



AUSTRALASIAN INSTITUTE  
OF MARINE SURVEYORS

# Shipshape

December 2025



**Bulk carrier safety, efficiency  
reshaped by new rules, tools**

**YEAR'S END A TIME TO REFLECT**

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# Shipshape

December 2025

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**Front Cover:** New rules and tools are reshaping bulk-carrier safety and efficiency. In an article beginning on page 18 , Morten Løvstad explains how.

**Back Cover:** Trawlers from northern Australian waters awaiting their annual refits in Cairns.



*A time to reflect. (Page 5.)*



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## ADVERTISING AVAILABLE

Advertising is now available in *Shipshape*, the official journal of the Australasian Institute of Marine Surveyors (AIMS). For all the information about advertising in our quarterly magazine, contact AIMS CEO Eric Perez at [gm@aimsurveyors.com.au](mailto:gm@aimsurveyors.com.au) or on +61 492 881 737.

# DRIVING INDUSTRY CHANGE: Collaboration within and across borders



*Years of Operation*

2026



# AIMS Conference

**Fremantle Sailing Club,  
Thursday 7 & Friday 8 May 2026**

# A time to reflect on achievements and highlights

THE approach of our 40<sup>th</sup> year as the peak body representing marine surveyors in Australia provides me with an opportunity to reflect on the achievements and highlights of the past 12 months as Chairman.

At the beginning of the year, in conjunction with fellow Board members and our CEO, Dr Eric Perez, a five-year strategic plan was developed to assist in guiding AIMS along a path of growth.

This plan was based on four pillars: Partnerships and affiliations; Building the membership base; Business development, marketing and promotion; and Professional development and standards. It sets AIMS up to continue to make its members relevant in the marine industry and continue to ensure a level of professionalism that is both expected and demanded.

During the last year, AIMS has formed an alliance with WISTA – the Women’s International Shipping and Trading Association Australia.

Working with WISTA allows AIMS to provide women, inside and outside the world of shipping, an opportunity to gain an insight into what a marine surveyor does and allows AIMS to tap into a large potential pool of future surveyors.

AIMS continued its push into the recreational space by forming an alliance with Boating Industry Association (BIA) of WA (Inc).

Western Australia is an important manufacturing hub for recreational boating, as well as being a challenging area for boaties. By promoting vessel safety through insurance and pre-purchase inspections, AIMS surveyors are ensuring that a day on the water is one to be enjoyed, not one to regret.

Our important partnership with Austbrokers Countrywide continues the provision and critical information regarding insurance products and service options for members.

AIMS remains a strong advocate of the need for professional indemnity and public liability insurance coverage.

AIMS continues its role as a primary source of knowledge for its members.

This year has seen more than 30 webinars and educational offerings created by our CEO. These offerings are from a broad range of industry



specialists and on an even broader range of relevant subjects.

Relevance for any profession is an on-going issue. How do we, as professionals, maintain our relevance with our clients and industry?

Primarily, we are risk mitigators. Marine surveyors provide clients with a means to identify the risks when they undertake any marine venture and how to mitigate those risks to an acceptable level. We maintain our relevance by continuing to provide a level of service and advice that adds value to our client’s venture.

As an organisation, AIMS continue to increase its relevance in the marine industry by contributing to the AMSA DCV Marine Surveyors Accreditation Working Group as a contributing organisation.

AIMS has also been recognised by Standards Australia as a leader in our field by providing contributions to the review of five standards: lifejackets; electrical installations for marina; ships and offshore facilities; shipbuilding; and small vessels (less than 35 metres).

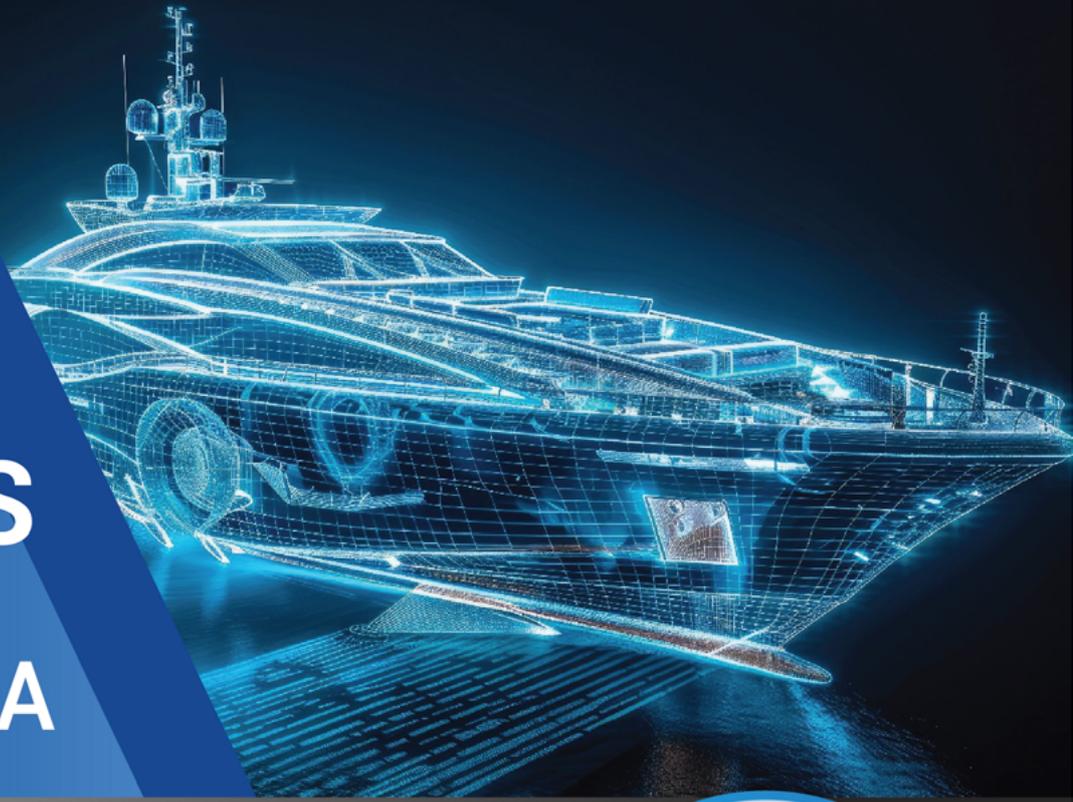
On behalf of the Board and AIMS, I would like to wish all our members a merry Christmas and a prosperous New Year. If the opportunity arises, which it seldom does in our profession, find some time to put up your feet and enjoy some precious time with family and friends.

**Eric McIlwain**  
Chair of the AIMS Board



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# A busy 2025 for AIMS

THIS year has again been an extremely busy and productive 12 months for the Institute.

## 1) Member engagement and industry representation

Here are some key highlights over the past 12 months.

### Partnerships and Affiliations

- New strategic partnership with Women's International Shipping and Trading Association (WISTA) Australia.
- New strategic partnership with the Boating Industry Association (BIA) of Western Australia. There are continuing strategic partnerships focusing on vessel safety between AIMS, BIA, and the BIA of Victoria (BIAV).
- A continuing positive relationship with Austbrokers Countrywide.
- Business Development, Marketing and Promotion
- Training fees funding the management and continual improvement of our training packages.
- CEO profile on LinkedIn has 530 followers.
- AIMS LinkedIn business page has 1,028 followers.
- AIMS Facebook page launched on 24 March 2025.
- From 1 July 2024 to 30 June 2025 there have been 66 workshops / webinars developed for members and community engagement.
- Attendance and AIMS representation at the Sanctuary Cove International Boat Show and Melbourne Boat Shows.

### Professional Development and Standards

- AIMS has established formal training opportunities for students.
- The training sector continues to be extremely busy, with strong local enrolments signaling an ongoing interest in the marine survey industry.

### AIMS Sub-committees:

- Recreational Standards Sub-committee was established on 3 June 2025 to develop, for example, recreational survey templates and guidelines for recreational vessel owners.
- Training Sub-committee was established on 10 March to review the Advanced Diploma.
- Conference Sub-committee was established on 26 March to help plan the 2026 AIMS Biennial Conference.
- Ongoing member compliance with Continuing Professional Development policy.



- Meetings with the Australian Maritime Safety Authority and Maritime New Zealand.

## 2) AIMS Team

I thank my Board, sub-committees, Sue Brown (Professional Development and Training Coordinator), and Susan Hull (AGSA Scheme, AIMS and Grain Accreditation Advisor).

I am also grateful for the level of engagement from members, which has helped me deliver value for your membership.

### 2.1) AIMS Board



Eric McIlwain | Chairman of the Board | Queensland

Eric is the Managing Director of Hastings Marine and Engineering, a marine surveying and engineering business he established in 2013. Eric has had a career in the maritime industry spanning more than 35 years, with roles as a Chief Engineer, Ship Repair Manager, Technical Superintendent and more recently that of Marine Surveyor.

He is an AMSA-accredited surveyor, accredited for initial and periodic surveys for domestic commercial vessels. Eric also undertakes a range of marine surveying services for his clients, from small recreational surveys to large ship and cargo surveys.

As Chair, Eric is responsible for the development and oversight of strategic direction, succession planning and sound business operations in conjunction with the Board and CEO.

Email: [chairman@aimsurveyors.com.au](mailto:chairman@aimsurveyors.com.au)



Greg Marsden | Vice Chairman | New Zealand

Greg has been a marine surveyor for over five years. Greg is an MNZ and AMSA qualified and recognised marine surveyor and owner operator of Marsden Marine

Ship Surveyors based in Wellington, New Zealand, specialising in recreational and sub 24m commercial vessels. In addition, Greg is also an Inspector with the International Marine Certification Institute (ICMI) specialising in CE compliance, and a qualified Marine Accident Investigator having undertaken specialist training in marine accident investigation through the UK's National Maritime Training Centre.

In this role he has supported investigations conducted by MNZ, the NZ Transport Accident Investigation Commission, NZ Police as well as technical consultancy support to civil disputes. Greg is the first New Zealand representative to join the AIMS Board and is keen to continue to foster the linkages between our Australian and New Zealand membership and surveying community.

As Vice Chair, Greg supports the Chair in his duties, including supporting the Chair, when and where necessary and supporting the Institutes wider strategic goals.

Email: [vicechair@aimsurveyors.com.au](mailto:vicechair@aimsurveyors.com.au)



Capt Scott Aiton | Company Secretary | New South Wales

Scott is the Director of Gibson, Minto and Aiton Marine Consultancy, with over 20 years' experience as a marine surveyor. Prior to this, Scott began his seagoing

career with BHP Transport before moving into tugs, working as a tug master in the ports of Newcastle, Sydney, Port Botany and Port Kembla. Scott has been a member of AIMS since 2003, following in the footsteps of his father Neil, who is one of the founding members of AIMS. As Company Secretary, his role is to monitor the compliance of all board activities and processes in conjunction with the CEO.

Email: [secretary@aimsurveyors.com.au](mailto:secretary@aimsurveyors.com.au)



Capt William Burton | Director | Queensland

In January 1970, William's plan to leave home, have no more school and see the world came to fruition when he was part of the junior entry to HMAS *Creswell* at Jervis Bay. There was, in fact, more school, but he marched about and played with boats.

With the new Federal Government, he was handed an Honourable Discharge and went off to sea for the next 33 years in the Merchant Navy, on various ships and cargoes, in both coastal and international waters. Currently with Plumley Pearson and White, William started surveying in 2006 with MCC Marine after moving down to Brisbane from Carins. In December 2011, he was elected a Member of AIMS and has watched the Institute grow and improve.



Wade Nagel | Director | Western Australia

Wade is the director of Adapt Marine, a marine surveying and consulting company established in 2022. With over 15 years' industry experience, Wade has served in various marine engineering roles before moving ashore, where he gained valuable experience in all aspects of vessel management and ship repair / new build on Australian-flagged vessels, both DCV and RAV.

Having spent the last eight years working ashore, doing marine surveying on the side, Wade decided it was time to transition into a fulltime marine surveying role, where Adapt Marine was established to service both the recreational and commercial marine sectors. He is AMSA-certified in multiple categories (G, H, I, J, K, L, N and O), in addition to AMSA DCV surveying. Wade is experienced in change-of-flag surveys, DCV/RAV gap analysis, on / off hire and pre-purchase inspections.

## 2.2) AIMS Operations



Sue Brown | AIMS Professional Development and Training Coordinator

As our Professional Development and Training Coordinator, Sue Brown is responsible for:

- managing new student enquiries and enrolments;
- marking student assessments;

- yearly reviews of training offerings and content in line with the Training Committee;
- compilation and updates of unit marking guides;
- assisting the CEO to identify and facilitate member CPD opportunities;
- coordination of sub-committees; and
- reviewing training income against budgets with the CEO.

Email: [training@aimsurveyors.com.au](mailto:training@aimsurveyors.com.au)



Susan Hull | AGSA Scheme, AIMS and Grain Accreditation Advisor

Susan Hull started her Maritime career with AMSA in July 2010 in the role of National Training Manager and her role was centred around the development of the first accredited marine surveyor qualifications. In 2011 she was seconded to the Regulatory Affairs and Reform division of AMSA to lead three main projects: (1) further development of marine surveyor qualifications, (2) development of guidelines for marine surveyor accreditation and (3) assist in the reform of seafarer qualifications to meet the requirements of the National Law. Her work with AMSA resulted in her forming close working relationships with marine surveyors and in late 2012 she was recruited as the Chief Executive Officer of the Australasian Institute of Marine Surveyors, a role that she held for 13 years. Today she works in a contractual role with the AIMS primarily focusing on the AGSA Scheme and the accreditation of grain surveyors.

Susan has led the way for the reform of professional standards for marine surveyors and has achieved much for the AIMS including: (1) 2014 Winner of Lloyds List Award for Services to the Maritime Industry, (2) 2018 Winner of Associations Forum - “Turn Around Association”, and (3) 2019 Highly Commended – Women in Shipping and Logistics.

Email: [grain@aimsurveyors.com.au](mailto:grain@aimsurveyors.com.au)

## 2.3) Sub-committees

### Domestic Commercial Vessel Sub-committee

The role of the DCV Sub-committee is to act as a representation of the members who are AMSA Accredited Domestic Commercial Vessel Surveyors.

The Sub-committee represents DCV accredited members in raising and addressing with AIMS issues or concerns within the industry. Its members will be responsible for contributing technical and industry knowledge and experience.

Subcommittee Members	
Name	Location
Zac Howells	QLD
Mike Ebsworth	QLD
Martin Williams	QLD
Rod Armstrong	QLD
Sue Brown	NSW
Mark Smith	QLD
Capt Peter Kerkenezov	NSW
Dr Eric Perez (Secretariat)	-

### Recreational Survey Standards Sub-committee

The role of the Recreational Survey Standards Sub-committee is to consult on projects related to marine survey standards within the recreational survey sector. Members join the Sub-committee for a specified period to fulfil the requirements of a project, the duration of which will vary dependent on the project outcomes. Each project has its own brief specific to the initiative.

Its members act in an advisory capacity and contribute technical knowledge and expertise to the project.

During this past year, a project committee was formed to explore the development of standard forms and templates for use by marine surveyors within the currently unregulated recreational survey sector. The Sub-committee’s work is ongoing.

Subcommittee Members	
Name	Location
Wade Nagel	WA
Russell Machan	NSW
Scott Cumming	QLD
Mark McIlwain	VIC
Dr Eric Perez (Secretariat)	-

### Training Sub-committee

The role of the Training Sub-committee is to assist in the review and provide consultative input on marine surveyor training courses offered by the AIMS.

This may involve reviewing the overall training suite and individual unit content currently offered as well as identifying gaps to assist in additional marine surveyor training either for the current needs of the industry or into the future.

Members will join the Sub-committee for a specified review period, the length of time dependent on the outcomes and progress of the project.

If a need is identified for the it to remain in place in an ongoing capacity, this will be reviewed with members at this time.

The Training Sub-committee is reviewing the units that comprise the Advanced Diploma of Commercial Marine Surveying.

Subcommittee Members	
Name	Location
Capt Denis Sango	WA
David Higgins	QLD
John Holden	QLD
Capt William Burton	QLD
Capt Norman Maningo	NSW
Sue Brown (Secretariat)	-
Dr Eric Perez (Secretariat)	-

### 2026 Conference Sub-committee

The 2026 Conference Sub-committee was formed to help the Institute deliver the 2026 AIMS Biennial Conference.

Subcommittee Members	
Name	Location
Stuart Marra	WA
Kerryn Woonings	WA
Wade Nagel	WA
Dr Eric Perez (Secretariat)	-

### 3) AIMS Annual General Meeting

The Board welcomes Zac Howells to the Board.



Zac Howells | Director | Queensland

Zac is a leader in the Australian maritime industry, with over 25 years of proven expertise in commercial shipbuilding, vessel repair and marine surveying. A master shipwright / boatbuilder and AMSA-accredited surveyor, he also holds Advanced and International Diplomas of Commercial Marine Surveying and is an ISM/ISPS auditor and flag-state surveyor for IMMARBE (Belize).

In Australia, Zac has led some of the most demanding and high-profile maritime works, including the construction and commissioning of advanced high-speed vessels, complex refits and conversions, stability testing, and compliance surveys for a wide range of domestic commercial vessels.

He works extensively with vessel owners, shipyards, and government authorities to ensure projects meet the highest safety and compliance standards.

On the global stage, Zac has supervised major new-build programs and complex conversions in leading shipyards across Australia, New Zealand, Thailand, Vietnam, Malaysia and the Philippines.

His experience includes overseeing the construction of high-speed aluminium catamarans, large-scale passenger vessels and specialised craft for both domestic and foreign flag states. He has also conducted pre-purchase, insurance and statutory surveys in Asia, the Pacific and other international ports.

In recognition of his technical expertise and leadership, Zac was the inaugural recipient of the Australasian Institute of Marine Surveyors Award for Excellence in 2015. He is known for his hands-on approach and uncompromising standards.

The Board also welcomes Michel Lagesse as a Life Member.



Life member – Capt Michel Eric Lagesse

Born in Mauritius, Michel grew up in Durban, South Africa, with all customary schooling conducted in Durban. He comes from a family of seafarers (over many generations), and commenced his own sea-going career in late 1976, as a 16-year-old, sailing / working as a “deck-boy” on a general cargo vessel that traded around some of the Indian Ocean Islands (Mauritius, Madagascar, Reunion Island) and South Africa.

Michel said that, working on such a vessel, sharing a cabin with five other somewhat “seasoned” crew members, using communal washroom facilities, etcetera, “certainly set me up for what may lie ahead”.

After soon realising the career path of a “deck-boy”, being that of a Bosun, Michel opted out and decided to join Safmarine Corporation as a deck-cadet in order to follow an officer’s career path instead, sailing on larger general cargo and bulk carriers, trading around most of the South-East Asian ports, Europe and USA, etcetera, with maritime college courses in between.

