IACS

International Association of Classification Societies

Annual Review 2024

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Trust in IACS' technical prowess

IACS' technical expertise central to its trusted status

By Roberto P. Cazzulo, IACS Council Chair

The challenges that IACS has met in 2024, the first year of my term as Chair of the IACS Council, have been many and varied on several technical issues relating to class and statutory activities. The 12 leading classification societies that are Members of IACS have tackled those challenges head-on by addressing matters of development, interpretation and application of regulations and standards that put ship safety and protection of the environment first. The recognition of these efforts is really a matter of trust in IACS and its Members.

IACS supports the industry by setting technical and quality standards which are adhered to and are mandatory for its Members. This includes the development of Unified Requirements (URs) that are translated by Members into their own class rules, Unified Interpretations (UIs) to ensure consistency among Members in the application of IMO instruments, as well as the Quality System Certification Scheme (QSCS) that includes procedures to be followed by Members when surveying a ship during construction and in service, and approving design plans and technical documents. For perspective, while over 50 classification societies remain outside its membership, IACS remains open to future applications if properly supported and objectively verified according to strict quality performance membership criteria, as applied equally to all Members.

In 2024, IACS submitted valuable technical contributions to IMO including, among others, safety guidelines and URs relating to the use of alternative fuels for ship propulsion, such as methanol, ammonia and hydrogen; Goal-Based Standards (GBS) for autonomous (MASS) vessels; URs for cyber security and resilience of new ships; and a recommendation for cyber security of ships in service.

IACS, in consultation with the IMO, flag States and industry, dedicated significant efforts in 2024 to upgrading the Common Structural Rules (CSR) for the design and construction of new bulk carriers and oil tankers, subject to IMO GBS verification. This work led to some concerns expressed by the industry on design waves and a relevant IACS recommendation, which were addressed at the December 2024 IMO Maritime Safety Committee meeting with positive feedback. IACS will continue to discuss these issues with the shipping and shipbuilding industries and other interested parties, focusing on consequence assessment and implementation of the rule change proposals before their approval and entry into force, expected in July 2029.

IACS also retained its close contacts with regional organisations, including the European Commission, the US Coast Guard, Paris and Tokyo MoU, and individual port authorities and flag States. IACS' collaboration with the Maritime and Port Authority of Singapore on standards and technology development and on a maritime energy training facility was a meaningful development last year. Discussions with the Paris MoU considered adopted changes to Port State Control criteria on class-related deficiencies, with the Australian Maritime Safety Agency on remote surveys for clearing detainable deficiencies, and with the EC and with the European Maritime Safety Agency on surveillance during construction of dual classed vessels.

Pivotal quality work

With regards to quality, IACS and its Members carried out outstanding work in establishing a new legal entity, the International Quality Assessment Review Body (IQARB) to assess the quality performance of Recognized Organizations (ROs) acting on behalf of flag States. IQARB merges the previously established quality assessment and certification entity of European ROs, founded in 2010. This is an important move from a regional approach towards an international approach under the auspices of the IMO and the EC.

In these and many other areas, IACS continues to be a trusted, technical, non-governmental, not-for-profit organisation. Its participation at the IMO and with other interested stakeholders underpins the continuous enhancement of maritime safety

and environmental protection regulations, as the industry faces new challenges and several levels of complexity.

IACS Members classify over 90% of the world's merchant ship tonnage, globally employing thousands of people dedicated to rule development, design approval, material and machinery testing, surveillance during construction, and periodic surveys for ships in service. IACS benefits from this collective expertise and active participation in working groups, and makes unique contributions to maritime safety and regulations through technical support, compliance verification and research and development.

IACS will maintain its strong presence at shipping's leading decision-making forums in 2025, including continuing its active role in technical discussions at the IMO and with flag States, and working with industry bodies where IACS' representatives can share their knowledge and insights to ensure a joined-up approach to the regulatory process.

IACS Members are champions for, and leading exponents of, continual investment in the technical knowledge, skills and capabilities that support a safer shipping industry – including the new technical skills required in an era of transformation, shaped by the twin forces of digitalisation and decarbonisation. IACS also requires its working groups to pay particular attention to the human element when developing a new regulation, promoting the application of a human-centred approach at the earliest stages of the design process.

IACS recognises the importance of acting with speed, agility and responsiveness in a rapidly changing industry, driven by the challenges and opportunities. At a time when technological innovation is outpacing regulations in many instances, IACS and its Members are moving at pace – without cutting corners – to put in place regulations and guidance to maintain the focus on safety standards.

About the author

Roberto Cazzulo graduated in civil engineering from the University of Genoa (Italy) in 1979. He joined RINA in 1981 within the R&D department then became manager of international affairs and deputy director of the Marine Division. In 2019 he retired from RINA and was then appointed Secretary General of Registro Italiano Navale, the RINA main shareholder. Since the '80s Roberto has represented IACS and the Italian Administration at the International Maritime Organization (IMO), chairing the joint MSC/MEPC working group on the Human Element and Formal Safety Assessment, and contributing to the development of the Goal Based Standards for new ship construction. He chaired the International Association of Classification Societies (IACS) in 2013-2014 when the Common Structural Rules for tankers and bulk carriers were adopted and submitted to the IMO for GBS verification. Roberto was elected IACS Council Chair for a two year term in July 2023.

Safety first and foremost

Safety considerations at forefront of IACS technical work programme

By Robert Ashdown, IACS Secretary General

2024 marked the fiftieth anniversary of the adoption of SOLAS and was a year when safety considerations were put front and centre of maritime initiatives. The IMO's theme for its annual World Maritime Day was *'Navigating the Future: Safety First!'* while the newly appointed European Commissioner for Transport, Mr Apostolos Tzitzikostas, in his hearing at the European Parliament, emphasised that he would make safety the priority for his tenure. This emphasis on safety was reiterated by the new IACS' Chair, Roberto Cazzulo who took office on the 1 January 2024 stressing his commitment to ensuring safety remained the Association's core focus for his chairmanship.

This commitment immediately manifested itself in the newly inaugurated Safe Digital Transformation Panel which started its work programme. This in combination with IACS' Safe Decarbonisation Panel – both underpinned by IACS' focus on the Human Element and Human Centred Design – *(see pages 40-42)* – means that IACS has in place the essential foundations to properly address the two major challenges of our time. The emphasis on the safety aspects of both decarbonisation and digitalisation also illustrates IACS' core objective of quickly developing and publishing the common technical requirements necessary for the various alternative fuels, technologies and digital solutions to minimise any gaps in the safety regime.

Facilitating and supporting the safe transition of the maritime industry through its fourth industrial revolution while maintaining and enhancing the existing web of safety and environmental requirements requires a very significant effort from IACS' twelve member classification societies. Collectively, their contribution to IACS in 2024 resulted in the adoption of 85 new or revised Resolutions and Recommendations and 77 submissions to IMO, along with the co-sponsorship of a further 12 papers. These, together with IACS' other activities in support of work streams whose outputs are not yet ready for publication, equated to almost 100 man-years of work in 2024, in direct support of the global shipping industry.

The practical outputs of these efforts are evidenced across a wide range of ship types and safety and environmental initiatives with notable publications on the loss of seaborne containers, quality of machinery piping systems, commissioning testing of Ballast Water Management Systems, synthetic materials in propeller shaft bearings, and protections against crankcase explosions, to name but a few. More detail on IACS' extensive technical work programme, including on decarbonisation and digitalisation, is described on pages 13-20 *Summary of IACS Technical Output in 2024*.

One special workstream, essential to ensuring that ongoing safety of ships in the face of new and innovative designs, related to the evolution of IACS Common Structural Rules (CSR), which progressed significantly in 2024. IACS' work in this respect is part of its continual 'class cycle' *(see page 11)* of review and improvement and its commitment to maintaining the highest standards to ensure safety, structural integrity, and environmental protection, as well as to meet the Goal-Based Standards (GBS) requirement for continuous improvement set by the IMO. The basis for revisions to CSR (including new wave loads, and other subsequent rule changes) will be more transparent and accurate as they are based on more scientific and validated data and include a more comprehensive and technically sound background compared with the existing CSR.

As with all IACS workstreams that can potentially benefit from the practical and operational experience of the end-users, the evolution of CSR revisions are being made as part of a truly collaborative process with multiple IACS/industry meetings held in 2024. The work will continue into 2025 and be subject to further extensive scrutiny by

"A key role for IACS lies in ensuring the consistent and global implementation of IACS Resolutions by IACS' Members"

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all stakeholders, intentionally designed to be inclusive and transparent, and allowing for widespread consultation with flag State Administrations, shipowners and shipyards.

IACS willingness and drive to engage openly with its stakeholders is, of course, not limited to CSR. Last year saw the usual programme of meetings with industry at both the technical and strategic levels, as well as with marine insurers, individual flag State Administrations, regional regulators and of course the IMO at both the Member State and secretariat levels *(see pages 51-58)*. This was also reflected in the development of two new High Level Position Papers on Digitalisation and the Human Element, bringing the total to nine. This was alongside greater efforts made to raise awareness of IACS' outputs with an enhanced and proactive distribution of outputs that are considered to be of general interest to the maritime community.

Aside from developing new and revised safety and environmental standards, a key role for IACS lies in ensuring their consistent and global implementation by IACS Members. This is done through the IACS Quality Management Certification Scheme, a scheme which is itself assessed by the Independent Quality Assessment Review Body (IQARB). IACS has been instrumental in the development and growth of IQARB over the past six years. Last year saw the incorporation of IQARB into a legal entity capable of delivering a common, independent, fully transparent and trusted mechanism which flag State Administrations can utilise as a tool to supplement their oversight of their Recognized Organizations (RO). Such an approach benefits Member States, maritime safety and the protection of the marine environment by allowing IMO Member States to focus their time and resources on RO monitoring activities in targeted areas and on specific safety and environmental matters pertaining to their flagged ships *(see pages 43-50)*.

An extensive technical work programme tailored to meet the requirements of the industry, a gold-standard quality management system to ensure the proper implementation of IACS Resolutions, a strong presence at IMO and in other regional forums and a governance structure and secretariat designed to ensure delivery means that IACS is well positioned to continue to meet the needs of the maritime industry it serves and the shared objective of safer, cleaner shipping. ●

About the author

Robert Ashdown has been Secretary General of the International Association of Classification Societies (IACS) since May 2015. He directs the Association's activities and initiatives, including relationships with the IMO, Flag Administrations, the EU, other industry associations, and media.
Before joining IACS, Robert was Secretary General of the Cruise Lines International Association (CLIA) in Brussels, representing the cruise industry at the institutions of the European Union on all policy/regulatory issues and with responsibility for transitioning the traditional passenger ship representation model into the European Chapter of the global CLIA organisation.
Robert has also worked for the UK Chamber of Shipping; as Head of its Technical Division he recalibrated the importance of environmental issues and developed the Chamber policy on GHG emissions. He also led the British Rig Owners Association (BROA), representing owners with North Sea marine offshore units.
Additionally, Robert is a Governor of the World Maritime University, sits on the Board of the Green Award Foundation, and is a Trustee of Stella Maris UK, a seafarers welfare charity.

About IACS

About IACS

Global technical standards for maritime vessels uphold safety and environmental protection

By Robert Ashdown, IACS Secretary General

The primary aim of ship classification is to ensure the structural strength and integrity of a vessel's hull and essential components, as well as the reliability of its propulsion, steering systems, power generation, and other critical systems necessary for safe operation. Classification societies achieve this through their own Rules, developed from decades of research and industry experience, and through compliance checks with international and national statutory regulations on behalf of flag States. These standards apply to the majority of commercial vessels, with classification and statutory certification typically intertwined, especially for vessels governed by the International Convention on Load Lines and SOLAS (Safety of Life at Sea).

A classification certificate does not guarantee a vessel's safety, fitness, or seaworthiness. Rather, it serves as confirmation that the ship complies with the classification society's Rules at the time of the survey. It does not cover the vessel's operations or maintenance between inspections. The onus for the safe operation of the vessel lies with the owners, operators, and the seafarers, who must ensure that proper maintenance is upheld to safeguard life at sea and protect the marine environment.

Classification societies are not liable for ensuring a vessel's operational safety, nor do they control how a vessel is maintained outside their formal inspections. If any defects arise that could jeopardise a vessel's classification status, owners must promptly report them to the relevant society. Where the conditions for the maintenance of class are not complied with, class may be suspended, withdrawn or revised to a different notation, as deemed appropriate by the society when it becomes aware of the condition.

> "IACS' role extends beyond mere rule-setting; it ensures the continuous refinement of classification systems based on feedback from the entire lifecycle of a vessel"

Rules and international standards

The foundation of effective classification lies in a thorough understanding of internationally accepted technical requirements for ships and other maritime structures. As part of the International Association of Classification Societies (IACS), the 12 Member societies are actively involved in shaping these standards, particularly through their advisory role to the International Maritime Organization (IMO). This partnership grants direct access to the development of international regulatory frameworks, enabling IACS Members to disseminate these standards and ensure uniform compliance across the maritime industry.

IACS' role extends beyond mere rule-setting; it ensures the continuous refinement of classification systems based on feedback from the entire lifecycle of a vessel – from design and construction to operational surveys. These insights help improve classification rules, making them more responsive to evolving safety and environmental standards. The process of gathering feedback during the design, construction, and in-service periods creates an invaluable cycle that continuously improves classification standards, fostering greater safety and environmental stewardship in the global shipping industry. Utilising the opportunities afforded by this 'class cycle' *(Figure 1)*, in support of the purposes and objectives of classification is a key element in IACS work.

Statutory requirements, often developed by IMO and the International Labour Organization (ILO), aim to harmonise global trade while ensuring the safety and environmental responsibility of ships. These rules are designed with a principle of 'no

Figure 1: The class cycle

more favourable treatment', ensuring that a vessel compliant with one flag state's regulations can freely trade worldwide without additional burdens. To assist with this global uniformity, IACS creates Unified Interpretations (UIs), which resolve ambiguities in the application of these standards, ensuring consistent interpretation across jurisdictions.

Supporting maritime safety and environmental protection

In its role, IACS not only sets technical standards but also assists international regulatory bodies in shaping statutory regulations that govern ship design, maintenance, and environmental protections. Its work ensures that safety standards are not only met but continually improved, providing a platform for innovative technologies and solutions that further advance the maritime industry's sustainability and safety.

The value IACS brings to the regulatory process is built upon four core principles:

1. Leadership: IACS stays ahead of emerging trends, collaborating with regulators and industry stakeholders to promote safety, environmental protection, and sustainability.
2. Technical expertise: The collective knowledge of IACS members drives the development of rules and standards that keep pace with technological advancements and changing societal needs.
3. Commitment to Quality: IACS is dedicated to upholding the highest global standards in maritime safety and operational performance.
4. Transparency: IACS works to clarify and improve regulations, offering practical solutions and fostering trust between stakeholders and the classification process.

IACS also engages bilaterally with individual flag State Administrations and regulatory bodies as required. Regionally, IACS maintains active engagement with regulatory bodies in key maritime hubs, such as Brussels, where it contributes to European shipping policy and technical regulatory discussions.

Scan this QR code to watch a video introduction to IACS

www.iacs.org.uk/about-us/introduction-to-iacs

Summary of IACS Technical Output in 2024

Reaping the benefits of well-established governance and a technical work structure

IACS' unrivalled technical know-how

By Dr. Ajay Asok Kumar, Chair, General Policy Group

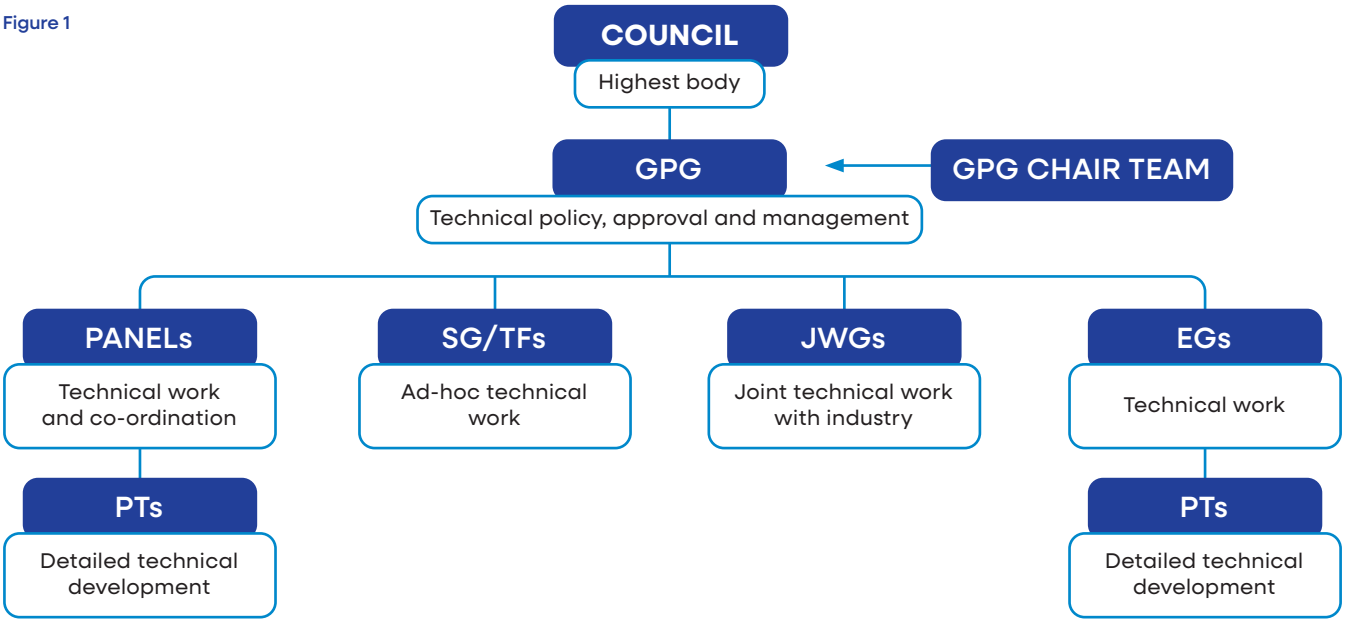
IACS' unique governance combined with a large pool of technical experts provided by its members support its missions to improve safety at sea and to prevent marine pollution. Major technical workstreams pursued by IACS in 2024 to achieve these goals are safe decarbonisation, digitalisation, and Common Structural Rules (CSR) for bulk carriers and oil tankers.

Common Structural Rules

Taking the latter first, the CSR set the class requirements for the design and construction of bulk carriers and oil tankers, unanimously adopted and consistently implemented by all IACS members. These rules aim to ensure safety, structural integrity, and environmental protection, to meet the Goal-Based Standards (GBS) for new construction of bulk carriers and oil tankers set by the International Maritime Organization (IMO).

The CSR are among the most important instruments ever developed by IACS. The first edition of the CSR was adopted by IACS and uniformly applied by its members early in the 2000s. Dramatic improvement in casualty statistics underscore the positive impact of CSR, combined with an enhanced survey

Figure 1



Note: SG – Small Group, TF – Task Force, JWG – Joint Working Group, EG – Expert Group, PT – Project Team. All the above groups are supported by the Permanent Secretariat. For details, please refer to the IACS Organisation section on pages 59-62.

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"IACS put a considerable amount of resources into planning, discussing, drafting and submitting up to 89 independent or joint submissions to IMO meetings in 2024"

programme, and coating standards for ballast tanks and cargo holds adopted by the IMO.

IACS has periodically conducted revisions to the CSR as part of its continual 'class cycle' of review and improvement and based upon any observations from the IMO GBS Auditors. The revisions reaffirm IACS' commitment to maintaining the highest standards, based on the best available data, technologies and techniques.

As reported in IACS Annual Review 2022, IACS published Rev.2 of Rec.34 'Standard Wave Data' to address an observation from the IMO GBS auditors asking for further justification that the wave data used in the rules properly represent North Atlantic conditions. IACS Rec.34 Rev.2, which is based on hindcast models validated by satellite data, provides a much more reliable and accurate basis for the calculation of design wave loads of ships such as pressures, motions, accelerations and hull girder loads.

Following a recommendation from another IMO GBS Audit voluntarily requested by IACS on Rec.34 Rev.2 and completed in 2024, IACS will make a new revision of this recommendation, with further information and background documentation to explain in a transparent manner the robustness of the methodology, based on open source hindcast models and the most recent data provided by any interested party.

IACS is continuing its strenuous efforts to complete the CSR rule change proposal by conducting consequence assessments on a series of vessels (both oil tankers and bulk carriers) to find the impact of new design wave loads on scantlings, compared with ships approved in accordance with current CSR.

Preliminary consequence assessment results can confirm that these CSR rule change proposals will strengthen safety standards, requiring improvement in some structural details from a design point of view.

The proposed CSR revision is subject to extensive stakeholder consultation including – but not limited to – an IACS external advisory group (EAG) and IACS members' technical committees. Stakeholders' representatives from shipowner and shipbuilder associations have been encouraged to actively participate throughout the consultation process, providing feedback and suggestions to ensure that the revised rules are practical, effective, and beneficial for the entire industry. The expected date of publication of the revised CSR, following IACS Council decision last December to extend it for two years, is July 2027. This is to allow enough time for the industry's feedback and to provide a more comprehensive technical background before their implementation and entry into force.

Once CSR changes are adopted, IACS will submit the whole rule change 'package' to the IMO Secretary-General to initiate a full GBS verification audit. The 'package' will include Rec.34 Rev.3, and the consequential changes to the Common Structural Rules, their detailed technical background and consequence assessment of the impact on the designs of ships.

Decarbonisation agenda

For the second work strand of decarbonisation, last year IACS made significant progress across four key workstreams related to decarbonisation: ammonia, hydrogen, lithium battery technologies and carbon capture. IACS Resolutions and Recommendations for these new technologies and fuels are being developed, alongside continuing support for the IMO with its work in these fields.

Some of the key outputs in the final stage of development include a new Unified Requirement (UR) on Ammonia Release Mitigation Systems (ARMS), two new URs on Materials and swappable tanks for hydrogen service, a UR on Approval of lithium batteries, a UR on Carbon capture system deploying chemical absorption method and a Recommendation on Gas dispersion analysis of ammonia, hydrogen and low flash point fuels.

In November 2024, IACS decided to withdraw UR H1 'Control of ammonia releases in ammonia fuelled vessels', originally published in January 2024, before its coming into force on January 1, 2025.

This was to avoid potential confusion within the industry due to some differences between the IACS UR H1 and 'The interim Guidelines for the safety of ships using ammonia as fuel' adopted at IMO MSC 109. A revised version of the UR, aligned with the IMO Guidelines, will be published in the near future.

In addition to the above, IACS, in co-operation with international organisations and other stakeholders, is investigating the global regulatory landscape and various policies relating to nuclear power technology in the maritime industry and the desired roles of IACS and classification societies in this. IACS has been participating in various international workshops to acquire knowledge in order to establish an IACS position that fits in the field of nuclear power technology.

Further, IACS is leading two Joint Industry Working Groups (JIWGs) on decarbonisation. The first is to discuss and develop a common understanding of the safety aspects of decarbonising technologies and fuels. This includes finding possible solutions to identified challenges and relevant regulatory needs. The second JIWG is to consider aspects other than safety such as technology readiness levels and commercial aspects of fuels/technologies

The number of IACS papers submitted to IMO/IACS Representatives for its meetings held in 2024:

IMO Event	Number of IACS Papers	Number of co-sponsored papers	Total number of IACS Papers	Number of IACS representatives
SDC 10	12	0	12	26
HTW 10	0	0	0	2
PPR 11	5	0	5	16
SSE 10	25	1	26	23
MEPC 81	2	3	5	17
FAL 48	0	0	0	1
LEG 111	0	0	0	1
MSC 108	5	1	6	12
NCSR 11	1	0	1	6
III 10	0	0	0	4
CCC 10	12	1	13	11
ISWG GHG 17	0	0	0	6
MEPC 82	4	3	7	10
C 133	0	0	0	2
MSC 109	11	3	14	18
Total	**77**	**12**	**89**	**155**

IACS Position Papers revised/developed in 2024:

Position Papers	New/Revision
Ballast Water Management	Revision
Cyber System	Revision
Underwater Noise Pollution	Revision
Container Ship Safety	Revision
Human Element	New
Digitalisation	New

for retrofitting and newbuilding, which could form part of the pathway to low greenhouse gas emissions shipping.

Digitalisation drive

On digitalisation, the Safe Digital Transformation Panel (SDTP), established at the end of 2023, handles all of IACS' digitalisation activities in a holistic manner with a focus on the safety implications that accompany increasingly digitised ships. A JIWG, led by IACS, has been established to ensure that the work programmes are tailored to meet the needs and priorities of the global maritime communities.

