened on survey to share?

Oh, my goodness... where do I start?

Back in February 2019, I received a call from the environmental authorities asking me to inspect a vessel that had broken free from its mooring and run aground somewhere on the West Arm of Kootenay Lake. At the time I was the only marine surveyor for well over a hundred miles.

The concern was straightforward enough - to determine whether the grounded vessel was leaking fuel or oil into the lake, which is an environmentally sensitive area.

Simple enough... or so I thought.

This happened just after one of Nelson's biggest snowfalls of the winter. I drove along the West Arm searching for the boat and eventually spotted it lying on its side... on the opposite shore.

Challenge No. 1:

There wasn't a road to reach it.

After studying a map and working out the best approach, I headed home, dug out my cross-country skis and winter gear, and drove to the furthest point I could reach on the opposite side of the lake.

Challenge No. 2:

The road ended.

So, like any dedicated marine surveyor (or perhaps slightly mad one), I strapped on my skis and headed along the snow-covered railway line towards the stranded vessel.

Eventually I reached a point where I could see the boat.

Challenge No. 3:

I still wasn't there.

Between me and the boat lay waist-deep snow covering what I could only assume was somebody's field. To this day I have no idea what was underneath because everything was buried. So, abandoning the skis, I waded through the snow, eventually reaching the shoreline and the casualty.

After digging away enough snow to climb aboard, I completed the inspection and was relieved to find that, despite its rather unfortunate parking position, the vessel wasn't leaking fuel or oil into the lake.

Mission accomplished, or so I thought.

My report had to explain not only the condition of the vessel but also exactly how I'd reached it. I thought nothing of it and documented the journey as part of the report.

A few days later, the lady who had commissioned the inspection called me from Victoria. Now, anyone who knows British Columbia knows that winter in Victoria is very different from winter in the Kootenays. While we were digging ourselves out from several feet of snow, Victoria

was probably celebrating the arrival of a whole centimetre.

She had read my report and rang simply to confirm one thing.

"Did you really ski to the boat?"

When I explained that skiing had only got me part of the way and that I then had to wade through waist-deep snow to reach it, there was a long pause before she laughed and said, "That certainly wasn't what I was expecting to read."

People often think marine surveying is about inspecting boats. Sometimes it is. Other times it's about figuring out how on earth you're actually going to get to them.

10. The marine surveying business can be a lonely one as many work in isolation. How do you cope with lone work, and do you have any advice for those who struggle?

I've never really struggled with working alone. In fact, I quite enjoy it.

A good survey demands concentration. Working alone allows me to stay focused and maintain a logical inspection process without unnecessary distractions.

Ironically, I often find the biggest challenge isn't solitude - it's company.

Owners, buyers and brokers naturally want to be involved, and that's completely understandable. Purchasing a boat is a significant investment, and owners are passionate about their vessels. They often have questions, opinions and stories to share, all of which can be valuable. The challenge is balancing those conversations with the need to remain focused on the inspection itself.

Anyone who has carried out surveys for a while will know how easy it is to be interrupted halfway through inspecting a system, only to spend the next ten minutes discussing the owner's latest upgrades or the buyer's plans for cruising. Before long, you're trying to remember exactly where you left off.

That said, not everyone enjoys working on their own. Marine surveying can be an independent profession. For me, though, the best results come from giving the vessel my undivided attention first and discussing the findings afterwards.

Q11. Tell me something about the location in which you live and work. What do you like most about your 'backyard'?

I consider myself incredibly fortunate to live and work in British Columbia. They don't call it "Beautiful British Columbia" for nothing.

One of the things I love most about this part of the world is the variety. One day I might be surveying a vessel in a busy marina, and the next I could be travelling through remote coastal waters surrounded by mountains, forests and wildlife. The scenery is spectacular, but it is the feeling of being somewhere truly unique that makes it special.

There is also something special about the connection between the people and the water here. Boating is not just a hobby for many British Columbians; it is a way of life. The coastline, islands and waterways are part of everyday living, and you meet passionate boat owners who have incredible stories about their vessels and adventures.

I still find myself occasionally looking around and thinking how lucky I am. The view from the office is certainly different from most workplaces - and sometimes the commute involves a boat, a mountain road or a ferry. That's not a bad way to spend a working life.

Q12. And finally, all marine surveyors need a release from what can be a demanding profession - perhaps a hobby or pastime once the work is done. What do you enjoy doing to recharge your batteries?

For me, the answer probably won't surprise anyone - I go sailing (racing).

After spending my entire life around boats, the water is still where I feel most relaxed. There is something about stepping aboard a vessel with no survey report to write, no checklist to complete and no deadline waiting at the end of the day that completely changes the experience. Sailing (racing) allows me to enjoy boats purely for what they are meant to be and the fact it's someone else's makes it even better that I have no vested interest other than getting across the finish line as quick as possible.

When summer arrives, I also try to get away camping whenever the opportunity presents itself. British Columbia is an incredible place to explore, and getting out into the wilderness is a great way to disconnect from emails, reports and the constant demands of running a business.

I think having that work life balance is important in surveying. You're often dealing with significant financial decisions, complex technical issues and clients who rely heavily on your judgement. Having something outside of work that allows you to switch off is absolutely essential.

Jason's regular Sunday out - racing around the cans at SNSYC (Sidney North Saanich Yacht Club) with Mt Baker in the background



Jason and his wife (who is blind) on the west coast of Vancouver Island



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