On completion of his 2<sup>nd</sup> Navigating Officer (Class 3 - FG) Certificate in early 1983, he joined Unicorn Shipping Lines until mid-1991, sailing within the various watch-keeping ranks, and trading along both

east and west coasts of Africa, including the Indian Ocean islands. He obtained his Chief Navigating (Class 2 – FG) Certificate in 1988.

Around mid-1991, he departed Unicorn and took a position in Richards Bay, South Africa, as a tug master, working on both Voith-Schneider (harbour tugs) and Kort-nozzle-propelled short / deepsea salvage tugs until mid-1994, during which time he obtained his Master Mariners (Class 1 – FG) Certificate in 1992.

Wanting a “change” in the working environment, in late-1994 he departed from the tugs and joined South African Stevedores Pty Ltd, based in Richards Bay, as their Operations Manager at the Richards Bay Coal Terminal (RBCT) facility.

Michel’s employment role entailed being the single loadmaster / consultant to the RBCT, interfacing between the Terminal and +/- 750 coal-loading bulk carriers annually, and consultant to RBCT with regards to the design and operating features of their latest “semi-automated” ship-loader, in addition conducting and providing stevedoring expertise in bulk, break-bulk, general, heavy lift, project and container cargoes “outside” of RBCT.

During his employment period with South African Stevedores, he began interacting quite closely with marine surveyors, gaining an interest into what marine surveying entailed and that became the next change in his career path.

Following an opportunity to emigrate to Australia, in July 2000, he joined a “marine and cargo” survey company based in Geraldton, WA, where he remained until January 2005, during which time he was fortunate to be exposed to a wide variety of different survey work.

This work exposure included product-sampling, marine insurance and ship agency, not only in Geraldton but also in most of the ports in Western Australia.

During 2004, Michel obtained gazetted approval as a marine pilot for King Sound, Derby, WA, for the various vessels that were fixed to load lead / zinc concentrates transferred from a self-unloading barge (*Western Challenge*).

After being transferred to Fremantle, WA, during late 2003 – while there were, and still are, several marine survey companies in operation – Michel said he became aware of a lack of truly independent marine surveyors

This anomaly encouraged him to venture out on his own, which he did in February 2005, and established ACME Marine Services International Pty Ltd, being an independent marine and cargo

survey company, with no financial affiliations / associations to any particular company other than its clients, etcetera.

During mid-2025, he decided to reduce the company’s employment (at that time five fulltime surveyors), with Michel being the sole member / owner of the business; with effect from 1 July 2025.

“I became a member of the Australasian Institute of Marine Surveyors (AIMS) in May 2004, and, over the years, assisting where I could as the WA Branch Chairperson, as Sub-committee and executive representative, etc,” he said.

“I view the work of the AIMS, through the enormous efforts made by those representing sub-committees and the executive, both past and present, as extremely important in maintaining some higher level of integrity, professional ethics and moral judgement amongst the members of AIMS.

“It is my view and opinion that the AIMS should continue to interact with the various industry stakeholders for the benefit of its exposure and purpose, while encouraging all its members to uphold true integrity, professional ethics and moral judgement in their workplace, and discourage / discipline / dismiss those members that fail to do so.

“Aside from the AIMS, I also hold membership with MLAANZ (Marine Law Association Australia and New Zealand) and the Company of Master Mariners – WA.”

#### 4) Melbourne Boat Show

It was another great Melbourne Boat Show. Our thanks to Michael Fitzallen from SeaWorthy Inspections and AIMS member for representing the Institute.

To Micheal’s left in the adjacent photograph is Mario Dsouza, AIMS member, and, to his far left, Colin Vagg, AIMS student.



## 5) Merchant Navy National Commemorative Ceremony

On behalf of the Board, I thank Prof. Chief Emmanuel Ezekiel-Hart, AIMS member, for representing the Institute at the Merchant Navy National Commemorative Ceremony, Merchant Navy National War Memorial, Canberra. (Photos below.)

This was the 35<sup>th</sup> Annual commemoration of Australian Merchant Navy seamen's contribution and sacrifice. The commemoration was held at Kings Park, beside Lake Burley Griffin in Canberra.

Prof. Chief Emmanuel Ezekiel-Hart said: "They went to sea but did not return like their military counterparts who also paid the supreme sacrifice. For them, Australia – unlike New Zealand – did not recognise them individually at the Australian War Memorial, yet they died on national assignment, encountering wars and battles with courage to deliver supplies and recover battles' essentials and casualties.

"Their graves no family can visit or care for. Their

hope for national recognition has become a political ping pong. Who shall save the service and sacrifice of the Australian Merchant Navy seamen?"

"At the laying of wreaths at the National Memorial for the Merchant Navy, I reflected further with each step with the wreath.

"And it dawned on me that I am Merchant Navy man who returned to tell the story. We served as unsung heroes; some did not return to their families, making the seas the last resting place – on the seabed or in a ship under the sea.

"The nation forgets them because they bear no arms for the nation, yet they still face dangers and risk to their lives supplying, receiving and transporting vital cargo. That is the Merchant Navy story.

"While I represented the Australasia Institute of Marine Surveyors, I recalled my service to the freedom and peace today in Liberia and Sierra Leone, supplying relief to the Nigeria-led Economic Community of West African States (ECOWAS) peace-keeping mission as part of the Economic



Community of West African States Monitoring Group (ECOMOG).

“Our ship in Monrovia faced attack by rebel forces but just in time was let go and sent offshore to Freetown, before heading to Lagos! I never was paid a cent for that sacrifice, but I am happy that Liberia and Sierra Leone regained peace and freedom.”

## 6) Industry Workshops and Webinars

AIMS continues to provide workshop and webinar content for members to engage with continuing professional development (CPD).



Workshop 23: Brian Gatt, Technical Director, Logix Group – 19 August

Topic: Signs of corrosion

With an extensive background in electrical and electronics, Brian has forged his way to become one of the leading experts in marine vessel corrosion and stray current diagnostics, conducted through the formation of a consulting business, Logix Consulting.

His hands-on experience, his marine electrical background and his passion for boating formed a commitment of improving current marine practices through providing innovation and practical solutions to the industry. His ability to solve complex corrosion problems has consolidated Brian’s position as a leading expert – consulting throughout Australasia and afar for many boat builders, boat owners, fleet operators and defence.



Workshop 24: Nick Parkyn, Nick Parkyn Marine Surveying / MarineML – 27 August

Topic: Surveying Yacht Spars

Nicholas (Nick) Parkyn has an extensive background in both the marine and information technology disciplines.

Nick’s work in the marine industry includes marine surveying, yacht and small craft design, and marine software development. He is experienced in composite design and fabrication and has specified synthetic rigging on designs since 1994. He was one of the first to apply Spectra to marine applications. He is the author of the book *What a marine surveyor needs to know about synthetic (composite) yacht rigging*.



Workshop 25: Greg Marsden - Managing Director at Marsden Marine Ship Surveyors & Marine Accident Investigations | AIMS Vice Chair – 17 September

Topic: Marine Surveying Specialisations

Greg has been a marine surveyor for over five years, prior to this working within the defence industry, specialising in test and evaluation. Greg is the Director of Marsden Marine Ship Surveyors based in Wellington, New Zealand. Greg is a MNZ and AMSA-qualified and recognised marine surveyor and an inspector with the International Marine Certification Institute specialising in CE compliance.

He is a qualified marine accident investigator, having undertaken specialist training in marine accident investigation through the UK’s National Maritime Training Centre and has supported MNZ, TAIC and NZ Police during investigations.

Greg is the first New Zealand representative to join the AIMS Board and is keen to continue to foster the linkages between our Australian and New Zealand membership and surveying community. As Vice-Chair, Greg supports the Chair in his duties, including stepping in on occasion where the Chair is unable to fulfil his role.



Workshop 26: Nick Parkyn, Nick Parkyn Marine Surveying / MarineML – 24 September

Topic: Keels



Workshop 27: Capt Willaim Burton – 8 October

Topic: Preparing a grain ship at an overseas port

In January 1970, William’s plan to leave home, have no more school and see the world came to fruition when he was part of the junior entry to HMAS *Creswell* at Jervis Bay. There was in fact more school but he marched about and played with boats.

With the new Federal Government, he was handed an Honourable Discharge and went off to sea for the next 33 years in the Merchant Navy, on various ships and cargoes, in both coastal and international waters. Currently with Plumley Pearson and White, William started surveying in 2006 with MCC Marine, after moving down to Brisbane from Cairns. In December 2011, he was elected a Member of AIMS and watched the Institute grow and improve.



Workshop 28: Billy Berg – 10 October

Topic: Pathway to becoming a Marine Surveyor

Billy is the owner of Double B Marine Services and a US Coast Guard-licensed 100-ton master captain with a towing endorsement. After several years in corporate land development, Billy sought a path back into the boating world. Encouraged by other captains, he began shadowing yacht and small-craft surveyors and quickly discovered a passion for the work.

His journey took a pivotal turn when he met Charles Leeuwenburg of W.C. Leeuwenburg Marine Cargo Surveyors, who introduced him to the cargo-survey field. Though he had no prior knowledge of bulk cargo operations, Billy embraced the opportunity, learning draft surveying from the ground up. Under Charles’ mentorship, he mastered the art of performing manual draft survey calculations without relying on computer programs.

Over time, Billy advanced from observing to completing surveys independently. He has since carried out surveys in Wilmington and Morehead City, North Carolina, and now regularly conducts cargo surveys in Charleston, South Carolina. Today, Billy continues to grow in both yacht / small craft and cargo surveying, bringing precision, hands-on experience and a commitment to excellence to every project.



Workshop 29: Nick Parkyn, Nick Parkyn Marine Surveying / MarineML – 29 October

Topic: Rudders



Workshop 30: Nick Parkyn, Nick Parkyn Marine Surveying / MarineML – 26 November

Topic: Appendages

## 7) Meet a Surveyor Series



Understanding why marine surveying matters is critically important as members work across the maritime sector, yet their role is not fully understood

The “Meet a Surveyor” video series goes a long way in explaining what marine surveyors do and why it matters.

Eric McIlwain – [Video 1](#) | [Video 2](#) | [Video 3](#)

Andrew Laughlin – [Video 1](#) | [Video 2](#) | [Video 3](#)

Capt Paul Willing – [Video 1](#) | [Video 2](#) | [Video 3](#)

Capt Peter Murday – [Video 1](#) | [Video 2](#) | [Video 3](#)

Cameron Hicks – [Video 1](#) | [Video 2](#) | [Video 3](#)

Michael Fitzallen – [Video 1](#) | [Video 2](#) | [Video 3](#)

Capt Scott Aiton – [Video 1](#) | [Video 2](#) | [Video 3](#)

Capt William Burton – [Video 1](#) | [Video 2](#) | [Video 3](#)

## 8) Newsletter Contributions

Thank-you to the members who contributed to this edition of the newsletter and, for members who do contribute, your article can be used as evidence of continuing professional development.

I encourage members to contribute to the newsletter. If you would like to know more, please contact the office.

## 9) Your Institute

Please contact me on +61 2 6232 6555 or send me an email with feedback, and ideas at [gm@aimsurveyors.com.au](mailto:gm@aimsurveyors.com.au).

Dr Eric Perez  
Chief Executive Officer

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# Building membership value

I AM grateful to Andrew Gosbell from the Associations Forum for an invitation to speak at a recent Queensland Association Lunch held at the Brisbane Convention & Exhibition Centre, focusing on my views on building value for the members I represent.

## Building your value proposition



involves a mix of understanding your members, making sure you communicate with them regularly, and understanding the business and industry level issues they face.

The relationship-building element is crucial within and external to not-for-profits.

The relationships you foster (in the case of AIMS, our important partnerships with Austbrokers Countrywide, Boating Industry Association, Boating Industry Association of Victoria, Boating Industry Association of Western Australia and WISTA Australia) help to build capability within each organisation and an understanding that your members impact individuals, businesses and industry outside their own spheres of influence.

Andrew asked me what my key learnings have been. For me, they included:

- 1 building relationships;
- 2 improving member and public communications;
- 3 building trust with your senior leaders within and outside the organisation; and
- 4 ever forgetting that organisations like AIMS are only successful with the generous contributions of members volunteering their time and expertise on Boards, committees or feedback on government reviews.

I am aware that the process of building membership value is ongoing and will pose challenges but you should expect this and keeping a lifelong learning and continuous improvement mindset has guided my practice.

Links:

- [Associations Forum](#)
- [Brisbane Convention & Exhibition Centre](#)
- [Austbrokers Countrywide](#)
- [Boating Industry Association](#)
- [Boating Industry Association of Victoria](#)
- [Boating Industry Association of Western Australia](#)
- [WISTA Australia](#)

**Dr Eric Perez**  
Chief Executive Officer



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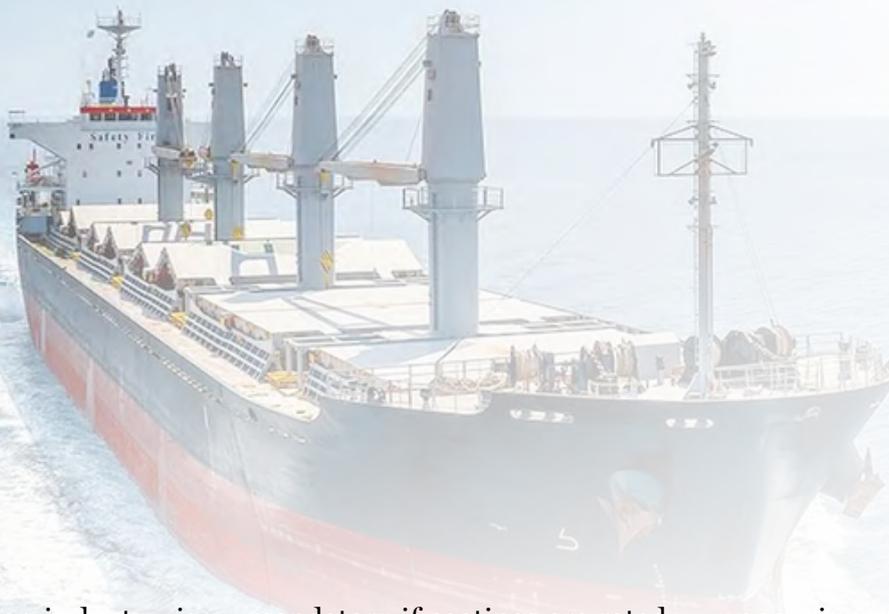


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# How new rules and tools are reshaping bulk carrier safety and efficiency



THE bulk carrier industry is evolving. New regulations, class notations and digital tools are reshaping ship design and operations, enhancing safety, compliance and efficiency across structure, crew and cargo.

From a regulatory perspective, some key developments have been introduced or taken effect over the past year, all of which will serve to enhance the safety of bulk carrier operations.

## 1) ESP Code amendments tighten inspection rules and affect bulk carrier performance

In 2022, the ESP Code (the international code on the enhanced program of inspections during surveys of bulk carriers and oil tankers) was amended and subsequently adopted by IMO Resolution MSC.525(106) and the IACS Unified Requirements.

Under the new requirements, which have been in force for surveys commenced on or after 1 July 2024, any coating condition rated below “GOOD” must be recorded and re-examined annually. For vessels over 20 years old and longer than 150 metres, annual inspections of double-skin void spaces are now

mandatory if coatings are rated “POOR”.



Under the amended ESP Code, any coating condition rated below “GOOD” must be recorded and re-examined annually.

This shift not only raises the bar for structural maintenance but also carries commercial implications. Downgrades in coating condition can lead to increased inspection demands, operational delays and reduced charter appeal, making proactive hull management a competitive necessity.

## 2) SOLAS update enforces stricter rules for lifting appliances and onboard safety

Complementing this focus on structural integrity is the

upcoming SOLAS Chapter II-1, Regulation 3-13, which introduces stricter oversight of lifting appliances. Effective from January 2026, all lifting appliances installed on or after this date must be surveyed and tested by a classification society.

The regulations are now under the SOLAS safety regime, instead of the previous International Labour Organization (ILO) scheme.



Previously, inspections could be carried out by any “competent person” but, under SOLAS, this is now stricter and under a more formalised process. This is in response to a rise in lifting-related accidents.

For existing equipment,

compliance is required by the first renewal survey after the regulation takes effect. Owners must now also implement structured maintenance and inspection regimes, maintain onboard records, and ensure crew are trained and familiar with the equipment. This regulation not only enhances safety but also reinforces accountability in onboard operations.

### 3) Grain Code update enables safer partial loading and greater flexibility

Meanwhile, the 2026 amendment to the Grain Code formally recognises a common but previously non-compliant loading condition: partially filled holds in the way of the hatch opening, with untrimmed ends. This scenario often arises when vessels reach maximum draught before full hold capacity.



*The 2026 amendment to the Grain Code addresses partially filled holds with untrimmed ends. It ensures both flexibility and stability.*

By acknowledging this practice and providing a framework for its safe execution, the amendment offers greater flexibility without compromising stability.

For newbuilds, this condition must be included in the grain-loading manual and implemented in the loading computer. For vessels already in service, updates are optional but may be necessary to meet port requirements.



### 4) Drone inspections and AI tools reshape bulk carrier survey practices

Technology is also playing a transformative role. Remote inspection techniques (RITs), particularly the use of drones for close-up surveys and ultrasonic thickness measurements, are gaining traction in the bulk carrier segment.

DNV has been a pioneer in this space since 2015 and, with the 2025 ESP Code update, drone-based inspections will be formally recognised. This development reduces the need for scaffolding, lowers costs and improves safety, especially in hard-to-reach areas.

Looking ahead, DNV is exploring AI-driven defect recognition, autonomous drone navigation and integration with digital twins through the REDHUS project. These innovations promise to make inspections faster, more accurate and less intrusive.



### 5) Digital cargo tools boost steel coil loading speed, safety and efficiency

Advancements in digitalization are also reshaping cargo operations. The Steel Load Planner, a self-service tool developed by DNV, enables operations teams to create rule-compliant steel coil loading plans – in the latest release this may be completed in less than five minutes. By replacing cumbersome tables and manual calculations with instant structural verification, the tool may improve cargo intake by 10 to 15 per cent, while also contributing to more efficient and, thus, more sustainable operations, and enhancing safety through precise load distribution. The upcoming Version 2, which will be launched later in 2025, will further streamline the process by auto-generating optimised plans based on coil data and vessel-specific structural capacity.

This service has already proven to be a significant success and is a prime example of how digital tools can bridge the gap between regulatory compliance and operational efficiency.

### 6) Deck cargo rules support transport of over-sized components

The role of bulk carriers is constantly evolving, particularly as global markets develop and the need for new materials and components changes.