Further to the report made in IACS Annual Review 2023 on the progress of this project, IACS has now finalised and published a new Recommendation (Rec. No. 183) to address ship data quality challenges. The Recommendation analyses the applicable standards and discusses and indicates a method to determine the quality of data generated onboard vessels or received

A selection of IACS papers submitted to IMO in 2024 and their outcomes

IACS Paper	IACS Paper	Outcome at IMO
SDC 10/6	Allowing the use of remote inspection techniques (RIT)	Agreed in principle. Work to be further developed by the Correspondence Group coordinated by IACS
SSE 10/17	Proposal to transfer the output "Review of the 2009 Code on Alerts and Indicators" to the provisional agenda of SDC 11	Agreed – biennium (2024/2025)
MEPC 81/4/6*	Proposal on guidance for the temporary storage of treated sewage and/or grey water in ballast water tanks	Agreed with modifications
NCSR 11/18/4	Implementation of MSC.1/Circ.1460/Rev.4 on the Guidance on the validity of radiocommunications equipment installed and used on ships	Agreed with modifications
MEPC 82/6/15	IACS unified interpretation MPC 131 (New, July 2024) of regulations 5, 26 and 27 of MARPOL Annex VI	Agreed
MSC 109/7/1*	Proposal for next steps to enhance maritime cybersecurity	Agreed
MSC 109/11/1*	Revisions to the IMO FSA Guidelines	Agreed with some changes
MSC 109/21/2	Inconsistent implementation of SOLAS regulations IV/10 and IV/15 and COMSAR.1/Circ.32/Rec.2 relating to an MF radio installation for sea area A3	Agreed

**Joint submission*

from other sources for performance optimisation, condition-based maintenance, system diagnostics, fault prediction, telemetry, remote monitoring, and others. The intention is to introduce information on existing industry standards that each organisation may follow based on their system specific scope and preferred applications, rather than specifying a single method to deal with data quality.

A new IACS Recommendation which provides technical and procedural cyber security controls related to the existing technologies used by shipping companies onboard for ships in service is also at the final stage of development. The controls outlined in the Recommendation will be as pragmatic as feasible to support the shipping industry.

In addition to the above, IACS project teams (PTs) are working on developing several Recommendations, including a digital protocol based on the Open Class 3D Exchange (OCX) standard for design review to facilitate 3D models exchange among stakeholders, including class transfers. Another Recommendation being developed is on categorising complex systems into those that require additional assurance actions beyond conventional classification/ risk approaches and recommending additional assurance actions necessary to deal with the identified complexity.

Summary of technical output

Over 2024, IACS adopted 85 new or revised Resolutions and Recommendations for implementation and application by its Member Societies. This is comprised of 29 URs, 26 UIs, 20 Procedural Requirements and 10 Recommendations. They include UR M10 on the Protection of internal combustion engines against crankcase explosions, UR M85 on Type approval testing of synthetic materials for aftmost propeller shaft bearings, UR C6 on Requirements for lashing software, UR C7 on Approval and certification of container securing systems, UI GF20 on Arrangements of fuel tanks in methyl/ethyl alcohol fuelled vessels, UI GF21 on CO2 fire extinguishing systems in methyl/ethyl alcohol fuelled vessels' machinery spaces, UI SC307 Hydrocarbon gas detection and bilge high level alarms in cargo pump-rooms, and Rec.175 on Conducting commissioning testing of Ballast Water Management Systems, and Rec.181 on Measurement of Underwater Radiated Noise from ships. For more details, please see the *IACS Publications* section of this Annual Review.

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To support IMO in its development, implementation and interpretation of statutory regulations, IACS also put a considerable amount of resources into planning, discussing, drafting and submitting up to 89 independent or joint submissions to IMO meetings in 2024, and sent 155 experts to attend IMO meetings as well as its Working Groups, Drafting Groups and Correspondence Groups.

Additionally, IACS issues and regularly reviews its Position Papers on key topics for the industry which provide background to subject matters, IACS' position on the subject and a summary of actions that IACS has taken. Last year, six IACS Position Papers were newly developed or revised, covering hot issues such as digitalisation, human element, container ship safety, and underwater noise pollution.

Through regular policy and technical level meetings, joint working groups and liaisons, IACS continues to be in close co-operation with other intergovernmental bodies, including ILO, EU, Paris MoU, Tokyo MoU, and IOMoU; international industry associations such as ICS, BIMCO, INTERTANKO, INTERCARGO, OCIMF, ASEF, and IUMI; and international standard bodies such as ISO. For example, IACS has a yearly policy level meeting with the ILO Director and participates in the Special Tripartite Committee. At an EU level, IACS is actively engaged in and contributing to Expert Groups, including the European Sustainable Shipping Forum, the Passenger Ship Safety Expert Group, the Marine Equipment Directive Expert Group and the Stakeholders Advisory Group on Maritime Security.

With industry, IACS leads several JIWGs, such as the JIWG on Future Proofing the Maritime Safety Regime which addresses the opportunities and risks associated with the deployment of complex novel technology on board ships in the context of the existing SOLAS survey and certification regime, and, as mentioned previously, the JIWGs on Safe Decarbonisation and Digitalisation.

Large pool of technical experts

To achieve all of the above, IACS calls on its seven dedicated Panels, eight Expert Groups, and 37 Project Teams, which form the foundation of IACS' technical achievements. Only the work of the Panel chairs, secretaries, and Project Teams managers and members fall within IACS' technical budget; the work of all Panel members, Expert Group chairs and members, and other Small Groups, Task Forces and Joint Working Groups, as well as IACS representatives to external meetings and events, are not covered by IACS's technical budget. The following budgeted man-days – a small portion of the total technical labour involved – indicate the scale of IACS' technical work:

Budgeted Personnel	Working Days
Chairs and Secretaries of 7 Panels	3,002
Managers and Members of 37 Project Teams	3,401

In 2024, IACS made significant progress in its technical work programme producing tangible and pragmatic output to support the needs of stakeholders, thus underscoring its unique role as a technical leader serving the maritime Industry. With a six-year long-term strategy established in 2022 in place, with a particular focus on ship strength, safe decarbonisation, digitalisation and human element, and a well-established governance and technical work structure to support it, IACS will continue to successfully deliver relevant and important technical outputs in 2025. ●

About the author

Dr. Ajay Asok Kumar holds a Bachelor's Degree in Naval Architecture & Ship Building from Cochin University of Science & Technology, India and Master's and Doctoral Degrees in Environmental and Ocean Engineering from the University of Tokyo, Japan. He has held various positions at ClassNK in Japan as Manager of External Affairs Department, Senior Ship Surveyor, Management Systems Auditor and Plan Approval Engineer. He was a member of General Policy Group (GPG) Chair Team in IACS Secretariat, London, before being elected as Chair of GPG from July 2024.

IACS Technical Work

IACS drives safety agenda for gas carriers

Project supports Type C tank longevity

By Hyungmin Cho, IACS Hull Panel Chair

The maritime industry is constantly evolving, with new regulations and standards being developed to ensure the continued safety and efficiency of shipping operations. One such initiative is the development of the interpretation on the International Gas Carrier Code (IGC) for Type C tanks.

IACS' Hull Panel has established a project team to enhance the understanding and application of the IGC Code, particularly in the context of Type C tanks used for high-pressure cargo tanks for gas carriers.

The project was initiated following concerns raised by a member society regarding the strength criteria of reinforced rings in LPG Type C tanks and the interpretation of allowable stresses in terms of plastic deformation. These issues were first discussed in September 2019, which highlighted the need for a Unified Interpretation (UI) to comprehensively address concerns.

The project's primary objectives are to develop a new UI for allowable stresses in Type C independent tanks, update the existing UI GC 8 for stiffening rings, create a new UI for fatigue assessment, and establish interpretations under the International Code of Safety for Ships Using Gases or Other Low-flashpoint Fuels (IGF Code). The project team aims to ensure consistent interpretation and application of these requirements across IACS classification societies and industries.

Materials under stress

One of the key work items involves developing new stress criteria for finite element (FE) analysis. This includes understanding the stress criteria in the IGC Code, investigating relevant reference documents such as the ASME Code, and studying the IGC Code Appendix 5 for working stress components combination from three-dimensional FE analyses. The goal is to develop new stress criteria for allowable stresses in terms of plastic deformation for IGC Type C independent tanks.

The task also includes updating the UI GC8 for strength criteria used in FE analysis of stiffening rings. This involves adding new stress criteria based on the IGC Code Appendix 5, determining stress ranges for fatigue strength compliance, and developing a buckling strength checking method for stiffening rings. The project team has conducted consequence assessments on real ships to justify the new criteria.

Another critical aspect of this task is developing a new interpretation for fatigue assessment of Type C tanks. This includes clarifying the requirements for fatigue assessment in the IGC Code and defining the FE fatigue assessment method for large tanks and Y-connections of Type C tanks. The new interpretation provides detailed guidelines for conducting fatigue assessments, ensuring the structural integrity of these tanks over their operational lifespan.

Strength requirements

The project team has already analysed the application of strength requirements for Type C tanks under the IGC and IGF codes. This involved clarifying the application of these requirements to typical containment systems and developing UIs for several IGF Code requirements related to structural safety. The aim is to ensure that the strength requirements are consistently applied and interpreted across different types of containment systems.

The following draft UIs are currently being developed by IACS:

Draft UI GC 8 Rev.2
Permissible stresses of the stiffening ring of Type C cargo tanks using FE method

Draft UI GC 8A
Finite element analysis of Type C cargo tanks

Draft UI GC 8B
Buckling assessment of Type C cargo tanks

Draft UI GC 8C
Fatigue analysis of Type C cargo tanks

In parallel with the development of the draft UIs to the IGC Code, IACS submitted a paper entitled "Draft Unified Interpretations of the International Code for the Construction and Equipment of Ships Carrying Liquefied Gases in Bulk" – which includes the same

Figure 1: FE analyses of typical single cylinder tank

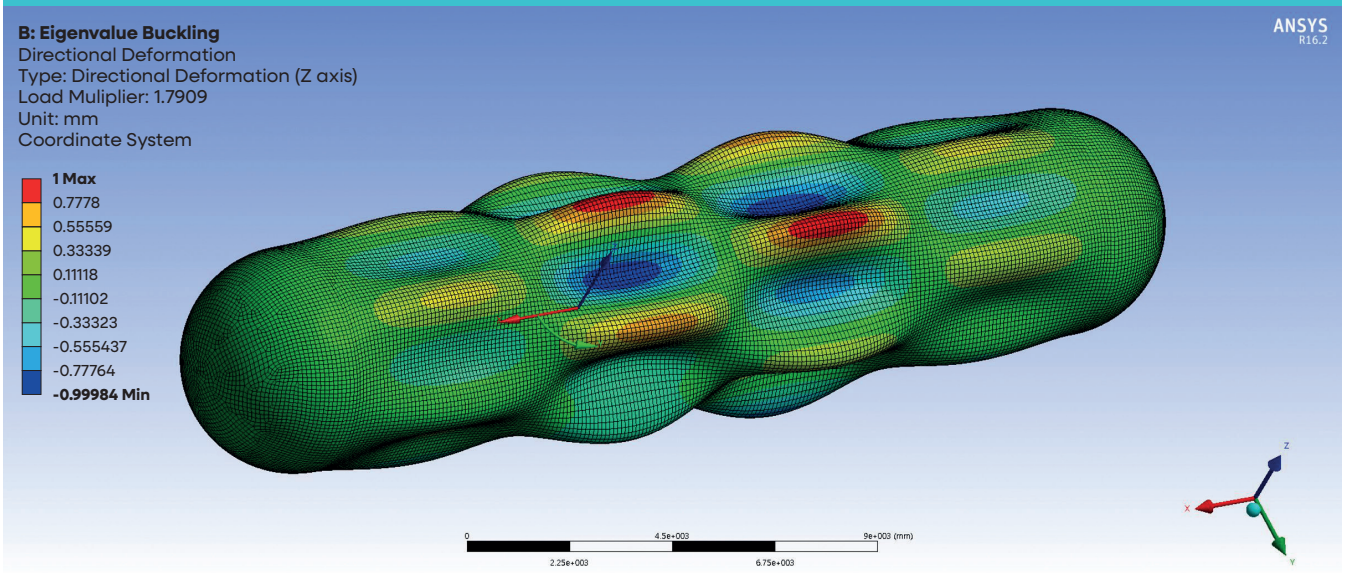


Figure 2: FE analyses for Buckling of typical single cylinder tank

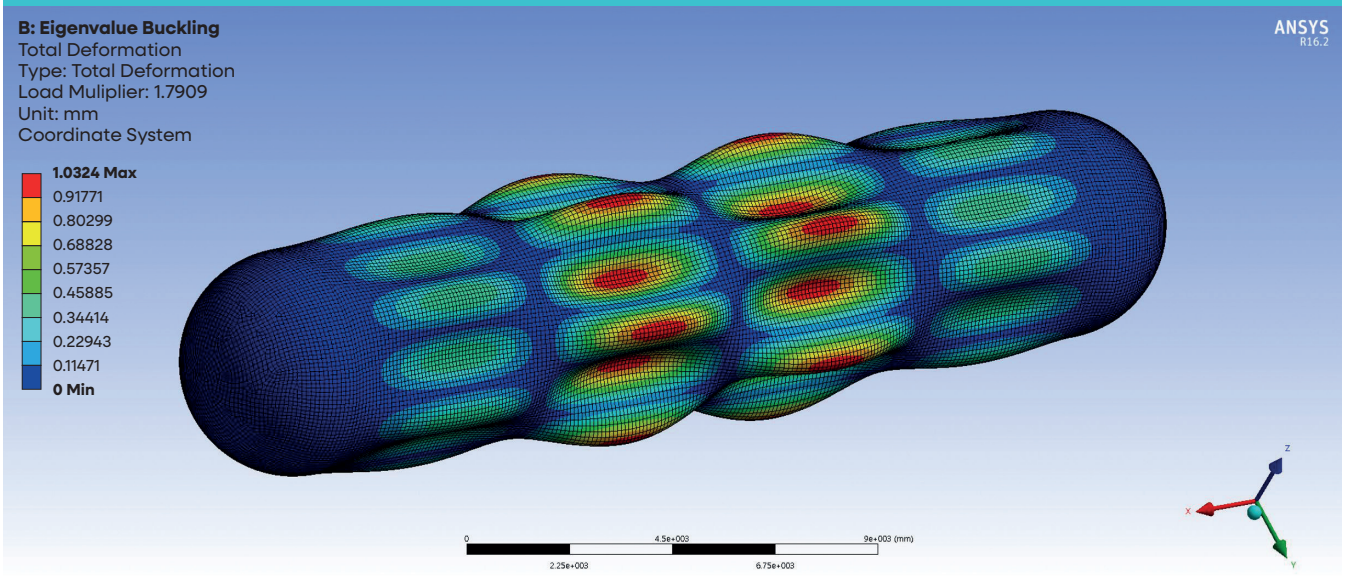
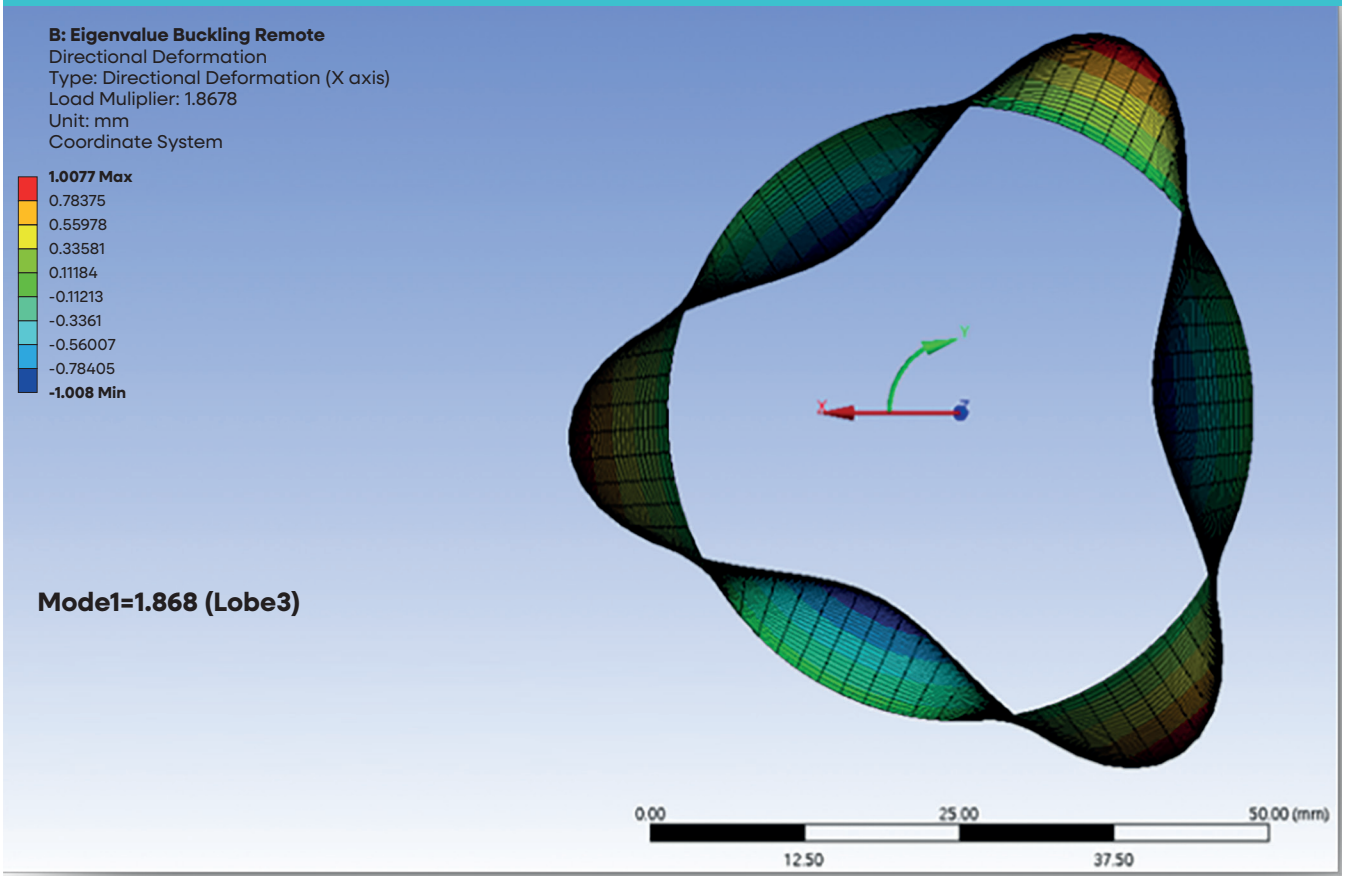


Figure 3: Linear Buckling mode of single cylinder tank section



"As the maritime industry continues to evolve, this IACS-led initiative is crucial in maintaining high safety standards and ensuring the longevity of gas carriers with Type C tanks"

content as the IACS draft UIs to IMO Sub-Committee CCC. CCC 10 agreed that the contents of the IACS draft UIs GC 8, 8A and 8B will be included in the updated IGC Code, to be implemented from January 1, 2028. In response, IACS will further review the draft UIs to accommodate this outcome.

In addition, the following IACS UIs for the IGF Code are also being developed:

Draft UI GF x2
Unified Interpretations for accidental design conditions

Draft UI GF x3
Unified Interpretations for loads due to flooding on ship

Draft UI GF x5
Unified Interpretations for fatigue design condition

Progress on safety

This project represents a significant step forward in enhancing the safety and efficiency of Type C tanks under the IGC and IGF codes. By developing interpretations for stress criteria and fatigue assessments, the project team aims to address existing ambiguities and ensure consistent application of these requirements.

This initiative will not only improve the structural safety of Type C tanks but will also contribute to the overall reliability and efficiency of gas carriers with high-pressure cargo tanks.

As the maritime industry continues to evolve, such IACS-led initiatives are crucial in maintaining high safety standards and ensuring the longevity of gas carriers with Type C tanks. The successful completion of this task undoubtedly sets a new benchmark for the industry, paving the way for future advancements in maritime safety and efficiency.

About the author

Hyungmin Cho is a seasoned naval architect, boasting both a Bachelor of Science and a Master of Science in Naval Architecture and Ocean Engineering. With a robust background, his proficiencies span across diverse domains, notably encompassing structural strength assessment utilising finite element analysis, spectral fatigue analysis, and the implementation of 3D model-based design approval systems. His significant contributions extend to the advancement of the IACS Common Structural Rules, evident through his active involvement in multiple IACS project teams dating back to 2008. Presently, Mr. Cho holds the esteemed position of Chair of the IACS Hull Panel, a role he will fulfill until the culmination of his three-year term in 2025.

Spotlight on protecting lives at sea

Leveraging IACS experience ensures the robustness of passenger ships

By Kathrine Ilje Nerland, IACS Safety Panel Chair

The Safe Return to Port (SRtP) scheme – introduced through SOLAS in 2010 – plays a crucial role in protecting lives at sea, reducing both the likelihood of evacuation and the risks involved with evacuating and rescuing thousands of persons on large passenger ships in the face of fire or flooding incidents.

The main goal of the scheme is that, even in the event of a flooding or fire casualty, a passenger ship should – without support – be able to return to port with its own machinery and provide a safe area for everyone on board, without the need to evacuate the ship. The SRtP regulations apply to passenger ships, including cruise ships, expedition vessels and ro-pax ships, that either have a length of 120 metres or more or have three or more main vertical zones.

The SRtP regulations in SOLAS are goal-based, emphasising system redundancy, emergency management, and casualty mitigation. These regulations are both ambitious and challenging, impacting the design and arrangement of complex ships and their systems, as well as ship operations.

While the SRtP scheme has been somewhat successful since its introduction fifteen years ago, industry experience has shown a non-uniform application of the requirements across the industry.

Consequently, the IMO has initiated a revision of the "Interim explanatory notes for the assessment of passenger ship systems' capabilities after a fire or flooding casualty" (MSC.1/Circ.1369) and related circulars. This revision aims to facilitate uniform implementation of the SRtP concept, taking into account the experience gained since its introduction and the existing industry standards on SRtP.

Applying IACS' experience

IACS Members have collectively gained extensive knowledge and experience with the SRtP concept through the application of their regulations on hundreds of passenger ships. This includes insights gained during the design and operational phases of passenger vessels, as well as in relation to the documentation required to demonstrate compliance with the SRtP requirements.

The IACS Safety Panel has established a dedicated project team, which is utilising this experience to actively contribute to the development of the explanatory notes, with a special focus on ship design. This has already resulted in several proposals on key concepts, such as:

- What it means to "remain operational", i.e. how propulsion, fire safety systems, bilge and ballast systems, watertight doors and other systems covered by the SRtP regulations may be designed and provided with sufficient redundancy to remain operational after a fire or flooding incident, and how the provisions could be arranged in the SRtP explanatory notes.
- Which environmental conditions should be considered for the SRtP concept, i.e. appropriate weather conditions for determining minimum propulsion power, calculation methods for dimensioning a return voyage, and the expected duration of a voyage with respect to fuel supply and necessary power to serve all SRtP systems on board.
- How alternatively fuelled ships should be considered, i.e. the SRtP analysis to include identification and consideration of functionalities that need to be available for an alternative fuel system to remain safe in a SRtP casualty scenario.

IACS is committed to sharing its experiences with application of the SRtP concept and new safety technologies and contributing to uniform implementation of the SRtP requirements. Ultimately, the goal is a safe journey for both passengers and crew, wherever they are in the world.

The IMO work on revising the "Interim explanatory notes for the assessment of passenger ship systems' capabilities after a fire or flooding casualty" (MSC.1/Circ.1369) will continue in 2025.

About the author

Kathrine Ilje Nerland, M.Sc, is a senior principal engineer and safety regulation expert at DNV in Norway. She has a strong international background in technical safety for ships and offshore units, project management and statutory compliance, including nine years working abroad in Europe, Asia and America. As an advisor to flag State Administrations, she has been deeply engaged in the regulatory development work at the International Maritime Organization (IMO). In her role as Chair of the IACS Safety Panel, Kathrine leads IACS' work on initiating and shaping the regulatory safety framework for the maritime industry.

Leading the way in safeguarding global marine ecosystems

IACS helps ship operators to meet BWMS regulatory requirements and establish industry-wide best practices

By Eva Peño, IACS Environmental Panel Chair

The discharge of ballast water containing non-native species into new environments can lead to severe ecological disruption, leading to the damaging decline of native species, habitat degradation and alterations to the food chain.

Ballast water management systems (BWMS) already play a vital role in combating this threat and protecting marine ecosystems by preventing the spread of harmful aquatic organisms and invasive species. However, to ensure that BWMS function effectively to mitigate these risks, rigorous commissioning testing is required. This testing verifies that BWMS operate as intended, ensuring compliance with environmental standards and safeguarding marine environments from ecological harm.

Commissioning tests are essential for ensuring that BWMS operate in compliance with the stringent standards of the 2004 International Convention for the Control and Management of Ships' Ballast Water and Sediments (BWM Convention). By verifying the effective functioning of BWMS, these tests support global efforts to combat marine pollution. These tests not only ensure compliance with the D-2 standard for ballast water discharge established by the BWM Convention but also validate the operational effectiveness of all mechanical, physical, chemical and biological processes within the BWMS. Additionally, they ensure that self-monitoring equipment functions properly, which is crucial for preventing ecological harm from invasive species.

This testing is a fundamental requirement that applies during the initial survey of a BWMS and during any additional survey prompted by significant changes, repairs or replacements of the system, as mandated by IMO BWM.2/Circ.66/Rev 5. The initial commissioning test verifies that the system is correctly installed and functioning as intended, while subsequent tests are crucial for assessing any modifications or repairs that may affect the system's performance. This ensures that the BWMS consistently operates effectively and meets established regulatory standards throughout its lifecycle.

IACS' involvement

IACS Recommendation No 180 serves as a comprehensive guide to conducting commissioning tests of BWMS, with the primary aim of ensuring that these systems function correctly and meet the D-2 standard for ballast water discharge established by the BWM Convention. In addition, it provides guidance on verifying whether the BWMS' mechanical, physical, chemical and biological processes are functioning correctly. The recommendation also covers the proper operation of self-monitoring equipment, which plays a critical role in mitigating the ecological risks posed by non-native species.

In addition, the recommendation further emphasises the importance of service suppliers conducting these tests, requiring their approval under the IACS Unified Requirement Z17 Procedural Requirements for Service Suppliers. This approval guarantees compliance with established quality management systems and ensures that suppliers have the necessary expertise and equipment for effective testing.

Adhering to the IACS guidelines for BWMS, commissioning testing helps ship operators not only meet regulatory requirements but also establish industry-wide best practices. These guidelines ensure that the testing process is comprehensive, efficient and aligned with global standards. One critical aspect of these guidelines pertains to obtaining representative samples from ballast tanks, which is vital for accurate testing. The guidelines recommend sampling from multiple locations within the tanks and at different depths to account for variations in water quality. Collecting two or more samples is advised to improve reliability, rather than relying solely on single or composite samples.

Additionally, the recommendation outlines both indicative and detailed analysis methods

for evaluating the biological efficacy of BWMS. Indicative methods may include quantification of adenosine triphosphate (ATP) to assess biological activity, while detailed methods could involve microscopy to identify and quantify organisms, ensuring compliance with the D-2 standard. During commissioning testing, specific self-monitoring parameters may also be assessed to verify the proper operation of the BWMS. This can include flow rate, residual active substance levels and other operational metrics that indicate the system's effectiveness in treating ballast water.

Encouraging accountability

Transparency is a cornerstone of effective ballast water management. One of the key aspects of the IACS guidelines is the emphasis on clear communication throughout the testing process. The guidelines specify the minimum reporting requirements for the results of commissioning tests. Reports must include detailed descriptions of the methods used, the results of biological efficacy testing and any deviations from expected outcomes. In cases where indicative analysis yields non-conclusive results, the guidelines explicitly recommend that a detailed analysis should be conducted. This ensures that any potential compliance issues are thoroughly investigated and addressed, maintaining the integrity of the BWMS. Additionally, instruments used for measuring self-monitoring parameters must have valid calibration certificates to ensure accuracy. While the guidelines do not require verification of these instruments during testing, they emphasise the importance of maintaining accurate and reliable measurement tools.

This transparency fosters a culture of accountability within the maritime community, encouraging stakeholders to actively participate in maintaining high standards for ballast water management. It also allows for the effective dissemination of best practices, enabling operators to learn from one another and continually improve their systems.

As the maritime industry continues to evolve amid increasing environmental regulations, it is imperative for all stakeholders in the maritime community to recognise the significance of commissioning testing. In addition to being a regulatory obligation, it should also be seen as a proactive measure that contributes to the sustainability and health of our oceans.

Following IACS Recommendation No 180 for conducting commissioning testing of BWMS fosters transparency and upholds industry best practices, enabling the maritime sector to lead the way in safeguarding global marine ecosystems from the harmful effects of invasive species.

About the author

Eva Peño is currently serving as the Chair of the IACS Environmental Panel. She initiated her career with Bureau Veritas in 2001, commencing her professional journey after earning her degree from the Escuela Technica Superior de Ingenieros Navales at the Politécnica in Madrid. Over the years, Eva has taken on various technical and project management responsibilities in both Madrid and Paris, diversifying her expertise and skills within the industry.

IACS in harmony with engine advancements

Meeting the challenge of new tech and alternative fuels

By Amir Lotfolazadeh, IACS Machinery Panel Chair

With the evolution of marine engine technology and the growing use of alternative fuels, IACS is working at the forefront of rule interpretations to maintain engine safety and reliability.

IACS recently published the revised version of its Unified Requirement M78 (UR M78) as Rev.2, addressing critical updates for dual fuel (DF) and gas fuel only (GF) engines. These Rev.2 changes emphasise enhanced safety and reliability and have expanded the scope to cover 2-stroke crosshead engines using natural gas (methane) as fuel.

To keep pace with the changing sector, IACS is set to release UR M78 Rev.3 in the first half of 2025 to cover additional fuel types and incorporate clarification on the required safety concept submission, updates to the risk analysis scope, and updated engine testing requirements to further improve the safety of modern engines fuelled by gases or low-flashpoint fuels.

The following key topics in UR M78 Rev.2 continue to shape the maritime industry's approach to operating gas-fuelled engines:

1. *Dual fuel and gas fuel only engines: advancing fuel management and safety.* As the industry progresses toward increased use of alternative fuels, a thorough understanding of the technical requirements and safety implications for these engines is essential. Recognising the importance of this shift, IACS has established a dedicated Project Team within the Machinery Panel to address these needs and accelerate the release of updated UR M78 standards. The updated UR M78 provides further detailed design criteria for DF and GF engines, with a focus on expansion beyond solely low-pressure trunk piston engines to include high pressure and 2-stroke crosshead engines using natural gas (methane) as fuel.

2. *Pilot injection monitoring: a key to combustion safety.* The requirement for fully operational pilot oil injection systems before gas supply ensures stable and safe combustion processes, preventing hazardous start-up conditions. This requirement ensures a controlled combustion start-up, reducing risks associated with premature or misaligned fuel injection that could lead to irregular combustion events. Effective monitoring of this parameter is critical to maintain combustion stability and operational integrity

3. *Safety measures for gas admission valves: prioritising hazard control.* To address safety concerns, hydraulically operated gas admission valves must now be provided with a sealing system to minimise the risks of gas leaks to the hydraulic control system.

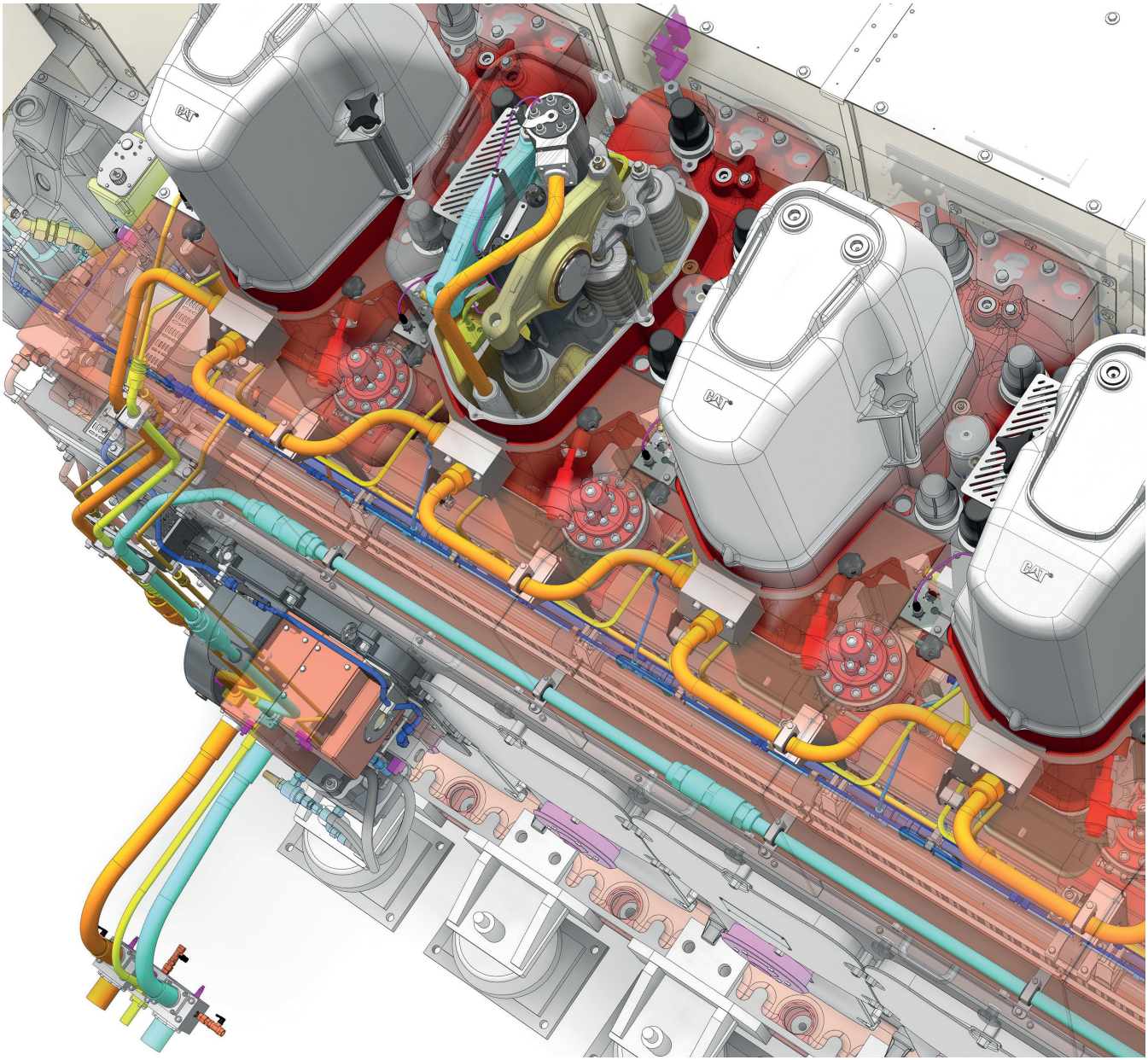
4. *Rigorous risk analysis requirements: a proactive safety framework.* The revision clarifies the existing risk analysis procedures and expands the scope of the risk analysis to include in-depth evaluation of those engines using active crankcase ventilation and justification on explosion relief valve arrangements.

5. *Monitoring and alarm systems: early detection for enhanced safety.* UR M78 includes monitoring and alarm systems to detect irregularities in combustion and gas supply conditions, enabling prompt action to prevent hazardous situations. These requirements are expanded to include, as applicable, failure of crankcase ventilation systems.

6. *Compliance with international codes: ensuring global safety standards.* Alignment with the IGF and IGC codes ensures that engines comply with internationally recognised safety standards, facilitating safe global operations.

7. *Ventilation and gas piping arrangements: designing for leak prevention.* Double-walled gas piping arrangements are required to prevent leaks and maintain integrity in hazardous environments, while effective ventilation of the double-wall piping system is used to provide early indication of a leak from the primary barrier thereby safeguarding crew and vessel.

8. *Environmental impact and emission reduction: supporting sustainability in marine operations.* The promotion of natural gas and other alternative fuels highlights a commitment to reducing emissions and supporting a more sustainable maritime industry.



Schematic representation of the Caterpillar methanol-fuelled engine; illustrating the fuel supply system, combustion process, emission control technologies and integration with marine power generation

Schematic of the MAN B&W ME-GI two-stroke dual-fuel engine; designed for LNG/methane-powered vessels

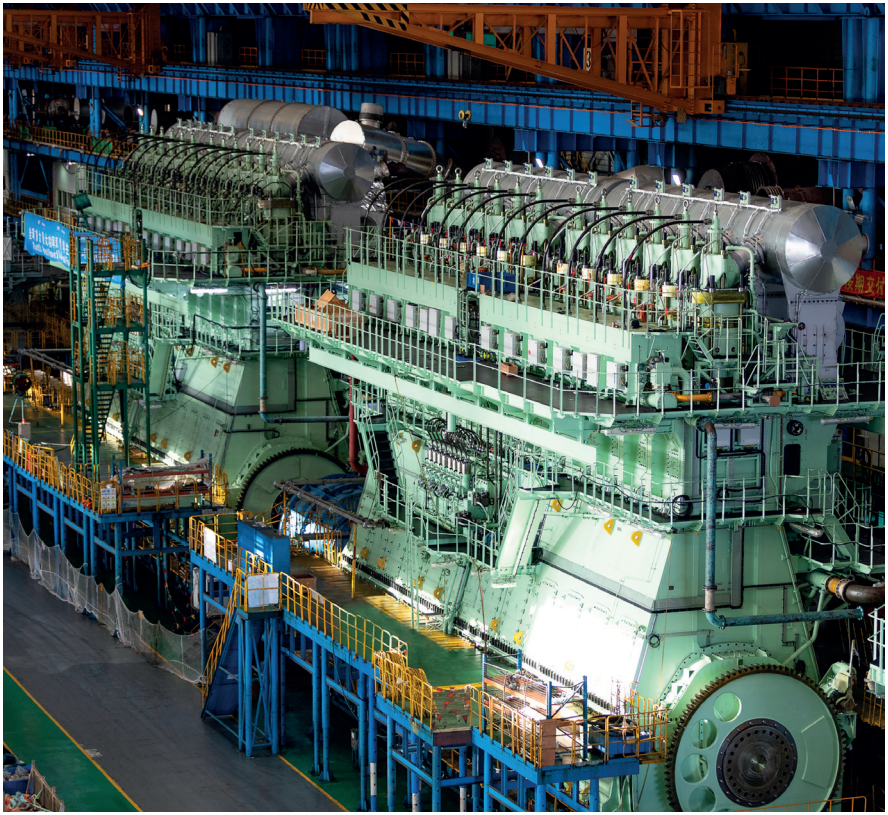
Step forward for modern marine engines

In response to the rapid advancement of engine technologies and the increasing adoption of alternative fuels, IACS is preparing to release Rev.3 of UR M78 in the first half of 2025. This revision will focus on new engine types that utilise a broader spectrum of gases and low-flashpoint fuels, going beyond the existing UR M78 scope for natural gas (methane) to include ethane, LPG, and methyl/ethyl alcohols (methanol/ethanol). These fuels, which offer significant advantages in reducing environmental impacts, also introduce unique safety and operational challenges that must be addressed in the latest revision.

These are some of the key updates that will be featured in UR M78 Rev.3:

1. *Safety concepts for modern engines fuelled by low-flashpoint fuels.* Rev.3 will provide a comprehensive framework for modern engines operating on low-flashpoint fuels. This includes detailed clarification on the required safety concepts, tailored to the specific properties and risks associated with new fuel types. These safety protocols will ensure that modern engines equipped with new technologies can operate safely within the parameters of their respective fuel characteristics.

2. *Extended risk analysis requirements.* As new fuels, such as methanol, ethanol, and LPG, are introduced into marine operations, additional safety concerns are introduced, and, for some fuels, their toxicity becomes an important consideration. The revised UR M78 will extend the risk analysis to cover potential hazards related to the additional fuels. This will involve assessing not only combustion risks but also the possible consequences of fuel exposure



Schematic of the WinGD 12X92DF two-stroke dual-fuel engine; optimized for LNG and conventional fuel operation in marine vessels

> "The updated UR M78 will continue to drive innovation and responsible operation in the industry, paving the way for safer, greener, and more reliable marine engineering practices worldwide."

to the crew or environment, ensuring that these new fuels are handled safely.

3. *Updated monitoring and safety system functions.* The updated revision will include further updates to the required monitoring and safety system functions. This update will ensure that systems are capable of detecting and responding to hazards unique to low-flashpoint and alternative fuels, such as gaseous or liquid fuel leaks and clarifies monitoring and safety functions that may be within the designer's specification, but outside scope of supply.

4. *Misfire and single cylinder cut off.* Rev.3 will provide further guidance on the criteria for allowing alternative fuel operation to continue in the event of unstable combustion or if pilot fuel injection fails on one cylinder.

5. *Type test, FAT, integration testing and shipboard trials for engine systems and subsystems.* Significant updates are included in Rev.3 for particular testing of engine systems and subsystems at type test, FAT, shipboard trials and for integration and functional performance testing. The complexity of modern engines, especially those that use multiple fuel types or advanced engine air and exhaust system technologies, requires rigorous testing to verify that all components work in harmony. These updated requirements ensure that modern engines perform reliably and safely under all operational conditions.

6. *Updated documentation and submission to IACS Members.* The revised UR M78 will also mandate that designers prepare and submit updated documentation for review by IACS Members. This documentation will include detailed information on the safety concept, risk analyses, and test reports to ensure that all aspects of the engine's design meet the newly established safety standards.

Safety, reliability, and environmental improvements

The new provisions in UR M78 Rev.3 will further elevate the standard of safety and reliability for engines powered by a broader range of new fuels. There are numerous benefits in implementing the updated requirements.

First, they offer enhanced safety protocols for new fuels. The clarification of the detailed safety concepts required for low-flashpoint fuels and gases, together with the extension of the risk analysis scope will contribute to reducing the risk of accidents associated with new fuel types.

Second, they bring improved operational reliability. Comprehensive type test, FAT, integration tests and shipboard trials support the verification that modern engines continue to operate safely and efficiently, even in the event of system malfunctions or abnormal conditions.

Third, they expand monitoring systems. With the update to monitoring and alarm system functions, Rev.3 ensures that advanced monitoring capabilities are in place to address the unique risks posed by alternative fuels, enhancing the ability to detect and respond to abnormal operation.

Fourth, they support proactive risk management. The new requirements, increased scope and functional testing clarifications of UR M78 will help identify and mitigate potential risks before they materialise, ensuring a proactive approach to managing safety and specific risks from the broader range of alternative fuels.

Fifth, they streamline compliance with global standards. By aligning further with the latest international safety codes and guidelines, Rev.3 ensures that modern marine engines are capable of meeting the rigorous standards required for global operations and sustainable maritime practices.

Lastly, they improve transparency. The new documentation requirements will foster greater transparency and collaboration between designers and classification societies, ensuring that safety measures are well understood and adhered to across the industry.

A more resilient future

IACS' release of UR M78 Rev.2 marked a significant step toward improving the safety and reliability of marine engines using dual fuel and gas fuel only configurations and expanded the scope to cover 2-stroke crosshead engines. Looking forward, Rev.3, scheduled for release in the first half of 2025, will provide essential updates for the next generation of marine engines and critically expands the range of alternative fuels, beyond natural gas (methane), to additionally include ethane, LPG, and methanol/ethanol. These updates will ensure that the maritime industry remains on the cutting edge of technological advancements, while also maintaining a strong focus on safety and reliability. The updated UR M78 will continue to drive innovation and responsible operation in the industry, paving the way for safer, greener, and more reliable marine engineering practices worldwide.

Adopting these requirements will strengthen the resilience of the maritime industry while supporting the global shift to sustainable marine practices. This revised UR reflects IACS's ongoing commitment to shaping a safer, cleaner, and more resilient future for global maritime operations. ●

About the author

Amir Lotfolazadeh graduated with a degree in Mechanical Engineering in 1991 and brings 34 years of extensive experience in the marine and offshore sectors. Since joining Bureau Veritas in 1999, he has held numerous managerial roles across diverse fields, including new construction, ships in service, materials and equipment certification, plan approval, and marine management system auditing. His responsibilities have spanned both regional operations and within Bureau Veritas' headquarters.

In January 2023, Amir was appointed Chair of the IACS Machinery Panel, a position he will hold for three years.

Facilitating remote, yet robust surveys

IACS leadership continues to strengthen the remote survey process

By Dr Kamru Zaman, IACS Survey Panel Chair

Remote ship surveys took the sector by storm in the Covid era as travel bans and lockdowns rendered in-person surveys a near-impossible task. IACS demonstrated its leadership during this time, recognising the urgent need for a 'new normal', promptly adopting new processes to remotely confirm the safety of the ship, and establishing procedures to ensure ships carried the necessary evidence of Convention compliance.

By definition, a remote survey is the process of verifying that a ship and its equipment are in compliance with the applicable statutory regulations and rules of the classification society where the verification is undertaken, or partially undertaken, without a surveyor's attendance on board.

To ensure uniformity for all IACS Members undertaking remote surveys, IACS' Survey Panel developed Unified Requirement (UR) Z29, which entered into force on January 1, 2023.

The UR includes the minimum quality requirements for information and communication technology, the scope and details of remote classification surveys, and details of the necessary recording and reporting of evidence and documents. This UR is predicated on the fact that any remote survey will only be viewed as appropriate if the level of assurance is not compromised, and if the survey is carried out with the same effectiveness as, and is equivalent to, a traditional ship survey carried out with a surveyor in attendance on board.

Generally, remote surveys will be carried out with an internet connection allowing live streaming of a visual examination, although, at the discretion of the surveyor, a combination of remote survey methods (recorded videos, photos, other data and/or supporting documents etc.) may be used.

Continuous improvement

In pursuit of continuous improvement, IACS recently carried out an internal investigation among Members to understand the lessons learned from undertaking remote surveys under UR Z29. Taken from the findings, Table 1 on the next page lists a breakdown of reasons for classification surveys conducted remotely by IACS Members, as listed in UR Z29.

The investigation found that while owners and ship managers generally have a positive impression of the use of remote surveys, the following issues with industry stakeholders were noted:

- Difficulty of some clients/crew to consistently provide livestreaming, supported by other means of ICT (photos, video clips, etc.).
- Reservations of some flag State Administrations towards remote surveys and their acceptance only on case-by-case basis.
- Reservations of some PSC authorities.
- Difficulty of demonstrating an equal level of transparency as physical surveys.
- Some crew's lack of training and proper understanding of remote surveys.

Skilled personnel are required to undertake a remote survey as it is reliant on a range of tools and systems (e.g. photography, video and scanning equipment, internet connection for live streaming, etc). A lack of these tools and systems combined with unskilled personnel using them can have a negative impact on the quality of survey.

Effective communication between the crew and the surveyor is a key requirement for a successful remote survey and therefore training and education for surveyors as well as crew is a key issue which must be addressed for the improvement of the remote survey regime.