Most recently, this has seen increased demand for the transportation of non-standard cargo, such as wind turbine blades and other large industrial components. As these cargoes grow in size, weight and complexity, traditional vessel designs and operational assumptions are being challenged. As a result, bulk carriers – particularly Ultramax and Kamsarmax types – are becoming increasingly favoured for the transport of these

components due to their deck space and structural capacity.

DNV's new deck cargo class notation reflects this evolving role, ensuring that vessels not only are structurally reinforced to handle these loads but also meet critical operational criteria.

The notation sets specific requirements for the strength of the weather deck and hatch covers, including coamings and securing arrangements, while also addressing intact and damage stability and navigational field of vision.

These standards help

shipowners demonstrate compliance with class and international regulations, streamline planning and approval processes, and reduce the risk of delays or disputes during port operations.

### **7) Regulatory shifts drive safer, smarter and more adaptable bulker operations**

Together, these developments are reinforcing the safety and reliability of bulker operations, helping bulker owners to stay in step with a fast-evolving maritime industry.

With the regulatory

environment expected to continue to develop, particularly related to the topic of decarbonisation, the ability to adapt and be flexible, and stay on top of regulatory and technological developments, will help bulker owners to make better-informed decisions and remain ahead of the curve.

**Morten Løvstad**  
Vice President, Business  
Director - Bulk Carriers

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## **Insurance saves big cyber bills**

ONE of the main functions of marine surveyors is at the frontline of the maritime industry, assessing the condition and safety of vessels. Unlike the days before technology, the toolkit of a surveyor today has evolved from clipboards, film cameras and filing cabinets to tablets running specialised software, cloud-based data storage and artificial intelligence for data analysis.

With technology, marine surveyors are equipped with the digital tools to enhance efficiency, accuracy, and reporting quality. But they also introduce new risk. By relying on a chain of third-party software providers, marine surveyors inherit the security vulnerabilities of those platforms. Additionally, the amount of sensitive data surveyors handle is also seen as a treasure chest for cyber criminals.

Vessel blueprints, structural deficiency reports, client financial information and personally-identifiable information make surveyors



high-value targets for data theft and extortion.

The 2023 ransomware attack on maritime software provider DNV is a reminder that a similar flaw in a surveyor's software can also create a direct gateway for cyber criminals to steal data from the cloud or launch an attack that disrupts the surveyor's own operations.

For small to medium enterprises, the average cost to recover from a cyber incident can easily reach six figures, an expense that a comprehensive Cyber Liability Insurance policy is designed to cover.

This insurance not

only provides financial indemnification but also immediate access to the expert incident response, legal, forensic and public relations services necessary for business survival in the aftermath of an attack.

Getting a quote is easy. Contact Austbrokers Countrywide Insurance and speak to their Certified Cyber Insurance Expert (CCIS), Roy Chen, who can conduct a free no-obligation Insurance Risk Review. Contact Roy Chen on 1800 245 123.

**Roy Chen**  
Dipl. Insurance Broking  
Insurance & Risk Advisor  
Austbrokers Countrywide

# Marine CE certification and compliance solutions: for new build boat manufacturers in the Far East

This article was provided by Anthony Gates, Marine Surveyor, AIMS member and Founder of Andaman Marine Surveyors Co Ltd.

Andaman Marine Surveyors are working in close partnership with HPiVS, the Notified Body trusted by boat builders of all sizes around the world, including Sunseeker, Bavaria and Seawind Catamarans.

Together, we can make it easier and cheaper for you to obtain the essential regulatory certification needed to sell boats in the UK, Europe, Australia, Saudi Arabia and around the world.

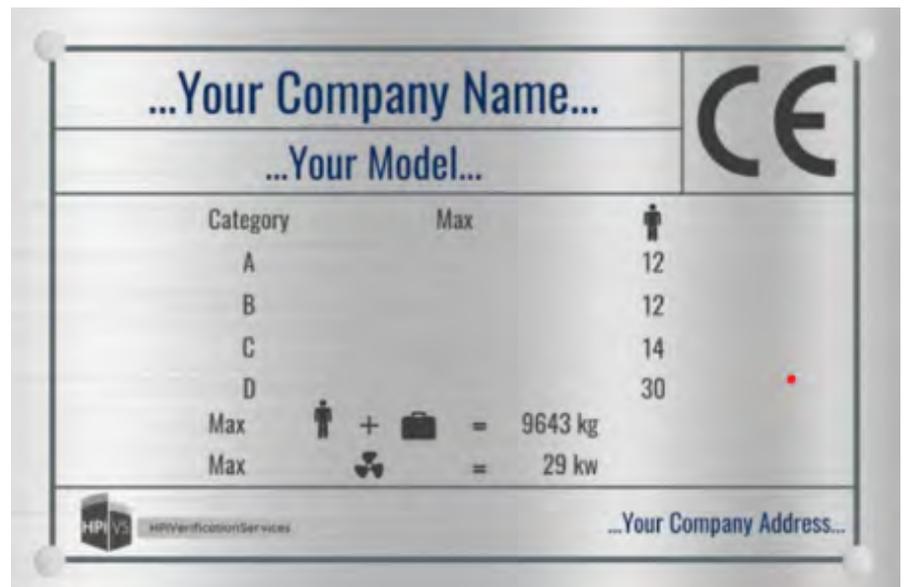
The partnership combines our expert on-the-ground support for customers based here in the Far East with the in-depth compliance knowledge, experience and licensing permissions from the team at HPiVS.

We've asked Maria Garcia-Donaire, QA Technical Director at HPiVS, to explain a little more.

## What does HPiVS do?

HPiVS is a Recreational Craft Directive (RCD) Notified Body accredited by INAB and Recreational Craft Regulations (RCR) Approved Body accredited by UKAS. This means we are licensed to issue CE mark certificates and UKCA Mark certificates, which are essential for any manufacturers looking to sell their products in Europe or the UK.

The CE mark is also used in other territories, such as Australia, and we are licensed to carry out a comprehensive range of additional inspections, including American Boat



and Yacht Council (ABYC) Compliance Reviews. This means we can issue you with the certification you need to sell your vessels anywhere in the world.

## What certification do boat manufacturers need?

The type of certificate you need depends on the type of boats / product and where you want to sell them. Holding the right level of certification is a legal responsibility.

It will help you to reassure potential buyers of your craft's capabilities, giving you competitive advantage, and is often a must-have for finance and insurance too. We know the various regulations, and how they are applied, can sometimes seem complicated.

We provide you with total peace of mind that your vessel meets all

the legal safety, environmental and performance standards, and your liability is reduced.

## Can AMS and HPiVS certify innovative vessels?

HPiVS stands at the forefront of UK and European thought-leadership and decision-making for marine compliance.

This includes supporting designers and builders of the latest industry innovations which currently fall outside of scope, such as foiling vessels, to find ways to effectively limit liability to make getting insurance and finance easier.

As well as marine certification, we are an accredited European Notified Body for the EU Pressure Equipment Directive. This makes us the certification body of choice for boats with hydrogen systems.



*Maria Garcia-Donaire, QA Technical Director at HPiVS*

Projects include certifying Chase Zero, Emirates Team New Zealand's hydrogen-powered hydrofoil chase boat for the America's Cup in 2024.

HPiVS is also a recognised organization by World Sailing to carry out Structural Plan Reviews under the World Sailing Offshore Special Regulations (OSR) for boat hull construction.

We're helping to set the standards, so, no matter how innovative your vessel or complex your project, you can be reassured that our in-depth understanding of the regulations and their application means we can help you to demonstrate compliance with safety and performance criteria and reduce your liability.

To find out more please go to [www.hpivs.com](http://www.hpivs.com) or get in touch.

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# Which NDT test should you choose for welds?

ONE question that pops up almost every time I am involved in a ship repair job is: “Once the welding is done, which non-destructive test (NDT) would you recommend for the weld?”

It’s a good question – and the answer isn’t “one-size-fits-all”. We have several tools in our NDT toolkit:

- dye penetrant test (DPT);
- magnetic particle inspection (MPI);
- ultrasonic testing (UT); and
- radiographic testing (RT)

Let’s quickly break these down.

## 1. Dye Penetrant Test (DPT)

- Best for detecting surface-level cracks.
- Simple and cost-effective.
- But it can’t detect sub-surface defects.

## 2. Magnetic Particle Inspection (MPI)

- Can detect slightly below-the-surface cracks due to the strong magnetic field.
- Not suitable for non-ferrous metals or most stainless steel grades.
- Can’t catch deeper weld flaws like slag inclusion, blowholes, or air entrapment.

## 3. Ultrasonic Testing (UT)

- Uses ultrasound signals to detect internal defects.
- Portable and flexible – equipment is easy to carry and deploy.
- Great for thicker welds or critical structures.

## 4. Radiographic Testing (RT)

- Uses X-rays to reveal deep-seated weld flaws.
- Offers the advantage of a

permanent record of the weld condition.

- Less portable and not always easy to use on-site compared to UT.

## So, which one should you pick?

For thin weld pieces (just a few weld runs) or non-critical parts, DPT or MPI can be a good choice.

For thicker welds (involving double-V or double-U preparations, multiple weld runs) or mission-critical components, UT or RT is the way to go for true peace of mind.

At the end of the day, choosing the right test is all about balancing practicality, cost, and the level of confidence you need in the weld’s integrity.

**Kalyan Das**  
ISM-ISPS & Service Supplier  
Auditor, Marine Surveyor,  
MLC Inspector at RINA and  
AIMS member

# Which NDT Test Should You Choose for Welds?



## Dye Penetrant Test (DPT)

- Detects surface-level cracks
- Simple and cost-effective
- Cannot detect sub-surface defects



## Magnetic Particle Inspection (MPI)

- Detects slightly below-the-surface cracks
- Not suitable for non-ferrous metals or most stainless steel grades
- Can’t catch deeper weld flaws



## Ultrasonic Testing (UT)

- Uses ultrasound signals
- Portable and flexible
- Great for thicker welds or critical structures



## Radiographic Testing (RT)

- Uses X-rays
- Provides a permanent record
- Less portable and not always easy to use on-site

# Survey to repair: turning findings into action

MARINE surveying is not just about identifying defects – it is about converting findings into safe, cost-effective and compliant repair solutions.

Phillip Fox of Midwest Marine Surveyors recently managed a case on the Midwest coast involving a serious incident on a bulk carrier: the failure of an SCR compressor.

The vessel was boarded via local launch, and damage inspections revealed significant fire damage to the compressor unit and to the surrounding compartment's A60 fire insulation, a critical safety barrier in vessel construction. Without repair, the vessel was deemed unseaworthy.

## 1. From damage survey to warranty survey

Close inspection determined that a pneumatic high-pressure circuit failure had ignited the compressor's electrical wiring.

This incident not only required a damage survey but also triggered a warranty survey due to the extent of the affected components and age of the vessel. Recognising the scope and regulatory requirements, Phillip engaged Tim Nexer of TK Marine Consultants.

TK Marine Consultants, an AMSA-accredited surveying company with strong knowledge of international standards and insurance club requirements, worked alongside Midwest Marine Surveyors to deliver a structured repair plan and Inspection & Test Plan (ITP) utilising a recognised insulation company, Griffin Marine.

## 2. Repair controls and compliance

When managing repairs of this scale, surveyors must ensure compliance at every stage. For

this project, key controls included the following.

**Qualified Contractors** – The insulation replacement required LR or DNV-certified insulators.

**Approved Insulation Materials** – Materials had to comply with the IMO FTP Code and be IACS approved.

**OEM Components** – Only OEM spare parts with IACS-type approval were quoted on the compressor. Using non-approved parts on a critical system could lead to litigation in the event of failure, damage or loss of life.

The ITP was counter-signed by the vessel's Chief Engineer or Master, confirming acceptance of the repair work. This step is crucial to ensure shipboard accountability and to provide closure for owners, managers, and insurers.

## 3. Collaborative project management

The project – from inspection

to full repair – was completed in just six days. This was possible through collaboration between independent surveyors, specialised contractors, and classification-approved suppliers.

The case highlights that, when different surveying companies combine expertise, projects are:

- delivered on schedule;
- completed within budget; and
- compliant with international standards.

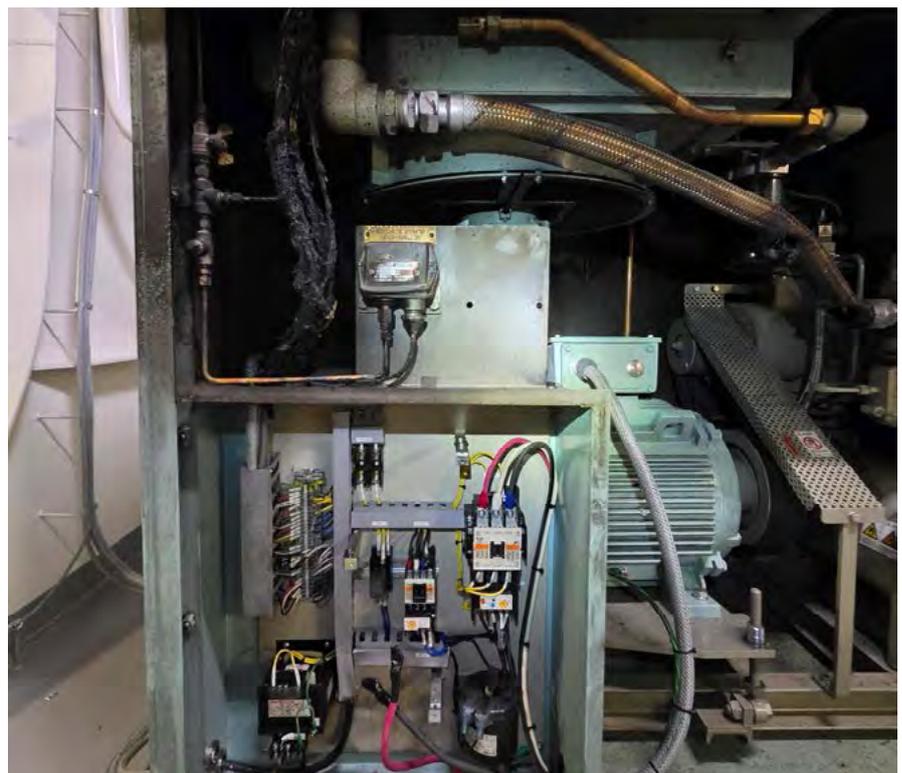
## 4. Project plan

### 4.1 Overview

Client requires SCR compressor removed and wiring isolated.

Compressor will be isolated by removing wiring from main switchboard in engine control room via circuit breaker for this unit. Circuit breaker to be tagged out and positively isolated with C/E having the key for the lock.

Wiring then to be disconnected from compressor and associate



alarm system and heater system. Wiring to be taped up and isolated inside a plastic junction box or if easily accessible remove wiring harness from nearby junction box.

Compressor to be removed as one unit after confirmation from ships crew on dimensions and lifting requirements through hatches and then out of engine room with ships gantry or stores crane.

Pneumatic system to be isolated after removal of SCR unit.

The compressor was left in place after a few considerations:

- lead time for a new compressor was 60 days;
- wiring repairs were to be in conjunction with ISO / Class requirements and cabling to be of low smoke and correct certification;
- pneumatic safety valves would need certifying and testing;
- alternative means of air from a secondary system was utilised and a condition of class issued to the vessel; and
- availability of Class Surveyor.

## 4.2 Labour requirements

Name	Role	Description
TK Marine	Mechanical fitters x 2	Removing compressor unit
TK Marine	Electrician	Isolate unit in all locations
Ships Agent	Provide clearance	Port clearance for removal and export
Midwest Surveying	Project Manager	Stakeholders' engagement

## 4.3 Ship requirements

Item	Question	To do	Report to
Bulk head doors / hatches	Will compressor fit out of hatches or doors?	Crew to measure	Report back to TK Marine
Asbestos	Asbestos free Declaration	Vessel supply documentation	Report back to Midwest Surveying
Lifting equipment	Are there lifting pad eyes for lifting or beams for beam clamps and has ship got chain blocks for job?	Ship to come back and check if we require chain blocks, shackles and beam clamps	Report back to TK Marine

## 5. Key Lessons for surveyors

- There are no shortcuts in marine repairs - particularly when dealing with fire

protection and critical machinery.

- The surveyor or project manager is ultimately liable for the integrity of repairs carried out under their supervision.
- A clear ITP, signed off by both the surveyor and ship's officers, is essential for accountability and documentation.

From the pictorial evidence of this case, the consequences of equipment and insulation failure were clear. However, through structured repair planning, the vessel was safely restored and returned to service.

Tim Nexer  
 Managing Director  
 TK Marine Consultancy Pty Ltd  
 AIMS member  
 Phillip Fox  
 Midwest Marine Surveyors  
 AIMS member



# Responsible Boat Owner campaign launched for Safe Boating Week

**The Boating Industry Association (BIA) is backing a Trans-Tasman effort to promote Responsible Boat Ownership, according to BIA CEO Andrew Fielding.**

THE Australia New Zealand Safe Boating Education Group (ANZSBEG) has launched a new public education campaign aimed at promoting safe and responsible boating practices to the millions of people who go boating each year.

The “Responsible Boat Ownership” campaign officially kicked off for the start of Safe Boating Week 2025, which ran across Australia from 6 to 12 October.

The campaign is a key initiative of ANZSBEG, which is a collaborative body that brings together all maritime regulators across Australia, New Zealand and Papua New Guinea, and peak bodies in aquatic recreation, such as Surf Life Saving, Royal Life Saving, Australian Sailing, Paddle Australia, Marine Search & Rescue, Bureau of Meteorology and the BIA. The collaboration ensures that all advice provided is trustworthy, consistent and relevant.

The “Responsible Boat Ownership” campaign’s initial phase is designed to help people

make informed decisions when buying a boat.

Mr Fielding said BIA was proud to have played a leading role in this national initiative to support a culture of safer boating in Australia.

“We want all Australians to have a safe and enjoyable time on the water,” he said. “This campaign is about empowering boaters with the knowledge to make responsible choices. It’s a joint effort to foster a culture of safety that goes beyond just one week of the year.”

The BIA is supporting this effort with the launch of a new BIA Marine Accredited Broker program, requiring brokers to meet criteria which help to protect and assure the best interests of the public.

BIA has also formed alliances with marine surveyors to further promote opportunities for the public to not only buy boats from a trusted source but to consider engaging a qualified marine surveyor where appropriate.

“We are taking these steps to

help the public make informed decisions when buying a boat, particularly used boats, because a great day on the water is a safe day,” Mr Fielding said.

The Responsible Boat Ownership campaign provides essential knowledge covering three key pillars of safe boating.

**Own it:** Helps potential and new boaters navigate the process of buying a new or used boat, understanding what to look for and spotting potential safety risks.

**Maintain it:** Provides tips on proper storage and maintenance to keep a vessel in top condition and ready for the next outing.

**Enjoy it:** Aims to help boaters make informed, safe and sustainable decisions to make the most of their boating experience, emphasising that an informed skipper is a good skipper.