According to the experience gained so far, a remote survey, when carried out in full compliance with the provisions of UR Z29, is considered an effective survey. Nevertheless, regular annual, periodical, intermediate and renewal complete surveys require a

Table 1: Remote surveys performed by IACS Members for eligible remote survey items in UR Z29

No.	Surveys and related items eligible to remote survey	Surveys identified
1	Postponement, issuance, deletion of Condition of Class	35.7%
2	Postponement of Class surveys	20.3%
3	Items of Continuous Survey for Machinery (UR Z18) or Planned Maintenance Scheme (UR Z20, PMS)	2.6%
4	Occasional survey for change of ship's name	0.6%
5	Occasional survey for loss of anchor	2.0%
6	Occasional survey for minor machinery or equipment damage	18.8%
7	Occasional survey for minor hull damage	4.4%
8	Occasional survey for minor deficiencies/defects not subject to a Condition of Class	4.4%
9	In-water bottom survey	0.6%
10	Specified items of a class periodical survey (excluding additional specific items of initial or renewal surveys), including completion of remaining items of a part held class periodical survey	0.3%
11	Non-propelled/un-manned barges/pontoon – annual surveys when no survey of hull compartments is due	0.0%
12	Minor retrofit/installation/upgrade of equipment	2.0%
13	Documentary or data-based initial/periodical/renewal/occasional verifications and surveys	8.4%

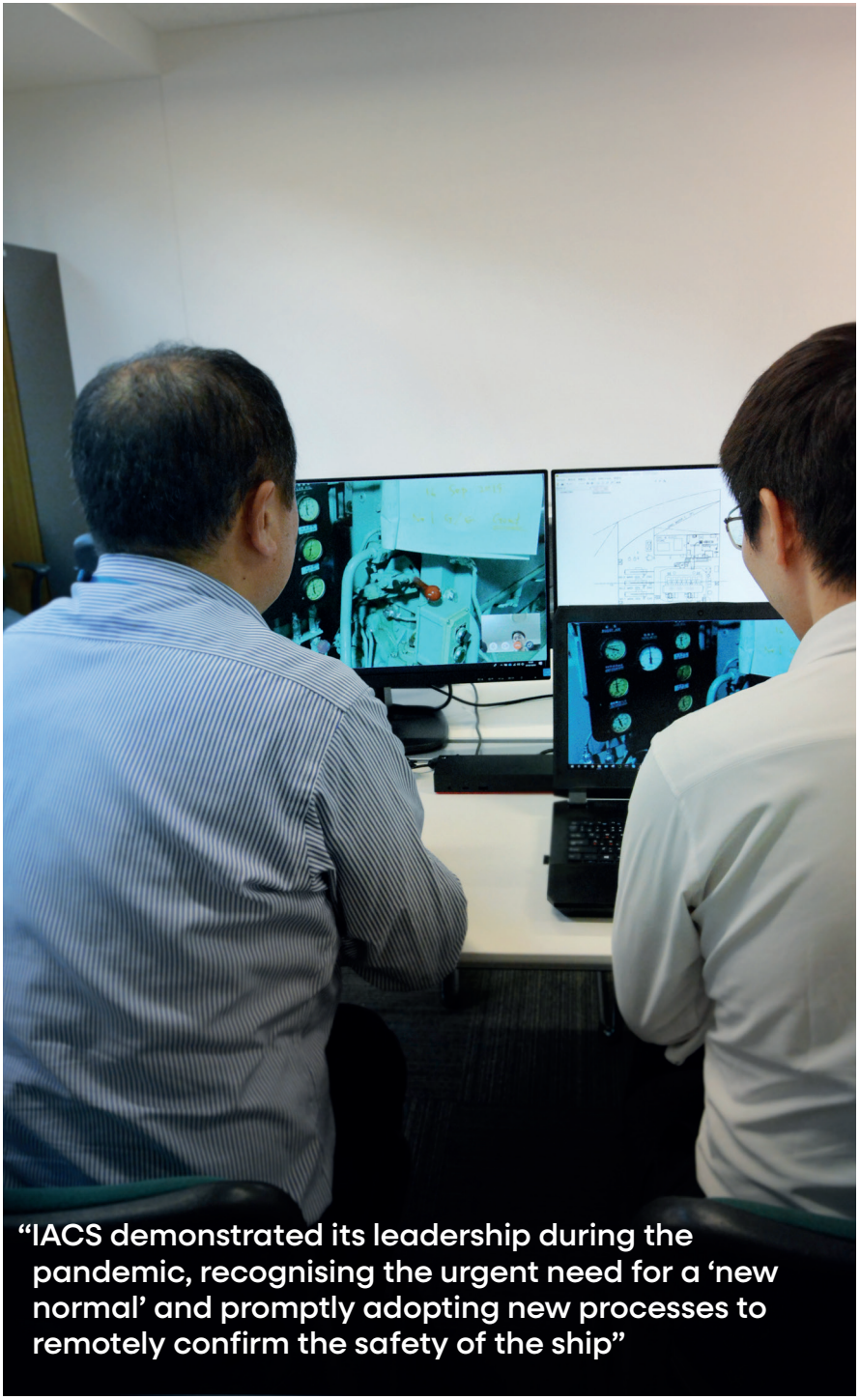
physical surveyor presence onboard. This hybrid approach leverages the efficiency of remote tools while maintaining thorough oversight for complex inspections.

Uniform implementation

IACS is closely monitoring the progress of discussions at the IMO on the development of remote surveys. Having engaged with the IMO for the Guidance on remote statutory surveys, adopted at the 33rd Session of the IMO Assembly, IACS has been supporting the IMO initiative to develop IMO Guidance on the implementation of remote surveys, audit for the ISM Code, and verification for the ISPS Code. Throughout, a balance between remote surveys and surveys with a physical attendance is being maintained to ensure the sustainability and robustness of the classification and statutory systems.

Based on the feedback received from IACS Members and mindful that the IMO is developing guidance on assessments and applications of remote surveys, IACS considers that any improvement of UR Z29 would be best timed to happen after the expected adoption of the IMO Guidance on remote surveys and audits at the 34th Session of the IMO Assembly.

Meanwhile, IACS, in co-operation with industry, remains committed to continuing its leadership on remote survey processes and will push for uniform implementation of remote surveys under the provisions of IMO Guidance and IACS UR Z29.



“IACS demonstrated its leadership during the pandemic, recognising the urgent need for a ‘new normal’ and promptly adopting new processes to remotely confirm the safety of the ship”

About the author

Dr. Kamru Zaman graduated from Bangladesh University of Engineering and Technology (BUET) in Naval Architecture and Marine Engineering where he served as a faculty member for a brief period. He obtained his Master’s and Doctoral Degrees in Engineering from Yokohama National University, Japan under the scholarship granted by the Japanese Government.

After completion of academic studies, Dr Zaman joined ClassNK in 2007. During his 18 year career with ClassNK, he has held various positions and roles in ship classification, from plan approval engineer to senior ship surveyor and ISM auditor for newbuilding and ships in service, and was also involved in activities related to international co-operation.

Dr. Zaman is currently working as a Principal Surveyor and Manager in ClassNK Head Office and serving as Chair of IACS Survey Panel where he oversees IACS work on the improvement of survey and certification of marine vessels.

Expert knowledge for cutting-edge tech

IACS enriches additive manufacturing landscape

By Dr. Dongchun (Mary) Qiao, Project Team Project Manager, IACS Materials and Welding Expert Group

Additive manufacturing (AM) – the process of fusing or physically joining materials to produce objects from a computer-aided design or digital 3D model – promises to be a game changer for the marine and offshore industries.

Also known as 3D printing, these systems convert 3D model data into a series of 2D cross-sections for layer-by-layer physical prints, ultimately producing a 3D object. In the marine industry, on-demand part manufacturing, replacements, and damaged part repairs could be carried out locally, completely independent from conventional supply chains.

AM technology has developed from prototypes to end-use applications, from small desktop Fused Deposition Modelling (FDM) or Powder Bed Fusion (PBF) machines to large robotic Directed Energy Deposition (DED) or computer numerical control (CNC) machines. The inherent versatility of 3D printing allows many different material types to be printed, from polymer materials to metals, carbon fibre composite, or ceramics.

> "IACS additive manufacturing Recommendation is expected to be an important contribution to the global AM landscape."

The AM process chain includes part design and/or design analysis, production of feedstock, the AM process itself, post building processing, and inspection and testing for components and test samples.

Classification societies assess and monitor the overall AM process chain, provide services, support inspection and testing plans (ITP) and review test results. Classification societies also approve AM parts for shipyards or for original equipment manufacturers (OEMs), AM feedstock, AM manufacturers for final material and AM repair facilities.

AM is different from the traditional manufacturing processes and so to approve each element of the AM process – from part design, digital control, AM building to final outgoing part – classification societies face many challenges, including multi-discipline engineering reviews, and specialised manufacturer surveys.

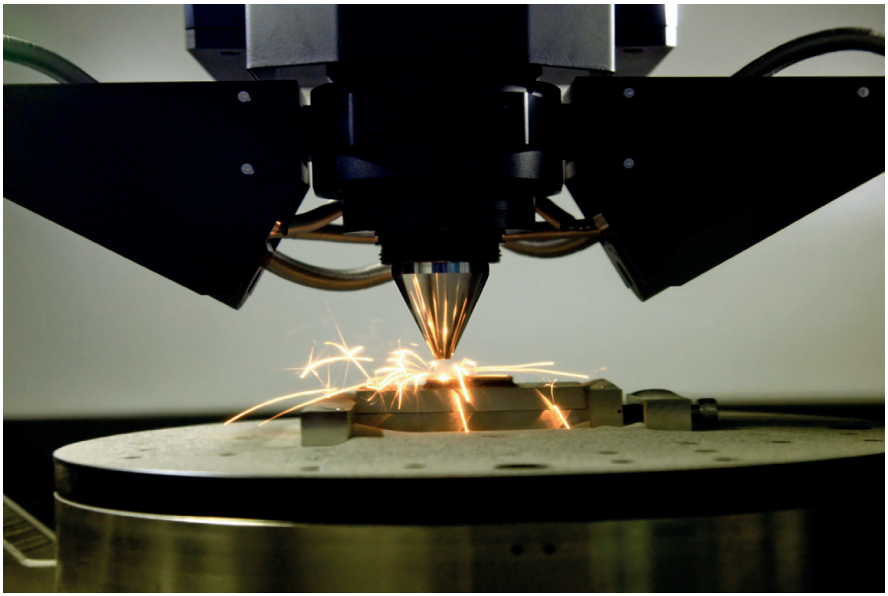
The characteristics of AM materials are another interesting variable that review engineers face. Depending upon the material and specific AM process applied, materials may be anisotropic, have more scattered properties, and have potential imperfections such as a lack of fusion, keyholes, porosity, misalignment, distortion, stacked discontinuities, or solidification cracking.

Aligned with its mission to support promising new technology and to mitigate potential risks, IACS has developed a Recommendation to recognise and interpret industry standards, establish qualification and certification processes, and support the equivalent and applicable existing IACS Unified Requirements, such as those contained in UR M for machinery and installations, S for hull structure and W for materials and welding.

The IACS Recommendation on additive manufacturing has been developed by a dedicated project team with metallurgical and welding specialists and published on the IACS website. The Recommendation is expected to be an important contribution to the global AM landscape, giving an IACS perspective for shipyards, OEMs and shipowners.

Credit: MarinaGrigorivna/Shutterstock

Powder Bed Fusion (PBF) modelling



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The Directed Energy Deposition (DED) process in action

About the author

Mary Qiao graduated with a doctoral degree in Materials Science and Engineering from the University of Tennessee, Knoxville. After graduation, she began her career as a Senior Metallurgist, supporting the development and performance of drilling and completion products in the offshore energy sector.

In 2017, Mary joined the Department of Technology America at the American Bureau of Shipping (ABS). Her current work focuses on the development of ABS Rules and Guides related to Materials and Welding, Nondestructive Testing, and Additive Manufacturing for structures and equipment.

Mary was nominated as a Project Team Project Manager (PTPM) and successfully led the development of the IACS Recommendation on Additively Manufactured Metallic Parts for Marine and Offshore Applications.

Putting people first

IACS places the human element at the heart of its safety agenda

By Boris Gruden, Chair, Expert Group on Management Systems

The human element in the maritime industry is an intrinsic part of safety at sea. Without a competent and supported workforce, the high standards set by IACS Members would be difficult to achieve.

IACS' focus on the human element encompasses safety, security and environmental protection, including consideration of digitalisation and decarbonisation aspects. IACS' Expert Group Management Systems and the Small Group Human Element identify risks posed to and by people in the entire ship's lifecycle and advise on how to mitigate them at the design stage.

IACS strives to achieve technical solutions that promote inherently safer designs, particularly in consideration of the human element. This includes adopting a human-centred design philosophy in the process of developing new IACS instruments.

IACS also aims to raise awareness within the shipping industry about the complex interface between people and systems on board. The key objective is to ensure that people are not harmed, and that systems are not damaged by people or used in an unsafe, insecure or environmentally damaging way.

IACS seeks to highlight and emphasise the importance of properly addressing human element aspects when developing new IACS Requirements applicable to the ship and ship systems within the scope of class, on the development of new IACS instruments, and for the approval of computer-based systems.

Training and guidelines

Over the past year, IACS has undertaken internal training sessions, produced several documents for internal and external use related to human element, and has been involved in human element related activities with other industry groups.

The two internal training sessions were delivered by the chair of the IACS Expert Group on Management Systems and the chair of the Small Group on Human Element. These focused on understanding and implementing the requirements of guidelines to address human element issues in IACS Working Groups. Training sessions were performed online and drew wide participation from all the IACS groups, supported by the General Policy Group.

IACS internal guidelines have been developed to help Working Groups identify and consider the possible impacts of and to the human element when developing new IACS Resolutions. These require all IACS Working Groups to adopt a human-centred approach, to consider how to utilise the best of human abilities and compensate for weaknesses, and to foresee risks posed by people (for example, human behaviour).

As part of IACS' 'Guidelines to address human element issues in all IACS Working Groups', IACS has developed a human element impact assessment checklist, which is to be used by IACS' Working Groups when developing new IACS instruments.

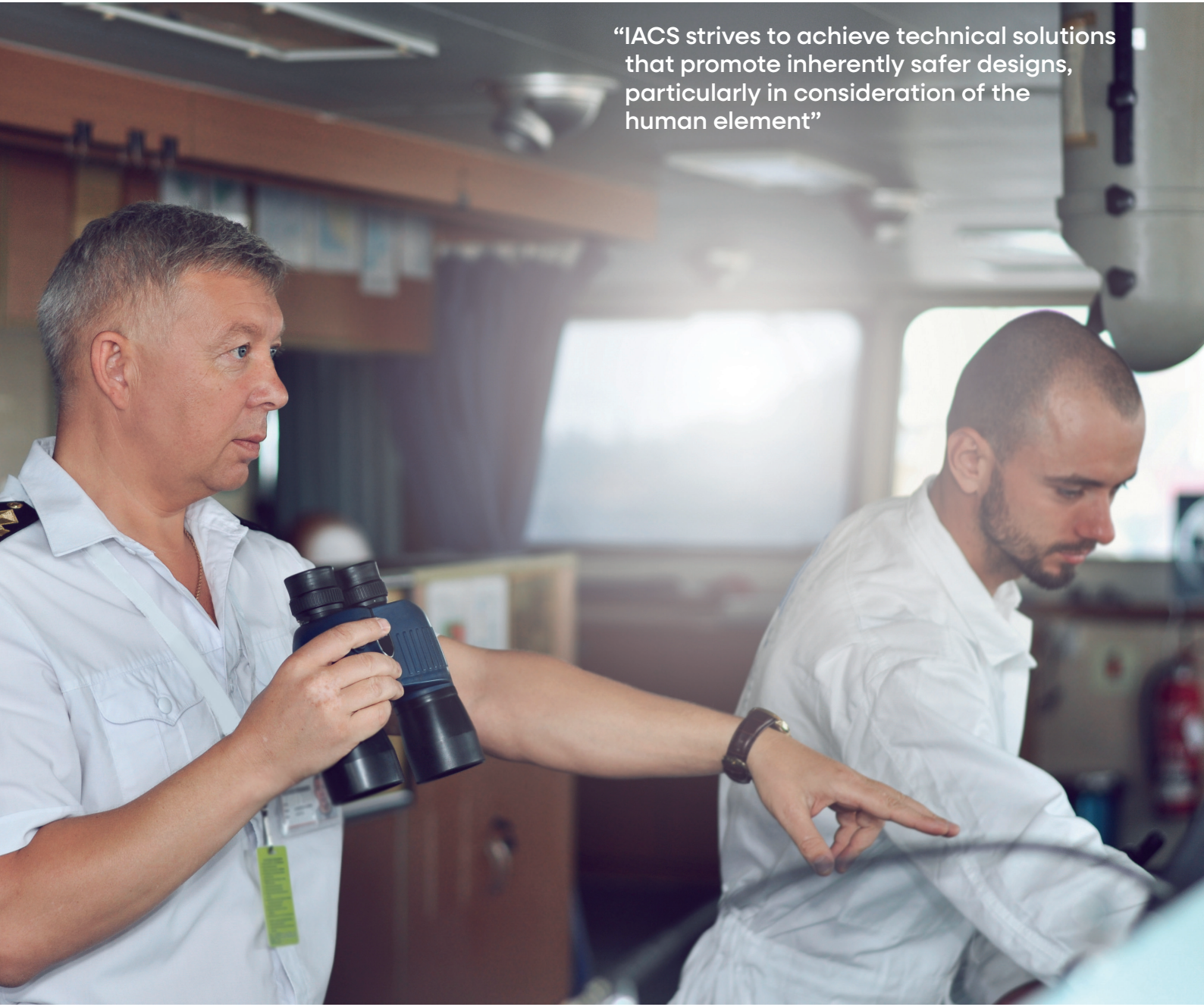
The Small Group on the Human Element was established to address the effect of people on systems and to contribute to the assessment of performed work and for the review of checklists provided by IACS Working Groups.

Competency consideration and assessment

In support of this work, IACS has produced an internal document, including a matrix, related to the identification of human element considerations and competencies within IACS. This is the proposed method to establish human element competencies and proposed assessments.

The existing IACS Human Element Recommendations for structural design (Rec.132), meanwhile, provides information on industry best practices regarding human element considerations for structural design of various arrangements, including lighting, ventilation, vibration, noise, access and egress.

The IACS High Level Position Paper (HLPP) on the human element presents IACS'


“IACS strives to achieve technical solutions that promote inherently safer designs, particularly in consideration of the human element”

position and initiatives related to human element issues to external stakeholders. The IACS HLPP on the human element also promotes IACS as an important contributor to integrating human element aspects within the shipping industry's regulatory requirements.

With regards to interested parties, IACS seeks to co-operate with industry, regulators and other stakeholders in support of approaches that place humans at the heart of the design process, considering people as part of a system, seeking to understand their needs, behaviour and required experiences, considering what should be expected from them, and promoting the need for skills and training.

Important work is being carried out by a Joint IACS/Industry Working Group on futureproofing the maritime safety regime, considering the ongoing digital transformation of the shipping industry. The project is collecting evidence and sharing supporting examples that cover safety considerations for complex systems that currently fall outside the prescriptive requirements.

IACS also participates in the IMO Human Element Industry Group (HEIG), led by the Nautical Institute and comprised of NGOs with a special interest in this topic. The HEIG has developed various documents; its recent focus has been on entry into enclosed spaces, considering both the management aspects and the safe design of vessels and a vessel's equipment – such as cargo hold ladders.

IACS' representative in HEIG is a member of HEIG workgroup involved in development of 'Guidelines on Human Centred Design'.

About the author

Boris Gruden graduated with a Master's degree in Mechanical Engineering from the University of Rijeka, Croatia. After working as a ship machinery installation designer for cruise ships built for Italian shipyards and project manager in Offshore Department of a shipyard located in Rijeka, Croatia he started his career in BV Croatia as ship in service/ new construction Surveyor and ISM/ISPS Auditor in 2001. In 2011 he was appointed as Manager of Ship Management Systems Department in BV HO in Paris, France. He has been a member of IACS EG MLC and EG Management Systems (MS) since 2011 and from 2020 he has been acting as Chair of IACS EG MS. Boris has been actively involved in training IACS WG Members in relation to IACS Guidelines to address human element issues in IACS working groups' work, and creating the IACS White Paper on the Human Element and IACS HLPP on Human Element. He is the current IACS representative in the Human Element Industry Group (HEIG), led by the Nautical Institute.

Quality and Safety

IACS sets the quality bar high

A full audit programme assures the robustness of quality management

By Jonathan Spremulli, IACS Quality Secretary

Quality is embedded in IACS' DNA. From the setting of high quality standards for entry, including the mandatory requirement for all Members to comply with IACS' Quality System Certification Scheme (QSCS), IACS assures the professional integrity of its Members and of their high professional standards.

Continuous progress was made on quality assurance in 2024 with the full implementation of QSCS. Accredited Certification Bodies (ACBs) recognised by IACS to audit its member classification societies in accordance with QSCS and the incorporated Quality Management System Requirements (QMSR) conducted all required audits in 2024, including Vertical Contract Audits (VCAs) relating to surveys of ships in service, ships under construction and surveys of machinery and equipment.

Additionally, the ACBs have undertaken QSCS audits globally with in-person sampled observations of these audits by IACS Operation Centre (OC) to assure the robustness of the audits. The performance of the ACBs has also been verified through a benchmarking exercise.

Last year saw OC resources increased in the Asia region, enabling the OC to attend and observe audits, especially VCAs of ships in service, more efficiently, taking into account late changes to audit dates that can frequently occur.

The Accredited Certification Body (ACB) benchmarking exercise is an important process in QSCS which takes place annually in December. The robustness of each ACB's audits is reviewed and assessed based on the year's observation reports and records, produced and maintained by the OC. Performance of each ACB is scored in accordance with fixed criteria as laid down in QSCS. Each ACB (for each classification society it audits) is expected to achieve a score equal to or more than 80% of the "best in class". The scores as well as possible areas for improvement are reported back to the ACBs and the respective IACS Members; subsequently Improvement Action Plans (IAPs) are submitted to the OC by the ACBs. The implementation of the IAPs is verified during the following audit year. Using this important audit observation and benchmarking process the robustness of auditing is verified, and continuous improvement is achieved.

Key events set the bar

During 2024, the annual QSCS Auditors Seminar and the annual QSCS End User Workshop, took place. The seminar – hosted in 2024 by IACS Member ABS – is an important event which all QSCS qualified auditors recognised by IACS are expected to attend. The seminar provides an in-confidence and interactive environment for refresher training for the auditors as well as a forum to provide feedback from the OC to the auditors and vice versa. It also provides updates relating to changes to QSCS and QMSR, and the QSCS audit focus areas agreed for the upcoming audit year. For 2024 the focus areas covered safety of surveyors (including latest version of PR 37 Procedural Requirement for Confined Space Entry), maintenance of ships (including IACS PRs 1C, 33 and 35) and ISM (including effectiveness of SMC audits and implementation of cyber security requirements). In 2024 the auditors received health and safety training, and updates on the Industrial Personnel (IP) Code and developments relating to autonomous shipping.

> "IACS assures the professional integrity of its Members and of their high professional standards"

The second event – the annual QSCS End User Workshop (EUW) – is aimed at all stakeholders interested in and involved with QSCS and the quality standards applied to classification societies. Attendees in 2024 included representation from seven IMO Member States, 16 classification societies, 3 ACBs, the European Maritime Safety Agency, IMO, the International Quality Assessment Review Body and the Quality Assessment and Certification Entity.

Credit: dcornelissen@chello.nl

This important event enables ACBs recognised by IACS, including BSI, DEKRA and SGS, to provide annual feedback on their experiences over the audit year in applying QSCS and auditing the classification societies they certify. The 2024 EUW was chaired by the chair of the IACS Quality Advisory Committee (AVC) and presentations were provided by representatives from Turkey, the US and the Marshall Islands with content related to their Member State oversight of their Recognized Organizations.

The workshop benefitted from being in-person with a good level of discussion both in session and in the margins. Positive feedback was received and I look forward to the 2025 workshop taking place in Hong Kong, China. ●

About the author

Jonathan Spremulli is the current IACS Quality Secretary, having been appointed in April 2022. He is a Chartered Engineer and Member of the IMarEST and is qualified in marine engineering and naval architecture. Jonathan has over 42 years of experience in the marine industry. Prior to joining IACS he most recently held positions including marine director at the International Chamber of Shipping and general manager for the Liberian Registry's London office. Jonathan has worked for over 20 years in classification, including for Lloyd's Register and RINA SpA. Jonathan started his career as a sea-going engineer for Canadian Pacific.

Exciting new phase for Quality Assessment

Strengthening Maritime Confidence: IACS's Journey Towards Independent Quality Assessment

By Arun Sharma, IACS SC/QP Chair

As part of IACS's ongoing commitment to continuous improvement in quality, back in 2018 the Association investigated whether a move towards a fully independent quality assessment review body would further strengthen maritime stakeholders' confidence in the IACS Quality System Certification Scheme (QSCS) and facilitate IMO Member States' awareness of the quality of the performance of their Recognized Organizations (ROs). This investigation resulted in the initiation of a trial of an independent and international quality assessment review body, established under the aegis of IMO, to review the findings of the Accredited Certification Bodies' (ACBs) audits of IACS Members and their corresponding corrective action plans.

Accordingly, the International Quality Assessment Review Body (IQARB), an advisory body, was established to review the certification process of the quality management systems of IACS Members by considering:

1. the adequacy of IACS QSCS in meeting the objectives set for classification societies/ROs by regulators and industry and its compliance with the requirements of the RO Code in relation to the relevant provisions of IMO mandatory instruments, e.g. SOLAS regulations I/6, II-1/3-1 and XI-1/1, etc. as well as the III Code;
2. the performance of ACBs against the criteria of QSCS;
3. the nature of the findings; and
4. the robustness and effectiveness of the agreed corrective actions that classification societies/ROs have put in place to address findings identified during the ACB audits.

These objectives have been achieved over the past few years and IQARB releases factual statements to each IACS Member in the public domain. These factual statements can be utilised by Member States as a component to help demonstrate that they are fulfilling some of their obligations with respect to the relevant provisions of the IMO mandatory instruments, e.g. SOLAS regulation XI-1/1, as well as the III Code and the RO Code, with regard to the oversight programme exercised by Member States for their ROs.