More information at [BIA Accredited Marine Broker program](#) and [ANZSBEG/Responsible Boat Ownership](#)

Boating Industry Association

**Own it  
Maintain it  
Enjoy it**

**Enjoy boating?  
It starts with  
the right boat  
and regular  
maintenance.**

[Find out more](#)

 Responsible Boat Ownership

# Beyond compliance: discovering the power of coaching during an audit

I DIDN'T expect to be inspired during a recent annual company audit – but that's exactly what happened.

Picture this. I'm seated across from the CEO, DPA, Technical Manager and a few other senior leaders. We're deep into the records, ticking boxes, reviewing compliance, doing what auditors do.

Then, the CEO leans forward and says something that shifts the tone entirely: "As you know, our Marine Division is part of the larger Mining Operations Group. It was started just a year ago but we're truly committed to building a high-quality team. We're doing our best."

He then handed me a stack of papers. Not financials. Not technical logs. But something far more telling – a follow-up report from a group coaching session the management team had recently undertaken.

And that's when things got interesting.

## 1. Coaching at the core: the GROW model in action

As I flipped through the pages, I saw the unmistakable framework of the GROW model – a powerful coaching tool used by leaders and coaches worldwide. It's simple but transformative. Let's look at how it works.

**G – Goal:** What do you want to achieve? This is where clarity begins. The team had outlined specific goals for the Marine Division – building operational excellence, fostering collaboration, and developing leadership depth.

**R – Reality:** Where are you now? This step is all about honest reflection. The report captured candid assessments of current challenges – limited experience in marine operations, evolving

team dynamics and the steep learning curve of a new division.

**O – Options:** What could you do? This is the creative phase. The team brainstormed strategies— from cross-training with mining experts to engaging external consultants and investing in leadership development.

**W – Will:** What will you do? This is where commitment meets action. Each leader had outlined specific steps they'd take, timelines, and accountability measures. It wasn't just talk – it was a roadmap.

## 2. Why this matters

In an industry often driven by hard metrics and operational KPIs, it was refreshing to see a leadership team investing in something softer – but arguably more powerful: mindset, alignment, and growth.

The Marine Division may be young but, with this kind of intentional leadership, it's sailing in the right direction.

## 3. Final thought

Audits usually reveal gaps. This one revealed growth.

To any leader reading this: coaching isn't just for individuals – it's a culture. And the GROW model? It's a compass worth using.

Have you ever undertaken a coaching session – either individually or as a team? What was your biggest takeaway? I'd love to hear your experience. Drop a comment and let's learn from each other.

**Kalyan Das**  
ISM-ISPS & Service Supplier  
Auditor, Marine Surveyor,  
MLC Inspector at RINA and  
AIMS member

## From Audit to Insight: A Surprising Coaching Lesson in Leadership



# Ammonia in shipping: tracing the emergence of a new fuel

DNV has released a White Paper discussing ammonia in shipping. The paper provides the context of ammonia as an emerging fuel type. References to sections in the White Paper have been identified and provided in footnotes to the paper.

## Executive summary

In the maritime sector, ammonia has been identified as a future fuel to decarbonise shipping. Interest in ammonia as a fuel has increased significantly in recent years, following the International Maritime Organization's (IMO) approval of the Net-Zero Framework in April 2025, though its use also presents new safety challenges compared to conventional fuels – primarily due to its toxicity.

This paper assesses the current status of low greenhouse gas (GHG) ammonia as a ship fuel by considering 10 main barriers, with a specific focus on the changes between 2020 and 2025.

Across most barriers, significant advancements have been made in the last five years. Today, ammonia-fuelled engines are in the final stages of development for installation on 39 scheduled new-builds, and major ports are preparing for safe ammonia bunkering – a significant development compared to 2020, when such engines were only at the concept stage with no ammonia-capable newbuilds on order.

To effectively address the remaining challenges, accelerate the uptake of ammonia as fuel and achieve the widespread use of ammonia, two inter-linked objectives must be met.

Firstly, to build, fuel and

operate a “pioneering” ammonia-powered fleet (a few dozen vessels, crewed by a few hundred competent personnel, and bunkering a few million tonnes of ammonia from a dozen ports).

Secondly, to establish the necessary framework for further scaling (thousands of vessels, many thousands of crew, bunkering tens of millions of tonnes of fuel from ports across the globe).

For a pioneering fleet, we argue that it is not necessary to fully solve all barriers. Currently, many of the main barriers can be considered sufficiently low, making the realisation of this fleet feasible:

1. a functional risk-based framework for the safe application of ammonia as a ship fuel allows for statutory approval of the first ammonia-powered vessels;
2. the required technical solutions are shortly being installed on several deep-sea newbuilds in the orderbook, and first use have been demonstrated – in a tug and an offshore vessel;
3. the first ports and fuel producers are ready to safely supply first movers; and
4. sufficient competent crew can be trained for a limited number of vessels.

Nevertheless, fuel costs are currently excessively high. This stifles demand, consequently restricting investment in essential fuel production, distribution and bunkering infrastructure.

This barrier can be addressed through financial support mechanisms which reduce the cost gap between low-GHG

ammonia and fossil fuel oils. The scope and duration of such mechanisms may be quite limited.

For the upscaling phase, our barrier assessment changes: while the success of the limited pioneering fleet can rely on bespoke solutions and the willingness of first-movers to accept an increase in commercial risk, scaling up requires a framework of standardised solutions that can be easily adopted across the industry.

To achieve this:

1. the global GHG regulations must be tightened to create functional price-parity for new fuels, with no delay in the ongoing work at the IMO with the Net-Zero Framework;
2. ammonia's strong industrial platform for scaling can thus be leveraged to achieve scale for the fuel-production, distribution, and bunkering infrastructure; further
3. the risk-based approval framework must be replaced by prescriptive regulations mandated by the International Code of Safety for Ships using Gases or Other Low-flashpoint Fuels (IGF Code);
4. many more ports must be able to supply fuel, requiring harmonisation of port safety standards and dissemination of lessons learned; and, finally
5. standardised training must be in place to ensure enough competent crew.

These advances are within reach and show a path ahead for ammonia to fulfil its potential as a decarbonization option for deep-sea shipping<sup>1</sup>.

<sup>1</sup> Executive Summary, DNV White Paper, pp.4-5.

## Section 2: Why ammonia?

Those who regard ammonia as a promising option would highlight the many advantages of the fuel compared with its competitors – though, as we will see in Section 3, the use of ammonia as a marine fuel is not without difficulties. The barriers to its widespread adoption are several. In the following, we outline the most important advantages.

Ammonia is a fuel without carbon, which means it releases no carbon dioxide (CO<sub>2</sub>) emissions when used in power generation devices, such as fuel cells, internal combustion engines and gas turbines.

Ammonia is a hydrogen-based fuel that is easier to store and transport than pure hydrogen. Its liquid volumetric density is 50 per cent higher than that of hydrogen<sup>2</sup>, positioning it as a candidate for deep-sea shipping fuel. It is also less flammable and can be liquefied at lower pressures and higher temperatures than hydrogen, simplifying its onboard storage.

Ammonia is seen as a less costly option, with more energy-efficient production compared with competing e-fuels, such as e-methanol or e-methane. Most ammonia is produced by the Haber-Bosch process, which combines nitrogen gas (extracted from the air) and hydrogen gas at high pressures and elevated temperatures to form ammonia.

Ammonia production, being carbon-free, does not rely on renewable carbon sources, such as atmospheric CO<sub>2</sub> or sustainable biomass. Green ammonia is, in principle, scalable, since it only requires renewable electricity, water and air. Alternatively, blue hydrogen for ammonia production can be generated from fossil sources with close to

<sup>2</sup> The volumetric energy density of ammonia and liquefied hydrogen is 12.7 and 8.5 gigajoules per cubic metre (GJ/m<sup>3</sup>), respectively.

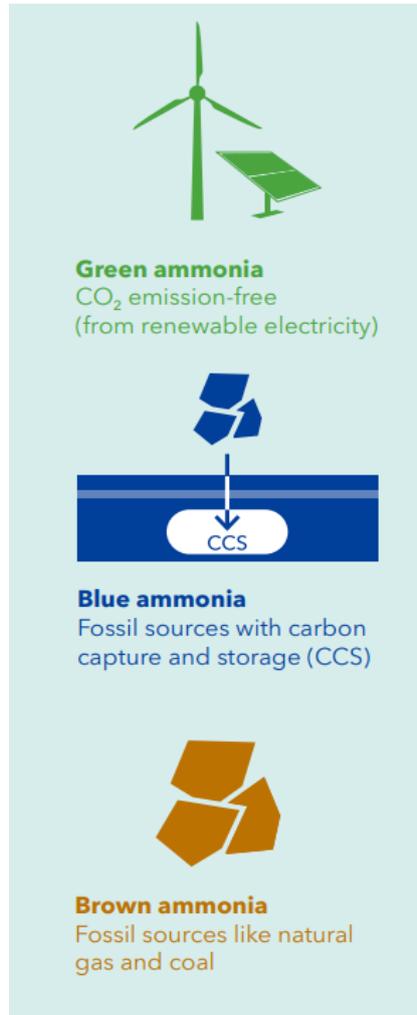


Figure 1.

complete carbon capture and permanent storage (CCS). See Figure 1. (This is Figure 2-1 in the original White Paper.)

Ammonia is one of the most widely produced chemical compounds, mainly due to fertiliser production. Although this ammonia production is almost entirely fossil (brown) today, the industry is developing green and blue production pathways for future supply. In 2024, ammonia's worldwide production reached approximately 200 million tonnes per annum (MTPA) and the successful decarbonisation of this production could lead to shipping benefiting from a well-established production and transportation infrastructure (DNV, 2024b).

Large ammonia storage facilities are typically situated at ports where ammonia is produced and distributed; 126 ports have



ammonia terminals ready to receive and ship this product from 550 ammonia plants (IRENA, 2022) (IEA, 2021). The geographical diversity of ammonia suppliers provides robust and secure supply chains.

The availability of sustainable green or blue ammonia for shipping depends on parallel developments across the complete value chain, including sustainable production, bunkering facilities and vessels, but the existing production and distribution infrastructure can largely be re-used, making scaling easier (Figure 2)<sup>3</sup>.

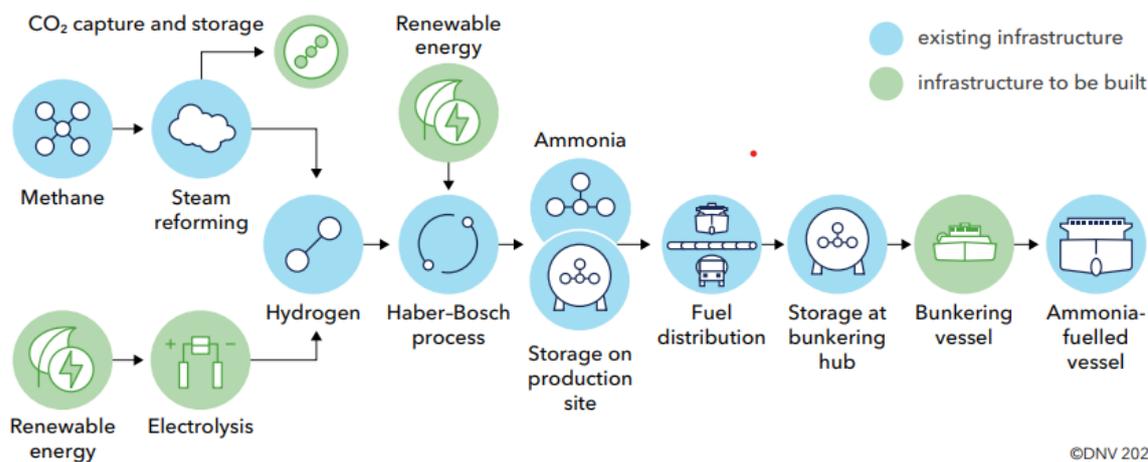
The use of existing infrastructure can be stimulated by a flexible chain of custody model that allows mixing of ammonia with different carbon intensity factors (DNV, 2024c<sup>4</sup>).

Ammonia is a substance well-known to the shipping industry, which already has extensive experience in handling and transporting ammonia as cargo at sea, with approximately 18 to 20 million tonnes of ammonia traded annually (some 10 per cent of the production). Ammonia is also used as a refrigerant in certain ship systems.

Despite these virtues, ammonia is at a significant disadvantage compared with conventional fossil fuels. Shipowners have always gravitated towards solutions that are cheaper, more available, more reliable, more efficient and need less space on board.

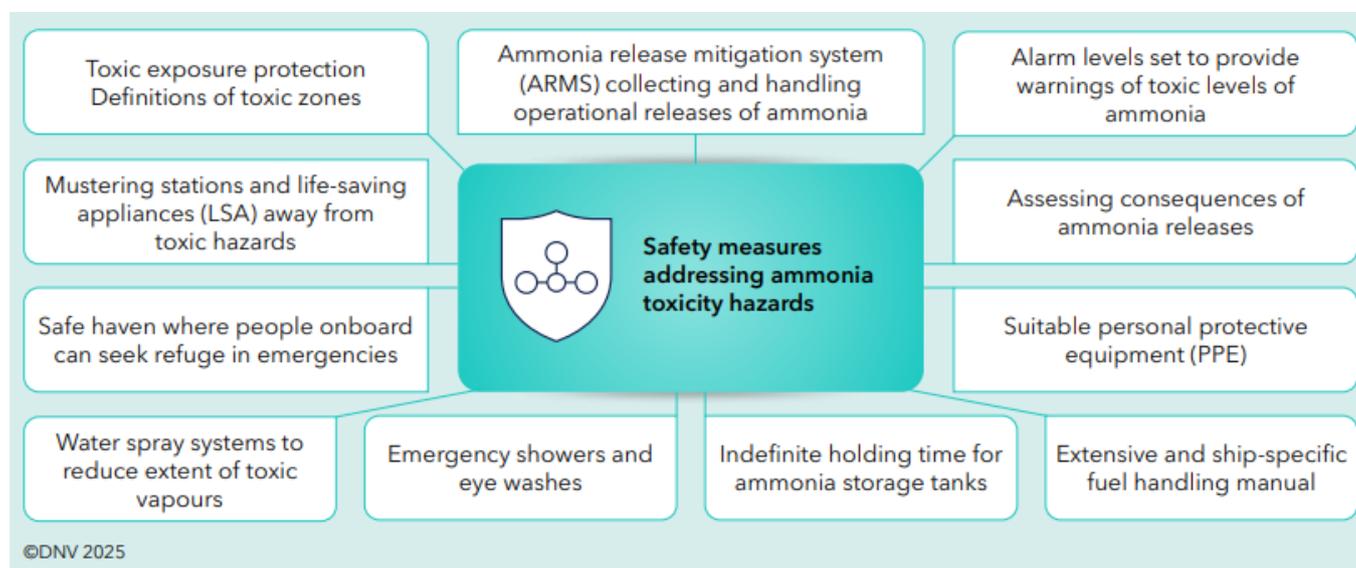
<sup>3</sup> Figure 2 is presented as Figure 2-2 on page 9 of the White Paper.

<sup>4</sup> DNV (2024c). Maritime Forecast to 2050 - Energy Transition Outlook 2024.



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Figure 2: Sustainable ammonia value chain for shipping where the existing production and distribution infrastructure can largely be re-used. Green ammonia will require hydrogen produced by electrolysis with renewable energy, while blue ammonia needs the addition of CO<sub>2</sub> capture in the steam reforming process, including permanent storage.



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Figure 3: Additional safety measures are required to manage ammonia as a fuel onboard ships in a safe way. The safety principles in the IGF Code for natural gas serve as a foundation.

The challenge is that ammonia and other low or near-zero GHG fuels are typically more expensive, less available, less mature, less efficient, pose new safety challenges (toxicity challenges for ammonia, see below) and require more space on board. The next section explores this in more detail.

### Addressing toxicity

Ammonia is toxic to humans, and exposure must be maintained within safe limits to safeguard personnel onboard or in proximity to the vessel. Even at low concentrations, it can irritate the eyes, lungs and skin. However, at higher concentrations or through direct contact, it can

present an immediate life-threatening hazard<sup>5</sup>. Ammonia is also hygroscopic, meaning it draws water from nearby sources, including the human body.

Mucous membranes, such as the eyes, respiratory system and skin, contain high moisture levels and are particularly vulnerable. Additionally, contact with liquefied ammonia can immediately cause frostbite, along with caustic burns.

Since the consequences of direct exposure to ammonia

<sup>5</sup> <https://www.gov.uk/government/publications/ammonia-properties-incident-management-and-toxicology/ammonia-toxicological-overview#health-effects-of-acute-or-single-exposure>

can be severe, technical safety measures integrated into ship design, as well as operational procedures, should aim to minimise and control ammonia releases. Although the safety principles in the IGF Code (segregation from external events, system integrity, double barriers, leakage detection and automatic isolation of leakages) serve as a foundation, additional measures are necessary for ammonia (Figure 3<sup>6</sup>) (DNV, 2022c<sup>7</sup>).

<sup>6</sup> Figure 3 is resented as Figure 2-3 on page 10 of the White Paper.

<sup>7</sup> DNV (2022c). Fuel properties and their consequences for safety and operability. DNV report no. 2022-1163, Nordic Roadmap publication no.1-B/2/2022.



These include implementing systems to prevent operational releases of ammonia, providing safe havens for people onboard where they can seek refuge, and having plans in place for safe evacuation in case of accidental ammonia release. Additionally, it is crucial to ensure that suitable protective equipment, depending on duties, is available.

Ensuring that the crew is familiar with the specific hazards related to ammonia is a prerequisite for safe operation – this will require new competencies on board and ashore.

Fuel transfer to a ship always poses a risk and a thorough risk assessment should be conducted to assess the consequences of a worst-case accident during bunkering.

To ensure the safety of society and personnel near a proposed bunkering site, the suitability of the geographical location for bunkering specific fuels must be evaluated by dispersion analysis, considering accidental release scenarios and weather conditions. This is especially important for ammonia bunkering, where potential evaporation of leaked fuel will necessitate considerable safety distances.

Many of the barriers to the uptake of ammonia as marine fuel (see Sections 3 and 4), both on board and ashore, are linked to the toxicity of ammonia.