IQARB has representatives from flag States, Industry bodies, the EC and other stakeholders. IQARB has been supported continuously by IMO and EC throughout its development process. MSC 108 and MEPC 81 approved the "Guidance in relation to the IMO Member State Audit Scheme (IMSAS) to assist in the implementation of the III Code by Member States" as provided in the annex to MSC-MEPC.2/Circ.19 issued August 9, 2024. The approved guidance states that in relation to Member State RO oversight "the Member State may take into account the Factual Statements issued by the International Quality Assessment Review Body (IQARB)" as proof of an RO's effective implementation of a Quality Management System.

With the progressive development of IQARB, in 2022 it was considered that the 'Proof of concept' phase of IQARB had been achieved and the focus thereafter has been towards its further development, which is an ongoing process. The ambition now is to develop IQARB into a truly international and independent body which could expand beyond the assessment of the quality certification process of IACS Members.

Most of the IACS Class Societies are also EU ROs and are obliged to comply with EU Reg. 391, which is currently assessed by the Quality Assessment and Certification Entity (QACE). To avoid duplication between IQARB and QACE, all the stakeholders including IACS, EU ROs and EC agreed in principle to merge the two entities IQARB and QACE into a single legal body, responsible for certifying EU ROs for compliance with EU Reg. 391, in addition to reviewing the certification process of Class Societies meeting the objectives of the IQARB.

The merger process was initiated by the representative of EU ROs with the active

involvement from all stakeholders and the process was supported by IACS, EC and other stakeholders. The inputs provided by IQARB members, IACS Members, QACE Members and EC were considered and taken into account for the development of Articles of Association (AoA) for the merged entity named as 'IQARB'. The AoA has been approved and adopted by QACE Members and subsequently has been endorsed by IACS and IQARB. This has completed the first phase of the merger process making IQARB a legal entity with the responsibility of administering and overseeing the processes of both IQARB and QACE. While IACS has agreed to join IQARB as a Special Member representing itself and all the EU ROs, EC has given its consent to join IQARB as an Agency Member and IMO has agreed to provide necessary support to IQARB and participate as an Observer.

The legal founding of IQARB thus fulfils the IACS objective of setting up an Independent International Quality Assessment Body for Class Societies and ROs. IACS remains committed to supporting IQARB as it develops further.

About the author

Arun Sharma is Executive Chairman of 'Indian Register of Shipping', an IACS Council Member and is currently the Chair of IACS Council's Sub Committee on Quality Policy (SC/QP). A marine engineer with a strong, technical and commercial background, Arun has held several top management positions with key shipping companies in his career spanning several decades, including The Shipping Corporation of India, Varun Shipping Company, Great Eastern Shipping and India Steamship. He has also served on the boards of the Indian National Shipowners' Association. In December 2019, he was featured in the Lloyd's List Top 100 Most Influential People in the shipping industry. He was also included in the Lloyd's List Top 10 in Regulation.

Arun held the position of IACS Chairman from 1st July 2019 to 30th June 2020 and led the Association during the particularly turbulent times of the pandemic. He was the recipient of India's highest maritime recognition, the 'Varuna Award' in 2021. He was also awarded the 'R. L. Jain Memorial Lifetime Achievement Award' in 2023 by the Institute of Marine Engineers (India).

IACS Members embody demonstrable quality

Continuous development ensures that high standards are maintained

By Łukasz Korzeniewicz, Chair, IACS Quality Committee

In the maritime industry, where safety, environmental protection and regulatory compliance are paramount, quality assurance is not just a process – it is a fundamental value that ensures the protection of life, property and the marine environment. IACS and its Members embody this commitment through their rigorous approach to maintaining high quality standards every day and at every level of their operations. Through continuous development, adherence to globally recognised standards and ongoing evaluation, IACS and its Members ensure that their services consistently meet the highest quality benchmarks.

The centre of IACS' commitment to quality is the Quality System Certification Scheme (QSCS), a comprehensive framework that ensures consistent application of quality standards across all Member organisations. The QSCS is integral to maintaining and enhancing the effectiveness of the Quality Management Systems of the classification societies and Recognized Organizations, whose primary mission is to ensure the safety of ships, the protection of the environment and the advancement of maritime regulations.

QSCS – widely recognised as a 'gold standard' within the maritime industry – is designed to ensure that IACS Members not only meet but exceed international regulations and quality benchmarks. Each IACS Member undergoes independent audits by Accredited Certification Bodies (ACBs), which evaluate compliance with ISO 9001 and applicable elements of the ISO/IEC 17020 integrated within the Quality Management System Requirements (QMSR) that are part of the QSCS. This auditing process ensures that classification societies maintain consistent quality in their processes, including ship surveys, inspections, certification and rule-development.

Each IACS Member is subject to rigorous audit processes carried out by the ACBs and their auditors to ensure that their operations comply with ISO 9001:2015 standards, as well as the specific requirements outlined in the QSCS.

Each year, IACS Members undergo a number of audits of their head offices, controlling offices, plan approval and survey locations, which are carried out by the ACB. The selection and number of offices to be audited is, as in any other industry, estimated by the ACBs on the basis of the International Accreditation Forum (IAF) Mandatory Document.

Within the maritime industry, in addition to the standard office audits, the IACS Members are required to undergo Vertical Contract Audits (VCA), a more in-depth form of audit that assesses the effectiveness of specific services provided by classification societies. The VCA assesses the delivery of core services, including ships in operation, new buildings, safety management (such as the ISM and ISPS Codes and the MLC Convention) and equipment certification. The process involves a combination of process audits and product audits that examine the effectiveness of service delivery to identify potential areas for improvement.

By focusing on specific services, the VCAs ensure that all aspects of a classification society's work – from initial design assessments to the long-term maintenance of ships – are carried out to the highest quality standards. These audits are an integral part of ensuring the highest level of quality within the IACS membership.

IACS Members' adherence to the QSCS demonstrates their commitment to transparency, consistency and competence. It demonstrates that IACS Members are not only qualified but are continually improving their operations to meet evolving industry needs and regulatory standards.

Commitment to quality is central to IACS' mission to enhance maritime safety, protect the marine environment and ensure the overall integrity of the global shipping industry. As the maritime industry continues to evolve, IACS' and its Members' unwavering commitment to quality will remain a cornerstone of its success, ensuring that its Members continue to meet the challenges of the future while maintaining the confidence of regulators, shipowners and the public.

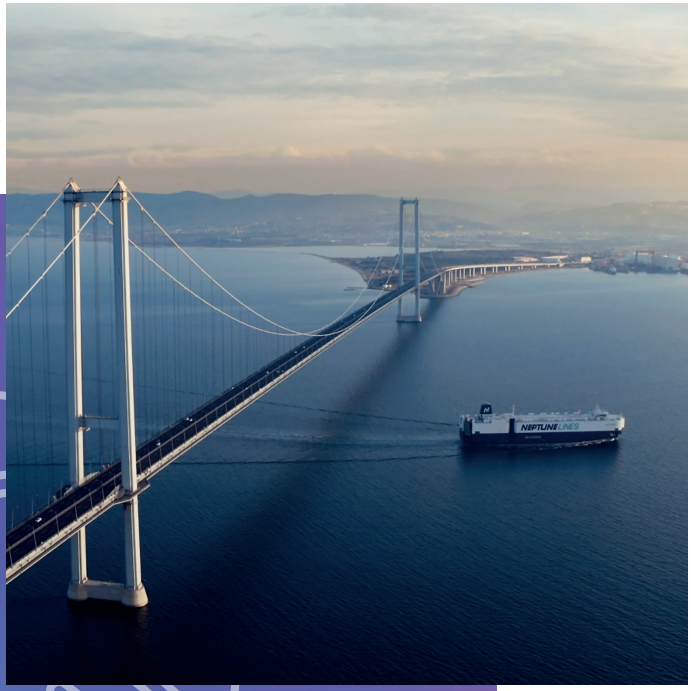
Credit: dcornelissen@chello.nl

Reputation is another aspect of the recognised pillars of trust and professionalism within the maritime industry that IACS and its Members have built up over more than half a century of service to the maritime industry. Maintaining this trust and professionalism requires a commitment to a culture of continuous improvement and increasing competence in every aspect of their operations, as well as an openness to new challenges and an ability to learn from opportunities for improvement.

IACS' comprehensive approach to quality assurance – through independent audits, knowledge exchange, and continuous improvement – ensures that its Members are equipped to provide safe, reliable, and environmentally responsible services to the maritime industry. ●

About the author

Łukasz Korzeniewicz graduated from the Maritime University of Szczecin with a Master's degree in Mechanics and Mechanical Engineering in 2002, from the University of Gdansk with a Master's degree in Law in 2011 and completed postgraduate studies in the field of occupational health and safety at the WSB University in Gdansk in 2022. Before joining the Polish Register of Shipping (PRS), he worked in a shipyard in Szczecin and as a watch engineer officer on merchant ships. His career at PRS has covered most aspects of the classification society's activities, starting as a technical assistant before moving on to plan approval surveyor, field surveyor, auditor and external co-operation department specialist and his current position as quality manager. Łukasz has been a member of several bodies of IACS during his 18-year career in classification, including the EU and Legal Expert Groups and the Quality Committee, of which he was elected Chairman in 2017. He was involved in the early development of QACE and IQARB and in 2021 he was elected President of QACE. Additionally, Łukasz is a lecturer for postgraduate studies at the Gdansk University of Technology.



International and Inter-Industry Relations

IACS vital seat at the IMO table

Delivering on a shared vision of safety at sea

By Konstantin Petrov, IACS Accredited Representative to IMO

As two sides of the safety 'coin', the statutory regime and the institution of classification have been strengthening their symbiotic relationship for over a century. IACS has enjoyed the status of a non-governmental international organisation with consultative status with the International Maritime Organization (IMO) since 1969, which has allowed both institutions to further the objectives of safety in a collaborative manner.

Highlighting the shared safety goals, in 2024 the IMO Council designated the theme for IMO World Maritime Day as "Navigating the future: safety first!" In a background paper on the theme, the IMO Secretary General concluded that "enhancing maritime safety by ensuring that each link in the chain of responsibility fully meets its obligations is a priority for the global maritime community and critical for future global economic growth and prosperity".

IACS and the IMO's relationship and shared safety vision has delivered such regulatory achievements as the ESP Code, the Condition Assessment Scheme for tankers, and recognition in the SOLAS and Load Lines conventions of the central role of classification in respect of requirements for structural, mechanical and electrical systems, to name but a few.

The strengthened statutory regime for ship structure has been developed through the introduction of goal-based standards built on IACS' concept for, and the delivery of, IACS' Common Structural Rules. IMO safety instruments pertaining to structure and engineering systems have a sound foundation in the detailed classification rules, the continuous evolution of which will assure that the mutually beneficial nature of this relationship will continue well into the future.

By building on our shared achievements of the past, IACS is confident that together we can successfully address the challenges of the future. In today's world, where the scope and pace of technological change is presenting new and different challenges, IACS continues to maintain its steadfast support for our shared vision of safety of shipping.

IACS' injection of ideas and knowledge into the work of the IMO is greatly enhanced by the unique role of IACS Members as Recognized Organizations charged with applying statutory regulations and classification rules and experiencing firsthand the effectiveness of their practical application.

Regular paper flow

Meanwhile, the number of Unified Interpretations developed by IACS each year has not diminished. Last year, with input from IACS, the IMO's Maritime Safety Committee (MSC) made a significant decision which will allow a more engaged review of the technical substance behind proposed interpretations. Also, it has introduced a safeguards tool which will permit screening out of those proposed interpretations that do not "fit the bill". IACS is committed to continue offering solutions to achieve clarity of regulations in their application and has embraced the safeguards tool by introducing the same in its internal UI development process. As we apply this screening tool, we learn more about it; IACS has already shared its experience with MSC 109 and intends to continue to bring others on that journey of discovery.

IACS also continues to provide its technical impartial advice to the MSC. For the 109th session of MSC, IACS prepared and submitted 12 documents across major safety agenda items, including GBS, MASS, safe decarbonisation, FSA, IGC and IGF Codes, and radio. That represented 20% of all action papers put to MSC 109.

Looking ahead, the flow of IACS support to IMO on aspects of maritime safety is steady, with 11 papers to the Sub-Committee on Ship Design and Construction and more in the pipeline to the Sub-Committee on Ship Systems and Equipment.

In parallel, IACS undertook to deliver for IMO the revision of four model courses free of charge, with three courses completed at a cost to IACS of £45,000.

All that would not have been possible without the unparalleled work of IACS technical experts in member classification societies, supporting the safety of ships and the people on board them. With last year's theme of safety, IACS salutes and thanks those experts for their expert guidance.

"IACS and the IMO's relationship and shared safety vision has delivered many regulatory achievements"

109th session of IMO Maritime Safety Committee (MSC). Mr Konstantin Petrov, IACS Accredited Representative to IMO, (left), Ms Mayte Medina, IMO MSC Chair, (middle) and Ms Kathrine Ilje Nerland, IACS Safety Panel Chair, (right).

About the author

Konstantin (Kosta) Petrov graduated from Saint Petersburg State Marine Technical University with a master's degree in Naval Architecture in 1996. Before joining IACS as its Accredited Representative to IMO in 2019, he worked for two classification societies. In both organisations he was responsible for international policy towards regulators and industry, later switching to leading business development with postings to Helsinki and Hamburg. Over a period of 29 years in classification, Kosta has chaired various international groups/committees in IACS, IMO, and industry, and promoted a classification and statutory regime as a way to deliver safe, secure and environmentally friendly shipping.

Co-operating on a safety front

IACS working with the EU to support shipping

By Astrid Silvia Grunert, IACS Representative to the EU

The year 2024, seen through an EU lens, was marked by profound changes but also by a sense of consistency and continuity. Firstly, the European elections from June 2024 led to a reshuffling of two of the major three EU institutions, namely the European Parliament and the European Commission. While the European Parliament experienced a large turnover of its members, the European Commission only saw its top politicians – the Commissioners – change, whereas the Directorate Generals continued working on their set policies.

> "IACS looks forward to continuing to marry innovation with continuity under its safety-first approach, supporting EU regulators on their challenging endeavours for the years to come."

This resulted in a nice balance of new impetus and experienced administration and offered a time to reflect on achievements attained and outstanding challenges, as well as evaluating policy directions and formulating recommendations for the five years to come.

In terms of achievements, regulators can look back at a term that has been dominated in an unparalleled way by an environmental agenda, summarised in the European Green Deal and put into action via the "Fit for 55 Package". This package, having successfully made its way through the EU decision-making process, is still 'in the making', with numerous details being determined and clarified through secondary legislative acts and continuous stakeholder consultation.

IACS and its Members played a significant role in this from the start, drawing on experience gathered from the MRV (Monitoring, Reporting and Verification) Regulation and keeping track of the expanding role of so-called 'independent verifiers'. The latter, transferred from land-based installations and often seen as the backbone of a functioning EU Emissions Trading System and FuelEU Maritime Regulation, has undoubtedly contributed to the feasibility and acceptance of the new schemes and has de facto created a new role in the shipping industry.

Having said this, challenges still lie ahead during the imminent implementation phase, and IACS – through its various panels, including the Safe Decarbonisation Panel and the Environmental Panel – keep addressing these towards regulators. The format of the European Sustainable Shipping Forum is appreciated, insofar as it facilitates discussions on various sub-aspects of the EU's environmental shipping legislation, ranging from alternative fuels to energy efficiency measures.

With the EU legislative package now completed, expectations from the industry can focus on a smooth implementation of those measures and on strong involvement in facilitating international solutions.

Re-focus on maritime safety

Last year also saw the finalisation of a review of key EU safety legislation, grouped together in a Maritime Safety Package. This package, comprising revisions of key legislation from the 2009 Maritime Safety Package, has put the focus back on maritime safety. It has, however, left no doubt that the existing maritime safety regime is far from being under attack, but rather in a process of being constantly perfected to be fit for the new challenges that the sector faces. This also includes a revision of the European Maritime Safety Agency (EMSA), the importance of which has indisputably grown substantially since its creation over 20 years ago. An adjustment of the mandate and the staffing of the agency to reflect its steadily growing portfolio is certainly timely.

Regular exchanges between IACS, the European Commission's DG MOVE and EMSA on topics relating to maritime safety at large, and the classification sector in particular, is much appreciated. IACS engages in regular specialised expert groups, including on passenger ship safety, maritime security and the Marine Equipment Directive,

and takes part in recurrent events, such as the EMSA Workshop on Alternative Fuels and Powering Solutions for Shipping and Ports and the Maritime Cybersecurity Conference. IACS brings both safety of alternative fuels and the inclusion of the Human Element into safety considerations into these discussions.

Setting maritime strategy

Looking at the upcoming challenges in relation to the EU, several aspects are worthy of mention. Firstly, the Draghi report on European competitiveness is expected to be the pivotal point and overarching priority for the Commission, in the same way as the EU Green Deal was for the previous Commission. The maritime industrial strategy, to be developed by new Transport Commissioner Apostolos Tzitzikostas and his team, will translate the Draghi report's findings into policies for the maritime sector.

IACS stands ready to support this task to ensure that safety is included as an underlying principle in all the upcoming deliberations. In that respect, Commissioner Tzitzikostas's announcement at his parliamentary hearing to make safety his number one priority has been positively received and resonates with the contributions that IACS intends to bring into this new five-year term.

In addition, the new Commission's aspiration to deepen ties with the IMO are truly welcomed by IACS. The work towards international solutions, be it on environmental, digitalisation or other fronts, should guide the policies for the sector as an unquestionable ultimate goal. IACS is pleased to be able to regularly exchange views and co-operate with the relevant European Commission directorates, such as DG MOVE, DG CLIMA and DG ENV, on the way forward towards global regulations for the shipping sector.

Last but not least, the announced new EU Port Strategy is – among others – expected to reflect on the reality of a fundamentally changing sector, with autonomous vessels of a not-too-distant future reformulating the concept of the ship-to-shore interface, in technical and also in legal terms.

Shipping will not entirely revolutionise over the next five years, but it is important to remember that the course for the future is largely being set now. IACS looks forward to continuing to marry innovation with continuity under its safety-first approach, supporting EU regulators on their challenging endeavours for the years to come. ●

About the author

Astrid Silvia Grunert has represented IACS at the EU since 2011. Prior to that, she held various positions in Brussels, including at CEOC (now the TIC Council), and the German Embassy. Astrid holds Master's degrees in International Relations and Romance Studies.

Prior to moving to Brussels and specialising in EU affairs, Astrid worked and studied in France, Austria and Germany.

Clear lines of communication with industry

IACS values the excellent working relationships it has with stakeholders

By Robert Ashdown, IACS Secretary General and Ajay Asok Kumar, IACS General Policy Group Chair

IACS values greatly its relationships with industry stakeholders, welcoming meaningful dialogue and collaboration on key technical and regulatory issues towards the shared goal of safety at sea.

In 2024, IACS continued to prioritise its active engagement with industry stakeholders through the activities of various Joint Industry Working Groups (JIWG) and other collaborative initiatives aimed at advancing safety, decarbonisation, and regulatory readiness.

The recently established JIWG on Safe Decarbonisation commenced its activities with a hybrid meeting in April 2024. The group's primary objective is to foster a common understanding of safety aspects related to decarbonising technologies and fuels. It will focus on safety risk analysis and regulatory gap analyses building on the work undertaken by IACS Project Teams (PTs) on Carbon Capture and Electrical Energy Storage Devices, and incorporating insights from PTs focused on Hydrogen and Ammonia. To enhance the focus of its activities, the JIWG has established sub-groups with defined Terms of Reference, enabling detailed examination of specific challenges.

IACS hosted its annual IACS/Industry and IACS/IUMI technical meetings in 2024, achieving significant progress on various work items. Topics included container vessel fires, loss of containers at sea, and human element considerations, along with updates on follow-up actions from the 2023 meetings and progress from various JIWGs.

In 2024, IACS engaged extensively with industry stakeholders and held two industry workshops to ensure transparency and to provide timely updates on developments related to the revision of Common Structural Rules (CSR). While the first workshop in February offered updates on CSR revisions, the second workshop in October highlighted preliminary Consequence Assessment (CA) results of the proposed rule changes and confirmed that the new corrosion additions will not be included in the Rule Change Proposal 2025.

At Tripartite 2024, the annual meeting of shipbuilders, class and shipowners, IACS further presented on CSR evolution, emphasising enhanced transparency and technical soundness. Additionally, a dedicated webinar was conducted to address stakeholder questions related to IACS Rec.34 Rev.2 and a briefing session was held in the margins of MSC 109.

In addition, Tripartite 2024 discussed a wide range of topics critical to the maritime industry. Among the key areas addressed were digitalisation, challenges associated with electric vehicles and Lithium-ion batteries, environmental issues, and the technical readiness of stakeholders to achieve GHG reduction pathways for both existing ships and new builds. IACS will continue to participate in the Tripartite Working Group on Carbon Capture led by Sea Europe.

Additionally, discussions explored addressing lifecycle GHG emissions from construction to scrap, the need to expand methods to measure underwater radiated noise (URN), and harmonising measurement standards. The Tripartite Working Group on URN, in which IACS also participates, will continue its efforts into 2025.

A dedicated session focused also on the strategic issues driving the future of shipbuilding and operations. Follow-up actions included defining complex systems, establishing frameworks for iterative design improvements through data exchange, and adopting a lifecycle approach to technology integration.

At its 90th Council session held in London in December, IACS invited the industry for discussions on the outcomes from Tripartite 2024 and to confirm establishment of new JIWGs. During the session, it was conveyed that the publication of the next set of CSR Rule Changes would be extended to July 2027. This extension allows more time for industry feedback on the new wave loads and to provide a more comprehensive technical background, including the Consequence Assessment (CA) results.

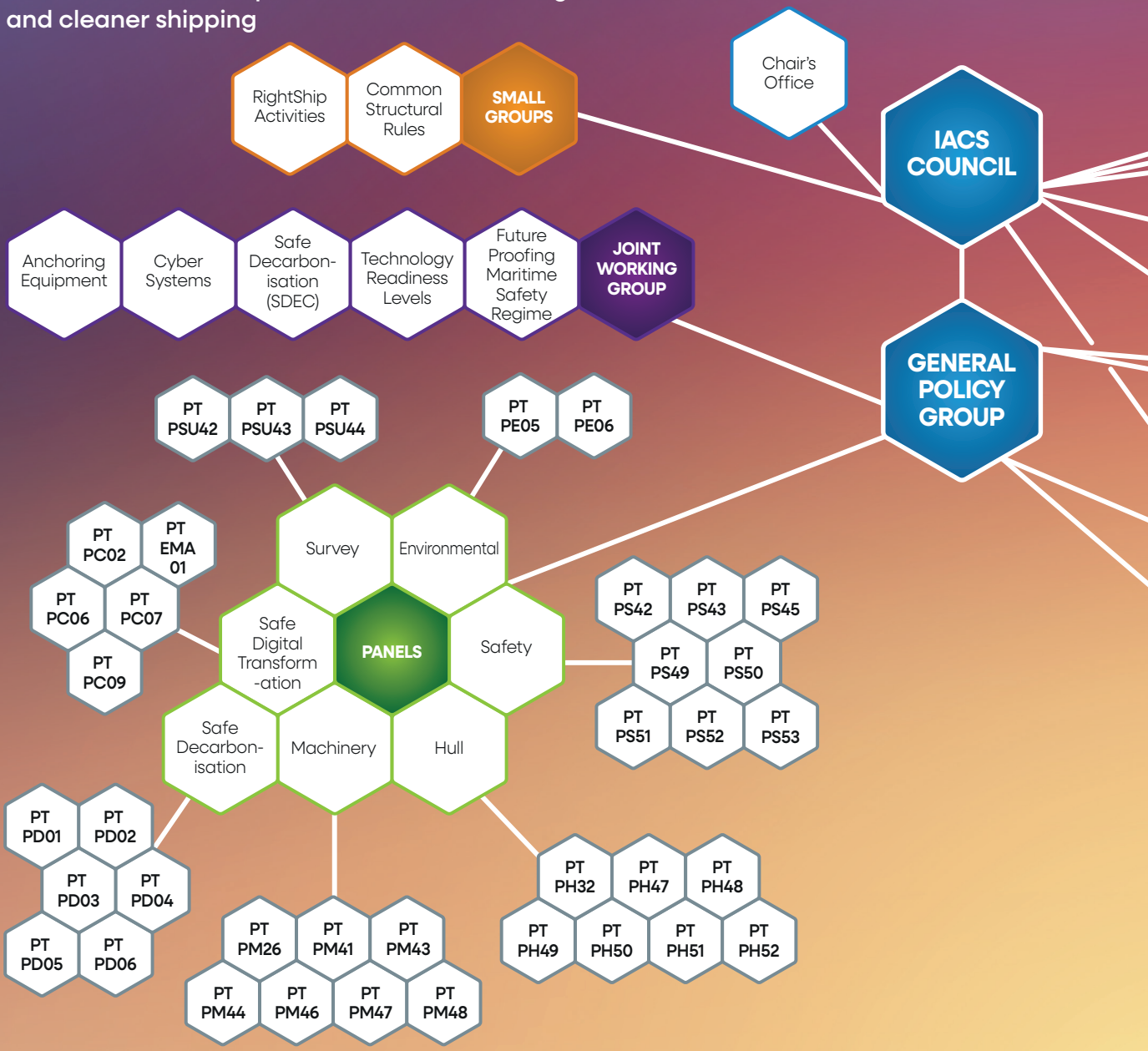
Through these initiatives, IACS reaffirms its commitment to fostering collaboration and advancing safety, decarbonisation, and regulatory readiness. By maintaining an open dialogue with the industry, IACS continues to deliver critical insights and support to meet the evolving challenges of the maritime sector.