A list of recommended further

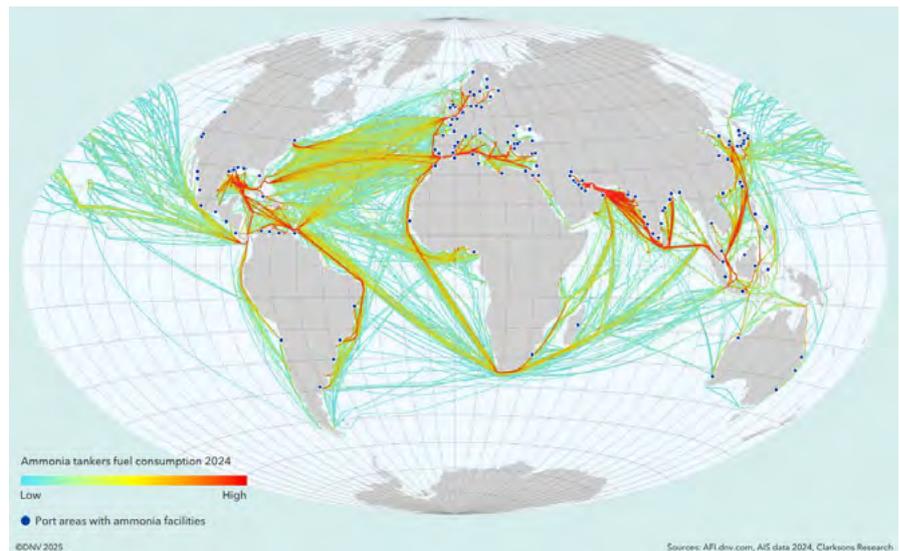


Figure 4 Geographical distribution of fuel consumption for a fleet of 274 ammonia carriers and location of around 140 port areas with ammonia facilities. This overlaps major trade routes for global shipping, indicating that this ammonia network could form a useful steppingstone for further scaling.

reading on the safe introduction of ammonia as fuel is provided at the end of this paper<sup>8</sup>.

### Section 3.2.1: Energy cost

Some front-runners decide to move ahead independently: *Yara Eyde*, an ammonia-powered container ship being constructed to serve the Oslo-Hamburg trade carrying fertilisers for Yara, has received CAPEX support from Enova.<sup>19</sup> Yara, a major ammonia producer, plans to fuel the vessel with green ammonia from its production, absorbing the additional cost to showcase the feasibility of ammonia as a fuel and cultivate a potential market for its product.

Fortescue, a major mining company with plans to produce low-GHG ammonia, has similar

plans to use ammonia to help decarbonise its operations. Others, such as car carrier owner Höegh, plan to build ammonia-powered ships to be in a position to offer transport to carbon-conscious customers from 2027, while Skarv Shipping Solutions, a joint venture between Grieg Edge and Peak Shipping, has placed an order for a dual-fuel ammonia general cargo ship to be delivered in 2027<sup>9</sup>.

### Section 3.2.3: Infrastructure

Figure 4 shows the geographical distribution of fuel consumption for a fleet of 274 ammonia carriers and location of around 140 port areas with ammonia

<sup>9</sup> First Out with Timber Transport on Zero-Emission Vessels: <https://skarvshipping.com/first-out-with-timber-transport-on-zero-emission-vessels/>. Section 3, DNV White Paper, p.20.

<sup>8</sup> Section 2, DNV White Paper, pp.8-10.

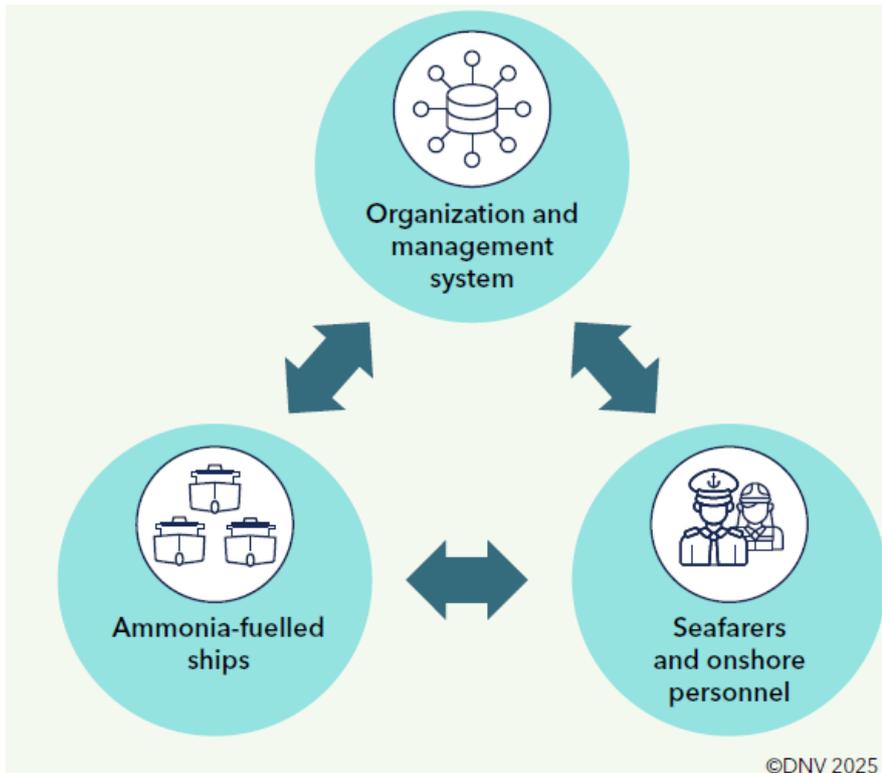


Figure 5: Operating ammonia-fuelled ships will impact the organisation and management system and require seafarers and onshore personnel to acquire new competencies (DNV, 2025a)

facilities<sup>10</sup>. This overlaps with major trade routes for global shipping, indicating that this ammonia network could form a useful steppingstone for further scaling.

#### Section 4.1: People and organisation

Compared with traditional fuels, ammonia's characteristics introduce added complexities to bunkering operations and ship operations relating to on-board fuel storage, fuel distribution and energy conversion, as well as maintenance and emergencies.

While the most effective risk-control measures are incorporated during the ship design and construction phases through technical solutions, it is vital to establish comprehensive training, operating procedures and a robust safety culture to ensure the ship's safe operation. This will require changes to the safety management system, generate the need for new competencies on board and

ashore, and may also affect the organization (Figure 5<sup>11</sup>).

Organisational factors supporting safe operation encompass various aspects, including working practices, safety culture, manning philosophy, and roles and responsibilities. In this context, we focus on three formal pillars related to training, procedures and management systems.

Hence, for this barrier to be considered resolved, ammonia-specific training courses, procedures and management systems as required by the IMO should be established and implemented to a level where the shipping organisations operate ammonia-fuelled vessels as part of their standard procedures and competent personnel are available to crew and support the operation of these ships.

#### Organisation and management system

Recognising that organisational factors related



to the safe operation of an ammonia-fuelled ship comprise more than the management system and organisational chart, the following framework is formally required by the IMO.

The International Safety Management (ISM) Code sets clear objectives and requirements for shipboard operations. The entire ship safety management system required by the ISM Code will be influenced by the use of ammonia as fuel, encompassing normal operations, maintenance and emergency preparedness.

The IMO interim guidelines for ammonia refer to the operational requirements outlined in the parts of the IGF Code applicable to natural gas, which state that specific procedures must be provided on board the ship for normal operations, including bunkering, as well as for maintenance and emergencies.

It also requires drills and emergency exercises to be carried out on board at regular intervals.

The ISM Code places obligations on ship operators to ensure that both the master and crew are well informed about the

<sup>10</sup> Figure 4 is presented as Figure 3-6 on page 23 of the White Paper.

<sup>11</sup> Figure 5 is presented as Figure 4-1 on page 24 of the White Paper.

risks associated with the ship's operations.

Additionally, training in using ammonia as fuel must be established and overseen, as mandated in the safety management system. This is further elaborated in "Guidelines for developing and implementing a Safety Management System for ammonia-fuelled ships" (MTF, 2025<sup>12</sup>).

The adoption of ammonia fuel, along with the related technologies, may also require changes within the ship operator's organisation, potentially resulting in the establishment of new roles and responsibilities on board and ashore.

### **Seafarers and onshore personnel**

The availability of seafarers with ammonia competence will be critical for the widespread use of ammonia fuel. Additionally, competence is required for all stakeholders onshore, including shipowners, ship management representatives, port operators and fuel suppliers.

While relevant competencies gained through decades of operating gas carriers will be valuable in training for other shipping segments, individuals with this competence are a limited resource, considering the small number of ships and seafarers in this segment compared to the world fleet.

Similarly, experience with operating tankers carrying ammonia as cargo will be valuable – but represents an even more limited resource pool. This means that there is an urgent need for training, which will in turn influence the crewing cost and the competition in the industry for qualified crew.

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<sup>12</sup> MTF (2025). Guidelines for developing and implementing a Safety Management System for ammonia-fuelled ships. Maritime Technologies Forum.



The IGF Code outlines crew members' training and competence requirements, referencing the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers (STCW). Depending on their duties on board, the crew shall hold certificates in basic or advanced training for service on ships subject to the IGF Code.

The STCW specifies additional training and qualification requirements for masters, officers, ratings and other personnel on ships subject to the IGF Code, and there are associated STCW courses for LNG fuel. However, existing training frameworks do not address the distinct properties and handling requirements of ammonia, and no specific STCW training courses are currently available for ammonia fuel.

Together with industry partners, DNV has developed a recommended practice (RP) that provides a clear roadmap for developing concrete ammonia-specific training courses.

The RP can also be used as input to competence planning

and operational manuals as well as for reviewing safety management systems.

It can also be used by third parties for certifying training programmes.<sup>40,41</sup> The Maritime Technologies Forum (MTF) has developed guidelines for safety management systems specifically for ammonia-fuelled ships, and these can provide further guidance in updating the safety management system (MTF, 2025).

The current availability of trained crew and personnel ashore, operational procedures and organizational structures is considered to represent a high barrier to the uptake of ammonia as fuel.

There is no experience from ships operating with ammonia fuel apart from the vessels demonstrating first-use, and no ammonia-specific STCW courses are available. However, extensive experience of operating gas tankers that carry ammonia as cargo can serve as a starting point for developing similar approaches for ammonia-fuelled ships and this is reflected in the barrier level (see below).

The above international framework and developments in guidance documents represent a good foundation for further reducing the “people and organisation” barrier. It will also be important to learn from early adopters, including the vessels already demonstrating the first use of ammonia as ship fuel.

Moving forward, the IMO is expected to initiate the development of training programs for seafarers on ships utilising ammonia as fuel this year.

Until STCW courses for seafarers on ships using ammonia as fuel are in place, training should be developed based on existing resources, including DNV’s RP, in consultation with the Flag Administration.

This may involve incorporating relevant sections of the IGF and STCW, employing risk assessments from the design phase to enhance understanding of risks, raising awareness, and devising emergency training scenarios (DNV, 2025a)<sup>13</sup>.

## Selected DNV projects

### Green Shipping Programme (GSP)

A public-private partnership initiated in 2015 with 120+ partners from industry and government, managed by DNV. By May 2025, the GSP has initiated 60 green pilot projects, several of which have considered the feasibility of using alternative fuels for various ship types and trades.

<https://greenshippingprogramme.com/>

### *Equinor* ammonia powered tanker

GSP pilot study facilitated by DNV, investigating the technical and economical applicability of implementing ammonia-eligible

<sup>13</sup> Section 4, DNV White Paper, pp.24-26.

engines and fuel and bunkering systems in a large generic tank ship design. With participation from 18 GSP partners covering the entire value chain, including Wärtsilä, Brevik Engineering, and Altera.

### *Grieg Star* ammonia powered bulk carrier

GSP pilot study facilitated by DNV, investigating the technical and commercial feasibility of retrofitting an open hatch bulk carrier for green ammonia operations in a trans-Atlantic route. With participation from 21 GSP partners covering the entire value chain, including Yara, NMA, and G2 Ocean.

### *Lerøy Havfisk* ammonia powered trawler

GSP pilot study facilitated by DNV, investigating if it is possible to implement an ammonia-fuelled system on a newbuild with similar performance as the current modern trawlers in their fleet. With participation from 13 GSP partners covering the entire value chain, including Wärtsilä, Skipsteknisk, and Grieg Maritime.

### Color Line ammonia as fuel

GSP pilot study facilitated by DNV to shed light on potential barriers, such as the environmental footprint, security aspects, technological solutions, cost and possible private and public financing solutions. Includes an ammonia bunkering quantitative risk assessment (DNV, 2021c<sup>14</sup>). With participation from 24 GSP partners across the entire value chain, including the Port of Oslo, Yara, DSB, and NMA.

### Blåvinge ammonia-fuelled AHTS

GSP pilot study facilitated by DNV, investigating the technical

<sup>14</sup> DNV (2021c). Ammonia Bunkering of Passenger Vessel – Concept Quantitative Risk Assessment. Green Shipping Programme. DNV report no. 2021-0205, Rev.0.

and economic feasibility of developing an ammonia-battery-hybrid anchor handling newbuild for the installation and operation of floating offshore wind turbines. With participation from 11 GSP partners across the entire value chain, including Vard, Yara, and DNB.

### Nordic Roadmap for Future Fuels

A Nordic collaboration project with 70 partners, managed by DNV and funded by the Nordic Council of Ministers. The project presented the Fuel Transition Roadmap for Nordic Shipping, with a focus on ammonia, hydrogen, and methanol, in 2024. The project has developed a complete proposal for ammonia fuel guidelines submitted to the IMO in 2023 from the Nordic countries.

<https://futurefuelsnordic.com/>

### Ammonia as a Marine Fuel Safety Handbook

Provides practical guidance on safety aspects of ship design in the development of ammonia-fuelled ships for shipowners, yards, and designers. Developed by DNV on behalf of GSP with input from the Norwegian Maritime Administration, the Nordic roadmap project and other industry partners.

<https://greenshippingprogramme.com/wp-content/uploads/2021/03/Ammonia-as-a-Marine-Fuel-Safety-Handbook-Rev.02.pdf>

### AEngine

A consortium led by Everllence to develop a two-stroke, ammonia-fuelled engine for maritime shipping with funding from Innovation Fund Denmark. DNV is among the consortium members.

<https://www.man-es.com/company/press-releases/press-details/2020/10/21/>

man-energy-solutions-to-lead-danish-consortium-developing-ammonia-fuelled-engine-for-maritime-sector

### Ammonia 2-4

An EU-funded project led by Wärtsilä where the overall aim is to demonstrate at full scale both a two-stroke and a four-stroke dual-fuel marine engine running on ammonia as the main fuel. DNV is among the partners.

<https://www.ammonia2-4.eu/>

### ARISE

A research partnership for controlled ammonia release at sea, where DNV is among the sponsors. ARISE aims to fill knowledge gaps by conducting experiments, thereby enhancing the quality and consistency of risk assessments.

<https://www.arise-partnership.org/>

### NoGaps

A collaboration project supported by Nordic Innovation and led by the Global Maritime Forum with partners including DNV, Wärtsilä, Yara, and Everllence. Aims to produce a detailed ship design for an ammonia-powered ammonia carrier.

<https://www.nordicinnovation.org/programs/nordic-green-ammonia-powered-ships-nogaps>

### Eidesvik's *Viking Energy*

The DNV-classed platform supply vessel (PSV) *Viking Energy* will be equipped with an ammonia dual-fuel engine. In 2026, the vessel is planned to operate on ammonia for Equinor.

<https://eidesvik.no/viking-energy-makes-history-as-first-ammonia-powered-offshore-vessel/>



### Maritime Technologies Forum (MTF)

A collaborative effort between Flag States and classification societies which includes DNV, working to bridge the gap between technological progress and regulatory process across the maritime sector.

The MTF has published several reports, such as “Guidelines for Developing and Implementing a Safety Management System for Ammonia-fuelled Ships” and “Safety Considerations for Establishing Green Shipping Corridors”.

<https://www.maritimetechnologiesforum.com/>

### *Fortescue Green Pioneer*

A converted supply vessel which became the first oceangoing vessel to be fuelled by ammonia after completing a set of trials in Singapore in May 2024. Gas-fuelled ammonia notation from DNV.

### Höegh Autoliners' Aurora Class car carriers

The first Aurora Class vessel entered into commercial operations in August 2024 with DNV's ammonia ready notation. By 2027, the last four vessels of the series are planned to be

delivered, able to run net zero on ammonia directly from the yard.

<https://www.hoeghautoliners.com/aurora-class>

[https://www.dnv.com/expert-story/maritime-impact/from-forecast-to-fleet-lessons-from-hoeghs-ammonia-transition/?utm\\_campaign=website&utm\\_medium=email&utm\\_source=newsletter](https://www.dnv.com/expert-story/maritime-impact/from-forecast-to-fleet-lessons-from-hoeghs-ammonia-transition/?utm_campaign=website&utm_medium=email&utm_source=newsletter)

### CMB.TECH's Yara Eyde

This 1,400 TEU ice-class containership is planned to be delivered by mid-2026 with DNV's gas-fuelled ammonia notation and will serve routes between Norway and Germany.

<https://cmb.tech/news/cmbtech-to-build-worlds-first-ammonia-powered-container-ship-in-partnership-with-ncl-and-yara>

### Energy sector

Several dozen industry projects in the energy sector for ports and terminals, producers of ammonia, producers of equipment, and others. Projects include qualitative safety studies, technology qualification, GHG emission assessment,

LCA studies and assistance on market strategy and regulations<sup>15</sup>.

**Authors:** Linda Sigrid Hammer, Magnus Strandmyr Eide, Marius Leisner and Øyvind Endresen. **Reviewers:** Håkon Hustad, Christoffer Böhmer, Jason Stefanatos and Jan Kvålsvold.

White Paper link: <https://www.dnv.com/maritime/publications/ammonia-in-shipping-download/>

DNV White Paper  
“Ammonia in Shipping: Tracing the emergence of a new fuel”

<sup>15</sup> Selected DNV projects, DNV White Paper, pp.38-41.

# Scheduled extinguishing agents in the marine industry

THE fire industry's primary concern is to safeguard life, assets and the environment. The importance of safety at sea relies heavily on correct fire protection procedures, which is key to shipboard safety. This applies to cruise ships, merchant ships and naval vessels, and is vitally important for the fishing and pleasure craft fleet.

Fire protection equipment containing ozone-depleting substances (ODS) and synthetic greenhouse gases (SGG) (scheduled extinguishing agents) used in vessels are regulated under the *Ozone Protection and Synthetic Greenhouse Gas Management Act 1989* (the Act) and the *Ozone Protection and Synthetic Greenhouse Gas Management Regulations 1995* (Regulations).

Fire protection is an essential component of marine safety equipment. Depending on the vessel size, gaseous fire suppression systems can protect:

- internal combustion;
- gas turbines;
- main or auxiliary propulsion;
- machinery spaces;
- paint and oil lockers;
- pump rooms; and
- ☐ control rooms.

Gaseous fire suppression systems will be found in most vessels, including:

- passenger ferries;
- police vessels;
- barges;
- car ferries;
- tugs; and
- major shipping generally.

Gaseous fire suppression systems protecting machinery spaces, particularly in the case of smaller craft, may well incorporate scheduled extinguishing agents.

## 1. Australian Maritime Safety Authority (AMSA)

AMSA is Australia's national

agency responsible for maritime safety, protection of the marine environment and maritime aviation search and rescue.

AMSA is a statutory authority established under the *Australian Maritime Safety Authority Act 1990* (the AMSA Act) and is in control of the safety of domestic commercial vessels and the seafarers who are operating in the domestic commercial industry.

AMSA regulates light commercial vessel safety around Australia, while State and Territory agencies administer safety requirements for private vessels. While AMSA is the single national regulator for commercial vessel safety, the Department of Climate Change, Energy, Environment and Water regulates the use of scheduled extinguishing agents on these vessels.

For further information on AMSA and their National Standards for Commercial Vessels please go to [www.amsa.gov.au](http://www.amsa.gov.au)

### Did you know?

Halon 1211 and halon 1301 was primarily used in the marine industry, however in 1993 it was banned from being imported into Australia;

Halon 1211 and halon 1301 are scheduled extinguishing agents controlled under the Montreal Protocol;

The ozone depleting potential (ODP) and global warming potential (GWP) of halon is higher than CO<sub>2</sub>. Halon has an ODP of 10 (meaning that it is 10 times more potent in destroying the atmosphere) and a GWP of 6,200 (meaning that it is 6,200 times as potent as CO<sub>2</sub> in warming the atmosphere).





## 2. Foreign flagged vessels

Must have fire systems in accordance with International Maritime Organisation (IMO) requirements.

Halon systems are still permitted, and halon can be purchased from the National Halon Bank or companies which hold a Halon Special Permit (HSP).

Access to supplies of halon is limited and minimum quantities will only be provided for recharging gaseous fire suppression systems to ensure safe operation.

Halon will not be supplied to vessels registered in non-Montreal Protocol signatory countries.

## 3. Local commercial vessels

The most commonly used scheduled extinguishing agents used are FM-200® and NAFS-III because of their ability to act as leading alternatives to halon.

FM-200® can protect from most of the hazards that halon does but is less toxic.

Scheduled extinguishing agents such as, FM-200®, FE-227™ and NAF S-III, must be obtained from companies holding an EATA.

## 4. Recommendations

The Board recommends the following actions to ensure that technicians working in the marine industry are compliant with the *Act* and *Regulations*, while contributing to Australia's effort in reducing emissions of scheduled extinguishing agents into the atmosphere:

- Builders / owners / operators of vessels with gaseous fire suppression systems containing scheduled extinguishing agents must ensure that the installation and maintenance of these systems is done by licensed technicians;
- all technicians working with scheduled extinguishing agents must hold the appropriate licence, authorisation, or permit; and
- regular service and maintenance of gaseous fire suppression systems to ensure full functionality in the event of a fire.

While there is no requirement

to replace systems, owners should consider changing systems to environmentally-friendly alternatives. There are several extinguishing agents that are not regulated under the *Act* and *Regulations*.

For example, owners may wish to consider systems which use Novec™ 1230, inert gas or condensed aerosols. The system replacement could be timed with a major service of the system. For example, at the appropriate period for a hydrostatic test.

## 5. Do you require a licence?

Licences, authorisations and permits are issued by the Fire Protection Industry (ODS & SGG) Board, and are required when handling scheduled extinguishing agents in the marine industry.

Vessel owners and operators do not need to be licensed but have obligations to prevent emissions of scheduled extinguishing agents.

Technicians installing, servicing, maintaining or decommissioning systems containing scheduled extinguishing agents must hold an Extinguishing Agent Handling Licence (EAHL).

Technicians or companies who buy, store and/or sell scheduled extinguishing agents must hold an EATA.

Foreign flagged vessels can acquire halon when they are in Australian waters and technicians servicing systems on foreign flagged vessels must hold an EAHL.

Companies / businesses who buy, store and / or sell Halon must hold an HSP.

**Fire Protection Industry  
(ODS & SGG) Board**

# Cargo securing of containers



THIS article is drawn from *Maritime Safety Awareness Bulletin: Shaping Shipping for People*, Issue #22, September 2025: “Cargo securing of containers”.

## 1. Cargo securing

Inadequately stowed and secured cargoes cause significant harm to people, the environment, other cargoes and vessels, not only at sea but also during loading and discharge.

These safety issues may result in serious incidents, environmental pollution and reputational damage to the shipping industry and can also cost tens of millions of dollars to clean up<sup>1</sup>.

Safety of Life at Sea (SOLAS) Convention and Marine Order 42 (Carriage, stowage and securing of cargoes and containers) stipulates that cargo shall be loaded, stowed and secured to prevent damage or hazard to the ship, persons and loss of cargo overboard.

<sup>1</sup> Kinley, M. 2020 “A time of reminders”, Shipping Australia, Spring/Summer. p. 52.

During ships inspections, the Australian Maritime Safety Authority (AMSA) identified the following stowage and securing issues involving cargo containers:

- exceeded maximum permissible container stack weights;
- exceeded maximum permissible weight distributions within stacks; and
- cargo was not appropriately secured throughout the voyage to prevent loss of cargo overboard.

## 2. Case study 12 – 50 containers overboard<sup>2</sup>

The vessel underwent a series of heavy rolls that resulted in the loss of 50 containers overboard.

The investigation found that the vessel’s fixed container securing arrangements on deck were inadequately maintained and the strength of the securing fixtures were severely reduced by

<sup>2</sup> Australian Transport Safety Bureau (2022) [Marine Occurrence Investigation Report – Loss of containers overboard from APL England](#). 16 December 2022.

corrosion, which compromised the effective securing of cargo.

For extended periods, shipboard inspections failed to detect deteriorating condition of the vessel’s deck structure and fittings.

## 3. Case study 2 – 81 containers overboard<sup>3</sup>

Approximately 81 containers were lost overboard and a further 62 were damaged due to heavy rolling while the vessel was enroute to Sydney.

The investigation found that (amongst other factors):

- the calculated resultant forces on the weights and distribution of containers in two bays exceeded the allowable force limits specified in the ship’s cargo securing manual;
- the cargo planning process ashore did not ensure that the proposed container stowage

<sup>3</sup> Australian Transport Safety Bureau (2022) [Marine Occurrence Investigation Report – Loss of containers overboard YM Efficiency](#). 13 February 2020.



Figure 1. Thinned, heavily wasted and failed lashing eyes (top) and wasted and failed container support structure (bottom)



Figure 2: Damaged containers

plan complied with the stowage and lashing forces requirements of the ship's cargo securing manual;

- the master and chief mate did not check that the proposed container stowage plan complied with the cargo

securing manual; and apart from on-the-job training and mentoring, there was no evidence to indicate that the officers had been trained in the use of the loading computer system or the lashing calculation program.

#### 4. Strategies to prevent container loss

The requirements for ensuring the proper stowage and securing of cargo containers are set out in the International Convention for the Safety of Life at Sea (SOLAS), 1974 Chapter VI, Regulation 5. SOLAS requires cargo to be appropriately secured “throughout the voyage” to prevent loss of cargo overboard.

The ship's approved cargo securing manual includes requirements on cargo securing, including the types and correct application of cargo securing devices provided on board the ship. The following are some practical strategies for improving container securing and preventing container loss.

#### 5. Maintaining and monitoring cargo securing arrangements

Operators must ensure that securing devices are in good condition, compatible with the ship and maintained in accordance with the inspection and maintenance schedule contained in the cargo securing manual.

This includes establishing maintenance schedules to ensure cargo securing equipment and fittings are regularly inspected and maintained.

Maintenance processes and procedures should be regularly reviewed for continued effectiveness. Crew need to monitor cargo securing arrangements throughout the voyage to ensure the lashing arrangements have not become loose.

## 6. Procedures and training

Operators should provide training to ensure crew are appropriately trained and familiar with the contents of the approved cargo securing manual, in accordance with their respective roles on board.

Exceeding the mass limits defined in the cargo securing manual may result in the destruction of lashings and fittings or the collapse of individual containers.

The approved cargo securing manual should be comprehensive and understandable. Poorly written procedures will likely result in poor practices or non-compliance. It is important to ensure the manual is developed to align with the way tasks are actually conducted onboard for safety and practicality.

Operators should regularly review the procedures and manual to ensure they are up-to-date and effective to enable the crew to implement the requirements of the manual appropriately.

## 7. Preparing for weather and sea conditions

Severe weather conditions may be experienced at any time of the year off the Australian coast. Most container loss incidents in Australian waters have occurred during severe weather conditions.

Strong southerly winds, when combined with an easterly swell, can create extreme wave conditions where container ships are at risk of losing cargo overboard. In such incidents, swell size and interval may lead to excessive or even parametric rolling resulting in extreme acceleration forces on container stacks.

Cargo shall be stowed and secured in accordance with the Code of Safe Practice for Cargo Stowage and Securing (CSS

Code). The CSS Code General Principles state:

“Decisions taken for measures of stowage and securing cargo should be based on the most severe weather conditions which may be expected by experience for the intended voyage.”

Additionally, due to the construction of container ships, the effects of parametric rolling are pronounced and can cause stress on securing systems leading to container loss<sup>4</sup>. As such, vessel dynamics should be considered in evaluating sea states and applying weather routing during voyage to minimise effects of parametric rolling.

Guidance for avoidance of parametric rolling is provided in MSC.1/Circ.1228 Revised guidance to the master for avoiding dangerous situations in adverse weather and sea conditions. While the vessel’s safety management system will contain procedures relating to heavy weather, early avoidance is better than proceeding through heavy weather<sup>5</sup>.

Effective weather routing procedures should be in place. The master should always consult the latest available weather information and vessel operators should ensure the master always has access to this information<sup>6</sup>.

In Australia, the Bureau of Meteorology (BoM) provides weather forecasts and high seas warnings to GMDSS equipped ships; these are received by appropriate terminals configured to NAVAREA XI.

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4 Dutch Safety Board (2020) [Investigation Report - Safe container transport north of the Wadden Islands Lessons learned following the loss of containers from MSC Zoe](#). June 2020.

5 Code of Safe Practice for Cargo Stowage and Securing (CSS Code).

6 MSC.1/Circ.1228 Revised guidance to the Master for avoiding dangerous situations in adverse weather and sea conditions

## 8. Concentrated Inspection Campaign

Australia, along with member Authorities of the Tokyo and Indian Ocean MOUs continue to identify issues relating to improper cargo securing and stowage. A concentrated inspection campaign is planned to be conducted by both MOUs in relation to cargo securing and stowage in 2026, in collaboration with the Paris MOU.

## 9. Key messages<sup>7</sup>

Safety management systems should capture, and address risks associated with cargo.

Introduce specific measures and controls to mitigate risks effectively.

The risk assessment should capture risks involving heavy weather navigation, including precautions to prevent the loss of cargo, and ensure appropriate checklists are available.

Effective weather routing, based on the latest available weather information, should be undertaken.

Regularly review the risks and control measures to ensure the controls remain effective and up to date, in light of new information or a change in operational condition.

The ship’s crew must be familiar with the approved cargo securing manual.

Cargo securing equipment and fittings should be regularly inspected and maintained.

Containers must be stowed and secured in accordance with the approved cargo securing manual and the crew should check this before signing off on cargo load.

**Australian Maritime Safety Authority**

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7 Australian Maritime Safety Authority (2002) [Marine Notice 2022/02 - Proper stowage and securing of cargo containers](#).

# Livestock carrier loss of propulsion entering Fremantle

THE following report was published by the Australian Transport Safety Bureau (ATSB) on 4 September 2025: *Australian Transport Safety Bureau – Loss of propulsion while entering the Port of Fremantle involving Al Messilah: 2 km from Fremantle, Western Australia, on 4 March 2025*

## 1. The occurrence

On the morning of 4 March 2025, the livestock carrier *Al Messilah* was waiting to enter the Port of Fremantle, Western Australia, after departing from Shuwaikh, Kuwait on 2 February 2025.

The ship was boarded by a pilot at the inner pilot boarding ground to guide the ship to North quay berth 2 in the Fremantle Inner Harbour for loading operations (Figure 1). The master-pilot exchange was completed with no defects reported regarding the main engine. During the transit 2 tugs, *Svitzer Redhead* and *Svitzer Falcon*, were in attendance, with *Svitzer Redhead* made fast at the port quarter and *Svitzer Falcon* at the port shoulder.

The pilotage proceeded routinely until 0741 local time<sup>1</sup>, when the ship's stern was abeam 1/A buoys at the Inner Harbour entrance channel. At this point, with the ship travelling at 10 knots and heading 084° true course, the main engine stopped while running at slow AHEAD. The pilot alerted both tugs, ordering *Svitzer Redhead* to shorten up (to prepare to push

<sup>1</sup> Local time was Western Standard Time (WST), which is Coordinated Universal Time (UTC) +8 hours. It was noted that discrepancies existed between the ship's bell book, engine movement log, and time stamp on portable pilot unit (PPU) recording provided by Fremantle Pilots.



Figure 1: Inner Harbour Fremantle (Source: Google maps, annotated by the ATSB)

on the ship) and *Svitzer Falcon* to stand by to lay back.

Meanwhile, the master coordinated with the engine control room to restart the main engine. The chief engineer, who was in the engine control room at the time, observed that just prior to the engine stopping, the AHEAD and ASTERN indicator light began flickering between directions. They then took manual control of the engine from the bridge to the engine control room and attempted to restart it in both AHEAD and ASTERN directions. After initial checks, the engine was started in AHEAD and the pilot was advised to only use the engine in the AHEAD direction.

At 0744, after passing South Mole and prior to reaching the wheel-over point (Figure 1), the main engine was back online with slow AHEAD engaged. The pilot attempted to contact vessel traffic service (VTS) on channel 8 to provide detail of the engine stoppage, but received no response. The pilot then contacted VTS on channel 12 and

asked the VTS operator to switch to channel 8. On channel 8, the pilot notified VTS of the main engine issues and requested engine monitoring, subsequently advising VTS: "We're all good."

As they were saying this to VTS, the engine failed a second time and could not be restarted. With the ship continuing under its own momentum, the pilot gave instructions to the helmsman to ensure the ship turned to enter the Inner Harbour.

The pilot also instructed *Svitzer Redhead*, which remained connected at the port quarter, to push at minimum power to assist the turn and to maintain the ship in the centre of the harbour.

With the engine still failed, the pilot attempted to contact VTS on channel 8 twice at 0752, to inform them of the engine failure and discuss contingency berthing options, but received no response.

A follow-up call was made to VTS via mobile phone, which also went unanswered. The pilot

then contacted the mooring team leader on channel 8 to enquire about available berths but the call could not be established.

The pilot subsequently established contact with the team leader via mobile phone and advised them that the engine had failed, and they may need to berth where they could.

The team leader confirmed that D and F berths were vacant but advised against berthing between them due to a known misalignment of the wharf.

By 0757, as the ship passed north quay berth 2 (Figure 1), the crew were able to restart the main engine with dead slow AHEAD engaged. The ship then continued to F berth with the engine at dead slow AHEAD with no further issues. The ship was all fast at 0835.

## 2. Context

### 2.1 *Al Messilah*

The ship *Al Messilah* was built by the Hashihama Shipbuilding Company in Japan in 1980. It was converted into a livestock carrier in 1997 by Meyer Werft in Germany.

At the time of the incident, it was owned, managed and operated by the Kuwait Livestock Transport & Trading Company, and was classed with Lloyd's Register. The ship regularly traded between Fremantle, Australia and Shuwaikh, Kuwait.

The ship had an overall length of 185.85 metres and a beam of 32.0 metres. It had a gross tonnage of 38,988 and a deadweight of 12,900 tonnes at a draught of 9.024 metres.

The ship was equipped with a Mitsui B&W 9L67GFC main engine that delivered 12,356 kW through a fixed pitch propeller. In ballast condition, the ship's manoeuvring speeds were 6.2 knots at dead slow AHEAD and 8.2 knots at slow AHEAD.

### 2.2 Crew

*Al Messilah* was manned with 57 personnel and all crew members held the required qualifications and endorsements for their respective positions.

The deck department comprised the master and five officers, including two chief mates, a second mate, a third mate and a radio officer. The master held an Egyptian master's certificate of competency re-issued in 2023 and had six years' experience in the rank, including 14 months on board *Al Messilah*.

The chief officer had 11 years of experience in the rank and had served on board for three months.

The engineering department included the chief engineer, a second engineer and two third engineers.

The chief engineer held a Singapore-issued certificate of competency as a marine chief engineer, issued in 2021, and had previously served on the ship on multiple occasions, completing six months on board during the current tenure.

The second engineer held an Egyptian certificate of competency re-issued in 2024, with nine years' experience in the rank and a total of 27 months served on the ship.

### 3. Fremantle Pilots

Fremantle Pilots (FP) was a privately owned company that had provided continuous contracted pilotage services within the Port of Fremantle since 1994. FP was reported to pilot about 3,500 ship movements annually.

The experienced pilot assigned to *Al Messilah* held an unrestricted licence as a port pilot, issued by Fremantle Ports, and a master mariner's certificate of competency issued by the Australian Maritime Safety

Authority (AMSA). They had been on this ship for pilotage on multiple occasions in the past.

## 4. Main engine control and starting sequence

Control of the main engine was available from the bridge using the engine order telegraph (telegraph) handle<sup>2</sup> on the bridge manoeuvring console, from the engine control room, and locally at the engine.

The engine was directly coupled to a fixed-pitch propeller. To reverse the direction of propeller thrust, the engine was required to be stopped and then restarted in the opposite direction.

When this was required, after the engine was stopped, the engine telegraph was moved to the AHEAD or ASTERN position. Valve 87 (see the section titled Pneumatic system and Figure 2) then directed control air through the appropriate line (AHEAD or ASTERN) to the main air distributor (see the section titled Main air distributor).

It also provided air to the intensifier booster of the camshaft reversing mechanism (see the section titled Camshaft reversing mechanism booster), positioning them for the commanded operation.

To start the main engine, it was initially turned using starting air. Once the engine speed reached a pre-defined threshold, the starting air was stopped and fuel introduced. The engine speed automatically adjusted to match the speed set by the bridge controls.

## 5. Pneumatic system

The main engine's pneumatic system (Figure 2) used compressed air, referred to as control air, at a working pressure of 7 kg/cm<sup>2</sup>. This air came from the main air bottles, which store air

<sup>2</sup> An engine order telegraph is a communications device on the ship's bridge used to generate a change in engine speed or direction.