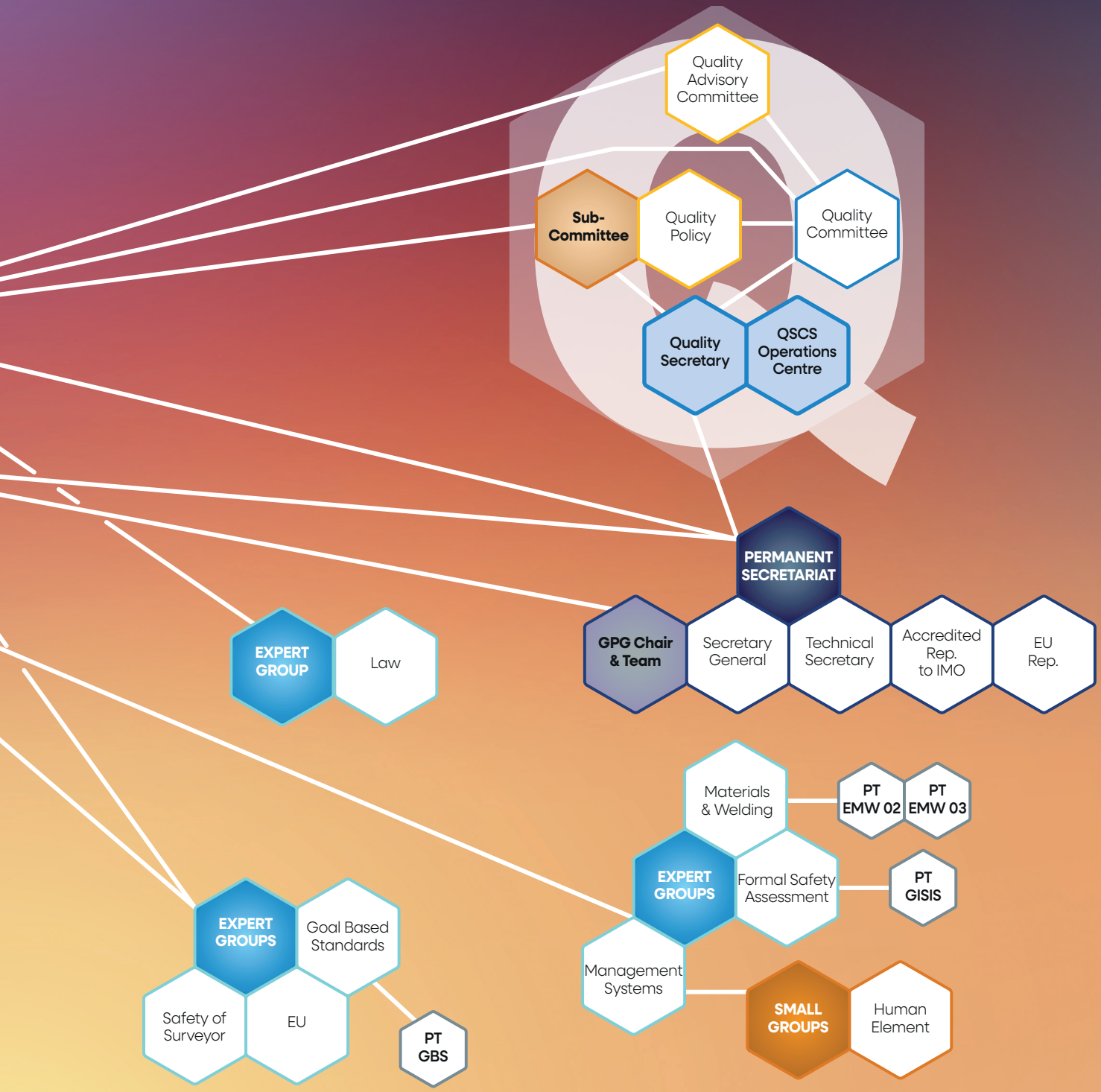
"In 2024, IACS engaged extensively with industry stakeholders and held two industry workshops to ensure transparency"

IACS Organisation 2024

IACS Organisation 2024

IACS deals with multiple tasks to advance the goal of safer and cleaner shipping




Quality Advisory Committee
Sub-Committee
Quality Policy
Quality Committee
Quality Secretary
QSCS Operations Centre
PERMANENT SECRETARIAT
GPG Chair & Team
Secretary General
Technical Secretary
Accredited Rep. to IMO
EU Rep.
EXPERT GROUP
Law
Materials & Welding
PT EMW 02
PT EMW 03
EXPERT GROUPS
Formal Safety Assessment
PT GISIS
Management Systems
SMALL GROUPS
Human Element
EXPERT GROUPS
Goal Based Standards
Safety of Surveyor
EU
PT GBS

Project teams in detail

Safe Digital Transformation Panel - 5 Project teams

PT PC02	Computer-based systems (UR E22)
PT PC06	Ship data quality
PT PC07	Compliance with UR E26 and E27
PT PC09	Cyber security controls
PT EMA01	Autonomous systems

Environmental Panel – 2 Project teams

PT PE05	Implementation of IMO SEEMP/CII
PT PE06	Implementation of the BWM Conv.

Hull Panel – 7 Project teams

PT PH32	CSR Maintenance Team
PT PH47	Stress criteria for Type C tanks
PT PH48	Anchoring for small vessels
PT PH49	Wave loads
PT PH50	New corrosion additions and CA
PT PH51	Securing of Containers at deck
PT PH52	CSR buckling of curved panels

Machinery Panel – 7 Project teams

PT PM26	IGF development
PT PM41	Shaft alignment investigations
PT PM43	Revision of UR M78
PT PM44	I.C Engine approval and inspection
PT PM46	Machinery Piping Systems
PT PM47	Earthing guidelines for ships and MODU
PT PM48	Anchor windlass, bow anchor winch

Safe Decarbonisation Panel – 5 Project teams

PT PD01	Ammonia as fuel
PT PD02	Hydrogen as fuel
PT PD03	Carbon capture & storage technologies
PT PD04	Use of novel batteries
PT PD05	Gas dispersion analysis
PT PD06	Nuclear power

Safety Panel – 8 Project teams

PT PS42	UR F44 to include chemical tankers
PT PS43	Underwater Noise
PT PS45	Develop text for SOLAS II-2/9
PT PS49	Intact stability with WAPS (Wind Assisted Propulsion Systems)
PT PS50	Mitigating fire risk on containerships
PT PS51	Revision of IACS Rec 99
PT PS52	Safe Return to Port concept
PT PS53	GBS requirements for LSA

Survey Panel – 3 Project team

PT PSU42	Revision of Model Course 3.05
PT PSU43	Revisit and Update of IACS UI GC 12
PT PSU44	Location of survey requirements

EG- Formal Safety Assessment – 1 Project team

PT GISIS	Examination and Testing of new GISIS MCI module

EG-Goal Based Standards – 1 Project team

PT GBS	GBS Maintenance

EG-M&W – 2 Project teams

PT EMW02	Guidelines for Additive Manufacturing
PT EMW03	Recommendation for ECA procedure

IACS Class Report 2024

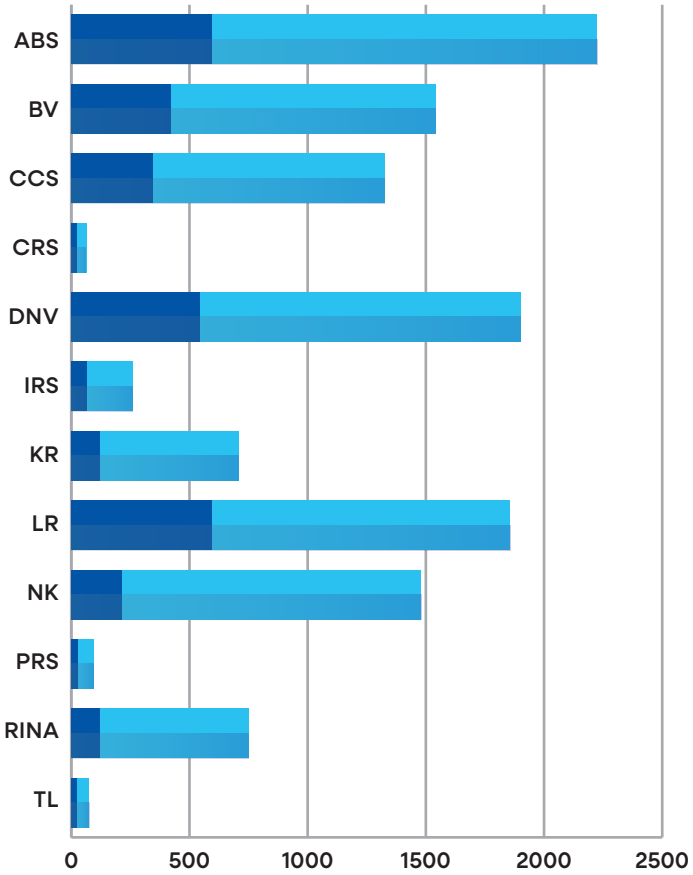
IACS Class Report 2024

Classed fleet figures include ocean-going self-propelled ships of 100 GT and over, excluding fishing vessels, military vessels and pleasure craft, with dual classed ships counted at 100%

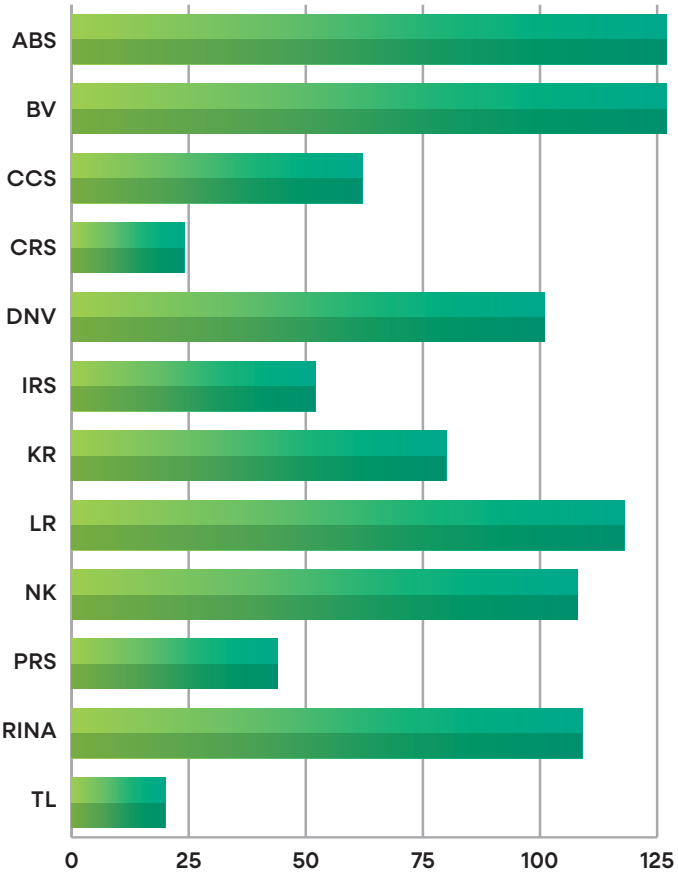
Number of surveyors[1]

Exclusive plan approval engineers

Exclusive surveyors involved in surveys on ships



Number of recognising flag State authorities[2]



Notes

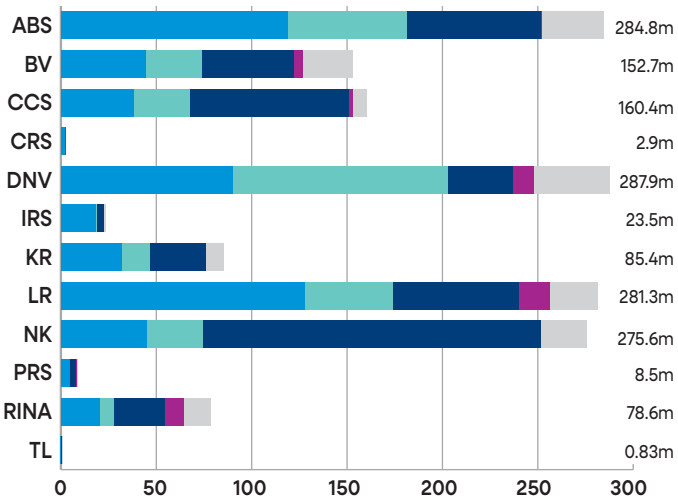
1 Combined total number of surveyors, consisting of the number of exclusive plan approval engineers (RO Code A1.1.2 Plan approval staff are the personnel authorised to carry out design assessment and to conclude whether compliance has been achieved), and the number of exclusive surveyors involved in surveys on ships (RO Code A1.1.1 Survey staff are the personnel authorised to carry out surveys (in operation and under construction), and to conclude whether or not compliance has been achieved).

2 Number of recognising flag State authorities means number of RO agreements with flag States, with general or standing authorisation to act on their behalf for any statutory certificate.

3 The total of IACS Members' figures is in excess of the Lloyd's List Intelligence global figure as each IACS Member counts dual classed ships at 100%.

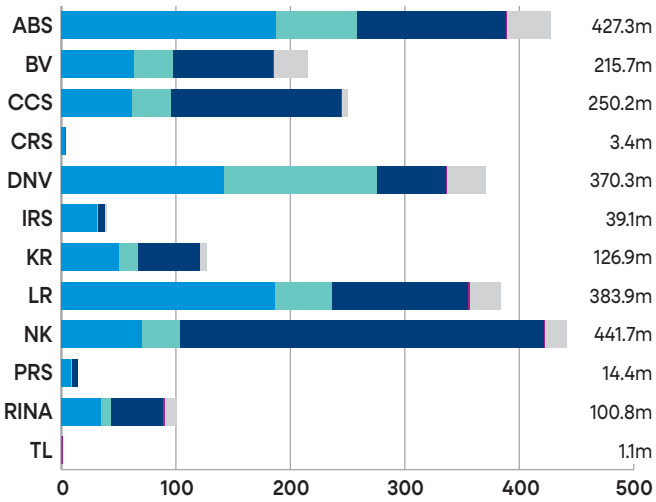
Total gross tonnage by type[3]

Tankers (crude, product & gas) # Container vessels # Dry bulk # Passenger vessels (over 12 pax) # Other ship types



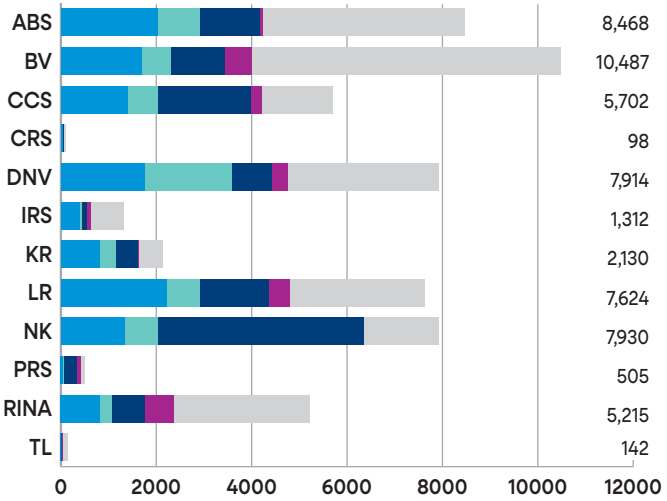
Total deadweight by type[3]

Tankers (crude, product & gas) # Container vessels # Dry bulk # Passenger vessels (over 12 pax) # Other ship types



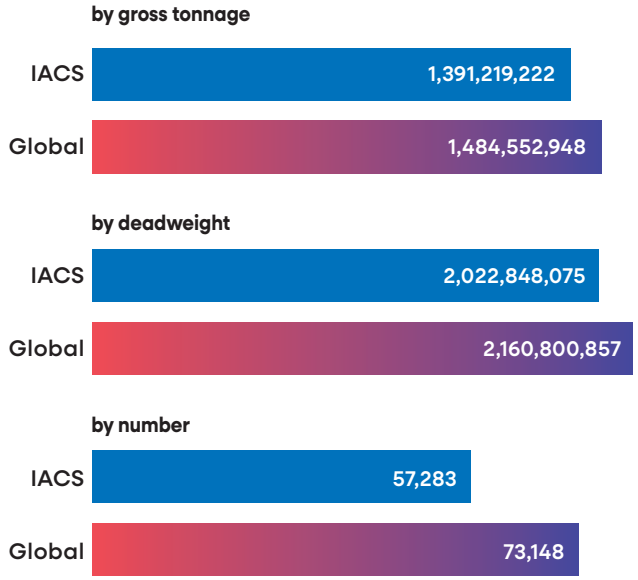
Total number of vessels by type[3]

Tankers (crude, product & gas) # Container vessels # Dry bulk # Passenger vessels (over 12 pax) # Other ship types



IACS fleet compared to global fleet

*Source: Lloyd's List Intelligence



IACS Publications

IACS's pivotal role in driving maritime innovation through comprehensive IACS resolutions

IACS resolutions encompass a wide range of class and regulatory matters relevant to the maritime industry. By providing a comprehensive scope of "Technical Resolutions", IACS facilitates the safe adoption of technological innovations while addressing class, regulatory, and operational dimensions.

The International Association of Classification Societies (IACS) plays a key role in advancing safety, innovation, and sustainability in the maritime industry. By updating and creating technical resolutions, IACS addresses new challenges in technology, regulations, and operations. This ongoing work ensures relevance and demonstrates IACS's leadership in shaping a safer, more efficient, and environmentally friendly maritime sector.

The selection below represents only a small sample of the work undertaken in 2024 and highlights IACS' activity across the maritime sphere. A list of all IACS Resolutions amended or developed in 2024 can be found in Appendix I.

Conducting Commissioning Testing of Ballast Water Management Systems

IACS introduced Recommendation 180 in April 2024, a detailed framework for conducting commissioning tests of Ballast Water Management Systems (BWMS). This initiative represents a significant contribution to environmental protection and compliance with international maritime regulations. Ballast water, essential for ship stability, can inadvertently transfer harmful aquatic organisms and invasive species, threatening marine ecosystems. Effective management of ballast water is vital to mitigate these risks, and BWMS plays a key role in ensuring that water discharged from ships meets strict environmental standards. The recommendation builds on the International Maritime Organization's (IMO) 2020 guidance, offering a uniform approach to verifying that discharged ballast water complies with the D-2 standard under the Ballast Water Management (BWM) Convention.

The recommendation emphasises the importance of commissioning tests, conducted during initial or additional surveys after significant changes or repairs to the BWMS. These tests validate the system's ability to properly treat ballast water, assessing the operation of mechanical, chemical, physical, and biological components. Properly conducted tests help prevent ecological damage caused by the spread of non-native species.

Rec.180 includes practical guidance and best practices for ship operators to prepare for and execute commissioning tests effectively. It introduces standardised reporting forms, enhancing transparency and ensuring that all stakeholders, including regulators and industry participants, are informed and engaged in the process.

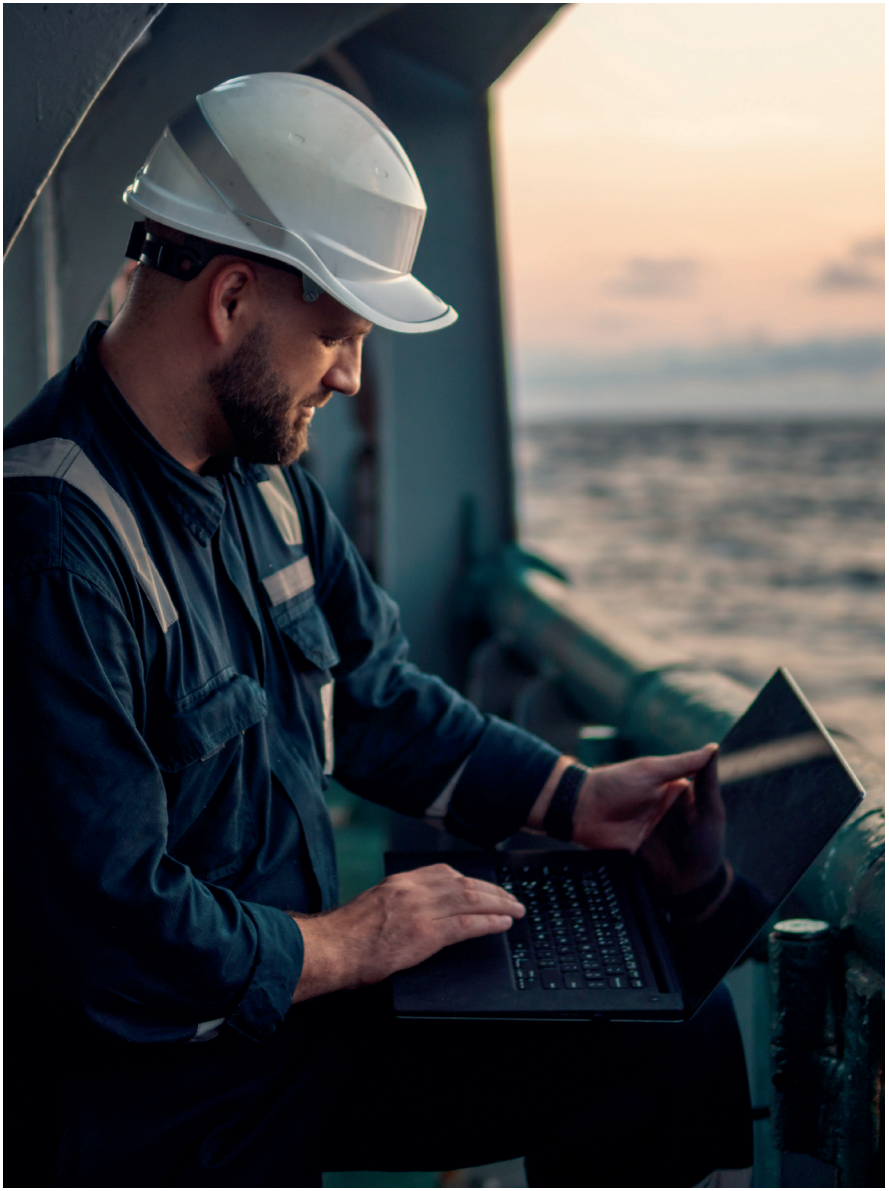
This initiative highlights IACS's commitment to safeguarding marine ecosystems by supporting the seamless and consistent implementation of international regulations. By adopting Rec.180, the maritime industry can enhance its ability to manage ballast water sustainably, reduce environmental risks, and establish a foundation for best practices in this critical area.

Enhance cargo securing systems on container ships

In response to growing concerns over containers lost at sea, IACS has adopted two new Unified Requirements: UR C6 and UR C7 in May 2024, designed to enhance cargo securing systems on container ships.

UR C6, Requirements for Lashing Software, focuses on the use of advanced lashing software to optimise cargo securing, reducing the risk of containers shifting or being lost during transit. This software

“By updating and creating technical resolutions, IACS addresses new challenges in technology, regulations, and operations.”



will now be required on all newly built container ships, ensuring uniform performance standards and providing reliable tools for safe cargo stowage.

UR C7, complements this by establishing minimum requirements for the approval and certification of container securing systems, including fixed and portable fittings, structural plans, and safety access designs. Together, these rules aim to improve safety for ships, cargo, and personnel while protecting the marine environment.

Both requirements will apply to ships contracted for construction on or after July 1, 2025, marking a significant step forward in safer container shipping practices.

With these new measures, IACS emphasises its dedication to maritime safety, reducing accidents, and protecting the marine environment.

Type approval testing of synthetic materials for aftmost propeller shaft bearings

Recognising that synthetic materials are increasingly being used alongside traditional woods and white metals for aftmost propeller shaft bearings, a new Unified Requirement, UR M85, was introduced in November 2024 to provide the maritime industry with its first comprehensive technical guidelines for the type approval testing of synthetic materials used in aftmost propeller shaft bearings. These bearings are crucial to a vessel’s propulsion system, playing an essential role in ensuring long-term operational safety and efficiency.

The new UR addresses a significant gap in maritime standards by establishing a detailed framework for safety, reliability, and performance benchmarks. UR M85 emphasises a structured approach to type approval testing, mandating a thorough description of each product, the precise selection of test samples, and specific testing conditions. It sets stringent compliance requirements for material properties, ensuring that both non-elastomeric and elastomeric materials used in these bearings meet high standards for tensile strength, elongation, and metal adhesion. These criteria are critical for maintaining material integrity and performance across diverse operating conditions.

The requirement mandates that all testing be conducted in ISO/IEC 17025-accredited laboratories to guarantee reliability and adherence to the highest quality standards. It also prescribes rigorous wear testing procedures that align with ASTM G77-17 or equivalent standards. These procedures involve strict parameters for shaft material, lubrication type, and testing duration to ensure consistent and accurate wear data.

Furthermore, testing must replicate real-world operational conditions by regulating environmental factors such as temperature, humidity, and the use of substitute ocean water, ensuring materials are resilient under actual service conditions.

Once testing and documentation are successfully completed, a Type Approval Certificate is issued by the relevant Classification Society. This certificate validates the quality and compliance of the product with IACS standards, fostering trust and confidence among shipowners and operators.

The publication of UR M85 underscores IACS's commitment to addressing operational challenges and promoting industry-wide resilience through robust technical standards. By collaborating closely with industry stakeholders, IACS aligns its guidelines with evolving technological advancements and contemporary industry needs. This initiative highlights IACS's role in driving innovative, safety-focused solutions in the maritime sector and invites designers, manufacturers, operators, and owners to integrate these standards into their practices, fostering safer and more reliable maritime operations.

Protection of internal combustion engines against crankcase explosions

To address the safety challenges introduced by alternative fuels, such as gas and low-flashpoint fuels, the revision of UR M10, Protection of internal combustion engines against crankcase explosions, was released in November 2024. While these fuels are critical to achieving sustainability goals, they bring new risks, including the increased potential for crankcase explosions. The revised requirements provide comprehensive safety measures to mitigate these risks and ensure maritime operations remain secure.

A major update in the revision is the allowance of crankcase ventilation for dual-fuel and gas engines to maintain gas concentrations below the lower explosive limit (LEL). However, this is only permitted under stringent conditions, including continuous monitoring and predefined safety measures in case of system failures. The requirements also mandate a detailed safety evaluation for engines using these fuels, confirming either that gas concentrations stay within safe limits or that explosion risks are minimised through advanced safety protocols.

The updated UR M10 highlights the importance of oil mist detection (OMD) systems, providing clear guidance for selecting sample points and validating safety system arrangements. Manufacturers are now required to supply extensive documentation demonstrating the effectiveness of their safety measures. Furthermore, engine bearing temperature monitors and equivalent devices have been formally classified as essential safety components, reinforcing the importance of robust monitoring systems.

The revision reflects a joint effort by IACS, engine manufacturers, and CIMAC experts to ensure the guidelines are practical and up to date with modern technology. As the industry moves toward alternative fuels, IACS is focused on improving safety standards to address the risks these fuels bring. The updated UR M10 introduces new requirements designed to reduce the risk of explosions and support the safe adoption of sustainable fuels.

This update strengthens safety measures for maritime operations and highlights IACS's commitment to helping the industry transition to cleaner, safer practices.

Outstanding Resolutions and Recommendations

Procedural Requirements

PR 1B
Procedure for Adding, Assigning, Maintaining or Withdrawing Double or Dual Class

PR 42
Procedure for Assigning Class for a New Building project when the design is already approved by an Initial Society (Based on the Classification Rules and a Memorandum of Understanding (MoU) Between a Class Society, a Shipyard and, if applicable, a Ship Owner)

PR 18
Transfer of Safety and Security Management Systems Certification

Unified Requirements

UR C6
Requirements for Lashing Software

UR C7
Approval and Certification of Container Securing Systems

UR M10
Protection of internal combustion engines against crankcase explosions

UR M85
Type approval testing of synthetic materials for aftmost propeller shaft bearings

Unified Interpretations

UI GF20
Arrangements of fuel tanks in methyl/ethyl alcohol fuelled vessels

UI SC304
MSC.337(91) Code on noise levels on board ships – calibration of sound instruments

UI GF21
CO_2 fire extinguishing systems in methyl/ethyl alcohol fuelled vessels' machinery spaces

Recommendations

Rec.180
Recommendation for conducting commissioning testing of Ballast Water Management Systems

Rec.181
Measurement of Underwater Radiated Noise from ships

IACS Members 2024

IACS Members

ABS
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CCS
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CRS
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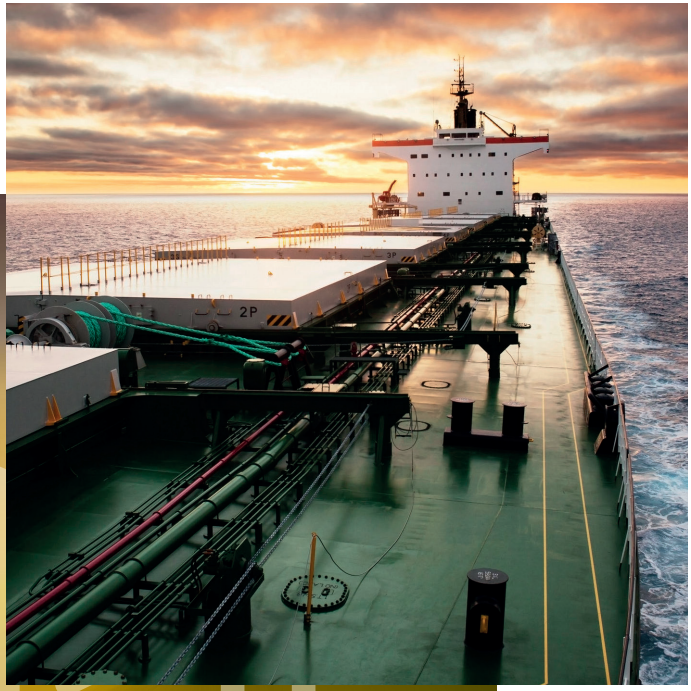

Appendices

Summaries of IACS Resolutions published in 2024

Summary of New/Revisions to IACS Unified Requirements published in 2024

New Revised Corrigenda Deleted/Withdrawn

Index	Resolution no.	Revision	Adoption	Title	Implemention Date
1	UR H1	New	Jan 2024	Control of Ammonia releases in Ammonia fuelled vessels	01-Jan-25
2	UR M78	Rev.2	Jan 2024	Reciprocating Internal Combustion Engines fuelled by Natural Gas	01-Jan-25
3	UR M3	Rev.7	Feb 2024	Speed governor and overspeed protective device	01-Jan-25
4	UR M43	Rev.1	Feb 2024	Bridge control of propulsion machinery	01-Jan-25
5	UR M47	Del	Feb 2024	Bridge control of propulsion machinery for attended machinery spaces	-
6	UR M84	New	Feb 2024	Capacity and availability of compressed air for essential services	01-Jul-25
7	UR M61	Rev.3	Feb 2024	Starting Arrangements of Internal Combustion Engines	01-Jul-25
8	UR E21	Rev.2	Feb 2024	Requirements for uninterruptible power system (UPS) units	01-Jul-25
9	CSR 2024	-	-	Common Structural Rules - Consolidated 01 Jan 2024	01-Jul-24
10	UR W8	Rev.4	Mar 2024	Hull and machinery steel castings	01-Jan-25
11	UR C6	New	May 2024	Requirements for Lashing Software	01-Jul-25
12	UR C7	New	May 2024	Approval and Certification of Container Securing Systems	01-Jul-25
13	UR Z7	Rev.29 Corr.1	May 2024	Hull Classification Survey	-
14	UR Z7.1	Rev.15 Corr.1	May 2024	Hull Surveys for General Dry Cargo Ships	-
15	UR S10	Rev.7 Corr.2	May 2024	Rudders, sole pieces and rudder horns	-
16	UR M46	Rev.4	Aug 2024	Ambient conditions – Inclinations and Ship Accelerations and Motions	01-Jan-26
17	UR E10	Rev.10	Aug 2024	Test Specification for Type Approval	01-Jan-26
18	UR Z1	Rev.10	Sep 2024	Annual and intermediate classification survey coverage of IMO Resolution A.1186(33)	-

Index	Resolution no.	Revision	Adoption	Title	Implemention Date
19	UR F44	Rev.3	Sep 2024	Fore peak ballast tanks and space arrangements on oil & chemical tankers	01-Jan-26
20	UR S35	Corr.1	Sep 2024	Buckling Strength Assessment of Ship Structural Elements	-
21	UR P4	Rev.8	Sep 2024	Production and Application of Plastic Piping Systems on Ships	01-Jan-26
22	UR Z17	Rev.19	Oct 2024	Procedural Requirements for Service Suppliers	01-Jan-26
23	UR M52	Rev.3	Nov 2024	Length of aftmost propeller shaft bearing	01-Jan-26
24	UR M85	New	Nov 2024	Type approval testing of synthetic materials for aftmost propeller shaft bearings	01-Jan-26
25	UR Z17	Rev.20	Nov 2024	Procedural Requirements for Service Suppliers	01-Jan-26
26	UR H1	Withdrawn	Nov 2024	Control of Ammonia releases in Ammonia fuelled vessels	-
27	UR M10	Rev.5	Nov 2024	Protection of internal combustion engines against crankcase explosions	01-Jan-26
28	UR M86	New	Nov 2024	Monitoring and Safety Functions for Exhaust Gas Cleaning (SOx) Systems	01-Jan-26
29	UR W24	Rev.5 Corr.1	Dec 2024	Cast Copper Alloy Propellers	-
30	UR W27	Rev.3 Corr.1	Dec 2024	Cast Steel Propellers	-

1. UR H1 (New January 2024)

UR H1 provides requirements for releases of ammonia from the onboard systems for bunkering, storing, preparing and using ammonia as fuel. It addresses normal operation as well as abnormal and emergency scenarios.

2. UR M78 (Rev.2 January 2024)

The scope of application of the UR M78 has been made to cover all types of engines (high pressure and low pressure, two stroke and four stroke, gas injection and pre-mixed gas type engine).

3. UR M3 (Rev.7 February 2024)

This revision was made to delete references in this UR to the requirements of UR M43 and UR M47 following Rev.1 of UR M43 and the deletion of UR M47.

4. UR M43 (Rev.1 February 2024)

This UR provides requirements for the bridge control systems for propulsion machinery, for attended and unattended machinery spaces. In this revision requirements existing in SOLAS II-1/49 have been removed. Additionally, it includes requirements of attended machinery spaces which were in UR M47.

5. UR M47 (Del February 2024)

UR M47 requirements are transferred to UR M43 and is therefore deleted.

6. UR M84 (New February 2024)

This UR provides requirements for the capacity and availability of compressed air required by systems, machinery and equipment providing essential services. The UR was considered necessary in order to ensure that sufficient compressed air capacity, in addition to the required starting air capacity, is ensured at all times where compressed air is essential for normal operation of the propulsion system.

7. UR M61 (Rev.3 February 2024)

This UR provides requirements for the starting arrangements of internal combustion engines. The UR has been updated to include a cross reference to the newly developed UR M84 – Capacity and availability of compressed air for essential services – to ensure that the new requirements in UR M84 relating to compressed air for essential services are also fully considered together with the requirements for engine starting.

8. UR E21 (Rev.2 February 2024)

In Rev.2 of this Resolution, the requirements for UPS are extended to other cases than alternative and transitional power, recognising widely used practice and existing usage that UPS is often utilised for continuous and uninterruptible services in the application of essential services like DP control system, AMS, BMS, etc.

9. CSR 2024

Common Structural Rules (CSR) consist of two parts. Part One provides requirements common to both double hull oil tankers and bulk carriers and Part Two provides additional requirements applied to either double hull oil tankers or bulk carriers. The consolidated version of CSR 2024 came into force on 1 July 2024.

10. UR W8 (Rev.4 March 2024)

UR W8 pertaining to hull and machinery steel castings has undergone a revision, incorporating updated requirements and clarifications regarding test block dimensions.

11. UR C6 (New May 2024)

UR C6 provides harmonised performance standards and requirements to facilitate consistent approval of lashing software. The main technical reason for the change is the absence of harmonised performance standards and guidelines required to facilitate consistent approval of lashing software.

12. UR C7 (New May 2024)

UR C7 to define the scope of approval and certification of container securing systems is developed. The main technical reason for the change is the regulatory gap among the Member Societies regarding the approval and certification of container securing systems.

13. UR Z7 (Rev.29 Corr.1 May 2024)

By this corrigendum, Para. 1.5 of this UR and its footnotes were updated due to withdrawal of UR S21A and merger of its contents into UR S21.

14. UR Z7.1 (Rev.15 Corr.1 May 2024)

By this corrigendum, Para. 1.6 of this UR and its footnotes were updated due to withdrawal of UR S21A and merger of its contents into UR S21.

15. UR S10 (Rev.7 Corr.2 May 2024)

The Rev.7 Corr.2 of UR S10 has been prepared to correct the editorial errors with respect to formulas for semi spade rudder with 2-conjugate elastic support stipulated in Annex S10.6.

16. UR M46 (Rev.4 August 2024)

Note 3 to M46.2 is updated accommodating the reference clause nos. of the IGC Code and the IBC Code that were previously specified in UI SC6 and UI SC290.

17. UR E10 (Rev.10 August 2024)

Item 8 (inclination test) is revised for the part relevant to Gas Carriers and Chemical Carrier, in alignment with Note 3 to M46.2 which is updated accommodating the reference clause nos. of the IGC Code and the IBC Code that were previously specified in UI SC6 and UI SC290. In parallel, the reference standards are also updated as per the latest and valid version.

18. UR Z1 (Rev.10 September 2024)

UR Z1 is revised as Rev.10 following the publication of the IMO Res. A.1186(33).

19. UR F44 (Rev.3 September 2024)

This UR provides requirements for fore peak ballast tanks and space arrangements on oil & chemical tankers. In Rev.3 modifications have been made to expand the application of UR F44 to chemical tankers.

20. UR S35 (Corr.1 September 2024)

An application statement in note.1 of UR S35 has been updated for further clarification.

21. UR P4 (Rev.8 September 2024)

This revision was made to add paragraph 4.6.7 in the UR as result of the changes made in UI SC299 for clarifications of (water) tightness test after a fire test of heat-sensitive bulkhead penetrations of passenger ships.

22. UR Z17 (Rev.19 October 2024)

In Rev.19 of this UR, reference was made to IACS Recommendation No.180 “Recommendation for conducting commissioning testing of Ballast Water Management Systems” in Section 18 of Annex to this UR.

23. UR M52 (Rev.3 November 2024)

The purpose of the revision is to emphasise that the bearing length application is only valid for the aftmost propeller shaft bearing, next to and carrying the propeller, to state that type approval is required for all synthetic materials for aftmost propeller shaft bearings.

24. UR M85 (New November 2024)

A new UR is developed to specify the technical requirements for type approval of synthetic materials for aftmost propeller shaft bearings.

25. UR Z17 (Rev.20 November 2024)

UR Z17 provides the procedural requirements for service suppliers. In this revision, the term related to QSCS was amended for clarity.

26. UR H1 (Withdrawn November 2024)

New UR H1 was withdrawn in November 2024 before coming into force on 1 January 2025 with the main reason being potential confusion which could arise within the industry due to the differences between the IACS UR H1 and the IMO Draft Interim Guidelines for Ships Using Ammonia as Fuel.

27. UR M10 (Rev.5 November 2024)

UR M10 was updated to address the crankcase safety for engines fuelled with gas or low flashpoint fuels and the conditions for accepting a ventilation of the crankcase.

28. UR M86 (New November 2024)

This Resolution provides the minimum requirements as regards monitoring and safety functions of exhaust gas cleaning (SOx) systems (EGCS).

29. UR W24 (Rev.5 Corr.1 December 2024)

The corrigenda include the minor edits for Table 3 and Articles 14.2, 15.

30. UR W27 (Rev.3 Corr.1 December 2024)

The corrigenda include the minor edits for Article 13.2.

Summary of New/Revisions to IACS Procedural Requirements published in 2024

New Revised Corrigenda Deleted/Withdrawn

Index	Resolution no.	Revision	Adoption	Title	Implemention Date
1	PR 1B	Rev.7	Jun 2024	Procedure for Adding, Assigning, Maintaining or Withdrawing Double or Dual Class	01-Jan-25
2	PR 42	New	Jun 2024	Procedure for Assigning Class for a New Building project when the design is already approved by an Initial Society (Based on the Classification Rules and a Memorandum of Understanding (MoU) Between a Class Society, a Shipyard and, if applicable, a Ship Owner)	01-Jan-25
3	PR 1A	Rev.10	Oct 2024	Procedure for Transfer of Class	01-Jan-26
4	PR 12	Rev.4	Oct 2024	Procedure for Statutory Certification at Change of Class without Change of Flag	01-Jan-26
5	PR 38	Rev.5	Oct 2024	Procedure for calculation and verification of the Energy Efficiency Design Index (EEDI)	01-Jan-25
6	PR 1 Annex	Rev.6	Oct 2024	Annexes to PR1A, PR1B and PR1C	01-Jan-25
7	PR 32	Rev.2	Nov 2024	Procedure for handling technical questions regarding the IACS CSR	-
8	PR 1A	Rev.11	Nov 2024	Procedure for Transfer of Class	01-Jan-26
9	PR 1B	Rev.8	Nov 2024	Procedure for Adding, Assigning, Maintaining or Withdrawing Double or Dual Class	01-Jan-26
10	PR 1C	Rev.7	Nov 2024	Procedure for Suspension and Reinstatement or Withdrawal of Class in Case of Surveys or Conditions of Class Going Overdue	01-Jan-26
11	PR 1D	Rev.3	Nov 2024	Procedure for Class Entry of Ships not subject to PR1A or PR1B	01-Jan-26
12	PR 12	Rev.5	Nov 2024	Procedure for Statutory Certification at Change of Class without Change of Flag	01-Jan-26
13	PR 41	Rev.1	Nov 2024	Reporting on existence of asbestos on board	01-Jan-26
14	PR 42	Rev.1	Nov 2024	Procedure for Assigning Class for a New Building project when the design is already approved by an Initial Society (Based on the Classification Rules and a Memorandum of Understanding (MoU) Between a Class Society, a Shipyard and, if applicable, a Ship Owner)	01-Jan-26

15	PR 9	Rev.5	Dec 2024	Procedural Requirements for ISM Code Certification	01-Jan-26
16	PR 17	Rev.3	Dec 2024	Reporting on deficiencies possibly affecting the implementation of the ISM Code on board	01-Jan-26
17	PR 18	Rev.2	Dec 2024	Transfer of Safety and Security Management Systems Certification	01-Jan-26
18	PR 24	Rev.3	Dec 2024	Procedural Requirements for ISPS Code Certification	01-Jan-26
19	PR 36	Rev.1	Dec 2024	Transfer of Maritime Labour Convention, 2006 Certification	01-Jan-26
20	PR 40	Rev.2	Dec 2024	Procedural Requirements for MLC, 2006 Certification	01-Jan-26

1. PR 1B (Rev.7 June 2024)

This procedure contains procedures and requirements pertaining to adding, maintaining or withdrawing a double or dual class and is applicable, unless stated otherwise, to vessels of over 100 GT of whatever type, self propelled or not, restricted or unrestricted service, except for "inland waterway" vessels. The obligations of this Procedure apply to Classification Societies which are subject to verification of compliance with QSCS. In this revision, the process for submission and approval of the plans for new construction of dual class ships is specified and plans to be approved, as a minimum scope, by the Second Society was clarified. Furthermore, a model format of the Trilateral Agreement to be made by the involved parties for the new construction of dual class ships was introduced as an annex to this PR to demonstrate a minimum content to be included in the said Agreement.

2. PR 42 (New June 2024)

In this PR, the process to assign the class for new building projects based on the Memorandum of Understanding (MoU) by the Society is specified when the design is already approved by another Society. Minimum scopes of plans to be approved by the Society, with which the ship is to be constructed and classed, is also clarified. Furthermore, a model format of the Memorandum of Understanding (MoU) to be made by the involved parties for the said new building projects was introduced as an annex to this PR to demonstrate a minimum content to be included in the said MoU.

3. PR 1A (Rev.10 October 2024)

This revision is to add New Para. C7 under Section C7 to require submission of the additional plans/documents for passenger ships.

4. PR 12 (Rev.4 October 2024)

This revision is to harmonise the requirement of this PR with PR 28 regarding submission/provision of the documentation for approval of an exemption.

5. PR 38 (Rev.5 October 2024)

Rev.5 of the PR was issued to enhance clarity on two specific matters. First, it addresses potential misinterpretation of the 1% accuracy margin permitted in previous versions when rounding attained/required EEDI calculated values. Second, it offers additional guidance to clarify the classification of cement carriers within ship type categories under the EEDI requirements.

6. PR 1 Annex (Rev.6 October 2024)

This PR provides annexes to PR 1A, PR 1B and PR 1C. This revision is to keep consistency on use of terms used in PR 1A and this Annex.

7. PR 32 (Rev.2 November 2024)

This PR provides procedure for handling technical questions regarding the IACS CSR. This revision is to clarify the issue of validity of QSCS SoC and CS compliance with QSCS, the term "QSCS" is identified and aligned with the proposed changes to Sec.5 of Annex 1 to IACS Procedures, Vol.3.

8. PR 1A (Rev.11 November 2024)

PR 1A provides the procedure for the Transfer of Class. In this revision, the term related to QSCS was amended for clarity.

9. PR 1B (Rev.8 November 2024)

PR 1B provides the procedure for adding, assigning, maintaining or withdrawing double or dual class. In this revision, the term related to QSCS was amended for clarity.

10. PR 1C (Rev.7 November 2024)

PR 1C provides the procedure for suspension and reinstatement or withdrawal of class in case of surveys or conditions of class going overdue. In this revision, the term related to QSCS was amended for clarity.

11. PR 1D (Rev.3 November 2024)

PR 1D provides the procedure for class entry of ships not subject to PR 1A or PR 1B. In this revision, the term related to QSCS was amended for clarity.

12. PR 12 (Rev.5 November 2024)

PR 12 provides procedure for statutory certification at change of Class without change of Flag. In this revision, the term related to QSCS was amended for clarity.

13. PR 41 (Rev.1 November 2024)

PR 41 provides procedure requirement for reporting on existence of asbestos on board. In this revision, Para. 2.3, which was deemed self-explanatory, has been deleted.

14. PR 42 (Rev.1 November 2024)

In this PR, the process to assign the class for new building projects based on the Memorandum of Understanding (MoU) by the Society is specified when the design is already approved by another Society. Minimum scopes of plans to be approved by the Society, with which the ship is to be constructed and classed, is also clarified. Furthermore, a model format of the Memorandum of Understanding (MoU) to be made by the involved parties for the said new building projects was introduced as an annex to this PR to demonstrate a minimum content to be included in the said MoU. In Rev.1, the term related to QSCS was amended for clarity.

15. PR 9 (Rev.5 December 2024)

Due to modification of Sec.5 of Annex 1 to IACS Procedures, Vol.3, wording "societies holding a QSCS certificate" is replaced by "societies subject to verification of compliance with QSCS in accordance with Section 5 of Annex 1 to the QSCS".

16. PR 17 (Rev.3 December 2024)

Due to modification of Sec.5 of Annex 1 to IACS Procedures, Vol.3, wording “societies holding a QSCS certificate” is replaced by “societies subject to verification of compliance with QSCS in accordance with Section 5 of Annex 1 to the QSCS”.

17. PR 18 (Rev.2 December 2024)

Following the modification of Sec.5 of Annex 1 to IACS Procedures, Vol.3 text in paragraph 5.0 is aligned with modified chapter titles in Sec.5 of Annex 1 to IACS Procedures, Vol.3.

18. PR 24 (Rev.3 December 2024)

Due to modification of Sec.5 of Annex 1 to IACS Procedures, Vol.3, wording “societies holding a QSCS certificate” is replaced by “societies subject to verification of compliance with QSCS in accordance with Section 5 of Annex 1 to the QSCS”.

19. PR 36 (Rev.1 December 2024)

Due to modification of Sec.5 of Annex 1 to IACS Procedures, Vol.3, wording “societies holding a QSCS certificate” is replaced by “societies subject to verification of compliance with QSCS in accordance with Section 5 of Annex 1 to the QSCS”.

20. PR 40 (Rev.2 December 2024)

Due to modification of Sec.5 of Annex 1 to IACS Procedures, Vol.3, wording “societies holding a QSCS certificate” is replaced by “societies subject to verification of compliance with QSCS in accordance with Section 5 of Annex 1 to the QSCS”.