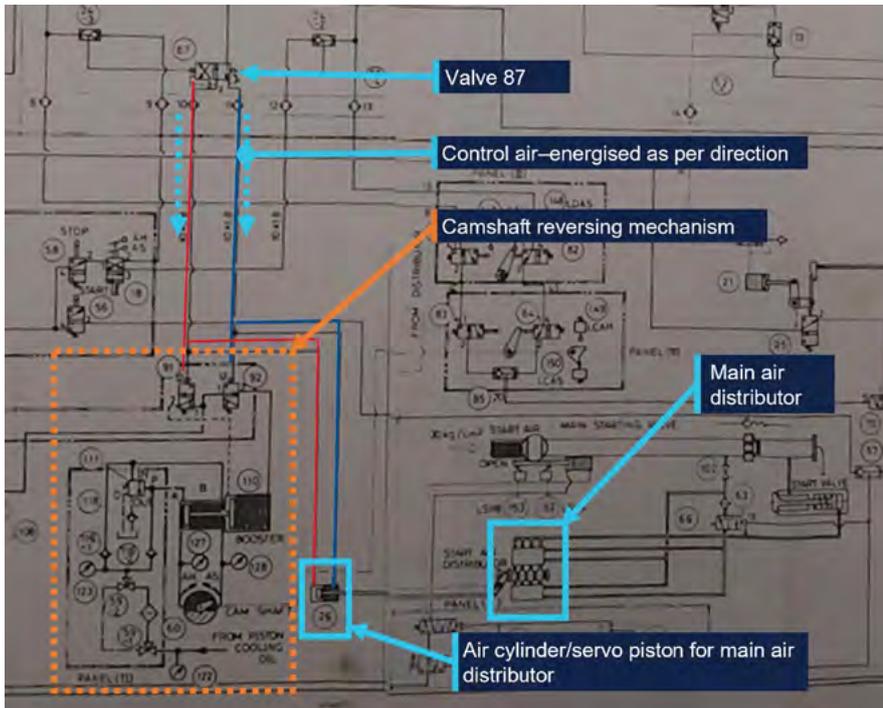


Figure 2: Pneumatic system Note: The blue line is showing the path of the control air in the AHEAD line and the red line is showing the path of the control air in the ASTERN line. (Source: Ship’s manager, annotated by the ATSB)

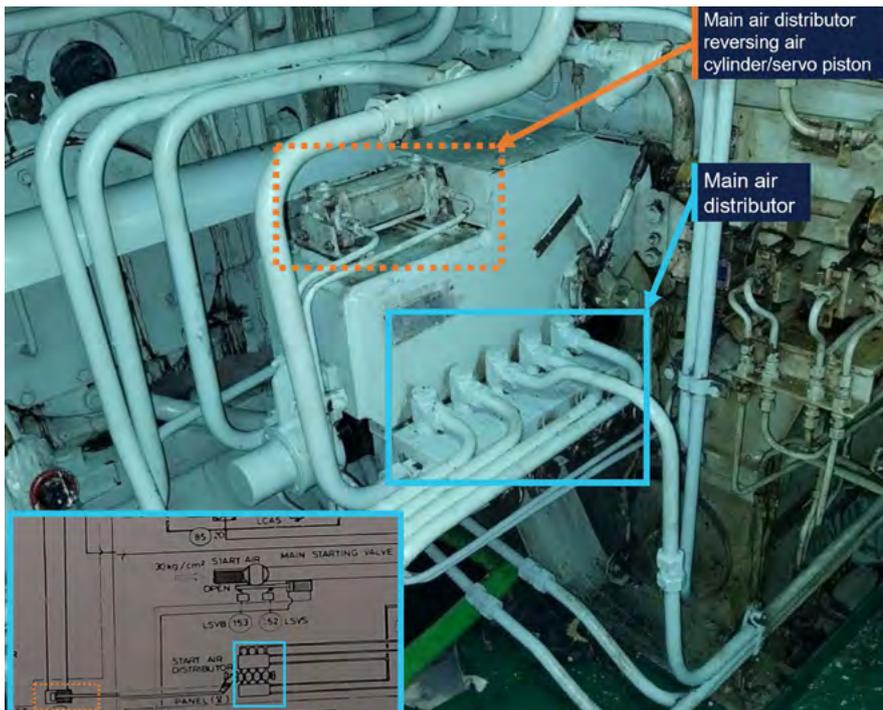


Figure 3: Main air distributor (Source: Ship’s manager, annotated by the ATSB)

at 30 kg/cm<sup>2</sup>. A pressure-reducing valve lowered the pressure to the required level. To meet the manufacturer’s air quality standards, the system also included a control air dryer.

## 6. Components

### 6.1 Main air distributor

Control air supplied through valve 87 was directed to either

the AHEAD or ASTERN line and acted on the servo piston (Figure 3). This piston moved the main engine air distributor into the correct position for the selected direction.

The distributor then directed high-pressure air to each cylinder’s start air valve to initiate engine rotation. By adjusting the firing order (timing and sequence

of air delivery to the cylinders), the distributor ensured the engine was started and rotated in the intended direction.

### 6.2 Camshaft reversing mechanism booster

At the same time as being directed to the distributor, the control air acted on the camshaft reversing mechanism intensifier booster (Figure 2) to change the camshaft’s position to match the selected engine direction.

This resulted in a change to the timing of the fuel injection and exhaust valve operation, allowing the engine to run in the required direction.

## 7. Shipboard maintenance procedures

As part of its safety management system, the ship manager advised that they implemented standard procedures across all ship and shore operations. This included manuals covering company procedures, fleet instructions, and safety management.

The system included general procedures, with the key procedure for main engine maintenance summarised as follows.

The company maintains machinery and equipment according to rules, manufacturer guidance, and risk assessments. If needed, stricter internal standards are applied.

Spare parts and tools are provided promptly. Maintenance records are kept up to date and checked both on board and ashore. Senior staff carry out regular inspections, and critical equipment is maintained.

### 7.1 Planned maintenance system

The fleet instructions manual on board *Al Messilah* included the procedures for planned maintenance, including key steps for maintaining the main engine, summarised as follows

Before starting any maintenance or repair work, crew must carry out a risk assessment and record it in the maintenance workbook. They must follow the manufacturer's instructions for all machinery, equipment, and systems. If needed, planned maintenance can be done earlier than scheduled, but it should not be delayed beyond the recommended time.

Planned maintenance is to be carried out as per the schedule laid out by the company for each ship. The chief engineer must closely monitor the system and report the status to head office on a monthly basis.

Any main engine maintenance to be carried out must first be discussed at the shipboard management meetings, where the decision will be made as to when the work will be undertaken. Hours between checks/overhaul of main engine and auxiliary engine components should be reported from the month-ending statement of main engine and auxiliary engine running hours forms.

## 8. On board maintenance practices and records

The ship's planned maintenance system (PMS) was monitored using a PMS form that referenced various main engine components (Figure 4). The maintenance tasks were scheduled at predefined intervals, as shown in the PMS form.

While the PMS identified the required maintenance tasks, there were no accompanying task-specific job cards or procedural breakdown guides available to guide crew through each activity. Instead, records of completed maintenance were kept in a handwritten logbook, which did not include detailed descriptions of the condition of the component, work performed, or parts replaced.

As of the end of February 2025, the main engine had

M.V. AL MESSILAH - MAIN ENGINES PLANNED MAINTENANCE SCHEDULE  
 For The Month Of: 28-Feb  
 Total Running Hours Of M/E At Noon On: 259438.50  
 Running Hours Of M/E Of This Month: 298.5

MAIN ENGINE.											
ITEM	1053.7	UNIT	NO 1	NO 2	NO 3	NO 4	NO 5	NO 6	NO 7	NO 8	NO 9
Scavange Space Cleaning	1000	Last Done: 258384.8 Since Last Done: 1053.7	258384.8	258384.8	258384.8	258384.8	258384.8	258384.8	258384.8	258384.8	258384.8
Fuel Valve Overhaul	4500-5000	Last Done: 258384.8 Since Last Done: 1054	258384.8	258384.8	258384.8	258384.8	258384.8	258384.8	258384.8	258384.8	258384.8
Exhaust V/V Overhaul	4000-5000	Last Done: 254286 Since Last Done: 1512.5	256050	255388	4052.5	4399.5	3387	1053.7	4399.5	3724.5	3724.5
E/ Carb Or Compress Oil	8000-9000	Last Done: 258384.8 Since Last Done: 1053.7	258384.8	258384.8	258384.8	258384.8	258384.8	258384.8	258384.8	258384.8	258384.8
Local Overhaul	As Req	Last Done: 249882.1 Since Last Done: 9556.40	249882.1	249882.1	249882.1	249882.1	249882.1	249882.1	249882.1	249882.1	249882.1
Fuel P/V Overhaul	As Req	Last Done: 258384.8 Since Last Done: 1054	258384.8	258384.8	258384.8	258384.8	258384.8	258384.8	258384.8	258384.8	258384.8
Cylinder Cover Overhaul	As Req	Last Done: 258384.8 Since Last Done: 1054	258384.8	258384.8	258384.8	258384.8	258384.8	258384.8	258384.8	258384.8	258384.8
Bearing Clearance Check	2000	Last Done: 259250 Since Last Done: 189	259250	259250	259250	259250	259250	259250	259250	259250	259250
Crank Web Defl. Check	2000	Last Done: 258384.8 Since Last Done: 1054	258384.8	258384.8	258384.8	258384.8	258384.8	258384.8	258384.8	258384.8	258384.8
Running gear inspection	2000	Last Done: 258384.8 Since Last Done: 1054	258384.8	258384.8	258384.8	258384.8	258384.8	258384.8	258384.8	258384.8	258384.8
Main B/C Inspection	3 Years	Last Done: 258384.8 Since Last Done: 1054	246308.8	249882.1	234332	234332	234332	234332	234332	234332	234332
Auxiliary Eng B/C Inspection	3 Years	Last Done: 258384.8 Since Last Done: 1054	234332	247676.2	234332	249882.1	234332	234332	249882.1	234332	234332
Cinva Head B/C Inspection	5 Years	Last Done: 234332 Since Last Done: 25107	234332	234332	246882.8	234332	234332	249882.1	234332	234332	234332
Inspect Spring Stoppers and Gibase Bolting Of Cam Shaft Reversing	8000	Last Done: 258384.8 Since Last Done: 1053.70	258384.8	258384.8	258384.8	258384.8	258384.8	258384.8	258384.8	258384.8	258384.8
FWD TIC Overhaul	8000-10000	CSM Due: April '27 Last Done: 257154	2284.50	2284.50	2284.50	2284.50	2284.50	2284.50	2284.50	2284.50	2284.50
AFT TIC Overhaul	8000-10000	CSM Due: April '27 Last Done: 5439.50	23979	23979	5439.50	5439.50	5439.50	5439.50	5439.50	5439.50	5439.50
FWD Air Cooler Cleaned	As Req	Last Done: 258384.8 Since Last Done: 1053.70	258384.8	258384.8	258384.8	258384.8	258384.8	258384.8	258384.8	258384.8	258384.8
AFT Air Cooler Cleaned	As Req	Last Done: 258384.8 Since Last Done: 1053.70	258384.8	258384.8	258384.8	258384.8	258384.8	258384.8	258384.8	258384.8	258384.8
Atom Out Out Thread	3 Monthly	Last Done: 258384.8 Since Last Done: 1053.70	258384.8	258384.8	258384.8	258384.8	258384.8	258384.8	258384.8	258384.8	258384.8
Pneumatic Control Check	3 Monthly	Last Done: 258384.8 Since Last Done: 1053.70	258384.8	258384.8	258384.8	258384.8	258384.8	258384.8	258384.8	258384.8	258384.8

Figure 4: Planned maintenance system for main engine (Source: Ship's manager, annotated by the ATSB)

accumulated 259,438.5 running hours, with 298.5 hours recorded during that month.

## 9. On-board maintenance

### 9.1 Pneumatic system maintenance requirements

The engine manufacturer initially recommended overhauling the pneumatic control system every 8,000 hours of engine operation. However, in 2001, this guidance was superseded by a service letter, introducing a time-based maintenance approach.

This updated maintenance guidance required that all non-metallic components and O-rings in the pneumatic system's valves were to be renewed every two years.

The ATSB did not identify any evidence that the maintenance of the pneumatic system was recorded in the PMS or that the updated time-based maintenance requirement had been included.

### 9.2 Control air dryer

### maintenance requirements

The maintenance procedures for the control air dryer stated that the unit must be kept clean and that the filter of the automatic condensate drain should be cleaned monthly under normal conditions and weekly in dusty environments.

The control air dryer was replaced in 2021, however no further related maintenance records were provided.

### 9.3 Engine manoeuvring system

The operator had one record of maintenance conducted on the engine manoeuvring and control system, which included part of the pneumatic system. This was done on 14 September 2024 and showed that the following work was completed:

- pneumatic vales 91, 92 and 93 overhauled and refitted;
- pneumatic valves 166 and 87 renewed;
- turning gear and local

- manoeuvring stand valves – O-rings replaced;
- main engine stop cylinder overhauled;
- limit switches lubricated;
- grease points regreased; and
- 7 bar and 30 bar line filters opened.

The last recorded maintenance by the part manufacturer was in 1994, the year prior to the current owner purchasing the ship.

Following the occurrence, the ATSB contacted the main engine manufacturer to clarify the maintenance requirements for components of the engine's pneumatic system.

The manufacturer advised that there were no formal maintenance recommendations for these components, and that maintenance practices were left to the discretion of the ship's management.

## 10. Maintenance training standards

The ship's master reported that the engineering crew on board had not received training specific to the maintenance of the main engine pneumatic systems.

## 11. Post-incident engine inspection

During maintenance conducted after the incident, it was identified that the seals on the servo piston of the main air distributor reversing cylinder had disintegrated.

The affected seals were subsequently replaced by shipboard personnel once the ship was safely moored alongside (Figure 5).

Subsequent to notification of the incident by the ship's master, the Australian Maritime Safety Authority (AMSA) boarded the ship and issued a deficiency under the *Navigation Act 2012*. In response, the ship's management arranged for the attendance of the engine manufacturer to

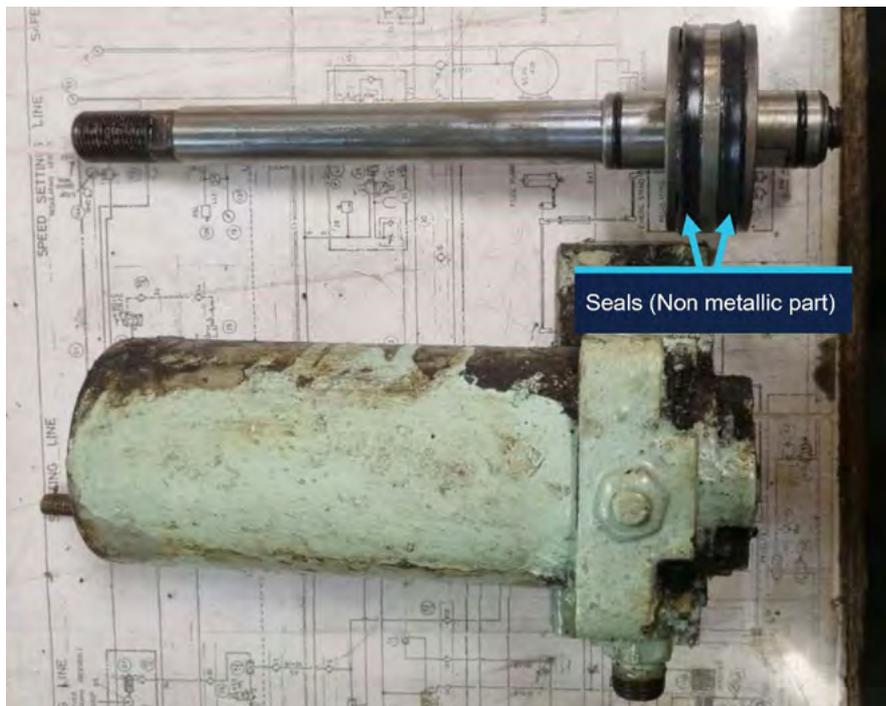


Figure 5: Main air distributor reversing cylinder/servo piston with new seals. Note: The image shows the piston after the seals had been replaced. (Source: Ship's manager, annotated by the ATSB)

repair and verify the integrity of the main engine control system while the ship remained berthed.

Verification of the repairs and functionality of the main engine control system was conducted by the ship's classification society<sup>3</sup>. At the end of this process, the classification society issued an actionable item requiring the main engine manoeuvring system to be serviced in accordance with the manufacturer's recommendations at the earliest opportunity. A due date of 6 June 2025 was assigned for completion of this action.

AMSA subsequently closed the deficiency prior to the ship's departure from port on 6 March 2025. No further deficiencies were issued at that time, as the classification society committed to ongoing monitoring of the outstanding item.

When the ship arrived at Khor Fakkan anchorage in the United Arab Emirates, the ship manager arranged for a complete overhaul

<sup>3</sup> A ship classification society is an organisation that establishes and maintains technical standards for the construction and operation of ships.

of the main engine pneumatic system.

The engine maker's service team attended the ship on 11 April 2025, inspected and overhauled the entire pneumatic manoeuvring system, including all of the pneumatic valves.

## 12. Communication protocols at Fremantle Ports

Fremantle Ports' communication protocols, as outlined in the Port Information Guide (2018), Harbour Master's Instruction HM02/18, and the VTS Operational Procedures (2022), designated very high frequency (VHF) channel 12 as the primary channel for VTS communications, with channel 8 reserved for tug operations.

Fremantle Pilots advised that during pilotage, it was standard practice to use channel 8 in the Inner Harbour and it expected this channel to be monitored by pilots, tugs, line boats mooring teams and VTS.

It further stated that, while channel 12 was monitored continuously on the ship's VHF radio, the communications

specific to the ship movement and pilotage were carried out on the dedicated channel 8, to which the pilot's VHF was switched during transit through the Inner Harbour. They advised that the use of channel 8 "avoids the need for parties (particularly the pilots, the tugs and VTS) to have to switch between channels during operation".

### 13. Subsequent incidents

Following this incident, during the ship's next port visit, in April 2025, there was a complete electrical power loss and black smoke emission from the engine room. It was revealed that the generator had failed. This was likely due to the degradation of the electrical cable insulation due to continuous relative movement caused by poor securing, leading to a short circuit in the system.

Additionally, multiple safety-related deficiencies were identified during a harbour master inspection on 28 April 2025, including:

- ❑ unsafe mooring arrangements;
- ❑ corroded and unserviceable equipment; and
- ❑ poor housekeeping and safety protocols.

These systemic shortcomings, along with the failure to report key incidents – such as a mooring line parting and onboard fire – led the harbour master to deem the ship unfit for further port calls.

As a result, *Al Messilah* was officially banned from returning to the Port of Fremantle by the harbour master until a satisfactory corrective action plan with objective evidence is presented to Fremantle Ports for review. As the ship transits only through the Port of Fremantle, this effectively banned it from entering Australia.

## 14. Safety analysis

### 14.1 Introduction

On 4 March 2025, the

livestock carrier *Al Messilah* lost propulsion while entering the Port of Fremantle with a pilot on board. The main engine stopped once while the ship was entering the harbour and failed a second time as the ship entered the Inner Harbour.