Summary of New/Revisions to IACS Unified Interpretations published in 2024

New Revised Corrigenda Deleted/Withdrawn

Index	Resolution no.	Revision	Adoption	Title	Implemention Date
1	UI SC249	Rev.2	Jan 2024	Implementation of SOLAS II-1, Regulation 3-5 and MSC.1/Circ.1379	01-Jan-25
2	UI SC266	Del	Feb 2024	Revised guidelines for cargo securing manual and code of safe practice for cargo stowage and securing – scope of application	-
3	UI SC301	New	May 2024	SOLAS Regulations II-2/9.7.2 and 9.7.5.1 – Separation of ducts from spaces	01-Jul-25
4	UI SC89	Rev.5	May 2024	Ventilation of Cargo Spaces	01-Jan-25
5	UI SC276	Rev.1	May 2024	Escape from machinery spaces on passenger ships	01-Jul-25
6	UI SC277	Rev.1	May 2024	Escape from machinery spaces on cargo ships	01-Jul-25
7	UI LL62	Rev.1 Corr.2	Jun 2024	Side Scuttles, Windows and Skylights	-
8	UI SC302	New	May 2024	Interpretation of SOLAS Regulation II-2/11.4.1 Pertaining to Crowns of Machinery Spaces of Category A	01-Jul-25
9	UI GF20	New	Jun 2024	Arrangements of fuel tanks in methyl/ethyl alcohol-fuelled vessels	01-Jul-25
10	UI SC156	Rev.3	Jul 2024	Doors in watertight bulkheads of cargo ships and passenger ships	01-Jul-25
11	UI SC303	New	Jul 2024	Harmonisation of Industrial Personnel Safety Certificate with SOLAS Safety Certificates	01-Jul-25
12	UI MPC131	New	Jul 2024	Unified Interpretation on the application of the amendments to Appendix IX of MARPOL Annex VI adopted by MEPC.385(81)	01-Nov-24
13	UI SC211	Rev.1	Sep 2024	Protection of fuel oil tanks and designation of fore peak spaces	01-Jan-26
14	UI SC99	Rev.2 Corr.1	Sep 2024	Flexible bellows of combustible materials	-
15	UI SC304	New	Oct 2024	MSC.337(91) Code on noise levels on board ships – calibration of sound instruments	01-Jul-26
16	UI SC259	Rev.1 Corr.2	Oct 2024	For Application of SOLAS Regulation II-1/3-11 Performance Standard for Protective Coatings for Cargo Oil Tanks of Crude Oil Tankers (PSPC-COT), adopted by Resolution MSC.288(87)	-

17	UI GF21	New	Oct 2024	CO2 fire extinguishing systems in methyl/ethyl alcohol-fuelled vessels' machinery spaces	01-Jan-26
18	UI SC306	New	Nov 2024	Valve piercing ship's collision bulkhead	01-Jan-26
19	UI SC307	New	Nov 2024	Hydrocarbon Gas Detection and Bilge High Level Alarms in Cargo Pump Rooms	01-Jan-26
20	UI SC4	Del	Nov 2024	Emergency source of electrical power	-
21	UI SC5	Del	Nov 2024	Emergency source of electrical power in passenger ships	-
22	UI SC269	Rev.2	Nov 2024	Means of escape from the steering gear space in cargo ships	01-Jan-26
23	UI SC11	Rev.2	Nov 2024	Precautions against shock, fire and other hazards of electrical origin	01-Jan-26
24	UI SC190	Rev.2	Nov 2024	Application of SOLAS Regulation II-1/3-6 (Res MSC.134(76)) and Technical Provisions on Permanent Means of Access (Res MSC.133(76))	01-Jul-25
25	UI SC191	Rev.9	Nov 2024	IACS Unified Interpretations (UI) SC 191 for the application of amended SOLAS regulation II-1/3-6 (Res MSC.151(78)) and revised Technical provisions for means of access for inspections (Res MSC.158(78))	01-Jul-25
26	UI SC305	New	Dec 2024	Single essential propulsion components and their reliability	01-Jan-26

1. UI SC249 (Rev.2 January 2024)

UI SC 249 provides clarification regarding the application of SOLAS II-1, Reg. 3-5 and MSC .1/Circ.1379 with respect to "new installation of materials which contain asbestos". Revision 2 considers recent amendments to IMO regulatory framework and editorial changes.

2. UI SC266 (Del February 2024)

UI SC266 was deleted since the text of interpretation is duly considered in the revised IMO circulars MSC.1/Circ.1352 or MSC.1/Circ.1353.

3. UI SC301 (New May 2024)

UI SC301 has been developed with a view to providing clarity on the application of the SOLAS Ch II-2 regulations 9.7.2 and 9.7.5.1 regarding separation of ducts from spaces, after it was raised in the industry for causing concerns with ambiguous applicability.

4. UI SC89 (Rev.5 May 2024)

This UI provides requirements for ventilation of cargo spaces. In addition to the requirements of Rev.4, this revision provides the ventilation requirement for DIRECT REDUCED IRON (D) (By-product fines with moisture content of at least 2%) that had been newly introduced in the IMSBC Code (Amendment 07-23) additional to the requirements provided by Rev.4.

5. UI SC276 (Rev.1 May 2024)

This UI provides unified interpretations of vague requirements for means of escape in machinery spaces on passenger ships as required by SOLAS II-2/13.4.1. Revision 1 clarifies the term "safe position".

6. UI SC277 (Rev.1 May 2024)

This UI provides unified interpretations of vague requirements for means of escape in machinery spaces on cargo ships as required by SOLAS II-2/13.4.2. Revision 1 clarifies the term “safe position”.

7. UI LL62 (Rev.1 Corr.2 June 2024)

This UI provides unified interpretations of Regulation 23 of Annex I of Chapter II of the Load Lines Convention, 1966, pertaining to side scuttles, windows and skylights. Correction 2 removes a previous footnote to interpretation (7) and editorially amends the UI to an updated template.

8. UI SC302 (New May 2024)

This UI provides an interpretation for the term crowns as used in SOLAS regulation II-2/11.4.1.

9. UI GF20 (New June 2024)

This UI provides interpretation of the provisions in MSC.1/Circ.1621 (Para 5.3) concerning the arrangements of fuel tanks in methyl/ethyl alcohol-fuelled vessels.

10. UI SC156 (Rev.3 July 2024)

UI SC156 Rev.3 has been published as a consequence of these recently published IMO instruments: MSC.474(102), MSC.491(104), MSC.492(104), MEPC.343(78), MEPC.345(78), MSC.526(106).

11. UI SC303 (New July 2024)

This UI clarifies how the IP Safety Certificate should be harmonised with SOLAS Safety Certificates.

12. UI MPC131 (New July 2024)

This UI provides an interpretation of the amendments to Appendix IX of MARPOL Annex VI adopted by MEPC.385(81) to ensure the uniform application of these amendments, whether implemented early or not, maintaining a consistent level of reported data granularity throughout the calendar year and thereby preventing varying levels of granularity within the ship’s data collected and reported for the same year. This UI also provides additional guidance to ensure that, following the entry into force of the amendments or the early implementation provisions, the SEEMP is revised in a timely manner.

13. UI SC211 (Rev.1 September 2024)

This UI provides interpretation of regulations 3.6 and 4.5.1.1 of SOLAS Chapter II-2 and paragraphs 1.3.6 and 3.2.1 of the International Code for the Construction and Equipment of Ships Carrying Dangerous Chemicals in Bulk (IBC Code). In Rev.1 of the UI, modifications have been made to align this UI with the amendments to UR F44 in its Rev.3.

14. UI SC99 (Rev.2 Corr.1 September 2024)

This UI serves to interpret the wording “short ducts, not generally exceeding 2 m in length” in SOLAS Reg. II-2/9.7.1.1 in connection with flexible bellows of combustible materials. Corrigendum 1 takes into account resolution MSC.365(93).

15. UI SC304 (New October 2024)

This UI provides interpretation on MSC.337(91) Code regarding noise levels on board ships – calibration of sound instruments. Calibration of sound level meter and accompanying field calibrator shall be made in a uniform way by laboratories worldwide, documenting that the same instruments continue to satisfy the accuracy requirements of MSC.337(91).

16. UI SC259 (Rev.1 Corr.2 October 2024)

UI SC259 Rev.1 Corr.2 provides interpretations requirements for the terminology used in in IMO resolution MSC.288(87), as amended by Res. MSC.558(107).

17. UI GF21 (New October 2024)

This UI provides interpretation of the provisions in MSC.1/Circ.1621 concerning the use of CO2 fire extinguishing systems in methyl/ethyl alcohol-fuelled vessels' machinery spaces and fuel preparation spaces.

18. UI SC306 (New November 2024)

This UI clarifies the allowable arrangements of valves piercing ship's collision bulkhead with regard to SOLAS regulation II-1/12.6.2.

19. UI SC307 (New November 2024)

This UI clarifies the safety measures of continuous monitoring for hydrocarbon gases with detectors and bilge level monitoring devices for tanker cargo pump rooms with regard to SOLAS regulation II-2/4.5.10.

20. UI SC4 (Del November 2024)

UI SC4 is deleted under the consideration that the interpretation from 1985 is not reflecting later SOLAS amendments and may go beyond an interpretation of requirements in the regulations.

21. UI SC5 (Del November 2024)

UI SC5 is deleted under the consideration that the interpretation from 1985 is not reflecting later SOLAS amendments and may go beyond an interpretation of requirements in the regulations.

22. UI SC269 (Rev.2 November 2024)

IACS UI SC269 provides unified interpretations of SOLAS regulation II-2/13.4.2.2 and 13.4.3.2 relating to means of escape from the steering gear space in cargo ships. Revision 2 clarifies that the conditions for the provision of one means of escape should apply regardless of the ship's size.

23. UI SC11 (Rev.2 November 2024)

This UI refers to "other high fire risk areas" mentioned in SOLAS II-1/Reg.45.5.3, which does not provide a determination of "other high fire risk areas". This Rev.2 was updated to clarify the definition of this term.

24. UI SC190 (Rev.2 November 2024)

In Rev.2 of this UI, intervals of periodic inspections of the permanent means of access were clarified together with other vague points included in interpretations on Para. 2.3 of SOLAS regulation II-1/3-6.

25. UI SC191 (Rev.9 November 2024)

In Rev.9 of this UI, intervals of periodic inspections of the permanent means of access were clarified together with other vague points included in interpretations on Para. 2.3 of SOLAS regulation II-1/3-6.

26. UI SC305 (New December 2024)

This UI provides a unified interpretation of requirements in SOLAS regulation II-1/26.2, with a view to facilitating its consistent and global implementation.

Summary of New/Revisions to IACS Recommendations published in 2024

New Revised Corrigenda Deleted/Withdrawn

Index	Resolution no.	Revision	Adoption	Title	Implemention Date
1	Rec 27	Rev.2	Feb 2024	List of minimum recommended spare parts for each type of auxiliary internal combustion engine driving electric generators for essential services on board ships for unrestricted service	-
2	Rec 28	Rev.2	Feb 2024	List of minimum recommended spare parts for auxiliary steam turbines driving electric generators for essential services on board ships for unrestricted service	-
3	Rec 29	Rev.2	Feb 2024	List of minimum recommended spare parts for main steam turbines on board ships for unrestricted service	-
4	Rec 30	Rev.2	Feb 2024	List of minimum recommended spare parts for essential auxiliary machinery on board ships for unrestricted service	-
5	Rec 180	New	Apr 2024	Recommendation for conducting commissioning testing of Ballast Water Management Systems	-
6	Rec 172	Rev.1	Apr 2024	EEXI Implementation Guidelines	-
7	Rec 180	Rev.1	Nov 2024	Recommendation for conducting commissioning testing of Ballast Water Management Systems	-
8	Rec 181	New	Nov 2024	Measurement of Underwater Radiated Noise from ships	-
9	Rec 90	Rev.2	Nov 2024	Ship structure access manual	-

1. Rec 27 (Rev. 2 February 2024)

Recommendation No.27 detailed the minimum spare parts to be carried on board for auxiliary internal combustion engines driving electric generators for essential services on board ships for unrestricted service applications. Following feedback from industry suggesting that the IACS Recommendations for spare parts are out of date, with particular mention of Rec. 26 for main engine spares, Rev.2 revised all of the Recommendations related to spare parts and recommends a risk-based approach to determination of the minimum spare parts to be carried on board and the detailed lists of spare parts are retained as examples only.

2. Rec 28 (Rev. 2 February 2024)

Recommendation No.28 detailed the minimum spare parts to be carried on board for auxiliary steam turbines driving electric generators for essential services of ships for unrestricted service applications. Following feedback from industry suggesting that the

IACS Recommendations for spare parts are out of date, with particular mention of Rec. 26 for main engine spares, Rev.2 revised all of the Recommendations related to spare parts and recommend a risk-based approach to determination of the minimum spare parts to be carried on board and the detailed lists of spare parts are retained as examples only.

3. Rec 29 (Rev. 2 February 2024)

Recommendation No.29 detailed the minimum spare parts to be carried on board for main steam turbines of ships for unrestricted service. Following feedback from industry suggesting that the IACS Recommendations for spare parts are out of date, with particular mention of Rec. 26 for main engine spares, all of the Recommendations related to spare parts have been revised in Rev.2 to recommend a risk-based approach to determination of the minimum spare parts to be carried onboard and the detailed lists of spare parts are retained as examples only.

4. Rec 30 (Rev. 2 February 2024)

Prior to this latest revision, Recommendation No.30 Rev.1 detailed the minimum spare parts to be carried on board for certain essential auxiliary machinery of ships for unrestricted service. Following feedback from industry suggesting that the IACS Recommendations for spare parts are out of date, with particular mention of Rec. 26 for main engine spares, all of the Recommendations related to spare parts have been revised in Rev.2 to recommend a risk-based approach to determination of the minimum spare parts to be carried on board and the detailed lists of spare parts are retained as examples only.

5. Rec 180 (New April 2024)

This Recommendation provides guidance for conducting commissioning tests of the Ballast Water Management Systems. (BWMS)

6. Rec 172 (Rev.1 April 2024)

These implementation guidelines have been developed by IACS in response to the Resolutions relating to EEXI. Rev.1 of the recommendation aims to leverage the implementation experiences of members regarding the application of the EEXI requirements, in order to efficiently address these issues while ensuring a harmonised implementation among the Members.

7. Rec 180 (Rev.1 November 2024)

Revision 1 incorporates two primary modifications: to align with Rev.1 of IMO Circular BWM.2/Circ.61; and to delete the size classification in Table 1 for “Single Turnover Active Fluorometry (STAF)”.

8. Rec 181 (New November 2024)

This recommendation aims to harmonise the methods used to measure, analyse and report underwater radiated noise from ships amongst IACS Members, ensuring consistency and comparability across different class notations.

9. Rec 90 (Rev.2 November 2024)

In Rev.2 of this recommendation, updates were made to keep consistency with Rev.9 of UI SC190 and Rev.2 of UI SC191.

Appendix II – Summaries of IACS Members' Class Report Data 2024

ABS

	No. of vessels	Deadweight	Gross Tonnes	Total no. of surveyors	Plan approval engineers	Exclusive ship surveyors	No. of recognising flag authorities
Total Size of classed fleet	**8,468**	**427,299,791**	**284,746,824**	**2,225**	593	1,632	**127**
Tankers (crude, product & gas)	2,027	187,784,497	118,810,720				
Container vessels	895	70,156,901	62,599,524				
Dry bulk	1,253	130,321,722	70,227,175				
Passenger vessels (over 12 pax)	44	297,507	320,760				
Other ship types	4,249	38,739,164	32,788,645				

BV

	No. of vessels	Deadweight	Gross Tonnes	Total no. of surveyors	Plan approval engineers	Exclusive ship surveyors	No. of recognising flag authorities
Total Size of classed fleet	**10,487**	**215,655,869**	**152,697,929**	**1,539**	422	1,117	**127**
Tankers (crude, product & gas)	1,682	63,614,882	44,186,209				
Container vessels	616	33,549,621	29,521,265				
Dry bulk	1,150	87,477,769	48,220,759				
Passenger vessels (over 12 pax)	549	711,602	4,911,825				
Other ship types	6,490	30,301,995	25,857,871				

CCS

	No. of vessels	Deadweight	Gross Tonnes	Total no. of surveyors	Plan approval engineers	Exclusive ship surveyors	No. of recognising flag authorities
Total Size of classed fleet	**5,702**	**250,216,868**	**160,425,358**	**1,327**	343	984	**62**
Tankers (crude, product & gas)	1,402	61,309,928	37,987,000				
Container vessels	626	34,079,849	29,758,417				
Dry bulk	1,960	148,837,454	83,346,861				
Passenger vessels (over 12 pax)	220	457,938	1,914,225				
Other ship types	1,494	5,531,699	7,418,855				

CRS

	No. of vessels	Deadweight	Gross Tonnes	Total no. of surveyors	Plan approval engineers	Exclusive ship surveyors	No. of recognising flag authorities
Total Size of classed fleet	**98**	**3,352,214**	**2,280,157**	**63**	24	39	**24**
Tankers (crude, product & gas)	36	2,808,573	1,705,551				
Container vessels	2	13,561	16,411				
Dry bulk	15	511,557	440,637				
Passenger vessels (over 12 pax)	15	5,425	46,791				
Other ship types	30	13,098	70,767				

DNV

	No. of vessels	Deadweight	Gross Tonnes	Total no. of surveyors	Plan approval engineers	Exclusive ship surveyors	No. of recognising flag authorities
Total Size of classed fleet	**7,914**	**370,342,509**	**287,928,243**	**1,900**	544	1,356	**101**
Tankers (crude, product & gas)	1,759	142,394,676	89,897,084				
Container vessels	1,825	133,022,443	113,129,384				
Dry bulk	842	60,084,745	33,698,749				
Passenger vessels (over 12 pax)	329	1,089,023	11,475,478				
Other ship types	3,159	33,751,622	39,727,548				

IRS

	No. of vessels	Deadweight	Gross Tonnes	Total no. of surveyors	Plan approval engineers	Exclusive ship surveyors	No. of recognising flag authorities
Total Size of classed fleet	**1,312**	**39,099,483**	**23,517,532**	**260**	65	195	**52**
Tankers (crude, product & gas)	398	30,717,411	18,088,461				
Container vessels	37	1,100,735	865,264				
Dry bulk	114	6,107,348	3,330,162				
Passenger vessels (over 12 pax)	64	27,416	103,250				
Other ship types	699	1,146,574	1,130,395				

KR

	No. of vessels	Deadweight	Gross Tonnes	Total no. of surveyors	Plan approval engineers	Exclusive ship surveyors	No. of recognising flag authorities
Total Size of classed fleet	**2,130**	**126,886,166**	**85,435,687**	**709**	120	589	**80**
Tankers (crude, product & gas)	813	50,106,585	31,727,901				
Container vessels	329	16,938,157	15,023,901				
Dry bulk	480	53,923,286	28,904,391				
Passenger vessels (over 12 pax)	10	50,226	171,352				
Other ship types	498	5,867,912	9,608,142				

LR

	No. of vessels	Deadweight	Gross Tonnes	Total no. of surveyors	Plan approval engineers	Exclusive ship surveyors	No. of recognising flag authorities
Total Size of classed fleet	**7,624**	**383,894,909**	**281,253,251**	**1,857**	593	1,264	**118**
Tankers (crude, product & gas)	2,210	186,463,239	127,685,301				
Container vessels	711	49,879,491	46,333,433				
Dry bulk	1,446	118,589,613	65,764,603				
Passenger vessels (over 12 pax)	435	1,695,590	16,251,227				
Other ship types	2,822	27,266,977	25,218,688				

NK

	No. of vessels	Deadweight	Gross Tonnes	Total no. of surveyors	Plan approval engineers	Exclusive ship surveyors	No. of recognising flag authorities
Total Size of classed fleet	**7,930**	**441,657,111**	**275,617,718**	**1,480**	214	1,266	**108**
Tankers (crude, product & gas)	1,327	70,249,887	44,679,924				
Container vessels	697	32,819,798	29,862,210				
Dry bulk	4,320	318,833,934	176,717,190				
Passenger vessels (over 12 pax)	6	13,857	81,467				
Other ship types	1,580	19,739,635	24,276,927				

PRS

	No. of vessels	Deadweight	Gross Tonnes	Total no. of surveyors	Plan approval engineers	Exclusive ship surveyors	No. of recognising flag authorities
Total Size of classed fleet	**505**	**14,437,673**	**8,524,736**	**93**	28	65	**44**
Tankers (crude, product & gas)	45	8,323,174	4,360,549				
Container vessels	7	74,717	57,469				
Dry bulk	286	5,849,629	3,564,397				
Passenger vessels (over 12 pax)	63	86,966	400,757				
Other ship types	104	103,187	141,564				

RINA

	No. of vessels	Deadweight	Gross Tonnes	Total no. of surveyors	Plan approval engineers	Exclusive ship surveyors	No. of recognising flag authorities
Total Size of classed fleet	**5,215**	**100,792,281**	**78,585,182**	**751**	120	631	**109**
Tankers (crude, product & gas)	818	34,603,719	20,209,870				
Container vessels	241	8,212,330	7,856,588				
Dry bulk	696	45,702,402	26,446,711				
Passenger vessels (over 12 pax)	605	1,307,247	9,908,711				
Other ship types	2,855	10,966,583	14,163,302				

TL

	No. of vessels	Deadweight	Gross Tonnes	Total no. of surveyors	Plan approval engineers	Exclusive ship surveyors	No. of recognising flag authorities
Total Size of classed fleet	**142**	**1,075,036**	**830,973**	**75**	25	50	**20**
Tankers (crude, product & gas)	3	41,035	26,380				
Container vessels	0	0	0				
Dry bulk	10	470,936	271,245				
Passenger vessels (over 12 pax)	26	15,516	42,517				
Other ship types	103	547,549	490,831				

Classed fleet figures include ocean-going self-propelled ships of 100 GT and over, excluding fishing vessels, military vessels and pleasure craft, with dual classed ships counted at 100%.

Number of surveyors includes combined total number of surveyors, consisting of the number of exclusive plan approval engineers (RO Code A1.1.2 Plan approval staff are the personnel authorised to carry out design assessment and to conclude whether compliance has been achieved), and the number of exclusive surveyors involved in surveys of ships (RO Code A1.1.1 Survey staff are the personnel authorised to carry out surveys (in operation and under construction), and to conclude whether or not compliance has been achieved).

Number of recognising flag authorities means number of RO agreements with flags, with general or standing authorisation to act on their behalf for any statutory certificate.

Appendix III – IACS Membership Criteria

Criterion 1
Evidence that the organisation is a Classification Society as defined in Annex 4 to the IACS Charter and that it meets the requirements as detailed in the guidance for this criterion in section C I-4 of Volume 2 of the IACS Procedures.

Criterion 2
Compliance with QSCS.

Criterion 3
Demonstrated ability to develop, apply, maintain, regularly update and publish its own set of classification rules in the English language covering all aspects of the ship classification process (design appraisal, construction survey and ships-in-service periodical survey).

Criterion 4
4(a) Demonstrated ability to provide surveys of the ships under construction in accordance with the Applicant's rules and in accordance with IMO, ILO and flag State requirements.

4(b) Demonstrated ability to provide periodic surveys of ships-in-service, in accordance with the Applicant's rules and in accordance with IMO, ILO and flag State requirements.

Criterion 5
Sufficient international coverage by exclusive surveyors relative to the size of the Applicant's support of construction programmes and classed fleet in service.

Criterion 6
Documented experience that provides evidence of an Applicant's capability to assess designs for construction and/or major modification and/or ships-in-service of various types subject to any applicable IMO and ILO Convention.

Criterion 7
Significant in-house managerial, technical, support and research staff commensurate with the size of the Applicant's classed fleet and its involvement in the classification of ships under construction.

Criterion 8
Technical ability to contribute with its own staff to the work of IACS in developing minimum rules and requirements for the enhancement of maritime safety.

Criterion 9
Contribution to IACS work by the Applicant, on an ongoing basis with its own staff as described in Criterion 8 above.

Criterion 10
Compliance of classed ships with all IACS Resolutions as defined in Annex 4 to the IACS Charter.

Criterion 11
Evidence that the IMO's Maritime Safety Committee has advised in writing that the Applicant's Rules and Procedures conform to the functional requirements of the International Goal-based Ship Construction Standards for Bulk Carriers and Oil Tankers (SOLAS Reg.II-1/3-10, IMO Resolution MSC.287(87)).

Interpretative guidance in respect of the above criteria is contained in the document IACS Procedures Volume 2 – Procedures Concerning Requirements for Membership of IACS, which is published and kept updated on the IACS website.

IACS

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