This analysis focuses on the circumstances of the incident, specifically examining the cause of the engine failures, the ship's planned maintenance system (PMS) and the operator's maintenance practices. It will also discuss the communication issues encountered during the emergency.

### 14.2 Engine failures

The investigation found that degraded seals inside the servo piston allowed control air to leak between the AHEAD and ASTERN chambers of the reversing air cylinder. This leakage introduced air into the ASTERN line of the camshaft reversing mechanism.

This likely resulted in the system not being able to maintain the control air pressure needed to fully actuate and hold the camshaft in the AHEAD position. The camshaft then likely moved to an indeterminate position, which misaligned the fuel injection and exhaust valve timing. The result was in the engine misfiring and stopping.

After the failure, the engine could only be restarted in the AHEAD direction. The position of the degraded seals at the time likely allowed sufficient pressure in the AHEAD line to enable this.

**Contributing factor** – While entering the Port of Fremantle, the main engine failed twice, most likely due to a failure of the seals in the servo piston of the main air distributor.

### 15. Ship manager's planned maintenance system

The planned maintenance system (PMS) was contained on

a form which listed the required intervals between maintenance activities. However, the PMS did not include job instructions or inspection criteria. In addition, there was no documentation of the condition of the component, nor the spares consumed during inspections or overhauls.

As a result, the PMS system lacked the detail required to track maintenance of critical components. On a ship, where there is a changeover of personnel, it is essential that maintenance systems have enough information to ensure the oncoming crew know what maintenance has been completed.

The ATSB could find no records of the maintenance activities on the main engine pneumatic system.

**Contributing factor** – The Kuwait Livestock Transport & Trading Company's planned maintenance system did not provide enough detail to track maintenance schedules, and did not have a specific maintenance item to record the maintenance activities on the main engine pneumatic system. (Safety issue)

### 16. Preventive maintenance of main engine pneumatic components

In addition, the PMS had not incorporated the engine manufacturer's service letter for the pneumatic system. This likely led to the manufacturer's recommendation for biennial servicing of non-metallic components and pneumatic control elements not being completed.

There was also no evidence that the ship's maintenance crew had been trained in how to maintain the system. In addition, the engine maker or its authorised service engineers had not attended the ship to service the pneumatic manoeuvring system since before the ship ownership was transferred to the current owner.

The records provided by the ship's manager also contained no entries for maintenance of the reversing air cylinder main air distributor.

A new control air dryer had been installed in 2022. However, there were no records to indicate that the crew had maintained or inspected the dryer in accordance with the manufacturer's instructions since that date. Given the ship's regular trade between Fremantle and ports in Kuwait with consistently high humidity, failure to maintain the air dryer increased the risk of moisture ingress. Moisture in the control air can cause internal corrosion, degrade seals and impair valve performance, particularly during frequent directional changes.

Following the incident, the engine maker's service team inspected and overhauled the complete pneumatic manoeuvring system, including all of the pneumatic valves.

**Contributing factor** – The main air distributor components, the main engine pneumatic system, and the engine control air system dryer were not maintained in accordance with the manufacturer's guidelines.

## 17. Communication protocols at Fremantle Ports

Fremantle Ports' formal protocols designated VHF channel 12 as the primary channel for vessel traffic service (VTS) communications, with channel 8 reserved for towage operations. However, Fremantle Pilots routinely use channel 8 for pilotage communications during Inner Harbour transits, expecting it to be monitored by all involved parties, including VTS.

During the *Al Messilah* incident, the pilot switched VTS communications from channel 12 to channel 8 to report a main engine failure. However, as channel 8 was not formally designated or assured

for continuous VTS monitoring, the pilot's subsequent attempts to contact VTS on channel 8 during the engine failure were unsuccessful. This in turn led to delayed emergency coordination.

This deviation from established protocol reduced communication reliability at a time when radio communication was essential.

**Other factor that increased risk** – The Fremantle Pilots' operational practice of using VHF channel 8 for communication with Fremantle VTS during Inner Harbour transits was not consistent with the port procedures and prevented effective communication. (Safety issue)

## 18. Findings

ATSB investigation report findings focus on safety factors (that is, events and conditions that increase risk). Safety factors include "contributing factors" and "other factors that increased risk" (that is, factors that did not meet the definition of a contributing factor for this occurrence but were still considered important to include in the report for the purpose of increasing awareness and enhancing safety).

In addition, "other findings" may be included to provide important information about topics other than safety factors.

Safety issues are highlighted in bold to emphasise their importance. A safety issue is a safety factor that:

- a. can reasonably be regarded as having the potential to adversely affect the safety of future operations; and
- b. is a characteristic of an organisation or a system, rather than a characteristic of a specific individual, or characteristic of an operating environment at a specific point in time.

These findings should not be read as apportioning blame

or liability to any particular organisation or individual.

From the evidence available, the following findings are made with respect to the loss of propulsion while entering the Port of Fremantle involving *Al Messilah*, 2 km from Fremantle, Western Australia, on 4 March 2025.

## 19. Contributing factors

While entering the Port of Fremantle, the main engine failed twice, most likely due to a failure of the seals in the servo piston of the main air distributor.

The Kuwait Livestock Transport & Trading Company's planned maintenance system did not provide enough detail to track maintenance schedules, and did not have a specific maintenance item to record the maintenance activities on the main engine pneumatic system. (Safety issue)

The main air distributor components, the main engine pneumatic system, and the engine control air system dryer were not maintained in accordance with the manufacturer's guidelines.

## 20. Other factors that increased risk

The Fremantle Pilots' operational practice of using VHF channel 8 for communication with Fremantle VTS during Inner Harbour transits was not consistent with the port procedures and prevented effective communication. (Safety issue)

## 21. Safety issues and actions

Central to the ATSB's investigation of transport safety matters is the early identification of safety issues. The ATSB expects relevant organisations will address all safety issues an investigation identifies.

Depending on the level of risk of a safety issue, the extent of corrective action taken by the relevant organisation(s), or the

desirability of directing a broad safety message to the Marine industry, the ATSB may issue a formal safety recommendation or safety advisory notice as part of the final report.

All of the directly involved parties are invited to provide submissions to this draft report. As part of that process, each organisation is asked to communicate what safety actions, if any, they have carried out or are planning to carry out in relation to each safety issue relevant to their organisation.

The initial public version of these safety issues and actions are provided separately on the ATSB website, to facilitate monitoring by interested parties. Where relevant, the safety issues and actions will be updated on the ATSB website as further information about safety action comes to hand.

### 21.1 Safety issue description

The Kuwait Livestock Transport & Trading Company's planned maintenance system did not provide enough detail to track maintenance schedules, and did not have a specific maintenance item to record the maintenance activities on the main engine pneumatic system.

### 21.2 Response by Kuwait Livestock Transport &

Issue number:	MO-2025-001-SI-01
Issue owner:	Kuwait Livestock Transport & Trading Company
Transport function:	Manne: Shipboard operations
Current issue status:	Monitor
Issue status justification:	The operator has commenced a review and upgrade of the planned maintenance system, including transitioning to a digital, class-approved platform and implementing 27 corrective actions identified through an independent survey. The ATSB will monitor the safety issue and reassess its status once these actions have been implemented and verified.

Image 1

Issue number:	MO-2025-001-SI-02
Issue owner:	Fremantle Pilots
Transport function:	Manne: Shipboard operations
Current issue status:	Monitor
Issue status justification:	Fremantle Pilots has committed to reviewing communication protocols in collaboration with Fremantle Port Authority and has indicated that preventive actions will be implemented following further review. The ATSB will monitor the safety issue and reassess its status once confirmation of these actions is received.

Image 2

## Trading Company

Following identification of deficiencies in the ship's planned maintenance system, the operator undertook a comprehensive review of maintenance and safety practices. Repairs to the main engine pneumatic system were completed in March and April 2025, with no further issues reported.

An independent survey conducted by ABL Dubai resulted in 27 corrective actions, which are being prioritised and implemented. The operator has committed to upgrading the planned maintenance system (PMS) to a digital, class-approved system and enhancing ISM code compliance through increased oversight and regular audits.

### 21.3 ATSB comment

The ATSB acknowledges the actions taken by the Kuwait Livestock Transport & Trading Company to address the identified safety issue. The implementation of a comprehensive review, repairs to the main engine pneumatic system, and commitment to upgrading the planned maintenance system are positive steps. The ATSB will monitor progress on the implementation of the 27 corrective actions and reassess the status of the safety issue upon confirmation of completion.

## 22. Port radio communication

### 22.1 Safety issue description

The Fremantle Pilots' operational practice of using VHF channel 8 for communication with Fremantle VTS during Inner Harbour transits was not consistent with the port procedures and prevented effective communication.

### 22.2 Response by Fremantle Pilots

Fremantle Pilots endeavoured to improve communication protocols and is actively working with Fremantle Port Authority (FPA) to review and update existing practices. This includes benchmarking against best practices at other Australian ports and providing feedback on the FPA port information guide.

Fremantle Pilots has committed to informing the ATSB of any preventive actions implemented following further review.

### 22.3 ATSB comment

The ATSB acknowledges the reactive steps taken by Fremantle Pilots to review and improve communication protocols in collaboration with Fremantle Port Authority. The commitment to benchmarking against best practices and updating procedures is a positive development.

The ATSB will await confirmation of the implementation of preventive actions and reassess the status of the safety issue accordingly.

## Full report

The full report can be accessed here: <https://www.atsb.gov.au/publications/investigation-reports/2025/report/mo-2025-001>

Australian Transport Safety Bureau

# A day in the life of a marine surveyor

WHEN I was asked to write an article describing a day in my life as a marine surveyor, I could not pick a specific typical day, as our working days are usually very diverse.

We predominantly do domestic commercial vessel (DCV) surveys, which on a day can be periodical, shaft and out of water surveys, attending afloat or docked at a shipyard.

In Cairns, this will involve driving to the ship berth or shipyard and working through the AMSA survey forms and other inspections onboard with the master and crew or maintenance contractors.

During dockings, setting out scope of works, from survey findings for various contractors, can be a significant part of the time spent at the vessel.

If the survey is in, say, Townsville, then four hours of driving time and hotel accommodation is also required. Darwin, Torres Straits, Weipa also require travel time, flights and accommodation as part of the survey day or days.

Often DCV new-builds are being built nowadays in Asian shipyards and we have several that build DCVs for Australia. The required overseas travel is often a life experience in itself.

These surveys are done at key milestones of construction, with sea trials and commissioning survey at the last overseas trip prior to coming to Australia. I find these surveys rewarding, given my background in ship construction and repair, as you follow a ship from a stack of steel or aluminium through to sailing on her for sea trials.

Every system and component



is checked during these surveys, so the ships become quite familiar in detail as the survey process and build progresses. Plan familiarisation, liaising with builders and designers, research and desktop assessments also form part of these new build surveys. Of course, the AMSA form and report-writing is ongoing.

On the shipping side, we do on hires, bunkers, insurance and hold cleanliness surveys. Being based in Cairns and as the sugar crushing export season is in full swing, there are hold cleanliness surveys to do on each visiting bulk carrier prior to loading. Mostly done in Mourilyan port which is one-and-a-half hours' drive from Cairns and we are required to attend on berthing.

Times can be unsociable hours, as opposed to DCV surveys, as other cargo surveyors will know from standing on a wharf waiting for the gangway to be deployed in the middle of the night. After boarding and discussing survey plan with the chief officer, getting hold hatches open and then a brisk cardio workout up and down five holds on a Handymax bulk carrier.

On passing holds, it is back to the ships office and produce the required reports before

disembarking and driving back home. Marine order 32 surveys are also often done on visiting bulk carriers, as these are required at the first port in Australia. Often this is Cairns, as bulk fertiliser materials are discharged in several ports along the Queensland coast from one ship.

Insurance report, either condition / valuation reports for insurers or damage surveys in the case of claims, are in our capabilities. These can be commercial ships or recreational ships.

I have noticed a couple of insurance companies now specifying condition reports to be done by an AIMS member surveyor, following the AIMS initiative in this sector.

Recreational ships can be challenging for survey, as the owners are not professional seafarers and often have little understanding of maintenance, critical safety systems, and what constitutes a safe and seaworthy vessel. I believe in educating people during the survey, as we find defects is a role we should shoulder as a marine surveyor.

This helps the owners and crew to understand why a particular defect in a component or system is unsafe. Often, when explained why, most people accept the logic, and we all have practical examples of when things go wrong and why.

To end, while not a "typical day" article, I hope to give an insight into what a day may look like in our marine survey company for myself or our other marine surveyor.

**Zac Howells**  
Principal Marine Surveyor  
Howells Maritime Services  
AIMS member

# A day in the life of a land surveyor

EVERY surveyor's day is different. Some are spent pegging neat suburban boundaries, others setting out buildings or control points on construction sites. But, for me, there's one aspect of surveying that I'm truly passionate about – finding old survey marks.

If I could be paid just to search for, uncover and document those marks, I'd do it full-time.

There's nothing quite like standing in the same spot another surveyor stood 100 or even 150 years ago, uncovering old rock marks, blazed reference trees, digging up galvanised iron pipes and the occasional old timber peg, while reconnecting that history with modern measurements.

A recent project of mine in Galston, New South Wales captured that feeling perfectly. It was a boundary adjustment survey for two brothers who owned side-by-side properties and wanted to realign the boundaries into more practical shapes.

On paper, it sounded straightforward. In reality, it turned into a rugged journey through cliffs, thick scrub and more than a century of surveying heritage.

## 1. Piecing together the past

Before I could begin any fieldwork, I had to research the survey history of the area. The most "recent" survey was from the 1970s – if you can call 50 years ago "recent" – and before that time, original Crown plans dating back to the 1880s. That was enough to excite my curiosity.

I armed myself with a collection of old survey plans, some faded and hand-drawn, and began piecing them together like a puzzle. Each plan told part



of the story – where previous boundaries lay, who the surveyors were and where the marks might still be hidden.

That's what I love most about surveying. It's detective work mixed with exploration. The instruments and software have changed but the goal remains still the same and that is find the truth on the ground.

## 2. Into the bush

With my Leica GS18 GPS and plenty of determination, I headed out to the Galston site. The terrain was steep and heavily vegetated – a mix of dense bush and rocky outcrops that made every step an effort. It wasn't long before I found myself climbing along narrow ledges, crawling under thick shrubs and navigating cliffs in search of elusive marks from long ago.

And then, one by one, they began to appear. Chiselled rock marks from the 1880s, faint but unmistakable. Some were perched on cliff edges, others buried under soil and leaf litter. Each one was a small triumph – a link back to the original survey that first defined these boundaries.

Standing beside those marks, I couldn't help but imagine the surveyors who placed them. They had no GPS or robotic total stations, only a vernier theodolite, chain, compass and sheer perseverance. Yet their work still stands the test of time. For me, rediscovering their marks isn't just part of the job – it's the most rewarding part of being a surveyor.

## 3. Bridging old and new

Once I'd located as many of the old marks as possible, the next step was to connect the survey to state control. I used my Leica GS18 to measure to nearby Permanent Survey Marks, then established a local control network across the site.

The GS18 performed exceptionally well under the thick canopy – even when GPS reception was unreliable it still allowed me to cover ground quickly. Rather than traversing all day and potentially finding nothing, the GS18 helped me identify which marks were still in their original positions and which areas were worth a closer look. It was an efficient way to plan what needed to be measured precisely with the total station and what

simply needed to be marked or referenced.

Some setups were tough – there were places where I could barely find a level patch for the tripod – but that’s surveying in the bush. The terrain demands flexibility. The GS18 gives me speed and the TS16 provides precision.

The conditions made each day an adventure. At times, I battled pouring rain that turned the scrub into a slippery, treacherous obstacle course, while other days brought scorching heat above 40 degrees Celsius. The combination of extreme weather and rugged terrain tested every part of the survey process and tested every part of me!

This is where history truly meets technology. The rock marks from the 1880s, the galvanized iron pipes from the 1970s and my modern GPS control all tie together – one continuous story of measurement through time.

#### 4. From Field to Final Plan

After marking the final boundaries and reference marks, the next stage moved from the field to the office. This involved preparing the new plan of survey, arranging for the local council’s signatures, obtaining the clients’ signatures and, finally, lodging the plan with NSW Land Registry Services (LRS).

Because this was a boundary adjustment between two adjoining properties, new certificates of title had to be issued. The two brothers were effectively swapping portions of land, so a transfer had to be prepared and lodged along with the plan. It’s a process that combines fieldwork, legal precision and coordination with multiple parties – the final step in turning survey data into a registered change of ownership.

#### 5. A moment of reflection

There was one quiet afternoon during the Galston job that summed it all up. I was standing



on the edge of a cliff, looking down at a rock mark carved in the 1880s. The light was fading, the GPS still logging. I realised that another surveyor had stood in that exact same spot more than 140 years ago, defining the very same point with tools that seem primitive by today’s standards – yet their work was spot-on.

That’s when you realise what a privilege it is to be a land surveyor. We don’t just measure property – we measure time. Every mark we uncover connects us to the surveyors who came before and every mark we place will one day guide those who follow.

#### 6. Sharing the journey

Because this Galston project was such a rich mix of history, adventure and problem-solving, I decided to document it on my YouTube channel *The Global Surveyor* - <https://www.youtube.com/@globalsurveyor>

Across three videos, I show the entire process, unscripted, raw and spontaneous – from researching old plans and hunting rock marks in the bush to connecting control with GPS and marking the new boundaries.

Video links to this project are below:

- <https://www.youtube.com/watch?v=ZTTkhEXT-iY>
- <https://www.youtube.com/watch?v=y5eS2cKV9io>
- <https://www.youtube.com/watch?v=kVTc6lcJf-8>

The goal of my channel is simple. I wish to show the public and future surveyors what our work really involves. Surveying is

incredibly broad – from civil and construction to mining, mapping and hydrographic work – but my personal focus is, and always has been, land surveying.

I love marking boundaries, interpreting evidence and especially finding those old marks that hold stories from generations past – thus the reason why my channel has an adventurous edge!

#### 7. The modern surveyor

Today, technology allows us to work faster and more accurately than ever before but the essence of the profession hasn’t changed. It’s still about precision, judgment and evidence.

Surveying stands at the intersection of heritage and innovation – where satellites meet chiselled rock marks. For me, that’s what makes it endlessly fascinating.

If you’d like to see this project and others like it, you can watch them on my YouTube channel *The Global Surveyor*, where I share the challenges and discoveries from real field surveys, unscripted, raw and unpredictable outcomes.

Because, at the end of the day, while surveying is a broad and technical profession, my true passion will always remain the same – finding old survey marks and keeping the legacy of our predecessors alive, one mark at a time.

Scott Taylor  
Registered Land Surveyor NSW  
Taylor Surveying (aka The  
Global Surveyor)



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OF MARINE SURVEYORS